Competition policy for the digital era

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Competition Policy for the digital era

Final report

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EXECUTIVE SUMMARY

CHAPTER 1: INTRODUCTION

Commissioner Vestager has asked us to explore how competition policy should evolve to continue to promote pro-consumer innovation in the digital age.

We structured our report as follows. First, we describe the digital world and what we see as the main ways in which markets function in the digital era (Chapter 2). We then outline our views of the goals of EU competition law in the digital era and the methodologies it should use (Chapter 3). Second, with this framework as background, we discuss the application of competition rules to platforms (Chapter 4) and data (Chapter 5), and we inquire whether European merger control needs an update (Chapter 6). We finally provide our conclusions.

An important caveat at the outset: we make general suggestions, but of course digital services can be very diverse and the ways they compete require, as always under competition law, a case-by-case analysis.

CHAPTER 2: DIGITISATION AND COMPETITION

We focus on three **key characteristics of the digital economy**:

a) ***Extreme returns to scale***. The cost of production of digital services is much less than proportional to the number of customers served. While this aspect is not novel as such (bigger factories or retailers are often more efficient than smaller ones), the digital world pushes it to the extreme and this can result in a significant competitive advantage for incumbents.

b) ***Network externalities***. The convenience of using a technology or a service increases with the number of users that adopt it. Consequently, it is not enough for a new entrant to offer better quality and/or a lower price than the incumbent does; it also has to convince users of the incumbent to coordinate their migration to its own services. Network effects could thus prevent a superior platform from displacing an established incumbent. The size of this "incumbency advantage" depends on a number of factors, including the possibility of multi-homing, data portability, and data interoperability.

c) ***The role of data***. The evolution of technology has made it possible for companies to collect, store, and use large amounts of data. Data is not only one of the key ingredients of Artificial Intelligence but also a crucial input to many online services, production processes, and logistics. Therefore, the ability to use data to develop new, innovative services and products is a competitive parameter whose relevance will continue to increase.

A consequence of these characteristics is the presence of strong "**economies of scope**", which favour the development of ecosystems and give incumbents a strong competitive advantage.

Indeed, experience shows that **large incumbent digital players are very difficult to dislodge**, although there is little empirical evidence of the efficiency cost of this difficulty. From a competition policy point of view, there is also a reasonable concern that dominant digital firms have strong incentives to engage in anti-competitive behaviour. All these factors heavily influence the forms that competition takes in the digital economy; they require vigorous competition policy enforcement and justify adjustments to the way competition law is applied.

CHAPTER 3: GOALS AND METHODOLOGIES OF EU COMPETITION LAW IN THE DIGITAL ERA

There is no need to rethink the fundamental goals of competition law in the light of the digital "revolution". Vigorous competition policy enforcement is still a powerful tool to serve the interests of consumers and the economy as a whole.

Over the last 60 years, EU competition rules have provided a solid basis for protecting competition in a broad variety of market settings**. Competition law doctrine has evolved and reacted to various challenges and changing circumstances case by case**, based on solid empirical evidence. **At the same time, the stable core principles of EU competition rules have ensured consistent enforcement**. We are convinced that the basic framework of competition law, as embedded in Articles 101 and 102 of the TFEU, continues to provide a sound and sufficiently flexible basis for protecting competition in the digital era.

However, the specific characteristics of platforms, digital ecosystems, and the data economy require established concepts, doctrines and methodologies, as well as competition enforcement more generally, to be adapted and refined.

a) ***The consumer welfare standard***. The term "consumer welfare" encompasses all "users" in a broad sense. This is particularly relevant in the digital economy, where "business users" are also affected by the practices of platforms. In a fast-changing world, we need to **rethink both the timeframe and the standard of proof** in the light of likely error costs. Also, what economists would call the "expected" impact on consumers will be too complicated to compute in many cases. Under-enforcement in the digital era is of particular concern because of the stickiness of market power caused by the factors discussed in Chapter 2. Therefore, we believe that **even where consumer harm cannot be precisely measured, strategies employed by dominant platforms aimed at reducing the competitive pressure they face should be forbidden in the absence of clearly documented consumer welfare gains**.

b) ***Market definition***. In the digital world, market boundaries might not be as clear as in the "old economy". They may change very quickly. Furthermore, in the case of multi-sided platforms, the interdependence of the "sides" becomes a crucial part of the analysis whereas the traditional role of market definition has been to isolate problems. Therefore, we argue that, in digital markets, we should put **less emphasis on analysis of market definition**, and **more emphasis on theories of harm and identification**

of anti-competitive strategies. At the same time, even if in some consumer-facing markets – according to their own account – firms compete to draw consumers into more or less comprehensive ecosystems, markets for specific products or services will persist from a consumer's perspective, and should continue to be analysed separately, alongside competition on (possible) markets for digital ecosystems. Where the firms' lock-in strategies are successful, and consumers find it difficult to leave a digital ecosystem, **ecosystem-specific aftermarkets** may need to be defined.

c) ***Measuring market power***. The assessment of market power has to be case-specific, and it must take into account insights drawn from behavioural economics about the strength of consumers' biases towards default options and short-term gratification. The assessment should also factor in all the ways in which incumbents are protected (and can protect themselves) from competition. We stress two aspects in particular. First, even in an apparently fragmented marketplace, there can be market power. This kind of market power is linked to the concept of "unavoidable trading partner" and has sometimes been called "intermediation power" in the area of platforms. Second, if data that is not available to market entrants provides a strong competitive advantage, its possession may lead to market dominance. Therefore, any discussion of market power should analyse, case by case, the access to data available to the presumed dominant firm but not to competitors, and the sustainability of any such differential access to data.

d) ***The error cost framework***. We propose that competition law should not try to work with the error cost framework on a case by case basis. Rather, competition law should try to translate general insights about error costs into legal tests. The specific characteristics of many digital markets have arguably changed the balance of error cost and implementation costs, such that some modifications of the established tests, including allocation of the burden of proof and definition of the standard of proof, may be called for. In particular, in the context of highly concentrated markets characterised by strong network effects and high barriers to entry (i.e. not easily corrected by markets themselves), one may want to **err on the side of disallowing potentially anti-competitive conducts, and impose on the incumbent the burden of proof for showing the pro-competitiveness of its conduct.** This may be true especially where dominant platforms try to expand into neighbouring markets, thereby growing into digital ecosystems, which become ever more difficult for users to leave. In such cases, there may be, for example, a presumption in favour of a duty to ensure interoperability. Such a presumption may also be justified where dominant platforms control specific competitively relevant sets of user or aggregated data that competitors cannot reproduce.

e) ***Competition law and regulation***. There is no general answer to the question of whether competition law or regulation is better placed to deal with the challenges arising from digitisation of the economy. This question can only be sensibly answered with respect to specific issues (as we do in the following chapters). Two things are clear, though. First, competition law has been designed to react to ever-changing markets. Second, competition law enforcement and regulation are not necessarily substitutes, but

most often complements and can reinforce each other. Ultimately, competition law – and in particular Article 102 TFEU – plays a useful role as a "background regime". The type of analysis that is so characteristic for competition law – namely thorough analysis of markets and market failures – can help to re-define the legal framework for the digital economy and provide important guidance to firms, the legislator, and the public debate.

CHAPTER 4: PLATFORMS

In markets where network externalities and returns to scale are strong, and especially in the absence of multi-homing, protocol and data interoperability, or differentiation, there might be room in the market for only a limited number of platforms. The consequences for competition policy are twofold. First, to provide incentives to supply goods and services on reasonable conditions and to innovate, **it is essential to protect competition "for" the market**. In this chapter, we therefore discuss the type of strategies that dominant platforms might use to limit the threat of market entry, or expand their market power into neighbouring markets, and how competition authorities should respond to them. Second, it **is equally important to protect competition on a dominant platform** (which in many cases might be the same as protecting competition "in" the market). In this respect, we argue that platforms play a form of regulatory role as they determine the rules according to which their users, including consumers, business users and providers of complementary services, interact, and, when they are dominant, have a responsibility to ensure that competition on their platforms is fair, unbiased, and pro-users.

Promoting competition for the market

In essence, the success of any attempt to challenge an incumbent will depend on the ability of a potential rival to attract a critical mass of users and thereby generate its own positive network effects. While a case-by-case analysis is always required, we believe that actions by a dominant platform that hinder rivals in doing so, or raise their costs, without constituting "competition on the merits", should be suspect under competition law. Such actions may take many different forms. We have focused our analysis on the actions that have been more frequent (or detectable) so far.

a) ***Most Favoured Nation (MFN) or best price clauses***. In the case of platforms, the suppliers of goods or services often fix the price. Hence, to protect their investment, platforms impose a requirement that goods cannot be sold through other channels at lower prices. These clauses may have both pro- and anti-competitive consequences and their effects depend on the particular characteristics of the markets. A case-by-case analysis is therefore necessary. However, **because of very strong network externalities (especially in multi-sided platforms), incumbency advantage is important and strict scrutiny is appropriate**. We believe that **any practice aimed at protecting the investment of a dominant platform should be minimal and well targeted**. If competition between platforms is sufficiently vigorous, it could be sufficient to forbid clauses that prevent sellers on a platform from price differentiating between platforms (i.e. a ban of "wide" MFNs) while still allowing clauses preventing the seller from offering lower prices on its own website ("narrow" MFNs). If competition between platforms is weak, then pressure on the dominant platforms can only come

from other sales channels (e.g. in the case of hotel booking platforms, direct sales by hotels on their own websites) and it would be appropriate to also prevent "narrow" MFNs.

b) ***Multihoming, switching, and complementary services***. In order to encourage exploration by consumers and to allow entrant platforms to attract them through the offer of targeted services, **it is key to ensure that multihoming and switching are possible and dominant platforms do not impede it**. There are many ways to restrict multihoming or make it less attractive – once again, case by case analysis is primordial. However, we believe that any measure by which a dominant firm restricts multi-homing should be suspect and such firm should bear the burden of providing a solid efficiency defence. At the same time, data regulation can also play an important role to foster multihoming, the offering of complementary services, and therefore competition. This concerns, specifically, two aspects (both discussed more in detail in the relevant data chapter): (i) **data portability**, i.e. the ability of users to transfer elsewhere the data that a platform has collected about them; and (ii) **interoperability** (in its various specifications, namely protocol interoperability, data interoperability, full protocol interoperability).

Promoting competition on the platform – platforms as regulators

As the recent economic literature has stressed, many platforms, in particular marketplaces, act as regulators, setting up the rules and institutions through which their users interact.

The fact that platforms choose rules is not a problem *per se*; we should welcome competition between different business models and different platform architectures and encourage innovation in that space — indeed, these types of innovation have allowed platforms to generate large efficiencies by enabling transactions that were not previously possible. Moreover, we would expect that, in many cases, platforms have incentives to write good rules to make their platform more valuable to users.

However, this might not always be the case. For instance, a dominant platform could have incentives to sell “monopoly positions” to their business users (e.g. in terms of the ranking of results displayed to consumers on a platform). Alternatively, as seen above, a dominant platform could design the rules (or apply them) in a way which allows it to engage in abusive self-preferencing.

To deal with these types of problem, we believe that – because of their function as regulators – **dominant platforms have a responsibility to ensure that their rules do not impede free, undistorted, and vigorous competition without objective justification**. A dominant platform that sets up a marketplace must ensure a level playing field on this marketplace and must not use its rule-setting power to determine the outcome of the competition.

Non-dominant platforms also play a regulatory role. However, to the extent that they are disciplined by competition, no far-reaching general rules would be needed. We feel that imposing far-reaching conduct rules on all platforms, irrespective of market power, could not be justified, given that many types of conduct – including potentially self-preferencing – may have pro-competitive effects.

In certain areas, regulation can bolster the role competition law in protecting competition in the platform economy. This is the case, notably of the transparency regime set out in the draft P2B regulation or in other areas where similar issues arise continuously and intervention may be needed on an ongoing basis (for example to impose and allow for effective interoperability). Apart from these limited settings, we believe that competition law can, and should, continue to accompany and guide the evolution of the platform economy.

Leveraging and self-preferencing

The fact that platforms act as regulators inform our treatment of leveraging and self-preferencing (we point out by analogy to precedents concerning sports leagues).

a) ***Leveraging***. From a business strategy perspective, leveraging can be "offensive" (to generate more profits) or "defensive" (preventing entry in the core market from an adjacent, often niche, market), but there are no analytical or legal differences between the two. Leveraging can take many different forms. As a large platform possesses a strong competitive advantage over new entrants because of network externalities and privileged access to data, it is important to try to mitigate these effects without sacrificing efficiency. We discuss some forms this might take.

b) ***Self-preferencing***. One specific technique of leveraging a platform's market power is *self-preferencing*, i.e. giving preferential treatment to one's own products or services when they are in competition with products and services provided by other entities using the platform. Article 102 TFEU does not impose a general prohibition on self-preferencing by dominant firms. In other words, **self-preferencing is not abusive *per se*, but subject to an effects test**. However, we believe that self-preferencing by a vertically integrated dominant digital platform can be abusive not only under the preconditions set out by the "essential facility" doctrine, but also wherever it is likely to result in a leveraging of market power and is not justified by a pro-competitive rationale. In a market with particularly high barriers to entry and where the platform serves as an intermediation infrastructure of particular relevance, we propose that, to the extent that the platform performs a regulatory function, it should bear the burden of proving that self-preferencing has no long-run exclusionary effects on product markets. Abusive practices of self-preferencing by digital platforms might pose specific challenges for remedies. Where self-preferencing has significantly benefitted a platform's subsidiary by improving its market position vis-à-vis competitors, **remedies might need to include a restorative element**.

CHAPTER 5: DATA

Data is often an important input for online service, production processes, logistics, smart products, and AI. The competitiveness of firms thus increasingly depend on timely access to relevant data. On the one hand, based on the above, the broadest dissemination and use of data by the greatest number of firms would seem to be desirable. On the other hand, however, the efficiencies of broad data dissemination must be balanced against a number of other policy concerns, such as the need to ensure sufficient investment incentives for firms to collect and process data, the need to protect

privacy (where personal data is concerned) and business secrets, and the possible collusive aspects of data sharing.

Against this background, we discuss the consequences of the economics of data for competition policy.

A necessary caveat is that **any discussion on (access to) data must take into account the heterogeneity of data and its uses along many dimensions**:

a) Data can be categorised as volunteered, observed, and inferred data. The type of data might influence the capacity of competitors to gather or obtain the same information independently.

b) Data can be collected and used in different forms: individual-level data, e.g. data from a specific user or a machine, bundled individual-level data used anonymously, e.g. movie preferences used for collaborative filtering, aggregated-level data, e.g. P&L information, and contextual data, e.g. maps information. Moreover, it can be generated at different frequencies, and data access can either concern historical or real-time data.

c) Data can be personal or non-personal. The General Data Protection Regulation (GDPR) sets up a special framework for personal data, which grants important rights of control to individuals. Therefore, access to, respectively, personal and non-personal data follows different paths and needs to be discussed separately.

d) Data can finally be requested and used for many different reasons (e.g. to provide complementary services to a product or service provided by a dominant firm, or for the purpose of training algorithms including for uses that are completely unrelated to the fields of activity of the data controller).

The significance of data and data access for competition will thus always depend on an analysis of the specificities of a given market, the type of data, and data usage in a given case. In this chapter, we try to analyse different scenarios. For the purposes of this summary, it is not possible to go through all of them, but we think it is important to highlight the following aspects.

a) ***Access to personal data***. **The GDPR can facilitate the switching between data-driven services, through data portability**. However, this will also depend on how the right to data portability is interpreted and implemented. We believe that **under the risk-based approach embodied in the GDPR, a more stringent data portability regime can be imposed on a dominant firm in order to overcome particularly pronounced lock-in effects**. Moreover, data portability in the GDPR has not been designed as a right to continuous data access or to request data interoperability between two or more services employed by the data subject, but simply as a right to receive a copy of some accumulated past data. It may thus facilitate a data subject's switching between services, but it has not been drafted to facilitate multi-homing or the offering of complementary services, which frequently relies on continuous and potentially real-time

data access. **More demanding regimes of data access, including data interoperability, can be imposed (i) by way of sector-specific regulation** (as in the context of the Payment Services Directive 2015/2366/EU) – in particular where data access is meant to open up secondary markets for complementary services; **or (ii) under Article 102 TFEU** – but then confined of course to dominant firms (see below).

b) ***Data sharing***. Data sharing and data pooling arrangements will frequently be pro-competitive: they enhance data access, may resolve data bottlenecks and contribute to a fuller realisation of the innovative potential inherent in data. The pooling of data of the same type or of complementary data resources may enable firms to develop new or better products or services or to train algorithms on a broader, more meaningful basis. However, such arrangements can become anti-competitive in some situations. For example: (i) competitors who are denied access (or granted access only on less favourable terms) might be foreclosed from the market; (ii) the data sharing arrangement may amount to an anti-competitive information exchange where it includes competitively sensitive information; (iii) the sharing or pooling of data can discourage competitors from differentiating and improving their own data collection and analytics pipelines; (iv) finally, there may be cases where the granting of access to data on non-FRAND terms may result in an exploitative abuse. The competition law assessment will necessarily depend, *inter alia*, on the type of data shared, the precise form of a data sharing arrangement or data pool as well as on the market position of the relevant parties. So far, the issue is a relatively new and under-researched topic in competition law. **A scoping exercise of the different types of data pooling and subsequent analysis of their pro- and anti-competitive aspects is therefore necessary to provide more guidance**. This might be done through, for example, guidance letters, "no infringement" decisions under Article 10 of Regulation no. 1/2003, or the next review of the Guidelines on horizontal cooperation. Later on, a block exemption regulation on data sharing and data pooling may be appropriate.

c) ***Data access under Article 102 TFEU***. Where competitors request access to data from a dominant firm, a thorough analysis will be required as to whether such access is truly indispensable. In addition, the legitimate interests of both parties need to be considered. We propose to be careful here: **it is necessary to distinguish between different forms of data, levels of data access, and data uses**. **In a number of settings, data access will not be indispensable to compete, and public authorities should then refrain from intervention**. Moreover, we believe that Article 102 TFEU is not the best tool to deal with data requests by claimants who pursue business purposes that are essentially unrelated to the market served by the dominant firm (i.e. access to data for the purpose of training AI algorithms for unrelated purposes); in such cases, the emergence of market-based solutions or the adoption of a regulatory regime would seem preferable. **There are other settings, however, where duties to ensure data access – and possibly data interoperability – may need to be imposed**. This would be the case, in particular, of data requests for the purpose of serving complementary markets or aftermarkets – i.e. markets that are part of the broader

ecosystem served by the data controller. **However, in these cases competition authorities or courts will need to specify the conditions of access**. This, and the concomitant necessity to monitor, may be feasible where access requests are relatively standard and where the conditions of access are relatively stable. Where this is not the case, in particular where a dominant firm is required to grant access to continuous data (i.e. to ensure data interoperability), **there may be a need for regulation** – which must, at times, be sector specific. Nonetheless, competition law can specify the general preconditions and inform the possible regulatory regimes.

d) ***Data and aftermarket doctrine.*** Where machine producers do not let users have access to the data by the machines, fears have been expressed that this could amount to foreclosure of secondary markets. We propose some directions for an update of the traditional competition law analysis of aftermarkets, which in its present form does not take into account the specificities of data.

CHAPTER 6: MERGERS AND ACQUISITIONS IN THE DIGITAL FIELD

Chapter 6 deals with one specific aspect of the current debate on the role of merger control in the digital era: **acquisitions by dominant platforms of small start-ups with a quickly growing user base and significant competitive potential**. We focus, in particular, on whether the current regime of EU merger control needs to be adjusted to better address concerns relating, *inter alia*, to the early elimination of potential rivals. Such concerns are reinforced by the importance of network externalities in the digital economy and may be particularly serious if dominant platforms engage in systematic patterns of such acquisitions. We have analysed this issue under two aspects: (a) whether the current jurisdictional thresholds set in the EU Merger Regulation (EUMR) are sufficient to "catch" these transactions; and (b) and the substantive competitive assessment.

a) ***Jurisdictional thresholds***. Many of these acquisitions may escape the Commission's jurisdiction because they take place when the start-ups do not yet generate sufficient turnover to meet the thresholds set out in the EUMR. This is because many digital start-ups attempt first to build a successful product and attract a large user base while sacrificing short-term profits; therefore, the competitive potential of such start-ups may not be reflected in their turnover. To fill this gap, some Member States have introduced alternative thresholds based on the value of the transaction, but their practical effects still have to be verified. While it is important to ensure that potentially anti-competitive transactions are duly scrutinised by competition authorities, one also has to consider the market need for legal certainty, as well as the need to minimise the additional administrative burden and transaction costs which an extension of jurisdiction would trigger. We therefore conclude **that it is too early to change the EUMR's jurisdictional thresholds**; it is better for the time being to monitor the performance of the transaction value-based thresholds recently introduced by certain Member States, as well as the functioning of the referral system. However, should systematic jurisdictional gaps arise in the future, a "smart" amendment to the EUMR thresholds may be justified.

b) ***Substantive assessment***. While the EUMR's "significant impediment to effective competition" test remains a sound basis for assessing mergers in the digital economy, we believe that there is a need to **revisit the substantive theories of harm** to properly assess certain specific cases. This concerns specifically cases **where a dominant platform and/or ecosystem which benefits from strong positive network effects and data access, which act as a significant barrier to entry, acquires a target with a currently low turnover but a large and/or fast-growing user base and a high future market potential**. In such cases, competition law should be particularly concerned about protecting the ability of competitors to enter markets, as competition in the market is typically reduced and competitive threats will typically come from the fringe. Buying up promising start-ups that offer fringe products or services may therefore result in early elimination of potential competitive threats. In this setting, the competitive risk resulting from an acquisition is not limited – as in traditional "conglomerate" theories of harm – to the foreclosure of rivals' access to inputs. It extends to the strengthening of the platform's (or ecosystem's) dominance, because the acquisition can: (i) intensify the loyalty of those users that consider the new services as complements to services already offered by the platform/ecosystem; and (ii) help retain other users for which the new services might be partial substitutes to the ones already available. Therefore, we think that the best way to handle these acquisitions is **to inject some "horizontal" elements into the "conglomerate" theories of harm** and try to answer the following questions:

(i) Does the acquirer benefit from barriers to entry linked to network effects or use of data?

(ii) Is the target a potential or actual competitive constraint within the technological/users space or ecosystem?

(iii) Does its elimination increase market power within this space notably through increased barriers to entry?

(iv) If so, is the merger justified by efficiencies?

The test proposed here would imply a **heightened degree of control of acquisitions of small start-ups by dominant platforms and/or ecosystems**, to be analysed as a possible strategy against partial user defection from the ecosystem. Where an acquisition is plausibly part of such a strategy, the notifying parties should bear the burden of showing that the adverse effects on competition are offset by merger-specific efficiencies. This theory of harm does not create a presumption against the legality of such mergers. However, it takes due account of new business strategies and the competitive risks they raise, and should help to minimise "false negatives" in a setting where the costs of systematic false negatives are particularly high.

1 INTRODUCTION

I. DIGITAL ERA – BENEFITS AND CHALLENGES

A. BENEFITS …

We are living in a period of exciting innovation and change. Digitisation has fundamentally altered the way data is generated, stored, processed, exchanged and distributed. In combination with the Internet, digitisation has led to the emergence of new possibilities and business models. New developments in artificial intelligence (AI) further create additional possibilities for new forms of innovation and societal and economic opportunities.

As data and information are the basis of almost all forms of interaction in society and the economy, the revolution in the way they are organised and transmitted has profoundly altered our lives. Many of these changes have greatly benefited European citizens. We find it natural to communicate seamlessly with virtually anyone around the world mostly for free. The accessibility of information has greatly increased – not least thanks to the emergence of new information intermediaries. Transacting across national borders has been facilitated, both for individuals and firms. Consumer choice has increased. Navigation apps give us directions to avoid traffic jams using real-time information from hundreds of thousands of commuters and allow us to make better use of our time. The distribution of cultural goods and news has become much easier. The data revolution promises to bring about a revolution in healthcare, finance, mobility, and education. Digitisation is impacting essentially every industry, from manufacturing to services to agriculture.

B. … AND APPREHENSIONS

Despite the many benefits that digital innovation has brought, much of the enthusiasm and idealism that were so characteristic of the early years of the Internet has given way to concerns and scepticism. There are fears such as data theft and loss of privacy, replacement of labour by machines,[1] domination of the economy by a few ecosystems and platforms, and reinforcement of economic inequality by new technologies[2]. Digitisation requires profound organisational changes in firms and public services in order to yield the gains in productivity it promises, and the ongoing adjustments create anxieties. There is also fear that the digital sector will naturally favour the growth of hugely influential platforms and ecosystems which

[1] See the work of Acemoglu, Autor, and others cited in "Tech Is Splitting the U.S. Work Force in Two", New York Times, 2019 (https://www.nytimes.com/2019/02/04/business/economy/productivity-inequality-wages.html).

[2] For instance Acemoglu and Restruepo discuss how, absent countervailing public policy, Artificial Intelligence could reduce wages in "*The wrong kind of AI? Artificial Intelligence and the future of labor demand*" (https://idei.fr/sites/default/files/IDEI/documents/tnit/newsletter/newsletter_tnit_2019.pdf).

will dominate the economy and use their power for their own aims. And indeed, by the end of September 2018, the first largest firms in the world by market capitalisation were in the digital sector, namely Apple, Amazon, Microsoft and Alphabet.[3] This concentration of economic wealth and power was not expected when the Internet was launched as a decentralized and layered communication protocol. This was reflected in John Perry Barlow's very influential "A Declaration of the Independence of Cyberspace",[4] in 1996 where he envisioned a totally decentralised world with a totally autonomous governance: "Governments of the Industrial World, you weary giants of flesh and steel, I come from Cyberspace, the new home of Mind. On behalf of the future, I ask you of the past to leave us alone. You are not welcome among us. You have no sovereignty where we gather."

In a more prosaic fashion, the economic literature of the beginning of the 21st century assumed that competition between online firms would arise as consumers hopped from site to site, easily comparing their offers. The reality however quickly turned out to be very different. Very early in the history of the Internet, a limited number of "gateways" emerged. With the benefit of hindsight, this might not be too surprising. Users have limited time and need curators to help them navigate the long tail of websites to find what they are looking for. These curators then developed a tendency to keep users on their platform, and by the end of the 1990s, it was common place to speak about AOL's "walled garden". AOL's market power however rested in great part on its role as an Internet service provider and both competition in that domain and, according to some observers[5], strategic mistakes after its merger with Time Warner eroded its power.

Fast forwarding to today, a few ecosystems and large platforms have become the new gateways through which people use the Internet. Google is the primary means by which people in the Western world find information and contents on the Internet. Facebook/WhatsApp, with 2.6 billion users, is the primary means by which people connect and communicate with one another, while Amazon is the primary means for people to purchase goods on the Internet. Moreover, some of those platforms are embedded into ecosystems of services and, increasingly, devices that complement and integrate with one another. Finally, the influence of these gateways is not only economic but extends to social and political issues. For instance,

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3 Followed by Berkshire Hathaway, Facebook, Alibaba, Tencent, JP Morgan Chase and Johnson & Johnson. Compare to the list at the beginning of 2001 which included, in order, General Electric, Cisco Systems, Exxon Mobil, Pfizer, Microsoft, Wal-Mart, Citigroup, Vodafone, Intel Corporation and Royal Dutch Shell. In 2001, the list included three firms active on the Internet, but two of them produced hardware. By 2018, the hardware firms had been demoted and seven of the firms in the list were what economists call "platforms", that is firms that derive their market power from connecting entities together.

4 https://www.eff.org/fr/cyberspace-independence.

5 See Kara Swisher with Lisa Dickey, "*There must be a pony in here somewhere: the AOL TIME WARNER and the quest for a digital future*", Crown Business, New York, 2003.

the algorithms used by social media and video hosting services influence the types of political news that their users see while the algorithm of search engines determines the answers people receive to their questions.

C. CHALLENGES

Against this background, there has been a polarised debate on whether – and if so which type of – regulation is needed. A broad scope of societal values is at stake, ranging from privacy to consumer protection to media diversity, to name just a few. In the context of these wide-ranging changes in society and markets and the vigorous ongoing debate, Commissioner Vestager has asked us to explore how competition law should evolve to ensure that digital era continues to benefit consumers.

This has been a challenging task. One of us is an engineer, the other a legal scholar and the third an economist. The three of us bear equal responsibility for the report, and we have had to learn each other's languages, to integrate our different perspectives and to come to conclusions that incorporate them.

The resulting report is proudly centrist and not written with a general pro- or anti-enforcement attitude. We believe that, at the current juncture, the most promising road is a vigorous competition policy regime. This can be achieved within the general framework of European competition policy as it has evolved in the last half century, but will require a rethinking of the tools of analysis and enforcement that is simultaneously energetic, disciplined and coherent. The core goal of competition law should remain that consumers benefit from the digital era and from innovation. And, as Commissioner Vestager has laid out: "The real guarantee of an innovative future comes from keeping markets open so that anyone, big or small, can compete to produce the best ideas." We hope that our report will contribute to this task.

Competition policy is needed in the new digital world. In an economy that is dramatically changing, competition law is flexible enough to intervene in an intelligent and supple manner at a time when the fundamental changes that the data and platform economy are bringing about challenge many of the other types of rules and regulations which have been tailored to deal with "old world" problems.

This competition policy must be vigorous, disciplined, and coherent. It must rely on solid analysis of the new market settings and of the market failures which will imply that "the invisible hand of the market" must be supplemented by "the visible hand" of competition authorities or of the legislator.

II. WHAT IS CHANGING IN THE DIGITAL AGE? A SKETCH AND A BRIEF GUIDE FOR READING THE REPORT

A core function of this report is to highlight changes in the way markets function in the digital era. We provide an overview of these changes in chapter 2, and focus on the three key characteristics of the digital economy:

(1) the role of data

(2) increasing returns to scale and network effects – which explain the rise of digital platforms and

(3) economies of scope, which explain the emergence and growth of digital ecosystems.

All of these factors heavily influence the form that competition takes today. Chapter 2 informs all subsequent – more policy oriented – chapters.

Platforms create major challenges for public policy, including competition policy. In market economies, competition has been the favoured model to ensure that the economy serves the needs of citizens, and competition has traditionally been understood as the presence of a large enough number of firms producing similar products. In order to increase their profits, firms compete to acquire market share through lower prices and innovation both in product design and in production technology. When such competition is not possible, governments have traditionally intervened through regulation or public ownership – examples include transportation networks and public utilities. As we will analyse in chapter 2, traditional competition – with a large number of firms competing – is often not feasible in the digital economy. Yet, in this very fast moving and diversified market, we believe that regulation organising the whole sector – akin to the type of regulation used for traditional utilities – is inappropriate. Rather, we must adapt the tools of competition policy to this new environment.

This is where chapter 3 – which is another "chapter of reference" for the rest of our report – is relevant. We do not think that there is a need to rethink the fundamental goals of competition law in the light of the digital "revolution". But we argue that we have to adapt its methodologies and analytical tools, economic theories of harm and legal doctrines to the new environment. This is to take account not only of the development of new entrepreneurial strategies of firms in reaction to the new ways markets function but also in the light of a change in "error costs". Where particularly strong positions of market power are protected by high and non-transitory barriers to entry, competition policy has reason to err rather on the side of those who propose to challenge such market power and/or to innovate independently.

The subsequent chapters then strive to specify what this means more concretely for some of the core policy themes of the digital era. Chapter 4 discusses application of competition rules to digital platforms. Recent economic research has seen platforms as regulators of the activities which they host. We propose that competition policy take this role of platforms as regulators seriously. Dominant platforms have "regulatory power" and have a responsibility to use that power in a pro-competitive manner.

Chapter 5 discusses the consequences of the economics of data for competition policy. Data is an indispensable input for providing digital services. However, data markets, data sharing and data pooling arrangements are not fully developed. The shape these markets will take, and the extent to which they will allocate data access efficiently, will depend on a general legal framework that is yet to be clearly defined (for example, defining contractual rules for access to non-personal data), and on the emergence of institutions that facilitate the management of consent into the processing of personal data. A good legal framework will take much of the pressure away from competition law. Legislation should give guidance to firms on what is allowed and not allowed if we want them to share data pro-actively. We end the chapter by discussing cases where a dominant firm must provide data access, under some form of data portability or interoperability requirements. The theme of interoperability appears in numerous places in our report, as we believe it to be one of the instruments that can keep markets open.

Finally, chapter 6 is dedicated to European merger control, which we consider to be important and which has been much discussed in policy circles. The specific issue is whether European merger control needs to be updated to better address the strategies of dominant platforms by which they acquire potential competitors that emerge at the fringe of the dominant firm's ecosystem at an early point of their life. The questions raised in this debate are an example of the need to develop new theories of harm to address potentially anti-competitive conglomerate strategies.

III. THE LIMITS OF OUR REPORT

A report such as this one cannot be, and is certainly not meant to be, comprehensive. It is part of a broader international debate on the direction that competition policy should take in a changing market environment. We build on this debate, e.g. in our repeated call for competition law to take a tough stance when dominant digital platforms protected by high and non-transitory barriers to entry reinforce those barriers. And we try to drive forward this debate, for example by highlighting the role of platforms as regulators and by emphasising the role of interoperability in an ever more interconnected and data-driven economy. Indeed, our ambition has been to identify some areas where our report, and the combination of our different professional perspectives, can make a relevant contribution to the ongoing debate – in particular with regard to platforms and data.

At the same time, we had to decide to leave out some much debated topics. For example, our report does not contribute to the intense academic debate on algorithmic collusion or on algorithmic pricing. Nor have we focused on procedural issues, in particular the question whether the law on interim measures needs to be reinforced.

We only briefly touch upon some themes, where more research will be needed. In particular, discussions are only just beginning about novel theories of harm regarding some types of conduct of conglomerate firms that are dominant in a core market characterized by strong network effects and a large user base but, based on these particular strengths, including data, reach out to broader markets. The relevant strategies, and their effects on competition and innovation, will need to be studied more in depth. Similarly, further research on the competitive impact of (big) data pooling might be needed.

Our report is focused on competition policy issues that cut across industries. Some industries which are becoming increasingly digitalized present specific issues. This may be true, in particular, for industries like finance and healthcare which are, at the same time, heavily regulated. Some of the more general statements in this report may not apply in those special circumstances. In this report, we leave sectoral specificities aside. When dealing with issues touched in this report from a sectoral perspective, care will need to be taken to adapt our line of reasoning to the special market and regulatory setting.

IV. THANK YOU

During the course of this adventure, we have received much support and input.

We are grateful, first and foremost, to Commissioner Vestager who has given us the opportunity to write this report with strong support from her Cabinet and DG Competition. She has taken great interest in our work throughout the past year, and has taken time to discuss the relevant issues with us.

Furthermore, we are much obliged to Commissioner Vestager's Cabinet, and especially to Wenzel Bulst, who have provided us with most valuable input and assistance. Thomas George has efficiently taken care of the practical organisation of our mission, with a smile!

Thank you also to Maria Jaspers and her policy team in DG Competition. Fabio Cannizzaro, Henri Piffaut, and Cyril Ritter have accompanied us throughout this year with important impulses, critique and support and have been the best fellows in our journey that we could imagine.

Moreover, we have much appreciated the precious input that we received through the consultation process, as well as the conference on "Shaping competition policy in the era of digitisation" organised by the European Commission on January 17, 2019. We would especially

like to thank the individuals and organisations who have taken time to respond to the consultation –their input has been gratefully received and taken into account.

Last but not least, we would like to thank our many colleagues, spouses, and friends who have accompanied us through this year and were willing to provide or test ideas, challenge rash theories, and encourage us in our endeavour.

Obviously, all mistakes remain entirely ours.

2 DIGITISATION AND COMPETITION

As we discuss in the introduction to this report, the changes brought about by the digitisation of the economy have been staggering. However, to better understand its consequences and to evaluate the changes it implies for the practice of competition policy, one needs to understand the ways in which it is changing the functioning of the economy. We attempt to explore some of them in this chapter.

I. THE DIGITAL ECONOMY

A. THE PLATFORM ECONOMY

Platforms create major challenges for public policy. In market based societies, competition has been the favoured model to ensure that the economy serves the needs of the citizen, and competition has traditionally been understood as the presence of a large enough number of firms producing similar products. In order to increase their profits, firms compete to acquire market share through lower prices and innovation, both in product design and in production technology. When such competition is not possible, governments have traditionally intervened through regulation or public ownership – examples include transportation networks and public utilities. When such competition is possible, governments use the instruments of competition policy to ensure that private entities do not hinder competition for their own interests, through cartel agreements, monopolisation strategies or mergers.[6]

As we will analyse below, traditional competition—with a large number of firms competing—is not always feasible in the digital economy. In these very fast moving and diversified markets, we believe regulations organising the whole sector—akin to the type of regulation used for traditional utilities—to be inappropriate. Rather, we must adapt the tools of competition policy to the new environment. In order to do this, one must take into account the forms that competition takes in this sector.[7] In this chapter, we focus on what we see as three key characteristics of the digital economy: extreme returns to scale, network effects, and the role of data. A consequence of these characteristics will be the presence of "economies of scope", which favour the development of the ecosystems which we discuss at the end of this chapter.

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6 We focus in this chapter, and in all this report, on the role of governments through competition policy. Of course, government intervention and regulation are used for many other objectives, for instance when externalities exist (pollution, global warming) or when it feels that market exchanges would be "unequal" (e.g. labour law).

7 The review of the characteristics below focusses on the increasing returns to scale, network externalities and data. A complete analysis would include more factors, in particular switching costs.

The first reason for which the new technologies of information are incompatible with traditional modes of competition is that they show very strong "returns to scale": the cost of production is much less than proportional to the number of customers served. While this has always been true to some extent, as bigger factories or retailers are often more efficient than smaller ones, the digital world pushes this phenomenon to the extreme. Once created, information can be transmitted to a large number of people[8] at very low cost. Once a search engine or mapping service has been developed and is running, it can usually serve fairly cheaply hundreds of thousands of users. This is not to say that servicing these users is not costly but rather that the costs rise much more slowly than the number of users.

With increasing returns to scale, competition between two firms producing the same product will not allow them to cover their costs. Indeed, were they to cover their (total) costs, they would have to price above the cost of serving an additional consumer (the marginal cost) and each of them would find it profitable to lower their price to steal the other's clients. As a consequence, no firm, unless armed with a much superior and cheaper technology, would want to enter a market dominated by an incumbent, even when this incumbent is making large profits.

The presence of large economies of scale also helps understand the rise of free services. There is some evidence that consumers are attracted by a zero price: there is an upward discontinuity in demand when the price reaches zero.[9] Now, consider the dilemma faced by a firm who must choose whether to charge for its service or distribute it at zero price, deriving its income from advertising. When both returns to scale and the attraction of free are strong enough, it will choose the second.

The second reason for which the new technologies of information are incompatible with traditional modes of competition is that they are often subject to network externalities: the usefulness for each user of using a technology or a service increases as the number of users increases.[10] This is true not only of the large social platforms — the larger the platform, the more the users will be able to find the person they want to communicate with on the platform — but also, for instance, for communication standards. The idea that the value of a network

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[8] According to https://newsroom.fb.com/company-info/, as of 30 September 2018, Facebook has about 65,000 monthly users per employee.

[9] For an entertaining discussion of this point, and references to more systematic evidence, see http://danariely.com/2010/11/10/the-power-of-free-tattoos/.

[10] Often, network externalities are positive (the usefulness of the platform increases with the number of users) over a certain range and negative when the number of users become very large. In this report, unless we specify otherwise, we will refer to positive network externalities.

increases more than proportionally with its size is expressed, in a somewhat exaggerated way, by Metcalfe's law, which states that the value of a network is proportional to the square of the number of nodes.[11]

A special case of network externalities has gained lots of attention since the beginning of the century: *two-sidedness*.[12] A platform exhibits two-sidedness when it connects two different and well-identified groups of users. For instance, a platform such as Steam connects publishers of video games to players, the publishers are one side of the platform and the players another side. Similarly, Airbnb connects owners of properties with renters and eBay buyers with sellers. For two-sided platforms, the benefit that one side derives from the platform depends on who participates on the other side: their number, but also on their identity. It also depends, as we will discuss further below, on the way in which the platform is managed.

For some authors, two-sidedness is so crucial that they make it a defining element of platforms.[13] Parker et al. begin their definition of a platform by "A business based on enabling value-creating interactions between external producers and consumers".[14] We believe this to be too restrictive. First, under this definition, one could not consider many social networks or messaging systems, e.g. WhatsApp, as a platform, in contradiction with common usage. Second, for some advertising-based platforms, the value creation from the matching of users and advertisers is mostly unidirectional, providing benefits mostly to the advertisers. Benefits to the users come from the services provided by the platform (e.g. media, search) sometimes include one-sided network externalities (social networks). Stressing the two-sidedness would imply that such a service would only become a platform after the introduction of advertising.[15]

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11 See chapter 17 of Carl Shapiro and Hal R. Varian, Harvard Business School Press, Boston, MA, 1999 for a discussion of network externalities and of Metcalfe's law (of which they correctly state that it "is more a rule of thumb than a law").

12 We use the term two-sided platform because it is the standard term in the literature. Many platforms have more than two "sides" and should properly be called "multi-sided".

13 The term network has come to designate, in some uses, institutions with a graph like structure and we will prefer the term "platform" to refer to "institutions that primarily rely on direct network effects".

14 Geoffrey G. Parker, Marshall W. van Alstyne & Sangeet Paul Choudary, "*Platform Revolution: how networked markets are transforming the economy and how the make them work for you*", W.W. Norton, New York, 2017. The book contains a useful glossary.

15 For further discussion of this point, see Sebastian Wismer & Arno Rasek, "*Market definition in multi-sided markets*" pp. 55-68 in OECD (2018) Rethinking Antitrust Tools for Multi-Sided Platforms, www.oecd.org/competition/rethinking-antitrust-tools-for-multi-sided-platforms.htm.

In this report we therefore use a more general definition of platforms including what some others call networks.[16]

The strategies of two-sided platforms have specific features which influence the way in which competition policy plays out. Each side of the market is both a consumer of the platform, and the "product" which is being sold to the other side of the market. It is perfectly natural and can be pro-competitive for a platform to subsidise one side of the market when its presence on the platform is very valuable to the other side. For instance, platforms which rely on advertising revenues will often provide content for a very low price, or even for free,[17] to consumers in order to attract them. The same phenomena are also present in non-digital platforms, for instance credit card companies subsidising cardholders and charging high prices to merchants.

Finally, our definition of platforms goes beyond online intermediation to include desktop, mobile operating systems and browsers, "offline" software, and app stores. For instance, operating systems are platforms, even by the restrictive definition of Parker et al., as they enable value creation interaction between their users and the sellers of applications. In the same way, cloud services are expanding beyond the provision of computing power and data storage into business-to-business ("B2B") platforms matching customers with providers of software solutions.[18]

At first sight, the consequences of (positive) network externalities for competition are similar to those of increasing returns to scale: large platforms are more efficient than smaller ones leaving space for only a small number of platforms in the market. Indeed, a large platform provides a more valuable service, e.g. access to more users for a one-sided platform, than a smaller one. There is, however, a subtlety here. The benefits of increasing returns to scale are due to technological conditions. The benefits, for an incumbent platform, of network externalities are due to the difficulty for users to coordinate migration to a new platform. Indeed, even if the users would all be better off if they migrated *en masse* to a new platform, they would not necessarily have an *individual* incentive to move to the new platform – whether or not they chose to do so depends on their expectation that others will follow.

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16 See for this differentiation: Bundeskartellamt, "*Arbeitspapier: Marktmacht von Plattformen und Netzwerken*", June 2016.

17 Of course, the fact that a platform provides a good or a service at a zero price to some consumers does not imply that it does not benefit from providing this good, for instance through the collection of data or the display of advertising, and hence the monetisation of the consumers attention. This model is, at the same time, typical for the two-sidedness of markets.

18 See for instance the Microsoft Azure marketplace at https://azuremarketplace.microsoft.com/en-us/marketplace/.

At the present time, there is no generally accepted analysis of these expectations, but it is fair to say that most economists believe that they represent a significant impediment to migration to a better platform – indeed writers on platform strategy stress the benefits of being a first mover. As Shapiro and Varian[19] put it

"Worse yet for would-be entrants and innovators, switching costs [this refers to what Shapiro and Varian call 'collective switching cost' stemming from network externalities] work in a non-linear way: convincing ten people connected in a network to switch to your incompatible network is more than ten times as hard as getting one customer to switch. But you need all ten, or most of them: no one will want to be the first to give up the network externalities and risk being stranded. Precisely because various users find it so difficult to coordinate *to switch to an incompatible technology, control over a large installed base of users can be the greatest asset you can have."*

Network effects could thus prevent a superior platform from overtaking an inferior one. Even when they cannot, they may cause the transition to be slower and more costly for the new market leader than it could have been. The size of this "incumbency advantage" will be affected by a number of factors including the possibility of multi-homing and, as we discuss later, data portability as well as data and protocol interoperability.[20]

The two characteristics of platforms which we have discussed above, namely increasing returns to scale and network externalities, could imply that — from a static efficiency perspective — concentration is desirable. As we will see below, data, in the absence of sharing, has the same consequences. If platforms were fully identical, non-interoperable, and if users would not multi-home, it would be wasteful to build several platforms serving the exact same needs when costs are strongly decreasing in size. Indeed, focussing on network externalities, Weyl and White[21] go as far as to argue that competition will lead to too little concentration. For the same reasons—absent differentiation and multi-homing—the normal play of competition will lead to concentration. This does not imply that competition will not have a role to play to discipline platforms, but it will imply that it takes a different form, namely competition "for the market", as we will discuss below.

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19 Carl Shapiro and Hal R. Varian, *op. cit.* chapter 7, pp. 184-5.

20 Network externalities can sometimes arise only at a local rather than global level. For instance, sale by owner websites can be local: buyers know the town they want to buy in and houses are not mobile. However, there exist many cases where—despite local network externalities—large platforms dominate the market, *e.g.* restaurant reservation platforms. This may be due to increasing returns to scale, either technological or in advertising the platform. Often, however, network externalities can be mostly local but have some global aspect, for instance due to the greater simplicity of using one account over different localities.

21 Glen Weyl and Alexander White, "*Let the Right 'One' Win: Policy Lessons from the New Economics of Platforms*", Competition Policy International, 2014, 12(2): 29-51.

In recent years, a third aspect of the economics of platforms has risen to prominence: the role of data. The evolution of technology has made it possible for companies to collect, store, and use large amounts of data. This has and will continue to enable considerable changes to the way markets function. Data is one of the key ingredients of AI and smart online services, and a crucial input to production processes, logistics and targeted marketing. The ability to use data and to develop new, innovative applications and products is a competitive parameter whose relevance will continue to increase. Furthermore, because data is sometimes accumulated as a by-product of the normal functioning of a platform, incumbents will have access to much more and more recent data than other firms, and this will be a source of competitive advantage. However, data is much more than a sub-product of platforms and deserves separate treatment, which we conduct in the following section.

B. THE DATA ECONOMY

Any discussion on data should start with an acknowledgment of the many different forms of data and the variety of its uses. On the forms of data, we will use the World Economic Forum's classification[22] on how individual-level data is obtained from a specific individual or machine: data can be volunteered, observed, or inferred.

Data is acquired through three main channels. First, some data is *volunteered*, i.e. intentionally contributed by the user of a product. A name, email, image/video, calendar information, review, or a post on social media would qualify as volunteered data. Similarly, more structured data—directly generated by an individual—like a movie rating, or liking a song or post would also fall in the volunteered data category.

Second, some data is *observed*. In the modern era, many activities leave a digital trace, and "*observed data*" refers to more behavioural data obtained automatically from a user's or a machine's activity. The movement of individuals is traced by their mobile phone; telematic data records the roads taken by a vehicle and the behaviour of its driver; every click on a page web can be logged by the website and third party software monitors the way in which its visitors are behaving.[23] In manufacturing, the development of the Internet of Things means that every machine produces reams of data on how it functions, what its sensors are recording, and what it is currently doing or producing.

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22 See World Economic Forum, Personal Data: The Emergence of a New Asset Class, January 2011.

23 See S. Engelhardt, G. Acar and A. Narayanan, "*No boundaries: Exfiltration of personal data by session-replay scripts*", November 2017 (https://freedom-to-tinker.com/2017/11/15/no-boundaries-exfiltration-of-personal-data-by-session-replay-scripts/).

Finally, some data is *inferred*, that is obtained by transforming in a non-trivial manner volunteered and/or observed data while still related to a specific individual or machine. This will include a shopper's or music fan's profiles, e.g. categories resulting from clustering algorithms or predictions about a person's propensity to buy a product, or credit ratings.

The distinction between *volunteered*, *observed* and *inferred* data is not always clear. Grey zones exist, and we do not propose to turn the distinction into a legal one. Despite its unavoidable fuzziness, the distinction is conceptually useful to assess whether access to data through the data controller is needed or whether other routes to access or substitution exist. Volunteered data can sometimes be obtained easily from the data subject itself. Inferring information from volunteered or observed data is an essential part of competition. Access to observed data – real time or historical – and also volunteered data may sometimes be essential to compete.

Second, beyond how individual-level data is obtained, we will also consider how data is used. We will define four categories of uses: *non-anonymous use of individual-level data*, *anonymous use of individual level data*, *aggregated data*, and *contextual data*. The first category, *non-anonymous use of individual-level data*, would be any individual-level data (volunteered, observed, or inferred) that was used to provide a service to the individual. For instance, a music app uses data about the songs a user has listened to in order to provide recommendations for new artists he or she might enjoy. Similarly, a sowing app uses data from farm equipment to monitor the evolution of the soil. Access to individual-level data can often be essential to switch service or to offer a complementary service.

The second category, *anonymous use of individual-level data*, would include all cases when individual-level data was used anonymously. Access to the individual-level data is necessary but the goal is not to directly provide a service to the individual who generated the data in the first place. These would typically include cases of data being used to train machine-learning algorithms and/or data used for purposes unrelated to the original purposes for which the data has been collected. An example of this would be the use of skin image data to train a deep learning (Convolutional Neural Network) algorithm to recognise skin lesions[24] or the use of location data for trading purposes.[25] In specific cases, the information extracted, e.g. the trained algorithm, can then be used to provide a better service to some of the individuals who contributed data. For instance, film reviews are used collectively to provide every individual

[24] Esteva, A., Kuprel, B., Novoa, R.A., Ko, J., Swetter, S.M., Blau, H.M. and Thrun, S., 2017, "*Dermatologist-level classification of skin cancer with deep neural networks*", *Nature*, *542*(7639), p. 115.

[25] http://news.mit.edu/2018/startup-thasos-group-measuring-economy-smartphone-location-data-0328.

with better recommendations (collaborative filtering[26]). For the *anonymous use of individual-level data,* access to a large dataset may be essential to compete.

The third category, *aggregated data,* refers to more standardised data that has been irreversibly aggregated. This is the case for e.g. sales data, national statistics information, and companies' profit and loss statements. Compared to *anonymous use of individual-level data,* the aggregation is standard enough that access to the individual-level data is not necessary.[27]

Finally, *contextual data* refers to data that does not derive from individual-level data. This category typically includes data such as road network information, satellite data and mapping data.

From a privacy perspective, *individual-level data,* when it refers to a natural person, is personal data (directly identifiable or under a pseudonym).

If the system or mechanism protects individual information efficiently, *anonymous use of individual-level data* would be considered anonymous data from the perspective of the user of the system and so probably fall outside of the scope of the General Data Protection Regulation[28] ("GDPR")[29] (See box "Anonymous use of individual-level data" in Chapter 4). Similarly, *aggregated data* would usually be anonymous and therefore defined as non-personal data[30] - even if the data that is aggregated was originally personal within the meaning of the GDPR. *Contextual data* would similarly be non-personal most of the time.

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26 https://en.wikipedia.org/wiki/Collaborative_filtering (in the version available on 29 March 2019).

27 For a deeper discussion between anonymous use of individual-level and aggregated data along with the privacy challenges of anonymously using individual-level data we would refer the reader to: de Montjoye Y.-A., Gambs S., Blondel Y., Canright G., de Cordes N., Deletaille S., Engø-Monsen K., Garcia-Herranz M., Kendall J., Kerry C., Krings G., Letouze E., Luengo-Oroz M., Oliver N., Rocher L., Rutherford A., Smoreda Z., Steele J., Wetter E., Pentland A., Bengtsson L., 2018, "*On the privacy-conscientious use of mobile phone data*", Nature SData, 5 https://www.nature.com/articles/sdata2018286.

28 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, *OJ L 119, 4.5.2016*.

29 Note that the precise requirements for what constitute anonymous data under GDPR have not yet been clarified by the EU courts. Which system and under which conditions would constitute anonymous use of data is therefore to be determined. For more information we refer the interested reader to the box "*Anonymous use of individual-level data*" in chapter 4 and to the Art 29 WP guidance on anonymisation: Opinion 05/2014 on "*Anonymisation Techniques: WP 216*".

30 With exceptions. Research has for instance shown that frequency tables from a census could be at risk https://www.sciencemag.org/news/2019/01/can-set-equations-keep-us-census-data-private or that aggregate location data can be sensitive to membership inference attacks Pyrgelis, A., Troncoso, C. and De Cristofaro, E., 2017. Knock knock, who's there? Membership inference on aggregate location data. arXiv preprint arXiv:1708.06145. https://arxiv.org/abs/1708.06145

All of this data is useful in so far as it produces information in the form of, for example, trained models, insights, as an enabler of services for individuals or machine users.[31] In order to analyse the consequences of data for competition in more depth, we must take a detour through the economics of information.[32] For our purposes, two aspects of information are important.

First, information is valuable to the parties who "own" — or rather control[33] — it, directly or indirectly. It may, for example, allow economic agents to take better decisions. From the viewpoint of an agent, the value of the information is the agent's willingness to pay for the increase in the quality of the decision which, given that information can always be discarded, is always positive. Of course, from a social viewpoint the acquisition of information by a malign agent can be detrimental.

Second, information has value but can be "reproduced" at very low cost. This creates several market imperfections which have been explored at length in the economic literature. One of the most important imperfections is a contradiction between the fact that information can often be reproduced and distributed a low cost, and therefore that it "wants to be free", and the fact that incentives need to be given to the collector (volunteered and observed) and/or to the producers of the information (inferred).[34]

Often, it is more efficient, from a social viewpoint, to share information: it is very cheap to do so, and the data can be valuable to the recipient. However, economic agents often have incentives to monopolise it. This is true of "productive" information which allows its possessor to create a product, for instance information about a technology of production: being the only one to possess this information gives a degree of market power. To incentivise the production and dissemination of this type of information, governments have created intellectual property

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31 There is a vast literature on the relationship of data, information, wisdom, knowledge and related concepts. An often-cited discussion of their relationship is "*From Data to Wisdom*" by Russel Ackoff, http://softwarezen.me/wp-content/uploads/2018/01/datawisdom.pdf.

32 Of course, this survey is highly selective. An accessible overview is provided by Joseph E. Stiglitz "*The contributions of the economics of information to twentieth century economics*", Quarterly Journal of Economics, vol. 115 (4), Nov. 2000, pp. 1441–1478.

33 Legally, no general property rights in data are currently recognised in Member States or at EU level. Rather, it is the *de facto* control over data that allows the "possessor" of data to exclude others from its use or to grant (possibly conditional) access. For more detail see chapter 5.

34 There are many exceptions and caveats to all the statements made here. It is usually efficient to provide as much information as he or she wants to an agent who will be the only one affected by the decision (for instance, whether or not to take an umbrella – if we forget the risk of poking someone else's eye). However this may not be the case in more complex situations where agents interact (see for example Jacques Crémer "*Arm's length relationships*", Quarterly Journal of Economics, Vol. 110, No. 2 (May, 1995), pp. 275-295).

rights and have at the same time limited them. No such property rights exist for data as such (see more below, chapter 5). Incentives to invest in data exist nonetheless, based on the technical control that the data controller can exercise

Incentives to monopolise also exist with regard to information about a specific person, collected, volunteered or inferred; information about a company; or information coming from a machine. However, with regard to this type of data, the information may be available to others through the data subject, either directly or on the basis of the right to data portability (Article 20 GDPR – see below). Access to a person's data or machine data is often essential to offer him or her a service. The importance of individual-level data, including historical data and data about a large number of individuals or machines, further increases with the personalisation of services and the use of AI. A music platform can, for example produce a better personalised experience for a user if it has data about his or her past behaviour and that of (a lot of) other users.

The distribution of information also affects one's bargaining position. For instance, a job applicant does not want to share all the information about his alternative offers with a potential employer, and the employer, in turn, does not want to share information about the quality of other candidates. We see this type of phenomena in play in the digital economy when people worry about the information that platforms have about them not necessarily for the sake of the information itself, the traditional "right to selective disclosure", but for how this information can be used against them, e.g. with targeted offers.

As we discussed above, access to *individual-level data* and *anonymous access to a large amount of individual-level data*, have become key determining factors for innovation and competition in an increasing number of sectors. We will discuss access to individual-level data by platform and within ecosystems later in this chapter, and at some length in the data chapter, including questions of data portability and data interoperability for personal and machine individual-level data, questions of access to privileged and private APIs, and the self-reinforcing role of data in ecosystems and leveraging market power.

Anonymous access to *individual-level data* can be used to gain a better understanding of the systems, e.g. statistical analysis of sales data, and to generate aggregated data. Anonymous access to individual-level data can also be used to train machine-learning algorithms. As discussed above, trained models can then be used to provide a better service to the individual who generated some of data in the first place or can be used for entirely unrelated purposes.

Although the benefits of access to individual data are clear, and, we believe, not controversial, the benefits of anonymous access to *individual-level data* need more analysis. One could

indeed argue that data is just one of the components needed to develop an AI algorithm. Computing power, software and skilled engineers are also necessary. From a competition policy viewpoint, it is important to understand whether any or all of these factors are impediments to entry into markets. Computing power has become much cheaper, and thanks to the development of cloud computing it can be rented when needed. It is not a bottleneck. Most of the software tools used in AI are open source or exist in an open source version. Examples include TensorFlow, Keras, Scikit-learn, or Torch. All of them are used by large companies and academic researchers. Software itself is thus not an obstacle to entry either.

Finally, analysts disagree on whether skilled engineers are a bottleneck, in the sense that competition law gives to this term. There is no doubt that skilled engineers have benefitted from very high salaries in the recent past, which proves that they are a rare and important input. This will only make it a bottleneck in the competition law sense, however, if this is combined with imperfections in the labour or capital markets which would make it more difficult for new entrants to hire them, when the terms are similar. This is an important debate, which has implications in particular for merger control. The recent emergence of a large number of specialised AI or machine learning master programmes and online courses are likely to make the scarcity less acute in the near future. If the analysis of the preceding paragraph is correct, the most important candidate for a competition bottleneck in AI is *anonymous access to individual-level data*. Lambrecht and Tucker[35] present an analytical framework to explore that question and conclude that "*[f]or a wide range of examples from the digital economy we demonstrate that when firms have access to big data, at least one, and often more, of the four criteria which are required for a resource to constitute a sustainable competitive advantage are not met.*" We believe that, on this level of generality, this is wrong. It is certainly the case that there exists a lot of public and commercial data that can be accessed, which sometimes can be helpful for undertaking preliminary analysis. We also agree that not all claims by entrants who access to the data of their installed competitors should be taken at face value. However, this does not contradict the fact, which we believe to be well established, that having accumulated large amounts of relevant data over a long period of time often provides a strong competitive advantage to incumbents. This does not lead directly to policy conclusions – we discuss them later – but should be taken into account in any analysis of the competitive landscape.

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[35] Anja Lambrecht and Catherine E. Tucker, "*Can big data protect a firm from competition?*", Competition Policy International, 2017 ("to qualify as a sustainable competitive advantage a resource needs to meet four criteria. It has to be inimitable, rare, valuable and non-substitutable", by reference to Jay Barney, "Firm Resources and Sustained Competitive Advantage", Journal of Management, Volume: 17, issue: 1, pp. 99-120, 1991).

II. COMPETITION IN THE WORLD OF PLATFORMS AND ECOSYSTEMS

A. INTRODUCTION: THE HETEROGENEITY OF PLATFORMS

Before turning to a discussion on the way in which competition plays in the world of platforms, we should point out that platforms are very diverse, sometimes embedded into ecosystems, and that the way in which they compete requires a case by case analysis. We will treat this issue in two steps. First, we will explain how network externalities play different roles in different platforms, before turning to the different roles of data.

To explore the role of network externalities, we will discuss how, while search engines, social media platforms and hotel or restaurant reservation platforms are often all described as multi-sided platforms, deriving their income from connecting individuals to advertisers, the basis for their competitive advantage is very different.

First, some platforms provide content, in a broad sense, freely accessible to users and sell the attention of these users to advertisers. For instance, search engines provide freely accessible lists of websites; gaming platforms provide freely accessible games; and news sites provide freely accessible editorial content. Their market positions stem from the quality of the content as perceived by their users and the presence of these users in turn attracts advertisers. These platforms thus have incentives to keep their users satisfied, which is not to say that the quality is optimal or that they would have chosen them if there was more competition.

Social media platforms are different. As a first approximation, users are attracted by the presence of other users. Advertisers are then, in turn, attracted by the presence of the users. If this analysis is correct, network externalities of the single-sided type is the basis of the difficulty of dislodging social media platforms from their market positions.

“Matching” sites for reservations or marketplaces are true two-sided platforms. The users on each side are attracted by the presence of the users on the other side. Typically, such platforms derive revenue by charging one or both sides. Their market positions are again protected by network externalities, and, in this case, by the quality of the matching algorithm and of the interactions between their users.

Access to data can represent another form of competitive advantage and is differentiated among platforms. We will quickly look at the *anonymous access to a large amount of individual-level data* and on access to *non-anonymous individual-level data*.

Exclusive access to a *large amount of individual-level data*, even when accessed anonymously e.g. to be used by a machine-learning algorithm, might provide a competitive advantage. A superior algorithm might then attract users who would contribute more and/or fresher data on an ongoing basis, thereby reinforcing the advantage.

Access to *non-anonymous individual data*—including e.g. both historical and ongoing observed data—may often be necessary to offer a service to an individual or would greatly increase its quality. In the context of platforms, data might furthermore have a positive feedback loop where control over some of an individual's data increases the platform's ability to collect more of it. This can, for instance, happen when data interoperability reciprocity agreements are in place, e.g. all companies interconnecting with the platform need to provide a copy of all the collected data back to the platform allowing the platform to collect data on the user's activity outside the platform and centralise the data. In the context of ecosystems, private data Application Programming Interfaces (API)[36] between services belonging to the same ecosystem might create a strong advantage for services that belong to the ecosystem, especially when the ecosystem is very large and involves numerous and diverse services.[37]

In the following sections, we will have to take some shortcuts and sometimes generalise. The aim of this discussion is to recall that platforms are different from each other and can be embedded into ecosystems, that access to data can be a competitive advantage and that competition policy must adapt to the specific circumstance of each platform.

Finally, it is important to understand that large platforms also enable other suppliers to offer their services through the platform. There exist numerous providers of complementary services on all (or connected to) the big platforms. Large platforms invite "third parties to sell their products or services on top of the original product the company already sells". [38] For instance, in 2005 SalesForce began encouraging its Customer Relationship Management software customers to build and sell other software, connected to its own. This allowed the platform to diversify its offering, and clearly has pro-competitive aspects. However, when the hosted service competes with services offered by a dominant platform itself, the rules

[36] A private API (Application Programming Interface) is a technique by which a service from an ecosystem can have access to data controlled by another service of this ecosystem. Private APIs are not available to services that do not belong to the ecosystem and to competitors.

[37] There are many other mechanisms by which firms are able to collect a lot of data. For instance, single sign-on mechanisms are convenient for users, and provide the firm which provides the service with information about their activities on the web.

[38] The quote is from Andrei Hagiu, Bruno Jullien and Julian Wright, "*Creating platforms by hosting rivals*" which present many examples and an interesting analysis of this strategy, http://profile.nus.edu.sg/fass/ecsjkdw/platform_%20hosting_competitor_11282018.pdf.

governing the cooperation between the two may become a prime concern of antitrust enforcement.[39]

B. COMPETITION AMONG PLATFORMS

With these concepts in place, we can analyse some aspects of the dynamics of competition among platforms. Our aim is not to do a complete survey — this would take us far much too time— but rather to analyse some of the ways in which competition rolls out in the digital space, stressing the ways in which it can indeed serve as a discipline on the behaviour of dominant platforms, but also the ways in which it can fail to provide sufficient discipline. Much of the disagreement on the proper role of competition policy stems from different analyses of this point.

For platforms, much of the competition plays around two dimensions: prices and product innovation. While in other industries reducing costs can be a major source of competitive advantage, this is often less the case in the digital world.[40] For the sake of brevity, we will not focus on this aspect.

As far as competition through prices is concerned, two aspects stand out: the dynamic aspect of pricing and the consequences of two-sidedness.

It is generally the case in many industries that firms introduce new products at a low price and increase the price once they have convinced consumers of the quality of their products. This dynamic is reinforced when network externalities exists, rewarding firms who have been able to acquire a large user base. This can lead companies to strongly focus on growth, making the difference between a natural strategy of market entry and predatory pricing not always clear.

In the case of two-sided platforms, pricing takes on special properties which have been examined in-depth by academic literature.[41] Its main message has been that, neither from the viewpoint of the platform's profits, nor from the point of view of social welfare, is there any

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[39] See Commission decision of 27 June 2017 in Case AT.39740 – *Google Search (Shopping)*.

[40] This is not to say that reducing costs especially infrastructure costs plays no role. Furthermore, some platforms might ignore parts of the service which they should provide but whose quality is less visible to the user, such as data protection.

[41] See, among many others, Rochet, Jean-Charles and Jean Tirole, "*Two-Sided Markets: A Progress Report*", Rand Journal of Economics, 2006, pp. 645-667; Caillaud, Bernard and Bruno Jullien, "*Chicken and Egg: Competition among Intermediation Service Providers*", Rand Journal of Economics, Summer 2003, pp. 309-328; Armstrong, Mark "*Competition in Two-Sided Markets*", Rand Journal of Economics, 2006, 37 (3), pp. 668-691.

reason for the prices charged to the two sides to reflect the respective costs of providing them with services. The side which is the most valuable to the other side will be "subsidised": outside of the digital economics realm, for instance, newspapers and magazines have long charged readers less than cost, because more readers attract more advertising. This can go as far as providing a side of the market free services as TV stations have traditionally done.

C. COMPETITION AMONG ECOSYSTEMS

Beyond platforms, competition in the digital economy is also increasingly a competition between ecosystems. Hardware and software are increasingly integrated, Internet of Things devices connect to online services and a few large tech companies offer a very broad range of services often fairly integrated with one another. For instance, when buying a phone today you "buy into" a large ecosystem that includes for example not only the operating system, a marketplace for applications, a payment system and a cloud service, but also a range of smart home applications and other devices. Similarly, a single log-in gives you access to a large range of online services such as watching videos, sending e-mails, buying books, playing games, online storage, maps, and communication systems.

The impact of ecosystems on the competitive landscape is well illustrated by the following quote from a recent report of the Financial Stability Board (FSB – hosted and funded by the Bank for International Settlements) discussing competitive threats to traditional banking:

"The competitive impact of BigTech may be greater than that of FinTech firms. BigTech firms typically have large, established customer networks and enjoy name recognition and trust. In many cases, these companies could also use proprietary customer data generated through other services such as social media to help tailor their offerings to individual customers' preferences. Combined with strong financial positions and access to low-cost capital, BigTech firms could achieve scale very quickly in financial services. This would be particularly true where network effects are present, such as in payments and settlements, lending, and potentially in insurance."

In effect, the FSB is arguing that large multiservice platforms benefit from what economists call "economies of scope": once they offer one service, they become more efficient at offering others. As the FSB argues, these economies of scope can arise from the possession of data which would enable, for instance, the design of a new service using an individual's data or the training of a new machine-learning algorithm. They can arise from network externalities, leveraging an existing and trusting user base thereby helping resolve the chicken and egg problem of starting a service with strong network externalities. Finally, it could come from the redeployment of technology which has proved fruitful in other areas. All of these are by

themselves pro-competitive: if large incumbent ecosystems are better at offering new services, there might be benefits at letting them doing so.

However, this might also prevent competition on the merits for new services. Ecosystems are an ensemble of services, some complementary, connected to another through private APIs which are APIs accessible only to services from the same ecosystem. If such privileged access to a user's data or connectivity with other services or Internet of Things devices allows a service from the ecosystem to offer a much better product, competitors will not be able to compete on the merit, e.g. based on the best algorithm. The multi-purpose use of data only makes this issue more prominent. Furthermore, the existence of some privileged APIs (with the consent of the user) might not be sufficient for a competitor to compete: 1) if the API made available to competitors is more limited (e.g. in functionalities, data it can access) compared to the API made available to the service that belongs to the ecosystem, or 2) the competitor cannot rely on the API to continue to exist and be available in the future. There indeed exist numerous examples of platforms discontinuing APIs as they grow larger or become dominant.

There is no doubt that, at times, competition between large ecosystems can be intense. In the context of abuse of dominance proceedings, the finding of some sort of multi-market competition will, however, not make up for the absence of sufficient competitive pressure in a given product market. One might furthermore worry that, over time, competition limited to a relatively small group of firms might not be as vigorous as one could hope. The economic theory of collusion has indeed shown that firms competing against each other across many markets will find it easier to collude.[42]

The emergence of ecosystems and the complementarity of services with one another and with devices is an important, but not yet very well researched, element of competition. Devices belonging to different ecosystems are harder and sometimes impossible to use together. Similarly, services from the ecosystem are often pre-integrated with one another, including data interoperability. Finally, new entrants might be dissuaded from building complementary services to the ones offered by the platform if their service relies on APIs that can be changed at any time, including by being made private to services from the same ecosystem. This has several implications for competition including lock-in into an ecosystem, data concentration and the difficulty for complementary services to develop and compete on the merit. This also

[42] See Bernheim, B., & Whinston, M. (1990). Multimarket Contact and Collusive Behavior. The RAND Journal of Economics, 21(1), 1-26 for an early theoretical analysis; William N. Evans and Ioannis N. Kessides, "*Living by the 'Golden Rule': Multimarket Contact in the U. S. Airline Industry*", The Quarterly Journal of Economics, Volume 109, Issue 2, 1 May 1994, pp. 341–366 for an early empirical exploration.

emphasises the importance of protocol and data interoperability and access conditions to individual-level personal and machine data, as we will discuss below and in the subsequent chapters.

D. COMPETITION ON INNOVATION

Finally, competition between platforms and ecosystems takes place in a spectacular way, through innovation. These innovations have improved the welfare of consumers by allowing them to connect to each other in unprecedented ways, such as giving access to new marketplaces and new services and allowing the efficient and very cheap distribution of cultural content. They have improved the efficiency of firms by allowing large amounts of data to be collected, shared, and used across supply chains. All these innovations have destabilised established industries, and while some of them have had their share of negative consequences, it is important to keep in mind that the overall consequences have been extremely positive. The aim of competition policy is to ensure that innovation keeps on serving consumers and firms. Of course, any given wave of innovation does not improve the fate of everyone in every direction. There are new negative (as well as positive) externalities and these may call for public intervention.

Innovation in the digital industries is however very different from innovation in, e.g. the pharmaceutical industry. First, it is less discrete: a new platform is a mixture of new features, new processes and new technologies arranged in a unique and innovative way to support a business idea. Second, it is never finished; products are in constant evolution, permanently being reworked. Third, it is less structured: often, the features of the innovation are developed at the same time as the innovation is implemented and tested. Fourth, it places less importance on formal intellectual property protection, such as patents or copyrights. The benefits of innovation are achieved by being “first to the market” with a service or a product and the ability to develop a user base. As we will see throughout this report, this raises important challenges for competition policy. Market boundaries change rapidly, large user bases can be created or leveraged rapidly, and future developments are very hard to predict even on a relatively short horizon – we will discuss later how the tools and models of competition policy, which are often too static to respond to these challenges, should be adapted.

E. COMPETITIVE DISCIPLINES FOR PLATFORMS AND THEIR LIMITS

The final issue addressed in this chapter concerns the ways in which competition can control and provide incentives to platforms, and the ways in which it fails to do so. As this is more relevant for competition policy, we will focus on the types of competition in which large

platforms participate, focusing first on competition with new entrants and competition between large platforms and ecosystems.

With network externalities and increasing returns to scale, economic theory predicts that there can be only a few platforms competing to provide any given type of service. If this is the case, competition "in" the market will be limited. The focus is rather on competition "for" the market, that is, competition to enter and replace a platform that holds a dominant position in the provision of a service. Some argue that this competition is extremely intense and that therefore incumbent firms have limited possibilities to exploit their market power, as they attempt to fend off competitors who try to take the whole market from them. This view is somewhat akin to the "contestable market" theory[43] of the 1980s and 1990s, which argued that markets with very few firms could still be considered competitive because of the presence of potential entrants. It is an understatement to say that the applicability of the contestable market theory has been controversial in traditional markets. It is even more doubtful in the presence of network externalities and ecosystems. Indeed, where network externalities exist, a new entrant needs not only to offer better quality and/or a lower price than the incumbent, but also to convince users of the incumbent to coordinate their migration to its own services. When the platform is part of an ecosystem, the lack of interoperability with other services of the same ecosystem and the absence or limited access to historical and future ecosystem data will make it difficult for a new entrant to compete on the merit of the specific service and/or algorithm.

Network externalities make the entry of new competitors more difficult — this is the famous "chicken and egg problem".[44] In the case of multi-sided platforms, in order to attract users on side A, a platform needs to have attracted users on side B, and to attract users on side B, it needs to have attracted users on side A (similar issues arise in the case of one-sided platforms). The same chicken and egg problem exists for services powered by Artificial Intelligence: the quality of the algorithm is a (non-linear) function of the amount of data (say number of users) it has access to. Even if users could choose to have their data entirely ported, a new service would need to convince enough of them to have enough data transferred to develop quality algorithms. Firms have developed strategies for getting around this problem, for instance by "subsidising" early users, but these strategies only mitigate the problem. Experience seems to show that large incumbent platforms are very difficult to dislodge, although there is little empirical evidence of the efficiency cost of this difficulty.

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[43] For an easy introduction to contestable market theory see Baumol, William J. "*Contestable Markets: an Uprising in the Theory of Industry Structure*", American Economic Review, vol 72 (1), pp. 1-15, March 1982.

[44] See Caillaud and Jullien, *op. cit.*

From a competition policy point of view, there is a reasonable anxiety that, fearing that the market could tilt against them, dominant platforms and ecosystems would have strong incentives to engage in anti-competitive behaviour.

Admittedly, the economic theory of network externalities typically considers well-defined markets where there is only a limited possibility for product differentiation. In practice, however, there are many platforms and the degree of competition on the features that they offer is not always clear. This differentiation may make entry easier: entrant platforms rarely compete directly with a dominant platform; rather competition comes through niches as a new platform offers some services which are not offered through a dominant platform, operates in adjacent markets, or, when technically possible, offers services which complement those of the main platform. Because of the presence of network externalities, the incumbent platform can fear that the entrant will, after having accumulated enough consumers, expand the range of services offered and threaten the incumbent's position. Indeed, there are many examples of installed large platforms who integrate new services pioneered by start-ups in the bundle of services that they offer. [45] The same dynamic is visible when considering ecosystems that launch new services in response to the threat of new entrants, sometimes leveraging their user base and/or data access. This is often done without increasing the price of the basic service and therefore puts enormous pressure on the new firms.

As we will discuss in more detail below, this makes the work of competition authorities very delicate: there can be efficiency advantages to bundle services, and consumers may gain through low prices or better services. However, a systematic strategy by dominant platforms to buy up or leverage their data assets to compete with innovative start-ups (even sometimes cutting off a competitor's access) may result in early elimination of an emerging competitive threat or otherwise strengthen the firm's dominance by increasing barriers to entry. Before concluding, let us mention that the entry of new competitors might be facilitated by *multi-homing and interoperability.* If users can use several platforms at the same time, i.e. multi-home, it will be easier for a new entrant to convince some users to switch to their platform while still being able to conserve the benefits of using the incumbent platform to interact with others. The new entrant might be able to offer a niche product which appeals to a relatively

[45] The possibly anti-competitive consequences of tying or bundling have been the subject of a large literature. A survey is provided by Rey, Patrick and Jean Tirole (2007), "*A Primer on Foreclosure*". Handbook of Industrial Organization, Volume 3. Ed. by Mark Armstrong and Robert Porter. Amsterdam: Elsevier, pp. 2145–2220. There are a number of recent papers who examine how the theory should be modified to take into account the specific features of digital markets, see Choi, Jay Pil and Doh-Shin Jeon, "*A leverage theory of tying in two-sided markets*", mimeo, 2016, https://msu.edu/~choijay/tying.pdf and de Cornière, Alexandre and Greg Taylor, "*Upstream Bundling and Leverage of Market Power*", mimeo, 2018, https://idei.fr/sites/default/files/IDEI/documents/conf/CSIO2018/de_corniere.pdf.

small group of the entrants. Similarly, interoperability allows new entrants to offer services complementary to those offered by one or several platforms, thereby facilitating multi-homing and allowing new entrants to grow and potentially challenge the dominance of a platform. As we will discuss below, it is important for competition policy to ensure that dominant platforms do not impair multi-homing[46] with new entrants.[47] (Multi-homing between large platforms requires a separate analysis — in some cases, it could limit competition. We discuss this in more detail in chapter 4.)

[46] In chapter 5, we discuss similar issues related to interoperability.

[47] Sometimes, government policies can impair competition while promoting some other social objectives. For instance, in some countries courts have ruled that some suppliers of personal services are to be considered as employees of the platform which they use to find clients. Because it is usually impossible to work at the same time for two different employers, these rulings might impede multi-homing and reduce competition. We do not wish to take a stand on the fundamental issue of whether this is a sound policy choice, but would like to use this as an example of the new interdependences between competition law and other regulations induced by digitalisation.

3 GOALS AND METHODOLOGIES OF EU COMPETITION LAW IN THE DIGITAL ERA

I. NEW CHALLENGES, NEW TOOLS

The changes in the competitive landscape that we have surveyed in chapter 2 have revived some long-standing debates about competition policy – debates about goals and about the interpretation and implementation of competition rules in the light of these goals; about how to consider innovation in applying competition rules, about methodologies that help us to determine relevant markets, market power and harm to competition; about the right degree of enforcement and the risks and cost of enforcement errors; about possible adjustments to procedural rules to ensure efficient enforcement in fast-moving times; and finally about the role of competition policy within the wider set of public policies, including data protection rules and fair trading rules.

Despite the differences between the economics of the digital sector and those of other sectors of the economy, it is widely accepted, and we concur, that vigorous competition continues to be the best way to serve the interests of consumers and the economy as a whole. The goal of competition policy as set out in Protocol No. 27 on the internal market and competition annexed to the Treaty on the Functioning of the EU ("TFEU")[48] remains valid in the digital era, namely the goal to establish and protect "a system ensuring that competition is not distorted".

Over the last 60 years, EU competition rules have provided a solid basis for protecting competition in a broad variety of market settings. Competition law doctrine has evolved and reacted to the varying challenges on a case by case basis. This evolutionary method has allowed competition law enforcers to react to changing circumstances based on the solid empirical evidence of real-life cases. At the same time, the stable core of EU competition rules has prevented EU competition policy from following fashions. We are convinced that the basic framework of competition law, as embedded in Articles 101 and 102 of the TFEU, continues to provide a sound and sufficiently flexible basis for protecting competition in the digital era. However, the challenges stemming from the rise of the Internet, the 'new economy' and, today, the digital economy do require an adaptation of the way this basic framework is applied. The specificities of platforms, digital ecosystems and the data economy require adaptation and refinement of established concepts, doctrines and methodologies, and competition law enforcement itself.

[48] *OJ C 115, 9.5.2008.*

In this chapter of the report, we briefly revisit the debate about the goals of competition policy and competition law, before turning to the need for some methodological adjustments in applying competition law in a digital market environment, and, in subsequent chapters, to adjustments of theories of harm and doctrines.

II. THE AIMS OF COMPETITION POLICY AND THE CONSUMER WELFARE STANDARD

In the US, digitisation has re-vitalised the long-standing debate about the goals of antitrust. Whereas the consumer welfare standard has guided the interpretation of the Sherman Act since the 1970s,[49] some assert that it should be revisited as a matter of principle.[50] Others admit that its implementation needs to be rethought in the digital environment.

In the European Union, the situation is somewhat different. While competition rules are ultimately meant to protect and benefit consumers,[51] the European Court of Justice (ECJ) has consistently ruled that in particular Article 102 TFEU is aimed "not only at practices which may cause damage to consumers directly, but also at those which are detrimental to them through their impact on an effective competition structure".[52] Nonetheless, the evolution of EU competition law since the mid-1980s is characterised by an increasing effort to set out a plausible link between negative effects on "competition as such"[53] and harm to consumers, i.e. to specify a "theory of harm".[54]

We propose that, while different views on the role of the consumer welfare standard in competition law persist, their practical importance is reduced in the digital economy. Even if one applies a consumer welfare criterion when assessing competition cases, it has to be implemented differently in a fast-changing world where prices play a very different role compared to traditional industries. Although we come from different backgrounds, we have found that the differences in our approaches to "theories of harm" are small. We do not need a new debate on the goals of EU competition law, but rather a new thinking on plausible

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49 See Hovenkamp, Is Antitrust's Consumer Welfare Principle Imperiled?, 2018.

50 Tim Wu, "*The Curse of Bigness: Antitrust in the New Gilded Age*", Columbia Global reports, New York, 2018.

51 See, *inter alia* Case C-468/06, *Sot. Lélos Kai Sia,* EU:C:2008:504, at para. 68; Case C-209/10, *Post Danmark I,* EU:C:2012:172, at para. 44; Case C-23/14, *Post Danmark II,* EU:C:2015:651, at para. 69; Case T-213/01, *Österreichische Postsparkasse v Commission*, EU:T:2006:151, at para. 115.

52 See, *inter alia* Case T-286/09, *Intel v Commission*, EU:T:2014:547, at para. 105; Case C-209/10, *Post Danmark I,* EU:C:2012:172, at para. 20; Case C-280/08 P, *Deutsche Telekom v Commission,* EU:C:2010:603, at para. 182.

53 For this term see, *inter alia*, Case C-8/08, *T-Mobile Netherlands and Others,* EU:C:2009:343, at para. 38; Case T-461/07, *Visa Europe and Visa International Service v Commission*, EU:T:2011:181, at para. 126.

54 See in particular: EU Commission, Guidance on the Commission's enforcement priorities in applying Article 102, *OJ C 45, 24.2.2009*.

theories of harm backed up by an increasing theoretical understanding of the specificities of digitisation and empirical evidence.[55]

A. WHO ARE THE CONSUMERS?

Where EU competition law considers harm to consumers, it consistently refers to both final consumers and consumers at the intermediate level, e.g. manufacturers who use a product as an input or distributors of a good or service.[56]

This is consistent with the consumer welfare criterion correctly understood. While it has sometimes been argued that the consumer welfare standard does not take into account the welfare of other parties affected by the practices under examination, this stems from a misunderstanding. The term consumer welfare is a shortcut which encompasses all "users" in a broad sense. It is important to stress this point, as the development of the "gig" economy implies that producers of goods and services will often be affected by the practices of platforms. For instance, drivers who connect to consumers through a platform would also be considered users, as would owners of holiday homes on a platform which connects them to vacationers. This is standard and is well understood. Therefore, the monopsony power of platforms should be taken into account, both when thinking of market power and of theories of harm.

B. EFFECTS-ANALYSIS IN THE DIGITAL ECONOMY

Generally speaking, theories of consumer harm can relate to any type of negative effects, whether on price, output, choice, quality or innovation. In its broad principles, the consumer welfare standard only states that real harm to real people is the reason competition should be defended. In practice, however, the effects analysis has often focused on identifiable consumer harm, and in particular on likely short-run and price-based effects.

In the digital economy, effects on quality and especially on innovation are more relevant. This is especially clear in platform-to-consumers ("P2C") platform markets, where services are offered to consumers at zero price, and where, therefore and obviously, there are no price

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55 See also: Johannes Laitenberger, CRA conference, 5 December 2018, pleading for a more empirically driven approach.

56 EU Commission, Guidance on the Commission's enforcement priorities in applying Article 102, *OJ C 45, 24.2.2009*, at para. 19; EU Commission, Article 81(3) Guidelines, 2004, at para. 84: The concept of "consumers" encompasses all direct or indirect users of the products covered by the agreement, including producers that use the products as an input, wholesalers, retailers and final consumers, *i.e.* natural persons who are acting for purposes which can be regarded as outside their trade or profession. In other words, consumers within the meaning of Article 81(3) are the customers of the parties to the agreement and subsequent purchasers. These customers can be undertakings as in the case of buyers of industrial machinery or an input for further processing or final consumers as for instance in the case of buyers of impulse ice-cream or bicycles."

effects. But it is also true for other parts of the digital economy, for instance platform-to-business ("P2B") and business to business ("B2B") platforms whose degree of innovation determines the productivity of the European economy.

Simultaneously, both the relevant timeframe and the standard of proof need to be rethought. In a digital world, where the future is more uncertain and less understood, there will be under-enforcement if we insist that the harm be identified with a high degree of probability. In some cases, one may be able to use the error-cost framework that we discuss below to compute what economists would call the "expected" consumer welfare, but in many cases this will be too complicated. Nonetheless, under-enforcement in the digital era will be of particular concern, all the more as the harm will presumably be longer term than in traditional markets because of the stickiness of market power caused by the factors discussed in Chapter 2. Therefore, even if the consumer harm cannot be precisely measured, strategies employed by dominant platforms aimed at reducing the competitive pressure they face should be forbidden in the absence of clearly documented consumer welfare gains. The analysis of the way in which competitive pressure is reduced should be undertaken with the same degree of discipline as evaluation of consumer harm is normally done. And, indeed, according to the ECJ's case law, the anti-competitive effect of a relevant practice must not be purely hypothetical.[57] Yet, it is sufficient to show that such practice "potentially" excludes competitors[58] or "tends to restrict competition".[59] 'Potentiality' or the 'tendency' should be evaluated with the same rigour as loss of consumer welfare is computed in traditional competition enforcement.

III. MARKET DEFINITION

A. PRICES AND COMPETITION WITH NETWORK EXTERNALITIES

As we have discussed in Chapter 1, prices play a different role when network externalities are present. This has important consequences for competition policy and in particular for market definitions. We will explore these differences before analysing the problems of market definition.

If bananas cost €0.5, consumers will buy bananas up to the point at which the value of the last banana purchased will be equal to €0.5. The price of bananas represents the value for consumers of the last banana they purchased. This principle must be adapted for goods which come in discrete quantities, but stays valid: the price of goods sold on a competitive well-regulated market measures the value of these goods.

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57 Case C-23/14, *Post Danmark II,* EU:C:2015:651, at para. 65.
58 Case C-23/14, *Post Danmark II,* EU:C:2015:651, at para. 66.
59 Case C-549/10 P, *Tomra and Others v Commission,* EU:C:2012:221, at para. 68.

This is not the case when network externalities are present. To simplify, we will focus on two-sided markets, which have been the centre of most of the discussion of this point. As we explained in chapter 2, when choosing their prices, two-sided platforms take into account the externalities which each side imposes on the other. Consider therefore a platform which charges €10 to side A and €15 to side B per hour of connection. The reasoning of the preceding paragraph is partly valid, as €10 does measure for each consumer on side A the value of the last hour of connection they purchased. However, and this is an important *caveat*, €10 does **not** represent the total value to consumers of an extra hour of connection by a side A consumer. Indeed, the €10 does not take into account the benefits that the side B consumers derive from that extra hour of connection.

When prices represent the social value of goods, they can be used to compute the variations of consumer welfare induced by different policies. This is not the case for services for which there are network externalities. Because one cannot read directly from the prices the total consumer value of the last unit purchased, computing variations of consumer welfare becomes much more difficult.[60] It is important to note that aggregating the prices on both sides in some way or the other would not solve this problem. Part of the social benefit of the platform is simply not visible from the prices.

To the difficulties which we have just raised, one must add technical difficulties when formal statistical methods are used to study demand for the services of two-sided platforms. Simplifying to the point of caricature, demand for a standard type of good depends on its price – to estimate a demand curve one needs data about the quantity demanded at different prices. Demand for the services of a two-sided platform by the users on side A depends on the price of the service to these users, as well as on the number of users on side B. Because the demand of users on side B depends in turn on the number of users on side A, the statistical methods which need to be used are much more complex, and the data required much richer. And of course, once the demand curve has been computed, contrary to what is true for ordinary goods or services, as the reasoning of the previous paragraph argued, more work is needed to compute consumer welfare.

The fact that prices play different roles in the case of two-sided platforms also makes it difficult to measure the values of changes in the quality of the services which are offered. Consider a platform that increases the quality of the service it provides. For a normal good, an estimate of the increase in consumer welfare generated by this quality can be attempted. For the service provided by two-sided platforms, this is much more difficult as the increase in the

[60] This would be true also for everyday goods whose consumption creates externalities, although most of the examples in this case are examples where the externalities are negative, because, among others, of congestion or environmental damages.

quality of side A will also increase indirectly the welfare of consumers on side B, by attracting more side A consumers.

B. THE "ZERO-PRICE" PROBLEM

Some observers have found striking the fact that digital markets often feature zero prices. There are many reasons why goods are provided at zero price in the economy, but in this discussion we will concentrate on the strategies of multi-sided platforms. In this case, the presence of zero prices is not a puzzle. As we have discussed in chapter 2, it is perfectly normal, and can indeed be pro-competitive, for such a platform to subsidise one side when its presence is important to the other side. If this importance is large enough, the platform would even be willing to subsidise participation. Because it is often impossible to actually pay for participation, the platform charges a zero price. And in many cases of interest there is not only a zero price, but also a subsidy, in the form of the provision of free services, search, music, video, games, etc.

Of course, the fact that some platforms charge zero price to consumers does not imply that they do not obtain benefits from serving these consumers — they typically subsidise the non-paying side by profits made on a different side of the platform (frequently the advertising side), that is they sell to that other side the attention of the users. A second consideration has become increasingly important: by using the service, the non-paying side provides data to the platform, which the platform uses both to provide a better service to consumers, but also to increase the benefits that the other side derives from the platform. These forms of "exchange" have facilitated recognition that the zero-price side of a platform can be part of a market.[61]

While consumer attention and consumer data frequently serve as a non-monetary form of consideration and are of significant value for firms, their economics are very different from those of prices.[62]

C. SSNIP TEST NOT APPLICABLE

It is clearly outside of the scope of this report to discuss in any detail the difficulties associated with the use of the small but significant non-transitory increase in price, or "SSNIP"

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61 For a recent example, see Commission decision of 3 October 2014 in Case M.7217 – *Facebook/WhatsApp*. On EU competition policy – and cases – in "zero-price" markets, where the analysis focuses on quality, data, and attention, see the EU contribution to the recent OECD roundtable at https://one.oecd.org/document/DAF/COMP/WD(2018)135/en/pdf. Note that a zero-price offer does not necessarily constitute a market – Wikipedia is an example in place. The relevant criterion in multi-sided market settings arguably is the existence of an overarching commercial strategy underlying the zero-price offer.

62 For an analysis from a legal perspective see Schweitzer, "*Neue Machtlagen in der digitalen Welt? Das Beispiel unentgeltlicher Leistungen*", Körber/Kühling (eds.), Regulierung – Wettbewerb – Innovation, 2017, at pp. 269 et seq.

test, to multi-sided markets. Suffice it to say that increasing one price without modifying the price on the other side does not make much sense, and there is no clear theoretical guide to know which way price changes on both sides should be balanced.

The problem is even more complicated when a zero price is charged on one side. In those cases, some have proposed to move to a "small but significant non-transitory decrease in quality" (SSNDQ) test. This test faces the same difficulties of balancing between the two sides as the SSNIP test. Furthermore, it is unclear how this test could be made operational in practice without a precise measurement of quality that would allow competition authorities and courts to determine an equivalent to a 5-10% price increase, and without a way to quantify the effects of the quality degradation on the firm's revenues in order to determine whether such a degradation would be profitable.[63] As stated by the OECD, "[the] idea is therefore probably more useful as a loose conceptual guide than as a precise tool that courts and competition authorities should actually attempt to apply".

D. CHARACTERISTICS BASED MARKET DEFINITION

In practice, the difficulties of using the SSNIP test or the SSNDQ test have not been an obstacle to market definition in EU antitrust and merger cases concerning platforms in general, and zero-price services in particular, as the Commission has instead turned to assessing service functionalities. While product and service functionalities have always been the starting point for determining substitutability relationships, they lack the same degree of theoretical rigour that the SSNIP test has introduced; however, they may well be all we have in the case of multi-sided platforms and we therefore discuss some of the issues arising.

First, when studying issues associated with multi-sided platforms, competition policy must analyse all the sides and take into account the ways in which they interact. We believe there is broad agreement on this point. On the other hand, much ink has been spilled trying to decide whether, from a formal viewpoint, one should consider whether there exist one or several markets.[64]

To understand the issues, consider the following three platforms. Platform A buys movies and charges consumers who want to see them (it is not a two-sided platform, and there are no network externalities there). Platform B buys movies, does not charge consumers but generates income by inserting advertisements in the movies. Platform C hosts movies produced by third parties, does not charge consumers and generates income, which it shares

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63 Commission contribution to the OECD roundtable on "*The Role and Measurement of Quality in Competition Analysis*", document no. DAF/COMP(2013)17, page 15: "*Price increases can immediately be translated into the evaluation of profits, while a very complex assessment would be needed for profits derived from quality degradation (such as calculations of cost savings).*"

64 See *Ohio v. American Express Co.*, 585 U.S. (2018).

with the purveyors of movies, through advertising. Clearly, the three platforms compete in the market for (showing) movies, and platform B and C compete in the market for advertisement embedded in movies (if such a market exists). In this case, one would want to define several markets, and when conducting the analysis of harm, one may have to take into account their interdependence.

To understand the type of cases where one would want to have only one market, consider a dating app which would be a pure matching platform: no ads, no selling of data, no partnership with restaurants for a first date (we know of no such site). The only product which it would sell would be the matching process. In this case, the only market in which it would compete would be the one for "matching", and there would be only one market.[65]

In the case of our hypothetical dating app, only one service is provided, and therefore the market is the market for matching. However, this is the less common case and one would generally want to define different markets on both sides. The test should be the following: would the platform, when considering the competitive threat, see different competitive threats on both sides? Take for instance a FSBO, "For Sale By Owner", real estate platform. It lists houses and provides search facilities for potential buyers. It does not monitor the sale price and cannot know whether a sale has been concluded between the two parties. It would seem that this provides *prima facie* evidence that there is only one market: services to put buyers and sellers in contact. On the other hand, the platform competes with real estate agents who provide both matching and complementary services (counselling, setting up appointments, etc.) and the intensity of competition between the platform and the real estate agents could be different on both sides.

In most cases, platforms provide services other than matching, and we therefore believe that it is safer to start with several markets. Of course, the analysis of competition and the theories of harm should take into account the relationships between the markets. Even more crucially, it should be remembered that the importance of market definition, and the methodologies developed for identifying it, were built for standard goods and services. In the digital world, it is less clear that we can identify well-defined markets. Furthermore, in the case of platforms, the interdependence of the markets becomes a crucial part of the analysis whereas the role of market definition traditionally has been to isolate problems. Therefore, in digital markets, less emphasis should be put on the market definition part of the analysis, and more importance attributed to the theories of harm and identification of anti-competitive strategies.

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[65] Even our dating app would compete with other dating apps that are active on several markets. In the analysis of the competitive threats it faces, the other markets on which these competitors are active could become relevant.

E. MARKET DEFINITION IN FAST CHANGING MARKETS

Another problem of market definition arises when a dynamic market environment leads to fluid, quickly-changing relationships of substitutability[66] and possibly partial overlaps of varying significance between different services, sometimes combined with practices of multi-homing and/or changing perceptions of consumer needs. Many experts argue, for example, that demand for cars is turning into a broader demand for mobility. Consumer demand for travel information can be met in very different ways compared to a few years ago, and consumer perceptions of viable substitutes may change. In such settings, the determination of substitutability relationships based on the present patterns of choice may turn out to be too narrow in hindsight and lead to "false positives". At the same time, inaction in the light of a mere possibility of changing market boundaries may lead to "false negatives".

The direction to take may therefore depend on whether competition law intervenes *ex ante* or *ex post*. Merger control certainly intervenes *ex ante* and is meant to protect the future competitiveness of the marketplace. In assessing whether a merger leads to a significant impediment to effective competition, competition authorities will take a forward-looking approach. Nonetheless, the question of how broadly to construe the concept of potential competition may arise (see below, chapter 7). In abuse cases, the problem is different: market definition is meant to determine the degree of market power at the time the conduct under examination took place in order to assess whether – *inter alia* – it has been used to strategically raise market barriers to entry. Competition agencies must therefore determine the set of substitutes as well as the innovation and changes in the market predicted by the parties at the time of the abuse –as was done in the European Commission Microsoft cases. To summarise: in abuse cases, competition authorities need to rewind and see the future as it was seen by the parties at the time of the conduct; in merger cases, they need to make their own assessment of the future evolution of the market and of technology.

F. ECOSYSTEMS

As we discussed in the previous chapters, in some consumer-facing markets and according to their own account, firms compete to draw consumers into more or less comprehensive ecosystems. This may allow them to steer demand towards products and services that belong to the ecosystem. They can do so by offering better quality products and services thanks, for instance, to interoperability with the rest of the ecosystem (private APIs) or thanks to the data, either personal or aggregate, which they have accumulated within the ecosystem. Finally, and more controversially, they can steer demand through nudges, biased rankings, use of default settings, etc. Where this type of competition is observed, a "classical" definition of markets for

[66] See William F. Baxter, The Definition and Measurement of Market Power in Industries Characterized by Rapidly Developing and Changing Technologies, 53 Antitrust L.J. 717, 717-718 (1984).

products or services may fail to capture a firm's strategy, as firms essentially compete for "access points" to consumers – where the access points themselves can differ. For example, devices like mobile phones, tablets or digital assistants act as both sensors (collecting data from consumers) and delivery devices (providing content/services to consumers). The background trend over the last 30 years has been that fewer devices provide ever more services/functions. Single-function devices such as Walkmans, typewriters, PDAs, maps, watches, etc. have been replaced by multi-function devices such as computers and smartphones. These devices are the access point to consumers and often function better if services from the same ecosystem are used on all of them. Control over the devices allows a platform to become a gatekeeper in terms of access to consumer data and capacity to deliver content and services. From a consumer's perspective, markets for specific products or services will persist. But where the firms' lock-in strategies are successful, and consumers are drawn into ecosystems which they find difficult to leave, ecosystem-specific aftermarkets may need to be defined. The pro-active protection of possibilities for consumers to switch, multi-home, and for services and device to interoperate independently of whether they belong to the ecosystem would gain additional relevance. Furthermore, a market for ecosystems might have to be defined.

G. DEFINING AND MEASURING MARKET POWER

Over the years, measures of market power and criteria for dominance for traditional markets have evolved with the aim of finding a sieve whose mesh is large enough to prevent overreach by competition enforcement authorities and fine enough to enable them to police infringements effectively. The digital economy has altered the legal, technical and economic fundamentals such that these measures need to be revisited. A complete analysis of the issues is far beyond our purview, but we hope that the considerations below can be useful.[67]

The concept of market power is used to identify cases of market dominance or – as the German Competition authority's Working Paper referenced in footnote 67 puts it – "whether or not the company's scope of action is still sufficiently controlled by competition". Traditionally, market power has been measured by market shares, i.e. by the ratio of sales of a firm to the total sales in the market, and market dominance has been assumed when the market share was above a certain threshold. As we have explained above, when there are network effects, the prices do not necessarily represent the value of the good or service to the consumers or to the firms which are selling them, so that the percentage of sales does not make much sense.

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[67] The Bundeskartellamt (German Competition Authority) has published an interesting working paper that surveys many of these issues: "*The Market Power of Platforms and Networks, Executive Summary*", June 2016. http://www.bundeskartellamt.de/SharedDocs/Publikation/EN/Berichte/Think-Tank-Bericht-Zusammenfassung.pdf?__blob=publicationFile&v=4.

This is, of course, obviously true when the price is equal to zero, but is also true in other two-sided markets. Furthermore, sometimes zero-price platforms compete for the delivery of services with platforms that charge a price, as we discussed above for instance in the case of music platforms; clearly the share of the market share cannot take into account only the paying consumers. A similar issue arises for digital firms which offer not only a service at zero price but also an upgraded paying version. The concept of market share is often not a useful concept to measure market power (of course, descriptive statistics such as shares of customers or downloads are still useful, but they are hardly conclusive).

In the case of platforms, the three characteristics that we have discussed in chapter 2 – namely increasing returns to scale, network externalities and data – reinforce the difficulty of measuring market power. In the discussion which follows we will concentrate on network externalities and data.

It is a commonplace in the economics of two-sided platforms that there can be market power even in an apparently fragmented marketplace. The classic example would be paper-based daily newspapers. Few people read more than one, and therefore the newspaper that an individual reads has a monopoly over access to that reader by a daily newspaper, even if the newspapers market is fragmented. This kind of market power – which is linked to the well-known competition law concept of "unavoidable trading partner" and has, with a view to platforms, sometimes been called intermediation power[68] – is compatible with fierce competition on the "monopolistic side". Indeed, because it is very valuable, firms will compete to acquire it, and will aggressively try to conserve it and possibly try to leverage it into adjacent markets once they have acquired it. Any such leveraging practices would then, however, be subject to abuse control. At the same time, widespread multi-homing will reduce this type of market power. We will return to the issue of intermediation power in chapter 4.

Similarly, if data that is not available to market entrants provides a strong competitive advantage, its possession may lead to market dominance. It is noteworthy that this dominance can extend to adjacent markets where the same data conveys strong competitive advantages in providing complementary services. Also, intermediation power and positions of power resulting from data control can be mutually reinforcing. Any discussion of market power should therefore analyse case by case the access to data available to the presumed dominant firm but not to competitors, and the sustainability of any such differential access to data. European competition authorities should develop an analytical framework to make this assessment as objective as possible.

[68] For this concept see Schweitzer/ Haucap / Kerber / Welker, Modernisierung der Missbrauchsaufsicht für marktmächtige Unternehmen, Baden-Baden 2018, pp. 85 et seq.

Therefore, we conclude that in digital markets there is no single parameter that would enable competition authorities to measure market power, or to declare that a firm is dominant, even as a rough approximation. Hopefully, better frameworks of analysis will develop as more cases are pursued and as the economics of the digital economy is better understood. Meanwhile, we agree with Professor Fiona Scott Morton, who in response to a question at the "Shaping Competition Policy in The Era of Digitisation" conference, insisted that the assessment of market power has to be case-specific, take into account behavioural economics insights about the strength of consumers' biases towards default options and present gratification, and be aware of all the ways by which incumbents are protected from competition, most of which we have discussed above.

IV. THE ERROR COST FRAMEWORK

The digital economy is characterised by a high degree of innovation and rapid changes in the markets. Furthermore, its economics are new and very different from those of "standard" industries. As a consequence, it is clear that there will be uncertainty about the consequences of any competition policy intervention or non-intervention. As Joskow and Klevorick[69] put it in a different context: "one is confronted with the difficult task of inferring long-run market outcomes from observable short-run behaviour and short-run market conditions. Any such inference entails uncertainty and hence the possibility of error; an assessment of long-run considerations is necessarily 'speculative and indeterminate'."

By itself, recognising the possibility of error does not imply that a competition authority should enforce less, or that it should enforce more. In this section, we will discuss the way in which competition authorities should act in these situations of uncertainty.

The first point to make is that decisions whether and when to intervene should not, and certainly need not, be taken in an arbitrary fashion. Based on decision-theoretic insights, Klevorick and Joskow developed a comprehensive framework for comparing and evaluating alternative approaches to antitrust problems, which has come to be known as the "error-cost"-test. According to this test, among alternative approaches, that approach should be chosen which will minimise the sum of the expected costs of error and the costs of implementation that would result if the policy were applied to the market under consideration. This framework has been particularly influential in US antitrust debates.[70] But the discussion of the relevance

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69 Klevorick / Joskow, A Framework for Analyzing Predatory Pricing Policy Pricing Policy, 89 Yale L.J. 213 et seq. (1979/80).

70 See dissenting opinion of Justice Breyer in *Leegin Creative Leather Products, Inc. v. PSKS, Inc., 551 U.S. 877 (2007)* . But see also the recent wave of U.S. analysis on error costs, for example: Shapiro, Carl, Antitrust in a Time of Populism (October 24, 2017). Available at SSRN: https://ssrn.com/abstract=3058345. Devlin & Jacobs, "*Antitrust Error*", https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1573693. Baker, "*Taking the*

of false positives versus false negatives has also splashed over to EU competition policy debates already some time ago.[71] More recently, it has gained prominence in international policy debates.[72]

It may be worthwhile to give a small example to explain what we mean. Assume that a competition authority needs to decide whether or not to forbid a practice (the decision to allow a merger would be treated in the same way). There is a 60% probability that the practice is pro-competitive, and in that case forbidding it would have a cost of 10. There is a 40% probability that the practice is anti-competitive, and in that case allowing it would have a cost of 20. Under the "more likely than not" criterion, the practice would be allowed. Under the error cost framework, the practice would be disallowed as the "expected cost" of forbidding it when it should be allowed, $60\% \times 10 = 6$ is less than the cost of allowing it when it should be forbidden, $40\% \times 20 = 8$.

We propose that competition law should not try to work with the error cost framework case by case, but rather should try to translate general insights in error costs into legal tests. For EU competition law, as for US antitrust law, the specificities of many digital markets have arguably changed the balance of error cost and implementation costs, such that some modifications of the established tests, including the allocation of the burden of proof and the definition of the standard of proof, may be called for. In particular, in the context of highly concentrated markets characterised by strong network effects and subsequently high barriers to entry (a setting where impediments to entry which will not be easily corrected by markets), one may want to err on the side of disallowing types of conduct that are potentially anti-competitive, and to impose the burden of proof for showing pro-competitiveness on the incumbent. This may be even more true where platforms display a tendency to expand their dominant positions in ever more neighbouring markets, growing into digital ecosystems which become ever more difficult for users to leave. In such cases, there may, for example, be a presumption in favour of a duty to ensure interoperability. A presumption in favour of interoperability may also be justified where positions of dominance are based on control over

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Error Out of 'Error Cost' Analysis: What's Wrong with Antitrust's Right", https://papers.ssrn.com/sol3/Papers.cfm?abstract_id=2333736.
Salop, "*An Enquiry Meet for the Case: Decision Theory, Presumptions, and Evidentiary Burdens in Formulating Antitrust Legal Standards*", https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3068157.
And, earlier, Beckner & Salop, "*Decision Theory and Antitrust Rules*", https://papers.ssrn.com/sol3/papers.cfm?abstract_id=138233.
All of these convincingly challenge the earlier view that false positives are more harmful than false negatives.

71 See Johannes Laitenberger, EU Competition law: relevance anchored in empiricism, speech delivered at CRA conference of 5 December 2018.

72 OECD, Safe harbours and legal presumptions in competition law, Competition Policy Roundtable, 2017.

specific competitively relevant sets of usage data that competitors are not able to reproduce. We will come back to this in the following chapters.

V. COMPETITION LAW AND REGULATION

In the broad debates on the appropriate legal framework for digitisation, competition law currently has a central place – some have spoken of a "re-discovery" of competition law. Simultaneously, one of the threads that runs through many digitisation debates is whether competition law should retain this place, or whether a greater role should be attributed to a regulatory regime or to general, non-market power related, rules.

There is not, and cannot be, a general answer to this question; it can only be sensibly discussed with regard to specific topics and we will therefore revisit this debate throughout our report. Yet, in this methodological chapter, some general remarks are called for.

Most other legal regimes – such as consumer protection law and arguably also data protection law – are based on typified conflicts of interest as they have frequently arisen in the past. As shown in chapter 2 of our report, digitisation has fundamentally changed the informational basis of our economy, as well as the dynamics of markets and competition, and these alternative legal regimes may fail to produce the appropriate outcomes where the balance of interests significantly changes. Competition law, on the other hand, has been designed to react to ever-changing market settings, to determine positions of power not sufficiently disciplined by competitive forces in whichever form they may arise, and to react to them in ways that take the specificities of the different markets into account. The resulting flexibility is a particular strength of competition law, with its broad, open and general rules, and has allowed it to prominently address the novel phenomena of the digital era and novel positions of power.

Yet, this strength of competition law – its case-specificity – also has a downside. Whereas much of the current debate on digitisation revolves around the speed of intervention, the determination of the relevant competitive forces in each case is time-consuming and costly, and the corollary of the breadth and flexibility of competition law is that its implementation is typically an elaborate process. This elaborate process and the academic discussion that accompanies it has led, and will continue to lead, to a better understanding of many of the characteristic features of the digital economy. These increased insights will help to readjust the general rules of consumer protection law, unfair trading law or even data protection law to better meet the new challenges of the digital economy. In return, the insights gathered in the enforcement of these rules will inform the development of competition policy. These readjustments may lead to modifications of the boundaries between the different legal regimes. In some situations, we will find that some issues are closely related to the existence of market power, but arise frequently and systematically enough that a new regulatory regime

is warranted. In other situations, the case-by-case approach of competition law will be found to remain the most appropriate legal framework.

Our report will revisit the question regarding the right legal approach chapter by chapter. Ultimately, competition law – and in particular Article 102 TFEU – shall resort to its general function as a "background regime". Until then, the type of analysis that is so characteristic for competition law – namely the thorough analysis of markets and market failures – can help to re-define the legal framework for the digital economy and provide important guidance to firms, the legislator and the public debate.

4 PLATFORMS

I. GENERAL ISSUES

In this chapter, we study how the principles that we have presented in chapters **2** and **3** can inform the application of competition policy to platforms. In particular, we will see how the presence of strong incumbency advantage – due to network externalities, economies of scale and data access – changes the principles of enforcement of competition policy. This issue has come to the forefront of recent competition policy debates, because of the economic importance that platforms have taken. As the European Commission has put it:[73]

"Online platforms are key enablers of digital trade. At present, more than a million EU enterprises trade through online platforms in order to reach their customers, and it is estimated that around 60% of private consumption and 30% of public consumption of goods and services related to the total digital economy are transacted via online intermediaries. …. This growing intermediation of transactions through online platforms, combined with strong indirect network effects that can be fuelled by data-driven advantages by the online platforms, lead to an increased dependency of businesses on online platforms as quasi "gatekeepers" to markets and consumers."

The aim of this chapter is not to recap the broad debate on platforms over the past few years,[74] but instead to focus on some points where we hope to add a fresh look. In section III, we discuss ways in which competition authorities can promote competition *for* the market and the type of strategies that dominant platforms might use to limit the threat of entry. In section III, following the recent economic literature, we argue that the marketplace platforms play a regulatory role as they determine the rules of the marketplace and possibly also the rules based on which their clients interact. We describe the economic, technical, and legal consequences of this approach for competition policy.

Before starting, we want to remind the reader that we have already dealt with the issues of market definition and market power in chapter 2. We will, however, engage tangentially with the issue of data, which will be discussed at greater length in chapter 5**.**

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[73] "Proposal for a regulation of the European Parliament and of the Council on promoting fairness and transparency for business users of online intermediation services", https://ec.europa.eu/commission/sites/beta-political/files/soteu2018-preventing-terrorist-content-online-regulation-640_en.pdf.

[74] For a lucid discussion of these developments see Jean Tirole's presentation at the "Shaping competition policy in the era of digitisation".

II. PROMOTING COMPETITION FOR THE MARKET

As we have discussed in chapter 2, in markets where network externalities and returns to scale are strong, there is, without multi-homing, protocol and data interoperability or differentiation, place for only a limited number of platforms. The aim of this section is to discuss ways in which competition authorities can protect competition for the market, which, as discussed in chapter 1, is necessary to provide incentives to supply goods and services at reasonable conditions and to innovate. In essence, the success of any attempt to challenge an incumbent will depend on the ability of a potential rival to attract a critical mass of users and thereby generate its own positive network effects. Actions by a dominant platform that hinder rivals from doing so, or raise their costs, without constituting "competition on the merits", should therefore be suspect under competition law.

A. MERGERS

One of the ways in which dominant platforms can impede competition for the market is to purchase potential competitors. We analyse in great depth this strategy, and its consequences for competition policy, in chapter 6.

B. MFN (BEST-PRICE CLAUSES)

Outside the digital economy, frequently in the context of B2B transactions, firms often guarantee to their customers that they are getting the lowest possible price. This is done by guaranteeing that either they will not sell to any other customer at a lower price, or that, should they do so, they will give a rebate to previous customers equal to that difference in price. These clauses are called "Most Favoured Nation" or MFN clauses, by analogy to international trade practice where in the context of trade negotiations, countries often promise that they will not offer more favourable terms to any other country. Others refer to these types of clauses as "best price clauses".

There is an extensive literature, both economic and legal, on MFNs as they can have both pro and anti-competitive consequences. On the pro-competitive side, they will for instance reassure a retailer that its supplier will not sell to other retailers at lower prices and hence encourage the retailer to invest in providing sales and service support for the product. On the anti-competitive side, they can dampen competition or facilitate collusion by making deviations from price agreements easier to observe. As Salop and Scott Morton put it: "What is clear is that MFNs are neither always anticompetitive, nor always procompetitive. Their effects

depend on the particular facts of the market."[75] A case-by-case analysis is therefore necessary.

Transactions intermediated online are, of course, subject to the same competition rules as any other, and therefore the standard restrictions on MFNs apply to selling or buying through platforms. However, there are certain features that are specific to MFNs in online markets, as emerged, for example, from the Commission's Amazon e-book case[76] and the cases before different national competition agencies linked to practices of hotel booking platforms. While we do not aim to present a complete analysis of these cases, we believe that the following considerations can be useful in analysing this type of behaviour.

Online marketplaces, like physical stores, play a dual role: they are "places" where consumers can purchase goods and services, but they also provide information to consumers about the availability and characteristics of goods. Platforms invest substantially to develop their websites and apps, making search and information acquisition easier for consumers. Physical stores also provide information to consumers and sometimes invest substantial amounts in displays or trained personnel. In order to encourage them to do so, brands and wholesalers sometimes establish selective distribution systems to make sure that stores that invest to provide good pre-sale service enjoy a sufficient margin. In the case of platforms, the suppliers of the goods or services often fix the price. Hence, to protect their investment (which is usually rewarded with a transaction fee on sales made through their intermediation), platforms frequently impose a requirement that goods cannot be sold through other channels at lower prices. For instance, booking.com imposed that hotel rooms could not be sold more cheaply on other platforms or directly by the hotel, either through its own website or through other means – an example of a so-called "wide MFN".[77] It expressed fear that if it did not do so, consumers would search for hotels on its website or app and then reserve a room at lower price on the hotel's website.[78] "Narrow" MFNs – another version – would only require the good or service not be sold at a cheaper price on the sales channels directly controlled by the seller.

Competition authorities are worried that these clauses, wide MFNs in particular, restrict competition and lead to higher prices. In particular, an alternative platform would find it

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75 Steven C. Salop and Fiona Scott-Morton, "*Developing an Administrable MFN Enforcement Policy*", Antitrust, Vol. 27, No. 2, Spring 2013, pp. 15-19.

76 See the press release of the European Commission at http://europa.eu/rapid/press-release_IP-17-1223_en.htm and its full documentation of the case at http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=1_40153.

77 A "wide MFN" prohibits a supplier to offer products or services provided on the platform more cheaply on its own website or on any other platform or comparison site.

78 Controlling prices does not amount to much when there are differences between the products or services being sold, such as cancellation policies, refunds, add-ons, etc. MFNs are therefore often accompanied by other clauses which try to limit competition in these dimensions. See the Commission's Amazon case for a discussion of some of these restrictions.

impossible to compete through lower prices in the presence of an incumbent platform with a large market share. Given that innovation in the design of the alternative platform, or in its business model, would be easy to imitate, this would imply that very little competitive pressure would bear on the established platform – or the established platforms (where such MFNs are used by all of them). Wide MFNs thus have significant potential to further hamper alternative platforms in overcoming the incumbent platform's (or platforms') competitive advantage of superior network effects.

Because of the varieties of theories of harm and efficiency defences which can be developed in the abstract for these practices, it is impossible to develop general rules about what should be allowed and not allowed, and, as discussed above for standard MFNs, a case-by-case approach is necessary. The following remarks may however help.

Incumbency advantage of platforms is important and strict scrutiny of MFNs is appropriate, because of very strong network externalities of the two-sided type in marketplaces. Any practice aimed at protecting the investment of a dominant platform should be minimal and well targeted. If competition between platforms is sufficiently vigorous, it could be sufficient to forbid wide MFNs while still allowing narrow MFNs. If competition between platforms is weak, then pressure on the dominant platforms can only come from other sales channels and it would be appropriate for competition authorities to also prohibit narrow MFNs.

For simplicity, and because this has been the focus of the economic literature, we have focused our analysis on the price dimension of competition, but *ceteris paribus*, the same type of reasoning would apply to other dimensions of competition, in particular innovation and quality.

C. MULTI-HOMING AND SWITCHING

An entrant platform will often be able to offer only a subset of the services offered by an incumbent platform. Users will therefore be hesitant to switch even if the services it offers are of better quality. Furthermore, users will often be uncertain on how well the new platform meets their needs. To get around this problem, consumers will want to multi-home: using both platforms. In order to encourage exploration by consumers and to allow entrant platforms to attract them through the offer of targeted services, it is important to ensure that multi-homing is possible and that dominant platforms do not impede its practice.

Platforms rarely directly forbid multi-homing by their users. Sometimes, they make it difficult through technical means. Multi-homing can also be made less attractive through fidelity rebates and some types of bundling. This can be true on the customer side of a two-sided platform, but also on the seller side, especially for platforms that intermediate the provision of services. This could for example be reflected in the criteria taken into account by a ranking algorithm or recommendation system – for instance if the ranking of a supplier is determined

in part by total sales, the suppliers of a service would have incentives to give exclusivity to a platform.

It should also be noted that the effects of multi-homing can be different when competition is *in* the market rather than *for* the market: it could dampen the intensity of competition.[79] Once again, case-by-case analysis is primordial, all the more because both types of competition often co-exist. However, we feel that a measure by which a dominant firm impedes multi-homing is suspect and an efficiency defence would be needed.

D. DATA REGULATION

We now turn to two especially important cases of how data regulation can hinder or help multi-homing and therefore competition.

1. PORTABILITY

Portability of data refers to the ability of users to transfer the data that a platform has collected about them. We discuss this in detail in chapter 6. The EU's General Data Protection Regulation (GDPR) has introduced a limited right to data portability (Article 20) as a means to avoid data-driven lock-ins. A competition policy consequence is that switching, and to some extent multi-homing, is facilitated. The effectiveness of the right to data portability in this regard depends on the way it will be implemented in practice, e.g. which kind of data can be ported. A competition policy perspective would suggest that dominant platforms could be subject to stricter requirements than non-dominant platforms.

2. INTEROPERABILITY

Interoperability is different from portability. In chapter 6 we define three "types" of interoperability: *protocol interoperability*, *data interoperability*, and *full protocol interoperability*.

Protocol interoperability refers to the ability of two services or products to interconnect, technically, with one another. This is the way in which interoperability has usually been thought of in competition policy circles. We prefer the term *protocol interoperability* to distinguish it from the access to data resulting from protocol interoperable systems. *Data interoperability* is roughly equivalent to data portability but with a continuous, potentially real-time, access to personal or machine user data. Existing data interoperability mechanisms

[79] See Mark Armstrong and Julian Wright, "Two-sided markets, competitive bottlenecks and exclusive contracts", Economic Theory (2007) 32: 353–380 for an early analysis and Robin S. Lee, "Vertical Integration and Exclusivity in Platform and Two-Sided Markets", American Economic Review 2013, 103(7): 2960–3000 for an empirical analysis of the game industry which showed that the fact that the game developers did not systematically multi-home favoured entrants.

typically rely on privileged APIs, which provide to a service B the means to access its users' data through a service A's API, if the users have given authorisation for this transfer of data.[80] Finally, full *protocol interoperability* refers to standards that allow substitute services to interoperate, e.g. messaging systems.

The duty to grant protocol interoperability has been imposed as a remedy in leveraging cases, e.g. in the Microsoft cases.[81] It allows for the development of complementary services and competition on the merit for those services. In order to be effective, it may sometimes require the development of standards which, if defined too strictly or too early, could hinder innovation. This risk is, however, limited if the (*de facto*) standard is defined and managed (in a fair way) by the dominant company for use by third-parties. Where conflicts of interest are present, the fair management of such a *de facto* standard may require regulatory oversight.

Data interoperability has come to the fore more recently as a consequence of the increased importance of data in order to provide services to individuals or machines and in the context of ecosystems. We discuss this further in the data chapter, but it is important to note here that data interoperability allows for complementary services to platforms or to other services to be developed in a larger range of cases than protocol interoperability. It can also favour multi-homing, allowing users to use several services or platforms along with complementary services (service A using data from both competing services B1 and B2). Although it can favour competition in mature markets, data interoperability can also have some anti-competitive consequences by limiting the incentives for new forms of collection of data.

Full *protocol interoperability* has the benefit that positive network effects stemming from the large user base of one platform extend to other platforms – in other words, through the imposition of interoperability requirements, the benefits of positive network effects can be shared among direct competitors. In this perspective, interconnection could be an efficient instrument to address concentration tendencies.

On the other hand, *full protocol interoperability* can come at a high price: the need for strong standardisation across several competing platforms could significantly dampen their ability to innovate and to differentiate the type(s) of service(s) they provide. One of the most important grounds for continuing competition between platforms, and possibly for competition for the market, could therefore be weakened or even eliminated. Furthermore, the need for coordination between the firms affected by the requirement would provide opportunities for collusive behaviour, for instance to limit innovation.

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80 An example would be the granting of access to a user's e-mail inbox to a complementary "reminder" service.

81 See Commission decision of 24 May 2004 in Case C-3/37792 — *Microsoft* and Commission Decision of 16 December 2009 in Case 39530 — *Microsoft (Tying)*.

We will argue, in chapter 6, that there is a case for imposing duties to grant *protocol interoperability* and (with the concerned users' consent) *data interoperability* upon dominant platforms. A duty to grant *full protocol interoperability*, on the other hand, should be handled with great caution.

III. PLATFORMS AS REGULATORS (COMPETITION ON THE PLATFORM)

A. BACKGROUND

Over the last 15 years, scholars and practitioners have extensively discussed the challenges that platforms pose for competition policy mainly from the perspective of what network externalities of the one-sided or two-sided type mean for market definition and enforcement.

More recently, scholars have turned their attention to the fact that a special feature of the intermediation function that platforms frequently fulfil is that it is accompanied by a rule-setting function: many platforms, in particular marketplaces, actually act as regulators, setting up the rules and institutions through which their users interact. The importance of this aspect of their behaviour has been highlighted by Parker, Van Alstyne and Choudary:[82]

"In the complexity of the governance issues they face, today's biggest platform businesses resemble nation-states. With more than 1.5 billion users, Facebook oversees a 'population' larger than China's. Google handles 64 percent of the online searches in the U.S. and 90 percent of those in Europe, while Alibaba handles more than 1 trillion-yuan (162 billion US dollar) worth of transactions a year and accounts for 70 percent of all commercial shipments in China. Platform businesses at this scale control economic systems that are bigger than all but the biggest national economies."

Rule-setting by platforms will take on different forms, depending on their function and design. For example, the "regulatory" function of a search engine will largely coincide with the design of the ranking algorithm, and hence with its core service itself. Other platforms impose rules and institutions that reach beyond the pure matching service and shape the functioning of the marketplace and, potentially, the relationship between the various platform sides, e.g. by regulating access to and exclusion from the platform, by regulating the way in which sellers can present their offers, the data and APIs they can access, setting up grading systems, regulating access to information that is generated on the platform, imposing minimum standards for delivery and return policies, providing for model contracts, imposing price controls and MFNs clauses, etc. Such rule-setting and "market design" determine the way in which competition takes place.

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82 Platform Revolution, p. 159. See also Henri Piffaut, "*Platforms, a call for data-based regulation*", CPI Antitrust Chronicle, May 2018, pp. 10-17.

Acknowledging and making explicit the rule-setting role of platforms adds a different and important aspect to our current understanding of digital platforms. It can help us to better understand and assess the competitive implications of platform conduct, and better analyse which conducts are pro-competitive and which conducts are anti-competitive. Later in this chapter, we will analyse how it can play a role in assessing the leveraging of monopoly power to adjacent markets, as well as practices restricting competition for the market.

Furthermore, we will argue that because of this function as regulators, the operators of dominant platforms have a responsibility to ensure that competition on their platforms is fair, unbiased, and pro-users. We will show that this is not a novel theory, by analysing how sport associations and sporting leagues have been subject to the same type of requirements. The issue has come to the forefront recently in the case of platforms that play a dual role: they at the same time operate marketplaces and sell or offer their own products and/or services on these marketplaces. This type of dual role would certainly influence the analysis of specific practices in competition cases, but we feel that the responsibility should extend to all dominant platforms, even those who do not play this dual role.

Platforms implement multidimensional and pervasive rules that include:

- Platform design choice: rankings (criteria and weights used), default options and other nudging strategies, search filters, etc.; rule of access to APIs and platform specific features, feedback and recommendation systems; payment systems; dispute settlement regimes.
- The rules of the relationship between the platform and the users: provision of payments, allocation of responsibility; sharing of information; prohibition on sale of counterfeit or "immoral" goods or goods that are not appropriate for the platform; etc.
- The rules of interactions between users:
    1. The "domiciliary rules": rules of conduct for the platform (e.g. limits of allowable speech); "rules of the market" (e.g. restricting the types of auction mechanisms that can be used)
    2. Rules determining how third parties on the platform may interact – for instance, pre-determining some of the dimensions of the contract that users on the platform are allowed to conclude or controlling prices.

Of course, the fact that platforms choose rules is not a problem *per* se; we should welcome competition between different business models and different platform architectures and encourage innovation in that space — indeed, these types of innovation have allowed platforms to generate large efficiencies by enabling transactions that were not possible. We would expect that, in many cases, profit maximising platforms have incentives to write good

rules to make the platform more valuable to their users. In the case of two-sided platforms, we would expect these rules to serve both sides in order to benefit from network externalities.

However, this might not always be the case. For instance, one cannot exclude the possibility that a dominant platform could have incentives to sell "monopoly positions" to sellers by showing buyers alternatives which do not meet their needs. For instance, hotel booking sites often propose a preferred placement to hotels who pay a higher commission. Given that "would-be buyers rarely scan down the results page and almost never click to the second page",[83] this effectively gives these hotels market power over potential clients. Alternatively, a platform whose main strategic objective is to attract more individual users could provide attractive conditions on the consumer side by sharing with them part of the benefits of its monopsony power on the business side.

To deal with these types of problems, we believe that it could be useful to acknowledge that dominant platforms have a responsibility to ensure that the rules that they choose do not impede free, undistorted and vigorous competition without objective justification. The rules and institutions provided by a dominant platform must not anti-competitively exclude or discriminate. A dominant platform that sets up a marketplace must ensure a level playing field on this marketplace and must not use its rule-setting power to determine the outcome of the competition.

The imposition of such a duty is not a particularity of the online world. According to well-established case law, institutions with a regulatory function are not bound by the free movement rules only. Special constraints upon the exercise of this regulatory function will also follow from competition law. The relevant principles have, in particular, been developed in the case law regarding sport associations and sporting leagues[84] which, in organising sports competition, set the rules determining who can participate and who shall be excluded, as well as the rules of the game etc. According to a longstanding jurisprudence – mostly based on Article 101 TFEU – such rules must not distort competition. Regarding anti-doping rules, the ECJ found in Meca-Medina[85] that, "in order not to be covered by the prohibition … in Article

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83 Hee "Andy" Lee, Basak Denizci Guillet, and Rob Law, "*An Examination of the Relationship between Online Travel Agents and Hotels: A Case Study of Choice Hotels International and Expedia.com*", Cornell Hospitality Quarterly 54(1) 95 –107.

84 *Inter alia*, Case C-519/04 P, *Meca-Medina and Majcen v Commission*, EU:C:2006:492. See also Commission decision of 8 December 2017 in Case AT.40208 – *International Skating Union's Eligibility rules.*

85 Case C-519/04 P, *Meca-Medina and Majcen v Commission*, EU:C:2006:492, at para. 47. David Meca-Medina and Igor Majcen were competitive long-distance swimmers that were banned for testing positive for Nandrolone, a prohibited anabolic steroid. They argued that the levels set by the International Olympic Committee (IOC) and the International Swimming Federation ('FINA) were too strict and chosen to serve the economic interest of the IOC and asked that the ban be declared void. They lost the appeal on the substance of the case, but as the quote in the text shows, the ECJ agreed that the IOC and FINA had a legal duty to impose rules that limited competition as little as possible.

101(1), the restrictions imposed must be limited to what is necessary to ensure the proper conduct of competitive sports", as such rules otherwise have the potential to result in an athlete's unwarranted exclusion from sporting events and in such a case to distort competition.

Furthermore, the European Commission has been mindful of potential conflicts of interest of sport associations that have a regulatory function, but are, at the same time, active in the organisation and commercial exploitation of sporting events. In its recent decision (based on Article 101 TFEU) on the International Skating Union's Eligibility Rules, the Commission therefore found that "[t]he exercise of the ISU's regulatory power should therefore be subject to restrictions, obligations and review to avoid a distortion of competition by favouring its own events and/or those of its Members above those of third party organisers".[86]

We have found the focus on the rule-setting power useful to think about the way competition policy should be applied to rules set by platforms. While the basis for controlling the exercise of a platform's rule-setting power will typically be based on Article 102 TFEU instead of Article 101 TFEU, the principles guiding the identification of anti-competitive exclusion will arguably be similar. As regards the more general principle of prohibiting distortions of competition not warranted by the rule-setting purpose, a dominant entity with rule-setting power must not be subject to a lesser standard than the one developed under Article 101 TFEU for horizontal rule-setting agreements where the effects on third parties are relevant.

For a number of issues, the focus on the rule-setting power of platforms is mostly relevant as a complementary analytical perspective as, for example, a platform's restriction of multi-homing on the seller-side can be addressed under Article 102 TFEU also without reference to a platform's regulatory function.

On the other hand, as we will see in more detail below, this perspective can provide guidance on how to deal with the rule-setting practices of dominant dual-role platforms.

B. TRANSPARENCY IS ALSO A COMPETITION POLICY ISSUE

If we accept the analysis above, dominant platforms have a responsibility to ensure that the rules they impose limit competition only insofar as this is necessary to ensure the proper functioning of the platform. This, of course, does not imply that they cannot charge for access to the platform or that they cannot offer services, such as advertising, to the sellers who use the platform. It however does imply limits on the strategies that they can use. Let us mention two of them.

[86] Commission decision of 8 December 2017 in Case AT.40208 – *International Skating Union's Eligibility rules*, at para. 137.

First, the platform must not unduly restrict competition. For instance, consider the hypothetical case of a platform that, faced with requests by users whose preferences it knows imperfectly, would present, among many irrelevant ones, only one choice that is acceptable to the consumer, even when it had several in its portfolio. Even if the choice corresponded in some ways to what it knows about the preferences of the users, the platform could be restricting consumer choice and making the marketplace less competitive. It would be selling monopoly power, and in the absence of a valid efficiency rationale, this would violate the obligations which we have described above. Notice that this would be true even if it allocated the right to be the offered choice equitably among the sellers on the platform. Even in this case, it would be selling monopoly power and be in breach of its obligations (we would expect that it would gain in this case by being able to charge higher fees on the sellers' side of the market). Difficult questions may arise in the future due an eventual increasing use of digital assistants, which would pre-determine their owner's choice of a product or service: where the limitation of choice is inherent in the nature of the service offered, it cannot be qualified as a platform's deliberate choice to restrict competition and may furthermore be justified by an efficiency rationale, but would need to be counterbalanced by a fiduciary duty of the digital assistant towards its owner.

Second, we believe that our analysis shows that transparency can be a competition policy issue. To take an extreme case, consider a platform which announces that its response to search queries by buyers is driven by considerations of price, quality and adequacy to what it knows to be the buyer desires (either through the terms of the search or by previous interactions), but which as a matter of fact receives commissions to favour some offers. Such a policy would constitute a misleading commercial practice within the meaning of Article 6 of the Unfair Commercial Practices Directive[87] and hence be prohibited under unfair trading law. We believe that, provided the platform is dominant, there can also be a potential competition angle under Article 102 TFEU. Through its lack of transparency, the platform is presumably distorting competition. Where a distortion of competition can be established, the duties of a dominant platform to avoid such distortion may exceed the duties required under unfair trading law.

At the same time, it should be kept in mind that there can be some useful information in the fact that a seller is willing to pay in order to be presented to the buyer. Therefore no competition policy concerns arise where the payment of commissions and its influence on the ranking is made explicit in a way that enables consumers to explicitly choose with a clear understanding of the trade-offs they are facing. In practice, there are limits to the attainable amount of transparency – for instance, it is difficult for a digital assistant to explain how the one choice it is proposing is affected by commissions. We do not believe that this difficulty

[87] *OJ L 149, 11.6.2005.*

should exempt platforms from the requirement of transparency, even if it limits their profitability.[88]

When there is enough competitive pressure, platforms will not have incentives to reduce competition or to offer goods that do not correspond to the requirements of the consumers, but network externalities – and sometimes information asymmetries – will frequently reduce the intensity of competition and, without any intervention by competition authorities, make such practices profitable.

C. LEVERAGING OF MARKET POWER AND SELF-PREFERENCING

As we think of marketplace platforms as regulators, one scenario immediately comes to mind as problematic: when the platform or another service from the same ecosystem is also a participant in the market. This is the issue of the way in which platforms treat their own products and services compared to those provided by other entities. We discuss this issue in some detail in the sections below. We first turn to some general considerations on the leveraging of market power, of which self-preferencing is a subcase.

1. LEVERAGING MARKET POWER

Using our discussion of ecosystems in chapter 2 as background, we discuss in this section the role of competition policy in preventing the leveraging of market power from one market to another (which of course, should not prevent pro-competitive expansion of the range of offerings by digital firms). This topic is not separate from the "competition for the market" topic. Some firms might leverage their market power to a closely related market, not for the "offensive" motive of generating greater profits, but for "defensive" motives of preventing entry in their core market (see also chapter 6). It is not clear that this is a meaningful difference analytically or legally. Nor is the topic separate from the "competition on the market" topic: particularly in cases of vertical integration, the dominant position on the platform market can be leveraged to the product or services market for which the platform provides an intermediation infrastructure.

Given its importance in recent debates, we will focus our discussion on the issue of bundling services or goods in a platform[89] and of the reasons why the topic is more pregnant in the digital industries that in many other sectors of the economy. As we have already discussed, a

[88] We recognize that there are trade-offs involved and that limiting the opportunity to profit from some innovations also has costs. The statement in the text represents our intuition about the magnitude of the different effects.

[89] Alexandre de Cornière and Greg Taylor, "*Upstream Bundling and Leverage of Market Power*" (unpublished WP, 2018) provide a short but clear-sighted discussion of the literature and of some of the specific features of platforms which require modifications in the analysis of theories of harm.

large platform possesses a strong competitive advantage over new entrants because of, *inter alia*, network externalities and privileged access to data. Often this advantage will translate also into advantages in related services. However, if we want to maintain a competitive playing field, it is important to try to mitigate these effects without sacrificing efficiency. Two points could be especially important. First, if the bundling is efficient thanks to the shared use of data, the data sharing policies which we discussed briefly above and will discuss at greater length in chapter 5, including data interoperability, can greatly help to level the playing field. Second, we would expect that dominant platforms would try to bundle services and products where their control of consumers' data and of network externalities are strong with other services and products where these factors play less of a role. In these cases, there is very little efficiency benefit to bundling and enforcement should be especially strict.

2. SHOULD PLATFORMS BE ALLOWED TO SUBJECT THEIR OWN PRODUCTS OR SERVICES TO DIFFERENT RULES THAN THE OTHER PRODUCTS AND SERVICES SOLD ON THE PLATFORM?

We now turn to one specific technique for leveraging a platform's market power: giving preferential treatment to one's own products or services, or one from the same ecosystem, when they are in competition with products and services provided by other entities.

On the one hand, one could argue that giving its products or services preferential treatment is an appropriate reward for management of the platform. On the other hand, where a dominant platform engages in self-preferencing, the distortive effect on downstream markets may be substantial, such that self-preferencing ultimately constitutes a disproportionate form of reward.

Article 102 TFEU does not impose a general prohibition of self-preferencing on dominant firms. According to a well-established case law, the owner of an essential facility must not engage in self-preferencing.[90] However, self-preferencing by a dominant firm can be abusive even below this threshold where it is not justified by a pro-competitive rationale and is likely to result in a leveraging of market power. In other words: self-preferencing is not abusive *per se*, but should be subject to an effects test.

In cases of vertically integrated dominant digital platforms in markets with particularly high barriers to entry, and where the platform serves as an intermediation infrastructure of particular relevance, we propose that, to the extent that the platform performs a regulatory function as described above, it should bear the burden of proving that self-preferencing has no long-run exclusionary effects on product markets. The dominant platform would then need

[90] See, *e.g.,* Case T-201/04, *Microsoft v Commission*, EU:T:2007:289, at para. 1088.

to prove either the absence of adverse effects on competition or an overriding efficiency rationale.[91]

3. WHERE SELF-PREFERENCING IS FOUND TO CONSTITUTE AN ABUSE, WHAT ARE THE APPROPRIATE REMEDIES?

In *Google Shopping,*[92] the Commission required Google and Alphabet to ensure that Google treats competing comparison shopping services no less favourably than its own within its general search results pages but it left it to Google and Alphabet to choose between the various ways available for doing so. There have been calls for more aggressive approaches.

Article 7 of Regulation no. 1/2003 allows the Commission to adopt behavioural or structural remedies which must, however, be effective in bringing the infringement to an end, and at the same time proportionate to the infringement. Given this legal framework, abusive practices of self-preferencing by digital platforms pose specific challenges. Behavioural remedies – for example remedies relating to changes to the design of a ranking algorithm – might be difficult for a competition authority to handle. Performance-based criteria are possible but might also present unique new challenges to competition authorities. Finally, decisions might arrive too late.

This may seem to argue for structural remedies, namely for an unbundling of vertically integrated platforms, whether in the form of a legal unbundling, an operational unbundling, an informational unbundling or an ownership unbundling. Regulators of transport and energy utilities have struggled with the issue of unbundling for years. With the separation of the management of the infrastructure and of services, they have pondered the costs and benefits of letting the firm that manages the infrastructure compete in the downstream market. They have, at times, concluded that the cost of self-preferencing would be too high and have imposed strict separation, although the same conclusion has not been reached in the telecommunications industry.

When it comes to digital platforms, it is less clear that the balance of costs and benefits argues for some version of unbundling of vertically integrated platforms. When compared to the traditional infrastructures (e.g. rail, energy networks), platforms differ as aspects of infrastructure provision and service provision may be mixed. While there may be cases in which full platform unbundling is called for, this remedy should not be the generalised answer to the finding of an abusive self-preferencing. Less restrictive ways to effectively preclude

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91 See, in this general spirit: ARCEP, "Smartphones, tablettes, assistants vocaux – les terminaux, maillon faible de l'ouverture d'Internet, Rapport sur leur limites et sur les actions à envisager", February 2018, https://www.arcep.fr/uploads/tx_gspublication/rapport-terminaux-fev2018.pdf – arguing for a principle of "net neutrality" for smartphones, tablets and voice assistants.

92 See Commission decision of 27 June 2017 in Case AT.39740 - *Google Search (shopping)*.

self-preferencing may exist. However, where – like in *Google Shopping* – the remedy imposed on a dominant platform consists in ensuring that it treats competitors no less favourably than its own subsidiary services, competition authorities should make sure that effective instruments of output control are in place. Also, where self-preferencing has significantly benefitted a platform's subsidiary in improving its market position vis-à-vis competitors, such remedies might include a restitutive element ("restorative" remedies). In order to enable formerly disadvantaged competitors to regain strength, it may, for example, be necessary to give them access to the dominant platform's competitively relevant data resources or otherwise compensate for their reduced visibility or lack of data access in the past.

D. DATA EXCHANGE

The private marketplaces run by platforms have one important feature that "real world" markets do not have: it is possible to observe in detail how the market functions. One can know the prices at which goods or services are exchanged, but also collect lots of information about the way the consumers choose and their search behaviour, the way prices are adjusted by the suppliers, the complementarity between the purchases of different goods and so on and so on. (In the rest of this section, to make the exposition easier, we will assume that the data is provided by a platform.)

This provides many opportunities for pro-competitive exchange of data. To give an example, clients of the same platform could access aggregate data from other users of a service or a platform (in the case of two-sided platforms, this data could originate from the same side or from the other side of the platform) to compare the efficiency of their operations to benchmarks provided by the platform or which they construct for their own purposes. For instance, platforms which provide travel services to firms could help them to compare their expenses and their policies to those of the market at large. It is certainly possible to develop theories according to which such data sharing would restrict competition and deter innovation, but in other settings it would lead to large productivity gains and should then be encouraged.[93]

Sharing data between individual firms in order to help them improve their products is a more difficult area. Regulators and competition policy practitioners are trapped in the well-known paradox of information in competitive markets. For a market to function well, participants should have access to lots of information about prices, goods for sale, etc. However, an increased flow of information also favours collusion.[94] Specific problems arise when a

[93] One could worry that because the data would be available only to firms who belong to the platform, this would increase network externalities.

[94] See, among many others, Ralf Dewenter, Ulrich Heimeshoff & Hendrik Lüth (2017), "*The impact of the market transparency unit for fuels on gasoline prices in Germany*", *Applied Economics Letters*, 24:5, 302-305, DOI: 10.1080/13504851.2016.1184371 for evidence that transparency can favour collusion.

dominant, vertically integrated platform provides privileged data access to its own subsidiary. As this constitutes a form of self-preferencing, we would apply the test set out above.

E. GENERAL CONDUCT RULES FOR PLATFORMS, COMPETITION LAW OR MARKET-POWER DEPENDENT REGULATION?

Non-dominant platforms also play a regulatory role. Does the recognition of this fact imply a call for general rules to be imposed on all platforms, or should (some) special obligations be placed only on dominant platforms (or, alternatively, to platforms with some degree of market power)? These issues, closely linked to the proper relationship between regulation and competition policy, are currently debated in the context of the Commission's proposal for a "Regulation on promoting fairness and transparency for business users of online intermediation services" (P2B-Regulation).[95]

To the extent that non-dominant platforms, in their regulatory role, can be expected to be disciplined by competition, no further reaching general rules would be needed — although one should add the *caveat* that the economic literature has shown that competition between two-sided platforms may not necessarily yield efficient outcomes.[96] The "unravelling" argument first introduced in the economic literature by Grossman and Hart,[97] would imply that competition will lead to transparency and therefore that competition would discipline platforms. However, this assumes away a number of behavioural aspects, and the generalised transparency regime which the draft P2B Regulation is proposing for essentially all platforms above a specific size, irrespective of market power, is a reasonable requirement. Given transparency, even if, because of bounded rationality and inertia, consumers fail to react to – *inter alia* – self-preferential rankings, the business side of the platform would presumably react, which would eventually lead the consumers to also switch. Under these circumstances, and given the risk of errors, we feel that imposing far-reaching conduct rules on all platforms, irrespective of market power, could be a dangerous path, given that many types of conduct – including potentially self-preferential conduct – may have pro-competitive effects.

The competitive discipline depends on the businesses leaving when they are harmed by certain forms of platform regulation. In determining the ability to leave, the specificities of "intermediation power" as discussed above in chapter 3 should be taken into account. As we

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95 European Commission proposal for a Regulation, 26 April 2018, COM (2018)238 final.

96 See our discussion in chapter 2 and Weyl and White (2014) cited there. For a discussion of the consequences of this statement in the case of credit cards see Jean-Charles Rochet and Jean Tirole, "*Competition Policy in Two-Sided Markets, with a Special Emphasis on Payment Cards*" in *Handbook of Antitrust Economics*, Paolo Buccirossi, ed., The MIT Press, 2018, pp. 543-582.

97 S.J. Grossman and O. D. Hart, "*Disclosure Laws and Takeover Bids*", in *Journal of Finance*, 1980, Vol. 35, No. 2, pp. 323-334.

discuss there, “intermediation power” – and hence regulatory power – can exist even where the market share, however measured, is significantly below 40 %.

IV. CONCLUSION

In this chapter, we have developed an analysis of competition policy for platforms in general. In this conclusion, we would like to stress some aspects which are especially relevant for the very large platforms which are dominating the current political debate.

The development of the large platforms in the beginning of the 21st century has brought many benefits, in Europe and all over the world, by enabling consumers and firms to take full advantage of the Internet technology developed in the last quarter of the 20th century. As is standard in market economies, the pioneering firms were rewarded by the acquisition of market power and the associated profits. However, the specificities of competition in the digital world, explored in chapter 2 and in this chapter, make market power “sticky”, and there is legitimate fear that the market power they have acquired will be hard to challenge. Furthermore, they have been able to build, on top of their core competencies, entire ecosystems which make it hard for new entrants to compete on the merit and which, many observers feel, face little competitive pressure.

Facing this new competitive (or uncompetitive) landscape, many policy makers and commentators on both sides of the Atlantic propose drastic reforms. As we are concluding our work on this report, David Cicilline, head of the U.S. House of Representatives Antitrust Subcommittee, is calling for a Glass-Steagall Act for technology companies, to mention just one prominent example. In this chapter, we argued that it is worth trying out a path which relies on established competition rules, vigorously brought up to date for the digital age with regard to methodological approaches, “theories of harm” and concrete tests. In some respects, competition law will benefit from being bolstered by regulation – for example a transparency regime as set out in the draft P2B Regulation. There are other areas where regulation might be appropriate, in particular where similar issues arise continuously and intervention may be needed on an ongoing basis, for example to subject platforms to an interoperability regime.

Apart from these limited settings, we believe that competition law can and should, for the foreseeable future, continue to accompany and guide the evolution of the platform economy. Its case law method is particularly well suited for the current state of evolution of the platform economy: a still experimental stage, where the efficiencies of different forms of organisation are not yet well understood and our knowledge and understanding still needs to evolve step by step.

In this ongoing process, where: (1) the position of dominance is bolstered by high and non-transitory barriers to entry; and (2) the structure of the market does not tend towards

effective competition within a relevant medium-term time horizon, we would apply the following three main principles, whose consequences we have explored in this chapter:

- Because of the innovative and dynamic nature of the digital world, and because its economics are not yet completely understood, it is extremely difficult to estimate consumer welfare effects of specific practices. Given the concentration tendencies of platforms, and the high barriers to entry in some of the markets they dominate, a finding that they restrict the ability of other firms to compete either on the platform or for the market in a way which is not clearly competition on the merits should trigger a rebuttable presumption of anti-competitiveness. It should be the dominant platform's responsibility to show that the practice at stake brings sufficient compensatory efficiency gains.[98] Given the breadth of the presumption, and the fact that our insights into possible countervailing efficiencies are still evolving, such efficiency defences should be fully explored by competition agencies and courts.
- Platforms act as regulators of the interactions they host. If dominant, they have a responsibility to ensure that they regulate in a pro-competitive way. In section III, we have explored in detail the consequences of this doctrine for competition policy.
- Dominant platforms should be subject to a duty to ensure interoperability with suppliers of complementary services. When they exist, APIs (protocol and data interoperability) and their access would be considered, and would be subject to the same requirements regarding self-preferencing, transparency, and platform-as-regulator.

We would like to end with a final word about transparency of the functioning of platforms. As we have pointed out several times, there exist many aspects of their functioning which are not well understood, either by academics or by competition authorities. The biggest platforms employ researchers who do very good work documenting some aspects of their behaviour and sometimes provide access to their data to qualified external researchers. However, for obvious reasons, this is not enough. As platforms act as regulators, they gain an impact on individuals, firms and society that reaches beyond "pure" market power. While respecting business secrets, public authorities should arguably find ways to ensure a sufficient understanding of how platforms work, i.e. the ways in which they fulfil their "regulatory" function. The information needed for this endeavour might need to reach beyond the already existing possibilities to get full access to data and algorithms in the context of competition law cases. We believe that the impact of platforms on society requires more transparency vis-à-vis civil society. While direct data access or algorithmic

98 We are aware of the difficulties of the task of carrying out this balancing of effects and the caveats on the difficulty of quantifying the harm might likely apply with respect to the task of quantifying the efficiency gains too.

sandboxing might not always be possible[99], action by platforms to actively prevent research in the public interest – from technical measures purposely designed to prevent transparency to legal measures such as making studies contractually inadmissible (e.g. against Terms of Service) or criminal (e.g. under the U.S. Computer Fraud Act) – should be viewed with great suspicion. More pro-active ways should also be found to grant independent researchers access to sufficient data or sandboxes[100] to provide European citizens with a clearer understanding of the way in which the platforms function. This is also important to provide competition authorities with a better understanding of the way in which these markets function.

99 Although some good, but still limited, examples exist *e.g.* King, G. and Persily, N., 2018. A new model for industry-academic partnerships. accessed online https://gking.harvard.edu/partnerships.

100 For instance, along the lines of what is being done by the National Bureau of Economic Research (NBER). Algorithmic sandboxes would also be useful tools for competition policy authorities.

5 DATA

I. ACCESS TO DATA – THE ROLE OF THE LEGAL FRAMEWORK OF DATA MARKETS, OF COOPERATION AND OF COMPETITION LAW: INTRODUCTION

We have already discussed the role of data for the digital age in chapter 2. Data is a core input factor for production processes, logistics, targeted marketing, smart products and services, as well as Artificial Intelligence (AI). It drives interoperability in interconnected environments and will revolutionise sectors such as mobility and healthcare. The competitive relevance of data is consequently very important. The competitiveness of firms will increasingly depend on timely access to relevant data and the ability to use that data to develop new, innovative applications and products. Against this background, an important debate has emerged on whether, and if so under which conditions and on which legal basis, public intervention is needed to ensure sufficient and timely access.

In this chapter, we want to advance a number of points that are important for this debate.

First, any discussion of access to data must take into account the heterogeneity of data (along many dimensions), of use cases, of desired access conditions, etc. Discussing access to data in the abstract is futile. We have introduced many of the relevant distinctions already in chapter 2, and will merely summarise them here, as a background for the analysis that is to follow.

Second, whether and which data can be accessed through market interactions will be heavily influenced by the legal and institutional framework. As the GDPR sets up a special framework for personal data that, *inter alia*, grants important rights of control to individuals, access to personal and non-personal data follow different paths and need to be discussed separately. With regard to non-personal data, an important debate on (non-competition law based) access rights has evolved; its outcome will have a substantial impact on markets for data and competition. With regard to personal data, much will hinge on whether intermediaries will appear to help data subjects control the processing of "their" data according to their varying preferences. Competition law must take these developments into account. Simultaneously, there is a notable interdependency between competition law and data protection law as the latter affects competition and as market power affects both the choices that data subjects realistically have and the privacy risks they are exposed to.

Third, before considering mandated access to data, the possibilities for voluntary data sharing need to be explored. Firms sometimes complain about the high degree of legal uncertainty they face when they consider data sharing and data pooling. We set out some general principles to help the development of more precise guidelines.

Fourth, we turn to the broad debate on whether and under which conditions access to data can and should be mandated under Article 102 TFEU. Again, we propose to be careful here: it is necessary to distinguish between different forms of data, levels of data access, and use cases. In a number of settings, data access will not be indispensable to compete, and public authorities should then refrain from intervention. In other settings, however, duties to ensure data access – and possibly "data interoperability" – may have to be imposed. While the general criteria for doing so can be taken from Article 102 TFEU, ensuring frictionless data interoperability on an ongoing basis will surpass the capacities of competition authorities. In such cases, there may, therefore, be a case for some sort of regulation – which must, at times, be sector-specific. When it comes to ensuring access to data for the purpose of promoting AI in general in order to foster innovation – i.e. a form of data access that is unrelated to the business activity of the data controller – we believe that a legal regime outside of competition law will be needed.

Finally, we must remember that broader diffusion of data is not always desirable, either from a social welfare or from a competition perspective. Privacy concerns impose limits where personal data is concerned. Business secrets may be an issue, and competition rules on information exchange may matter. What is more, when it comes to dominant firms, access to more data may tend to strengthen dominance or allow an incumbent to leverage market power. We will discuss this and propose some principles.

The aim of this chapter, as well as the rest of the report, is to present some general considerations as a contribution to the evolution of competition policy in the next few years in the digital sector. By its very broad scope, it cannot enter into specificities. In particular, there are some industries where the flow of data is regulated, among them, in particular, financial services and healthcare. Our analysis could have to be substantially adjusted for these sectors – we do not attempt to do so.

II. THE HETEROGENEITY OF DATA AND OF DATA USE CASES

When discussing access to data, we have to acknowledge, first of all, the diversity of the concept of data and of possible data access scenarios. The significance of data and data access for competition will always depend on an analysis of the specificities of a given market and the type of data and data usage in a given case.

For possible ways to categorise data, we refer back to chapter 2 of this report: data can be personal or non-personal, and on the basis of this distinction, different legal rules will apply that affect access to data (see below). We also remind the reader of the potential relevance of

public sector information and the current reform of the Public Sector Information Directive[101] which is meant to promote the availability of public sector data.

As discussed in chapter 2 of this report, data can roughly[102] be categorized as volunteered, observed and inferred data, and this distinction has implications regarding the questions on whether the same information can be gathered or gained by competitors independently or whether a dataset may be unique and access to it possibly indispensable to compete effectively. Data can, furthermore, be a single user dataset, bundled single user data (we here use bundle as a shortcut for anonymous access to individual-level data), or aggregate level data. And, in particular as far as observed and potentially volunteered data are concerned, it can be generated at different frequencies, and data access can either concern historical or real time data.

There are myriad different circumstances in which a firm could wish to have access to data controlled by another firm. For the purpose of introducing some relevant distinctions and to make our discussion more concrete, we will repeatedly refer to the following three, rather typical, scenarios (which we also call use cases):

- In scenario 1, a dominant firm has individual level data – whether personal (scenario 1a) or non-personal (scenario 1b) – about a specific person (or machine used by a person); this data is needed by another firm to provide complementary services[103] to a product or a service provided by the dominant firm to that specific person. For example, a firm offering a follow-up service for e-mails may require continuous access – that is access as the data is generated – to users' inboxes and calendars (scenario 1a), or a firm offering maintenance services for aircraft may desire to have continuous access to sensor data from a specific aircraft it wants to service. In scenario 1a, the data access request will typically require consent by the data subject (if the data is personal) and in scenario 1b by the machine owner or possessor.
- In scenario 2, a firm requests access to bundled individual level data or to aggregate data from a data controller. For example, the firm offering maintenance services for aircraft is not satisfied with access to the sensor data for the aircraft which it services, but wishes to also access the sensor data of all aircraft of the same type, in order to better predict upcoming problems. In such a setting, the firm requesting access may either offer services that are complementary to the product or service offered by the

101 Directive 2003/98/EC as amended by Directive 2013/37/EU and EU Commission, Proposal for a review of the Directive on the re-use of public sector information, 25 April 2018, COM(2018)234 final.

102 The following is not a legal distinction, and we are aware that it is not clear-cut. We consider it helpful nonetheless as a rough first filter for determining indispensability.

103 Including aftermarket services.

data controller (scenario 2a), or it may compete with the data controller in the downstream market (scenario 2b).

- In scenario 3, a firm requests data from data controllers for the purpose of training algorithms for uses that are completely unrelated to the fields of activity of the data controller. As we have discussed before, large-scale datasets collected for one purpose, e.g. location data, can be valuable for a broad range of applications. Therefore, scenario 3, too, is a relevant and important scenario.

We will refer to these use cases in particular when we discuss whether competition law can and should mandate access to data. But beyond that, they serve as a frame of reference for thinking about settings in which data access may be needed to innovate and compete – settings which may inform the way the legislative framework for data access is defined, or in assessing the efficiency of data sharing arrangements.

III. LAW AS A DETERMINANT OF DATA ACCESS AND COMPETITION

A. DATA ACCESS – THE NEED FOR A COMPREHENSIVE APPROACH

In an increasing number of contexts, data access is key for the competitiveness of firms and their opportunities to innovate. In this regard, the broadest dissemination and use of data by the greatest number of firms would seem to be desirable. But the efficiencies of a broad dissemination and use must be balanced against a number of other policy concerns. They start with the need to ensure sufficient investment incentives for firms to collect and process data where they are needed. And they extend to the commitment to protect privacy (where personal data is concerned), competition, and business secrets and not to impose undue costs on firms which control data.

In this section, we want to raise awareness that the role of competition law in ensuring access to data will depend on how different legal regimes relevant to data interact. Whether and how firms will be able to access personal data through the normal functioning of the marketplace will depend heavily on the way data protection law is interpreted and on the institutions that will evolve to help individuals exercise their rights to data control. Similarly, whether and how firms will be able to access non-personal data will turn on the allocation of rights of data control.[104]

Debates about data access should, therefore, not be led by specialists of the relevant policy fields in isolation. The European ambition must be to provide a coherent overall framework that promotes the overarching goals of protecting individual rights, fostering innovation, and fostering competitive markets. We will sketch some policy options that may help to reconcile

[104] Both property rights proper and contractual rights.

the different perspectives. More generally, we submit that in order for a well-functioning European data economy to emerge, it is of the essence to bring the different policy perspectives together. Competition law has to take data protection law into account, and the interpretation and implementation of data protection law should arguably consider both the existence or absence of competition and the effects on competition.

B. ACCESS TO PERSONAL DATA – THE LEGAL FRAMEWORK UNDER THE GDPR

EU law is strongly committed to the protection of personal data (see Article 8(1) of the Charter of Fundamental Rights of the EU). The GDPR, which sets out when and how personal data may be processed, has far-reaching consequences for the way personal data can be accessed, traded and shared. It sets out a legal framework for the digital economy which shapes the functioning of markets and competition in all areas related to personal data. However, the GDPR – while building on previous EU law[105] – is still new and not yet tested in court. While the Article 29 Working Party and its successor the European Data Protection Board have issued a large number of guidelines, important guidance regarding the commercial use of personal data is still pending. If we think of legal data regimes in a more integrated fashion (see above, A.), the interpretation and implementation of the GDPR should take the implications for competition into account; and under a risk-based approach,[106] it may consider the existence of market power. Moreover, it may be worthwhile for the European legislator to consider institutional models that may both help the data subjects to exercise their data sovereignty effectively and promote competition (e.g. legislation about data intermediaries). Competition law, on the other hand, can have the effect to protect and promote the individuals' choice also with a view to privacy policies.

1. THE GDPR'S SCOPE OF APPLICATION

A significant proportion of the data generated today is data on consumer behaviour. To the extent that this data can be related to an identified or identifiable person, it falls under the GDPR.[107] While anonymised data is not caught by the special regime of rights and duties set out in the GDPR,[108] data scientists have shown that anonymising individual-level personal data in such a way that individuals cannot be re-identified is very difficult. Anonymous data do not contain any direct identifiers (such as name, address, email, phone number). However, a

105 Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data, Official Journal L 281 , 23/11/1995, p. 31. The GDPR essentially updates rights already enshrined in that directive and applied in EU case-law over the last 20 years.

106 See Maldoff, "*The Risk-Based Approach in the GDPR: Interpretation and Implications*", March 2016, https://iapp.org/resources/article/the-risk-based-approach-in-the-gdpr-interpretation-and-implications/.

107 For the definition of "personal data", see Article 4(1) GDPR: "any information relating to an identified or identifiable person".

108 See Recital 26 of the GDPR.

hacker trying to re-identify an individual in the dataset can use information (e.g. birth date and zip code) he has about the person, e.g. from publicly or easily available data, to re-identify him or her.[109] While anonymising small data is hard, it is impossible for rich "observed" datasets using traditional statistical disclosure methods[110] (see the box on anonymous use of individual-level data later in this chapter). For instance, such datasets containing location data from mobile phone, credit card transactions, smartcard tap-in tap-out, and browsing (URLs) datasets have all been shown to be re-identifiable[111].

European data protection law, however, relies on a concept of "effective" anonymisation meaning that it should be unlikely that the person who accesses the data can re-identify a person in the dataset. [112] This is thus likely to open up the door to a broad range of security-based techniques allowing large-scale datasets to be used anonymously (see box below on anonymous use of individual-level data)[113]. This is important to keep in mind when discussing the possibilities for competition law to impose access to data remedies and for pooling of anonymous data.

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109 See, for example, Sweeney, L., 2000, "*Foundations of privacy protection from a computer science perspective*". In Proceedings Joint Statistical Meeting, AAAS, Indianapolis, showing that the ZIP code, gender, and date of birth where enough to uniquely identify 87% of the US population; a number later re-evaluated to 63% - see Golle, P., 2006, October. Revisiting the uniqueness of simple demographics in the US population. In *Proceedings of the 5th ACM workshop on Privacy in electronic society* (pp. 77-80). ACM.

110 By traditional statistical disclosure methods, we refer to the range of methods that attempt to modify a dataset to render it anonymous before sharing it. While a broad range of methods exists, they mostly consist of variations of data generalization and suppression along with swapping and sampling to decrease uniqueness or to achieve k-anonymity.

111 de Montjoye, Y.A., Hidalgo, C.A., Verleysen, M. and Blondel, V.D., 2013, "*Unique in the crowd: The privacy bounds of human mobility*", Scientific reports, 3, p. 1376; de Montjoye, Y.A., Radaelli, L. and Singh, V.K., 2015. Unique in the shopping mall: On the reidentifiability of credit card metadata. Science, 347(6221), pp. 536-539; Lavrenovs, A. and Podins, K., 2016, November. Privacy violations in Riga open data public transport system. In Advances in Information, Electronic and Electrical Engineering (AIEEE), 2016 IEEE 4th Workshop on (pp. 1-6). IEEE; and https://www.ndr.de/nachrichten/netzwelt/Nackt-im-Netz-Millionen-Nutzer-ausgespaeht,nacktimnetz100.html. See also: *e.g.* CASD (https://www.casd.eu/en/, secured data access center), OPAL project (https://www.opalproject.org/, "sending the code to the data"), Diffix (https://aircloak.com/, "privacy-preserving SQL queries").

112 See Recital 26 of the GDPR: "To determine whether a natural person is identifiable, account should be taken of all the means reasonably likely to be used, such as singling out, either by the controller or by another person to identify the natural person directly or indirectly. To ascertain whether means are reasonably likely to be used to identify the natural person, account should be taken of all objective factors, such as the costs of and the amount of time required for identification, taking into consideration the available technology at the time of the processing and technological developments."

113 For guidelines on what constitute anonymous data see Article 29 Data Protection Working Party, Opinion 05/2014 on Anonymisation Techniques. 0829/14/EN (April 10, 2014).

2. PROCESSING PERSONAL DATA UNDER THE GDPR – CONSENT, INTEREST-BALANCING, AND THE RELEVANCE OF MARKET POWER

While Article 6 of the GDPR offers six equally valid legal bases for the processing of personal dataincluding some that are particularly relevant in a commercial context (e.g. performance of a contract), we find that consent (lit. a) and legitimate interest (lit. f) are most relevant for the purpose of this report.

Much of the discussion of the GDPR has focused on the condition that users must consent to the processing of their data where required (art 6 lit a).[114] On the basis of the premise that consent can be regarded as a meaningful expression of "data sovereignty" only to the extent that individual consent is "freely" given, sufficiently informed and an "unambiguous indication of the data subject's agreement to the processing of personal data relating to him or her" (recital 32 of the GDPR), the GDPR has substantially tightened the conditions under which the consent is valid – namely, consent must be given through "affirmative" action which means that tacit forms of consent (e.g. silence, pre-ticked boxes) are invalid. According to Article 7(4) GDPR, "when assessing whether consent is freely given, utmost account shall be taken of whether, inter alia, the performance of a contract, including the provision of a service, is conditional on consent to the processing of personal data that is not necessary for the performance of that contract." The precise meaning of "freely given" and the limits this condition imposes on "data as consideration" business models, providing free services in exchange for data, is debated. In its recent Facebook decision, the German Bundeskartellamt has considered that the existence of a position of dominance – and hence the lack of reasonable outside options for consumers – is relevant for assessing the validity of consent.[115]

A tight construction of Article 7(4) GDPR and/or of the other preconditions for valid consent, as well as practical problems in getting and proving valid consent may push firms to rely more on Article 6(1)(f) GDPR in the future. That Article allows "processing [which] is necessary for the purposes of the legitimate interests pursued by the controller or by a third party, except where such interests are overridden by the interests or fundamental rights and freedoms of the data subject which require protection of personal data". The existence of market power should

[114] See also Article 29 Working Party Guidelines on consent under Regulation 2016/679, as last revised and adopted on 10 April 2018.

[115] Bundeskartellamt, Fallbericht v. 15.2.2019 zur Facebook-Entscheidung v. 6.2.2019, Az. B6-22/16, p. 11. For more on this topic, also see section 3.8 of Acquisti, A., Taylor, C. and Wagman, L., 2016. The economics of privacy. Journal of Economic Literature, 54(2), pp. 442-92; Acquisti, A., Brandimarte, L. and Loewenstein, G., 2015. Privacy and human behavior in the age of information. Science, 347(6221), pp. 509-514; and Turow, J., Hennessy, M. and Draper, N., 2015. The tradeoff fallacy: How marketers are misrepresenting American consumers and opening them up to exploitation, available at https://ssrn.com/paper=2820060.

however matter for assessing the balance of interests – as it does for assessing the validity of consent.[116]

Furthermore, a shift towards Article 6(1)(f) GDPR as a basis for data processing does not imply the end of consent. Interest balancing would tend to lead to some standardised rights to data processing, but also to limits to these rights. Any further-reaching data processing not covered by Article 6(1)(f) would require individual consent – albeit, arguably, under a higher standard of validity control.

The competitive landscape will affect the collection of data both under the consent or legitimate interest basis. Where Article 7(4) GDPR limits the validity of consent requested by a dominant company to what is necessary for the provision of the service, a permission under Article 6(1)(f) GDPR will arguably not reach further. Dominant firms may be subject to a particularly stringent data protection standard under both tests. In protecting consumer choice vis-à-vis dominant firms, competition law and data protection law can thus complement each other.[117]

Consent and interest balancing can diverge in other regards. In some settings, obtaining valid consent for uses that do not immediately benefit the data subject granting consent may be burdensome. Where the risk to the individual data subject is small but the potential usefulness of data access is high, interest balancing may then provide an alternative basis for data processing. Depending on legal standards, Article 6(1)f GDPR may thus well facilitate access to data for innovative, while non-privacy-intrusive purposes.

Finally, at the intersection of the GDPR and competition law, the recent Facebook decision by the Bundeskartellamt imposes, by way of a remedy, an “internal unbundling” of data collected by different subsidiaries of a dominant firm. A full discussion of the decision is beyond the scope of this report. Yet, the decision may impact the preconditions for data collection and aggregation by dominant firms in the future. Namely, it might require consumers to provide consent to data processing by specific services of a dominant firm, which may help to counterbalance the self-reinforcement of dominance by way of preferential data access.

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116 See Opinion 06/2014 of the Article 29 Working Party on the notion of legitimate interests of the data controller under Article 7 of Directive 95/46/EC, page 40: "A large multinational company may, for instance, have more resources and negotiating power than the individual data subject, and therefore, may be in a better position to impose on the data subject what it believes is in its 'legitimate interest'. This may be even more so if the company has a dominant position on the market. If left unchecked, this may happen to the detriment of the individual data subjects. Just as consumer protection and competition laws help ensure that this power will not be misused, data protection law could also play an important role in ensuring that the rights and interests of the data subjects will not be unduly prejudiced."

117 In some situations, they might also diverge, for example where a dominant firm's personal data collection were to comply with data protection law but increase its market power.

3. DATA PORTABILITY (ARTICLE 20 GDPR) AND COMPETITION

Another important concept introduced by the GDPR and of relevance for competition is data portability. According to Article 20, each "data subject shall have the right to receive the personal data concerning him or her, which he or she has provided to a controller, in a structured, commonly used and machine-readable format and have the right to transmit those data to another controller without hindrance from the controller to which the personal data have been provided". Article 20 furthermore emphasises that "the data subject shall have the right to have the personal data transmitted directly from one controller to another, where technically feasible." The right to data portability was introduced in order to strengthen the data subjects' control over "their" data (GDPR, recital 68). In the context of this report, we focus on the economic control it gives the individual: Article 20 GDPR is designed to facilitate switching between data-driven services. For example, a consumer who has posted content on a social networking site, or liked songs on a music streaming site, shall be empowered to easily migrate its data to another, competing site. Article 20 thereby provides data subjects with some degree of protection against data-induced lock-ins.

How the right to data portability will be interpreted and implemented is still partially unclear.[118] As of now, it is, for example, unclear which data is covered by Article 20(1) GDPR: data "provided" by a data subject seems to relate primarily to the category of "volunteered" data. The extent to which the right to data portability applies to observed data is not settled yet, bute recent communications seem to suggest it would.[119] Quite clearly, it will not extend to inferred data. Boundaries of the right to data portability are set out in Article 20(4) GDPR according to which this right shall not adversely affect the rights and freedoms of others where within a set of personal data, more than one data subject is concerned. This may be true, for example, where logs of phone communications and photographs shall be ported. As regards the design of the portability process, issues regarding the precise format, information about the dataset[120] and the frequency in which data portability can be requested from a controller and how quickly the data must be provided are yet to be resolved.

Whatever the precise answer to these questions, Article 20 GDPR has not been designed as a right to continuous data access or to request data interoperability between two or more services employed by the data subject,[121] but as a right to receive a copy of accumulated past data. It may facilitate a data subject's switching between services. But it has not been drafted

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118 Article 29 Working Party Guidelines on the right to data portability, as last revised and adopted on 5 April 2017.

119 Letter from Commissioner Jourova to Isabelle Falque-Pierrotin, chair of the Article 29 Working Party, 4 April 2017.

120 For the practical consequences of metadata uncertainties see Gal / Rubinfeld, "*Data Standardization*", 94 NYU Law Rev. (2019) – forthcoming.

121 For this definition see Gal / Rubinfeld, "*Data Standardization*", 94 NYU Law Rev. (2019) – forthcoming.

to facilitate multi-homing or the offering of complementary services, which frequently relies on continuous, and potentially real-time, data access. The concept of data portability under Article 20 GDPR must thus be conceptually distinguished from further-reaching data access rights as inherent, for example, in the Payment Services Directive 2015/2366[122] which establishes, for the financial sector, a much more elaborate data sharing regime to ensure interoperability between different services.[123]

Some analysts have, however, expressed fear that data portability may be costly and therefore, when imposed on non-dominant companies, in particular small firms and start-ups, could diminish competition and ultimately harm consumers.[124] In particular, they point to cases in which a non-dominant company would have invested in collecting and accumulating personal data and an incumbent would then devalue the investment by allowing users to easily migrate their data. Given the scope of the GDPR's right to data portability, this would however only apply to (the probably limited number of) cases where the *raw* data collected by the non-dominant company is essential to the innovation and has no existing substitute, and furthermore where the dominant company cannot easily develop a substitute (remember that the right to data portability does not apply to inferred data).

Considering both the purpose of Article 20 and its effects on competition, the right to data portability should be interpreted with a view to ensuring individual control of the data subject over his or her data, in particular with a view to avoiding data-induced lock-ins. But the interpretation should keep in mind the cost imposed on the data controller. Arguably, a more stringent data portability regime can be imposed on a dominant firm in order to overcome particularly pronounced lock-in effects.

More demanding regimes of data access, including data interoperability, can be imposed (1) by way of sector-specific regulation (as in the context of the PSD2 Directive) — in particular where data access opens up secondary markets for complementary services; or (2) under Article 102 TFEU — but then confined to dominant firms (see below).

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122 See in particular Articles 66 et seq. of the PSD2-directive (Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, *OJ L 337, 23.12.2015*.

123 See Articles 66 et seq. of the PSD2-directive.

124 For a more elaborate discussion see Swire/Lagos, "*Why the right to data portability likely reduces consumer welfare: Antitrust and privacy critique*", Maryland Law Rev. 2013, Vol. 72/2, p. 335 et seq.

BOX: FROM DATA PORTABILITY TO FULL PROTOCOLS INTEROPERABILITY

While interoperability has a long history in competition policy, new concepts such as data portability are also gaining relevance. In this box, we propose definitions for *data portability*, *protocol interoperability*, *data interoperability*, and *full protocol interoperability* and briefly discuss their impact on competition.

Data portability: In line with recent EDPB guidelines,[125] we refer to data portability as the ability of the data subject or machine user to port his or her data from service A to service B. This portability right can be exercised directly by the user, e.g. by downloading a file from service A and uploading it to service B, or he or she can have a third party exercise it. The GDPR specifically grants data subjects the right to have service A port their data to service B . The exact data that can be ported (volunteered and observed, not inferred) and how often data can be ported remains to be determined. The frequency at which data can be ported might be determined to be a function of the refresh frequency of the data but is unlikely to include real-time access.[126] From a privacy perspective, combined with subject access request, it will increase transparency allowing individuals to better understand which data is being collected about them.

Examples: The list of all the songs a person listened to, calendar entry, notes.

Implications for competition policy: *Data portability* is conceptualised in the GDPR as an individual right of the data subject that can help counter data lock-in and facilitate switching. It is also likely to facilitate access to *anonymised use of individual-level data* and *aggregated data*. Some have discussed the potential anti-competitive aspects of data portability but the anti-competitive potential of the GDPR's right to data portability seems to be limited.

Protocol interoperability: Ensures that two systems can fully work together and that complementary services can be provided. This is usually referred to as "interoperability" in competition law, e.g. in the Microsoft case.[127] We prefer the term *protocol interoperability* to distinguish it from *data interoperability* (see below). *Protocol interoperability* can exist within the context of platforms, with service B, C, and D being complementary services having to connect to platform A, e.g. an operating system. It can however also exist as interoperability between a range of complementary service A, B, C, and D, e.g. in the Internet of Things context with a range of devices interoperating with one another.

Examples: Operating systems (platforms), online service with their complementary services (see below), phone and chargers (e.g. charging protocols).

125 See Article 29 Working Party Guidelines on the right to data portability, as last revised and adopted on 5 April 2017.

126 De Hert, P., Papakonstantinou, V., Malgieri, G., Beslay, L. and Sanchez, I., 2018, "The right to data portability in the GDPR: Towards user-centric interoperability of digital services", in Computer Law & Security Review, 34(2), pp. 193-203.

127 Case T-201/04, *Microsoft v Commission*, ECLI:EU:T:2007:289.

Security: Given some of the current debate, we note here that there is a consensus among security experts that the secrecy of protocols is neither necessary nor often beneficial to security.[128]

Implication for competition policy: Allows for the development of complementary services and competition on the merit for those services. *Protocol interoperability* might, sometimes, require the development of standards — which can be standards defined by a standard-setting organization (SSO) or *de facto* standards set by consortia or a firm. While fairly defined and managed standards can greatly benefit competition, every form of standard-setting can also come with competitive risks.

Data interoperability: Similar to *data portability* but with real-time, potentially standardised, access for both the data subject/machine user and entities acting on his or her behalf. Existing *data interoperability* mechanisms rely on privileged APIs, when a user authorises a service B to access his or her data through service A's API, e.g. through an "access token".[129] Similar to *protocol interoperability*, *data interoperability* can exist within the context of platforms or as a network of services complementary to one another (the federated approach). In the case of platforms, it can enable the offering of a complementary service, but also a substitution of some of the platform's functionalities.

Security: One of the challenges of *data interoperability* is security, namely ensuring that the user agreed to the data to be shared and controls how the data is used once shared. The Cambridge Analytica scandal is an example of *data interoperability* gone wrong. Proper technical and legal standards, including data protection laws, will however strongly help mitigate the risks and reduce the costs.

Protocol interoperability: *Data interoperability* always requires some *protocol interoperability*, e.g. service A offering a privileged API that service B queries. This interoperability can rely on a few simple commands to retrieve or push simple data or offer a large range of complex services.

Costs: The costs of *data interoperability* are higher than those of *data portability* but are likely to remain fairly low in most cases. The costs of *data interoperability* can be broken down into fixed and variable costs, with fixed costs including the creation and maintenance of the APIs, and the variable costs the cost of answering an API call. This includes, amongst other things, the computing cost of answering the request and the cost of sending the information back (network cost). In most cases, the variable costs are low, but, for instance, complex search operations might increase the computing costs or the transfer of large amount of data increase the network cost. When the APIs already exists ("private APIs"), as can often be the case, the main incremental fixed cost would be the cost of ensuring security.

Implications for competition: *Data interoperability* allows for complementary services to

[128] See *e.g.* https://www.schneier.com/crypto-gram/archives/2002/0515.html#1 and Kerckhoffs's principle https://en.wikipedia.org/wiki/Kerckhoffs%27s_principle (as available on 29 March 2019).

[129] An access token is a credential, given by the user to a complementary service. This credential then allows the complementary service to access a third-party API (*e.g.* of a dominant company) to access the user's data.

platforms to be developed. It also allows users to choose each (unbundled) service freely and independently. It can also help multi-homing, allowing users to use several services or platforms along with complementary services. However, *data interoperability* can, depending on the type of data and the access modalities, potentially result in an anti-competitive information exchange.

Examples: Add-ons to platforms such as slack or gmail, APIs used by services like IFTTT, access to car data or Internet of Things data.

Full protocol interoperability: Ensuring that two or more substitute services interoperate, e.g. messaging systems. This requires a much deeper integration and standardisation than *protocol interoperability*. *Full protocol interoperability* has sometimes been imposed under regulatory regimes – with the interconnection of telecommunication networks being the most prominent example. As opposed to *protocol interoperability*, the network effects here depend on the number of users of all the services and the need for standardisation is higher as several services have to all agree on a common standard.

Examples: mobile phone networks, messaging systems, e-mails, but also file formats

Implication for competition: *Full protocol interoperability* will decrease the network effect-driven lock-in. The need for deep standardisation across numerous companies who are direct competitors runs the risk of reducing innovation and promoting collusion.[130]

BOX: ANONYMOUS USE OF INDIVIDUAL-LEVEL DATA

Anonymous use of individual-level data encompasses all the cases where access to the (pseudonymised) individual-level data is needed, even if the goal is not to use a specific individual's data, and the way that access for this purpose is granted ensures that the data user can not relate the information to an identified or identifiable natural person. For instance, machine learning models need to be trained on individual-level data, e.g. medical images or the list of movies a user has previously watched and liked. However, while the algorithm needs to be trained on individual-level data, it does not need to know who the specific individual is; only that user 7abc1a23 liked Black Mirror and Forbrydelsen but didn't like American Gods. The data is pseudonymised – direct identifiers such as names or Social Security numbers have been replaced with pseudonyms such as 7abc1a23. Once properly trained on the pseudonymous individual-level data, the model can usually be considered technically anonymous.[131] This is why we

[130] Moxie Marlinspike, "Reflections: The ecosystem is moving", 10 May 2016, available at https://signal.org/blog/the-ecosystem-is-moving/.

[131] Shokri, R., Stronati, M., Song, C. and Shmatikov, V., 2017, May. Membership inference attacks against machine learning models. In 2017 IEEE Symposium on Security and Privacy (SP) (pp. 3-18). IEEE; Veale, M., Binns, R. and Edwards, L., 2018. Algorithms that remember: model inversion attacks and data protection

call this approach "anonymous use of individual-level data". Beyond AI, analysis of mobility patterns in a city or statistical analysis of datasets also often need access to individual-level data even if the analyst is not interested and does not need to know the identity of individuals in the dataset.

As discussed earlier, numerous studies have however shown the limits of the techniques that have traditionally been used to anonymise data, and datasets that have been shown to be re-identifiable include mobility data, the list of apps installed on a smartphone, public transport card-type data, credit card transaction histories, online search histories, medical claim information, and movie rating data sets.[132] A report by the U.S. President's Council of Advisors on Science and Technology (PCAST) concluded that "Anonymization is increasingly easily defeated by the very techniques that are being developed for many legitimate applications of big data. [...] Anonymization remains somewhat useful as an added safeguard, but it is not robust against near-term future re-identification methods. PCAST does not see it as being a useful basis for policy."

New solutions have, therefore, been developed to allow datasets to be used anonymously. In short, instead of giving analysts a copy of the dataset, data controllers give analysts controlled access to a system that allows them to use the dataset. The dataset is typically pseudonymised and security techniques are deployed to ensure that the dataset is used anonymously. The system is called "remote access" when the analyst accesses directly the pseudonymous data, e.g. through a virtual desktop such as the French Secure Access Data Center (CASD) or the UK's ONS Secure Research Services. The system is called "question-and-answer" when the analyst does not access the dataset directly but only through an interface that prevents him from accessing an individual's data.[133] Examples of such systems include Diffix, a privacy-preserving SQL interface

law. Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 376(2133), p.20180083.

132 de Montjoye, Y.A., Hidalgo, C.A., Verleysen, M. and Blondel, V.D., 2013. Unique in the crowd: The privacy bounds of human mobility. Nature *Srep*, *3*, p.1376; Achara, J.P., Acs, G. and Castelluccia, C., 2015, October. On the unicity of smartphone applications. In Proceedings of the 14th ACM Workshop on Privacy in the Electronic Society (pp. 27-36). ACM; Lavrenovs, A. and Podins, K., 2016, November. Privacy violations in Riga open data public transport system. In 2016 IEEE 4th Workshop on Advances in Information, Electronic and Electrical Engineering (AIEEE) (pp. 1-6). IEEE; de Montjoye, Y.A., Radaelli, L. and Singh, V.K., 2015. Unique in the shopping mall: On the reidentifiability of credit card metadata. Science, 347(6221), pp.536-539; Barbaro, M., Zeller, T. and Hansell, S., 2006. A face is exposed for AOL searcher no. 4417749. New York Times, 9(2008), p. 8; Culnane, C., Rubinstein, B.I. and Teague, V., 2017, "*Health data in an open world*", *arXiv preprint arXiv:1712.05627* ; Narayanan, A. and Shmatikov, V., 2008, May. Robust de-anonymization of large sparse datasets. In *2008 ieee symposium on security and privacy* (pp. 111-125). IEEE.

133 For a complete discussion on the two models and anonymous use of data, we refer the interested reader to de Montjoye Y.-A., Gambs S., Blondel Y., Canright G., de Cordes N., Deletaille S., Engø-Monsen K., Garcia-

developed by Aircloak; TableBuilder, an online tool from the Australian Census Bureau; OPAL, a SafeAnswers tool based on open algorithms for location data; and Movement, an online tool by Uber for mobility data. "Question-and-answer" systems rely on a mix of manual access control and verifications to automated mechanisms such as noise addition, query set size restrictions, and Differential Privacy to ensure that the dataset is used anonymously. While modern more security-based solution are much more robust than traditional anonymisation methods, a trade-off between protecting individual's privacy limiting restrictions on the use of the data remains. For instance, vulnerabilities have recently been found in both TableBuilder and Diffix while the use of Differential Privacy by the US Census Bureau is heavily criticised by researchers worried that it might prevent many uses of the data.[134]

From a legal perspective, the precise requirements for data use to be qualified as anonymous for the purposes of the GDPR have not yet been fully clarified by the EU courts. The approaches mentioned above (the remote access and the question-and-answer models) are, however, in general, likely to fall under the legal concept of "anonymous information" under the GDPR (at recital 26). Indeed, under the question-and-answer model, only anonymous data is being shared with the analyst, who is, in general, very unlikely to be able re-identify a data subject.

C - ACCESS TO NON-PERSONAL DATA: THE LEGAL FRAMEWORK AND ITS IMPLICATIONS FOR COMPETITION POLICY

We have so far focused on access to personal data, as much of the data of interest to companies engaged in B2C services will be personal. However, access issues also arise with regard to non-personal data. For example, road network or soil information data may be strictly non-personal, as may be some sort of machine-related data generated in a non-consumer related context.[135]

Whereas the GDPR establishes decentralised access points to personal data, purely machine-related data may sometimes be under the exclusive control of a firm that has the factual power to control the data flow, and the way it is shared with other parties is a contractual matter. For example, with regard to machine usage data, this may often be the machine

Herranz M., Kendall J., Kerry C., Krings G., Letouze E., Luengo-Oroz M., Oliver N., Rocher L., Rutherford A., Smoreda Z., Steele J., Wetter E., Pentland A., Bengtsson L., 2018, "*On the privacy-conscientious use of mobile phone data*". Nature SData, 5.

134 Mervis, J., 2019. Researchers object to census privacy measure.

135 Sometimes, there may be issues of employee data protection involved here. But we leave these issues aside for the purpose of this report.

producer. We leave aside, for the purpose of this report, the broad debate that has ensued regarding the legal protection of non-personal data and databases.[136] In practice, control over relevant data is typically ensured by technical means.

On the plus side, *de facto* control over data allows data controllers to exclude others from data access and to appropriate gains from data collection, and thereby provides incentives to invest in data collection and storage. On the minus side, the possibility to exclude may allow the data controller to, for instance, lock-in a machine user into the data controller's aftermarket services. Also, when past usage patterns allow for a more cost-efficient service, a machine user may be prevented from switching to a different machine supplier if it is impossible to port the usage profile. Against the background of such examples, the debate on data protection has shifted to whether other parties who have participated in the data generation (e.g. the machine user) or who have other legitimate business interests have, or should be granted, a right to access that data.

A mandatory right of machine users to port non-personal data, as established by Article 20 GDPR for personal data, is currently not recognised under EU law or, to our knowledge, under national law of any of the EU Member States. Machine users may negotiate for such access rights contractually. But where a machine producer enjoys some degree of market power, or even just bilateral power, the bargaining power of a machine user may not suffice. A number of experts and industry participants argue that exclusive control over machine usage data then leads to the foreclosure of secondary markets and may significantly reduce the contestability of a machine producer's position on the primary market, due to a data-driven lock-in of machine users.[137]

Foreclosure of secondary markets has been extensively studied in the competition law literature, since the U.S. Supreme Court decision in Kodak. In that case, Kodak sold copiers, and was recognised as having no market power in that activity but was accused of using its control over Kodak parts to monopolise the market for servicing its copiers. The Supreme Court found

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136 See Drexl, "*Data Access and Control in the Era of Connected Devices – Study on Behalf of the European Consumer Organisation BEUC*", 2018. A dataset may be protected by the Trade Secrets Directive: see recital 2, concerning "commercial data" as distinct from "technological knowledge" – see Directive (EU) 2016/943 of the European Parliament and of the Council of 8 June 2016 on the protection of undisclosed know-how and business information (trade secrets) against their unlawful acquisition, use and disclosure, *OJ L 157, 15.6.2016*. See also: Directive 96/9/EC of 11 March 1996 on the legal protection of databases, *OJ L 77, 27.3.1996*, as well as its ongoing evaluation and the Synopsis Report on the responses to the public consultation activities on the evaluation of Directive 96/9/EC, 25 April 2018. See also Radauer/Gkogka/Calatrava Moreno, Study in support of the evaluation of Directive 96/9/EC on the legal protection of databases, 2018. While the Database Directive protects the structure/format of the dataset rather than the underlying data as such, it may have the effect of protecting the dataset indirectly.

137 Note that a similar line of reasoning could apply to personal data – although the right to data portability (Article 20 GDPR) may, in some settings, mitigate the concerns.

"that a manufacturer could, as a matter of law, have monopoly power in the servicing of its own equipment, even if it had no such power in the sale of that equipment." In other words, aftermarkets can be separate (and potentially monopolistic) markets for competition law purposes, even if equipment markets are competitive".[138] The Supreme Court analysis has also influenced the European debate.[139] Of course, the issue was not whether Kodak had monopoly power in a physical sense over the servicing – it clearly had if it refused to sell parts to competitors. Rather, the issue was the relevance of this monopoly power. However, a typical "Chicago" style argument would state that if the market for the original equipment is competitive, Kodak would have no incentives for anti-competitive behaviour in the secondary market, as any gain on this account would be negated by a reduction of the price at which it can sell the primary good.

The same reasoning can be applied to the market for data. If machine producers do not let users access the data so that they can control the after sales market, a "Chicago" style argument would tell us that, absent market power, they would do so only for pro-competitive reasons. To the observation that many users complain about the lack of access to the data, the proponents of this approach would reply that these users do not realise that the price of the machine would change if access to the data was mandated.

The "Chicago" critique of Kodak has led to a relatively narrow construction of the so-called "aftermarket doctrine" in both U.S. antitrust and EU competition law.[140] In EU competition law, it has been used sparingly in recent years.[141] While market definition focuses on the aftermarket sales to customers who have already acquired the primary product, such that separate aftermarkets for complementary services may well be found to exist,[142] the analysis

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138 Carl Shapiro, "*Aftermarkets and consumer welfare: making sense of Kodak*", *Antitrust Bulletin*, 1995, vol. 63, pp. 483-511. This article provides a very useful analysis of the case and of the analytical challenges it creates.

139 For a discussion of the consequences of the Kodak case in Europe see Robert Bell and Jacob Kramer, "*Competition/Antitrust Challenges in Technology Aftermarkets*", http://eu-competitionlaw.com/competitionantitrust-challenges-in-technology-aftermarkets/#, visited on 20 March 2019.

140 For legal guidance see Commission Notice on the definition of relevant market for the purposes of Community competition law, *OJ C 372, 9.12.1997* at para. 56: "A narrow definition of market for secondary products [...] may result when compatibility with the primary product is important. [...] A different market definition may result if significant substitution between secondary products is possible or if the characteristics of the primary products make quick and direct consumer responses to relative price increases of the secondary product feasible". See also DG Competition discussion paper on the application of Article 82 TFEU to exclusionary abuses (2005), at para. 247. This passage has not entered the Commission's Guidance on enforcement priorities in applying Article 82 TFEU to abusive exclusionary conduct, *OJ C 45, 24.2.2009*.

141 But see Case T-712/14, *CEAHR v Commission*, EU:T:2017:748 and Case T-751/15, *Contact Software v Commission*, EU:T:2017:602.

142 For the relevant exceptions see DG Competition discussion paper on the application of Article 82 TFEU to exclusionary abuses (2005), at para. 247.

of dominance is a complex exercise that includes an analysis of the competition on both the aftermarket and the primary market. Meanwhile, the scholarly debate has continued, and a number of arguments have been presented why after-market behaviour is a relevant concern for competition authorities,[143] even when the primary market is competitive.[144]

We would point out that some of the specificities of data could imply that the competition policy treatment of access to data should be different from that of standard aftermarkets: in the data economy, the aftermarket doctrine may need an update, and may be up for a revival. The reader should, however, be aware that there is very little economic analysis of these issues, so that our conclusions should be considered as very preliminary.[145]

- Data from one machine user can affect the aftermarket opportunities of other machine users: for instance, the data can be used for training a predictive AI algorithm which makes maintenance more effective. Individual users will not take this positive "externality" into account and this presumably makes it less costly for the machine supplier to exclude users from the data.
- Data can provide a competitive advantage not only in markets for secondary goods, but also at the time of replacement of the machine, as competitors have less information on which to base their offers. One way to think about this issue is that the cost of switching to a competitor has increased, given a competitive advantage to the original machine supplier.[146]
- On the other hand, providing data might in some cases reveal some of the Intellectual Property of the machine user, and this might provide a rationale for some restrictions on data access.

We discuss below in more detail how competition law could address some of these concerns. Note that the issue could also be addressed within the framework of contract law. In its recent

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143 When the primary market is competitive, the issue is not the eventual excessive profits of the suppliers – these will presumably be eaten away by competition, but the inefficiencies stemming from the exclusion of presumably more efficient providers of the secondary services or goods.

144 Carl Shapiro, *op. cit.*, provides some theories of harm in this case. A more recent policy oriented summary can be found in "*Competition Issues In Aftermarkets: Background note by the Secretariat*", OECD, DAF/COMP(2017)2, 20 June 2017, https://one.oecd.org/document/DAF/COMP(2017)2/en/pdf.

145 For a thorough discussion of the aftermarkets doctrines as it applies to data governance for connected cars, see Wolfgang Kerber and Jonas Severin Frank, "D*ata Governance Regimes in the Digital Economy: The Example of Connected Cars*", 2017, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3064794.

146 Switching costs were introduced in the economic literature by Paul D. Klemperer, "*Markets with consumer switching costs*", *Quarterly Journal of Economics*, 1987, vol. 102, 375–394. For discussion of the more recent literature and analysis of dynamic competition with switching costs see Gary Biglaiser, Jacques Crémer and Gergely Dobos "The Value of Switching Costs", *Journal of Economic Theory*, 2013, vol. 148, n°3, pp. 935-952 and "Heterogeneous switching costs", *International Journal of Industrial Organization*, 2016, vol. 47, pp. 62-87.

communication "Towards a common European data space",[147] the European Commission has advocated some key principles to be respected in data-related contractual agreements concluded in B2B relationships. In such agreements, the contracting parties should recognise their respective contributions to the generation of data as a by-product of using a product or service, should protect the commercial interests of data holders and data users and should enable data portability as much as possible, while ensuring undistorted competition when exchanging commercially sensitive data (p. 10). Potential remedies in case of an unfair withholding of data access in contractual relations remain, for the time being, within the domain of national contract law.

At the European level, the withholding of data access may, in some settings, therefore present itself as a competition law concern. We will address this in the next section.

IV. DATA ACCESS AND COMPETITION LAW

While laws and institutions may emerge under data protection, national (or possibly EU[148]) contract law or in other policy fields that may help to promote efficient data access in many contexts, competition law remains an important background regime. Issues relating to data access may arise in different settings:

- Firms are currently experimenting with different forms of data sharing and data pooling. These arrangements will frequently be efficient and socially desirable, but they can also be anti-competitive in other situations.[149] Competition law should try to encourage the first type and should try to provide legal clarity on this topic as fast as possible — we recognise that this is not an easy task.
- Dominant, data-rich firms may refuse to grant other firms access to data. Much debate and uncertainty currently exist as to when a refusal to grant access to data, including through interoperability, should be considered an abuse as it leads to anti-competitive foreclosure. When this is the case, data access may be mandated under Article 102 TFEU.
- In some situations, competition law may limit a dominant company's access to data.
- Finally, access to data can be an issue in the context of merger control.

147 25 April 2018, COM(2018)232 final https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0232&from=EN.

148 A general interest in a harmonised approach regarding contractual access to data at EU level (under Article 114 TFEU) may result from the fact that, absent such a harmonisation, widespread practices of withholding access to data may create lasting barriers to entry and significantly hamper the functioning of the internal market.

149 Chapter 8 of Oligopoly Pricing: Old Ideas and New Tools by Xavier Vives (MIT Press, Cambridge, 2000) has an extensive discussions of information sharing between firms.

We will not deal with merger control in this section of our report. The role of data and data access is already widely acknowledged and carefully considered in European merger control.[150]

We will, however, address the other issues in turn.

A. DATA EXCHANGE, DATA SHARING, DATA POOLING

1. INTRODUCTION

In the previous section, we have emphasised that law and institutions matter: they will determine the availability of "data access points" and they are hence decisive for the exclusivity or plurality of data control. Likewise, they will shape practices of data exchange and data sharing.

Already today, data is shared and exchanged in the marketplace. In its Guidance on sharing private sector data in the European data economy,[151] the European Commission has distinguished various models of B2B data sharing, in particular an "Open Data approach" whereby a data supplier makes available its data to an in principle open range of (re-)users, *inter alia* to promote the evolution of an ecosystem of third party applications, e.g. under the control of the individual or machine user; data monetisation on a data marketplace; or data exchanges in a closed platform, either set up by one core player in a data sharing ecosystem or by an independent intermediary. The accessibility of public sector data is further promoted by the PSI Directive.[152] Finally, data is often exchanged or shared bilaterally or multilaterally based on a joint interest of the parties in such data sharing arrangements. Data sharing arrangements which contain an element of reciprocity – at least some member firms contribute data – are called "data pools".

Such data sharing arrangements will often be pro-competitive. They enhance data access, may resolve data bottlenecks and contribute to a fuller realisation of the innovative potential inherent in data. The pooling of data of the same type or of complementary data resources may enable firms to develop new or better products or services or to train algorithms on a broader, more meaningful basis.

Yet, competition law defines important boundaries regarding the legitimacy of the conception and implementation of data sharing systems. In particular, the following concerns may arise: data sharing or pooling may amount to an exclusionary practice where competitors who are either denied or granted access on less favourable terms are effectively shut out of the

150 See for example Commission decision of 6 September 2018 in Case M.8788 – *Apple/Shazam*.
151 25.4.2018, SWD(2018)125 fin.
152 Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information, OJ L 345, 31.12.2003.

market; the data sharing arrangement may amount to an anti-competitive information exchange where it includes competitively sensitive information;[153] furthermore, the sharing or pooling of data can restrict competition where it is found to discourage competitors from differentiating and improving their own data collection; finally, there may be cases where the granting of access to data on non-FRAND terms may result in an exploitative abuse. It is important to note that not only restrictions on data access *per se*, but also restrictions on data use can have anti-competitive consequences. Therefore, enforceable restrictions, including technical ones, on the use of the data could affect the classification of sharing or pooling as pro- or anti- competitive.

2. THE MULTIPLICITY OF TYPES OF DATA POOLS

So far, the issue of data pools is a relatively new and under-researched topic in competition law. Its economics is also not very well understood. A scoping exercise of the different type of data pooling and a subsequent analysis of their pro- and anti-competitive aspects is therefore necessary to provide more precise guidance on this topic, through, for example, guidance letters, "no infringement" decisions under Article 10 of Regulation no. 1/2003, or the next review of the Guidelines on horizontal cooperation. More legal clarity on the principles guiding the competition law assessment may significantly facilitate and promote data sharing. Factors that will be relevant for the assessment of data sharing or pooling arrangements include, among others:

- What “type” of data is shared or pooled: contextual, e.g. maps, and aggregated data, e.g. frequency tables for accidents, or individual-level data? If individual-level data, the WEF terminology we used—volunteered, observed, or inferred—might be relevant and help understand the pro- and anti-competitive aspects of data pooling.
- Furthermore, if individual-level data is being pooled, even if the identity of the person or machine identifier are not known to the participating firms, is data from the same individual or machine but coming from two different firms reconciled under the same pseudonym?
- Are individual-level or machine data being pooled together but used anonymously, or is the data personally identifiable?
- Are technical measures put in place to limit and/or control how the data is being used e.g. ensuring that individual-level data is used anonymously or that the reconciliation

[153] See EU Commission, Guidance on sharing private sector data in the European data economy, document SWD (2018) 125 final, 25.4.2018, in particular pages 3, 5, and 7: The guidelines (which aim to provide basic practical and legal advice but not specialist competition law advice warn that (a) data sharing through such "platforms" should not include competitively sensitive information; and (b) exclusive access clauses in such agreements should be in line with competition law. See also Commissioner Vestager, "*Big Data and Competition*", speech at the EDPS-BEUC Conference on Big Data, Brussels, 29 September 2016.

of individual-level data does not allow the participating firms to learn, for instance, who, among their customers, is multi-homing?

3. BROAD PRINCIPLES FOR ASSESSING DATA POOLING UNDER ARTICLE 101 TFEU

In our subsequent discussion of principles for the Article 101 assessment, we will focus on data pools; but similar principles may apply to other data sharing arrangements.

A) EFFICIENCIES

The assessment of data sharing and pooling arrangements should start with a recognition of the significant efficiencies they can produce. We have already highlighted the important efficiencies of scale and scope for data (see chapter 2). Access to pooled data may allow firms to produce better products/services than they could develop based on their "own" data alone. To the extent that data is the "raw material" for quality competition and innovation, enhancing data access will frequently promote, rather than impede competition.

Also, where risk assessment is core to the product provided – like in the banking and insurance sectors – the exchange or pooling of information about consumer defaults and risk characteristics can contribute to the well-functioning of markets, depending, however, on the precise design of the pooling arrangement, including the access regime.[154]

In the past, the efficiencies of data pooling have mainly been discussed with a view to the credit industry and the insurance industry. In the *Asnef-Equifax* case,[155] the ECJ acknowledged the important efficiencies of creditworthiness registries as they exist in several Member States, which make available to credit providers relevant information about existing or potential borrowers, in particular concerning the way in which they have previously honoured their debt. The increase in the amount of information available to credit institutions on potential borrowers was found to reduce "the disparity between creditor and debtor as regards the holding of information, thus making it easier for the lender to foresee the likelihood of repayment. In doing so, such registers are in principle capable of reducing the rate of borrower default and thus of improving the functioning of the supply of credit."[156] The availability of data on the past behaviour of customers in terms of accidents or credit default allows

[154] It should be remembered that "too much information" can prevent insurance against certain risks. For instance, if an insurance company has genetic information which enables it to better predict the risk of cancer, it will discriminate against its clients according to this risk. The literature on the subject is vast. For an interesting analysis of another type of cases where more private information is socially harmful, see Jack Hirshleifer, "*The Private and Social Value of Information and the Reward to Inventive Activity*", 1971, *American Economic Review*, 61(4), pp. 561-574.

[155] Case C-238/05, *Asnef-Equifax*, EU:C:2006:734.

[156] Case C-238/05, *Asnef-Equifax*, EU:C:2006:734, at para. 47.

consumers who carry a lower risk to benefit from lower prices and provides an incentive for consumers to limit their risk exposure.[157]

In other settings, data exchanges or data pools may help firms to offer complementary, value-added services and thus foster entry into neighbouring markets. Access to in-car data or to smart home data may serve as examples. Moreover, data pools may arise in the future that allow firms to access the pool for selecting appropriate datasets for training algorithms for a multitude of unknown purposes.

Whereas EU competition law typically inquires into the potentially restrictive effects of a given agreement first, and then considers possible efficiencies under the exception as set out in Article 101(3) TFEU, some restraints have been found to be objectively necessary for the performance of contracts with a legitimate and pro-competitive goal that improve the functioning of markets, and therefore not to be restrictive of competition within the meaning of Article 101(1) in the first place. Moreover, the ECJ has held in *Asnef-Equifax* that creditworthiness registries of the kind described above are not restrictions by object (para. 48). Whether they constitute a restriction by effect will depend on "the economic and legal context in which the registers exist, and in particular on the economic conditions of the market as well as the particular characteristics of the register" (para. 57). The likelihood of finding a restriction by effect will increase with the degree of concentration of the relevant market. Furthermore, the information sharing arrangement must not reveal the market position or commercial strategy of competitors, and the register should be accessible in a non-discriminatory manner, in law and in fact, to all operators active in the relevant sphere (para. 58-60). This framework of analysis may extend to other forms of data pools and exchanges. Both the purpose of the data pool or exchange and the details of its implementation will then be relevant for the assessment, and due regard must be had to design a regime that hedges against anti-competitive use of the data sharing, legally and possibly technically.

In the insurance industry, on the other hand, some data pools, namely joint compilations on average costs of risks and tables on frequency of certain types of accidents, were block exempted under Article 101(3), provided the pools were limited to aggregated and non-binding actuarial data, without any financial information, and available on FRAND terms including to non-participants and new entrants.[158] That block exemption expired on 31 March 2017 – not because these data pools became more problematic under Article 101,[159] but rather because the Commission's 2011 Guidelines on horizontal cooperation offer guidance on the antitrust

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157 EU Commission, Guidelines on horizontal cooperation, at para. 97.

158 Commission Regulation (EU) No 267/2010 of 24 March 2010 on the application of Article 101(3) to certain categories of agreements, decisions and concerted practices in the insurance sector, OJ No. L 83, 30.3.2010, p. 1 (the "Insurance Block Exemption Regulation" or "IBER").

159 See the reasons for the expiry of the block exemption in the Commission's Daily News press release for 13.12.2016.

assessment of information exchange agreements, including data pools.[160] At the same time, the old Insurance Block Exemption Regulation (IBER) shows that the exemption was narrowly conceived.

The efficiencies of data sharing and pooling outside the credit industry and the insurance industry can significantly differ. Little experience exists so far. Possible efficiency gains will therefore need to be analysed closely case by case – sometimes in the context of Article 101(1), but mostly in the context of Article 101(3).

B) COMPETITION CONCERNS

As the preceding discussion shows, data exchanges and data pooling may also raise important competition concerns.[161]

First, data is not only a raw material for innovation, but its informational content can turn a data sharing or data pooling arrangement into a vehicle for exchanging commercially sensitive information such as costs or prices. It is well known that exchanges of information can favour collusion — Chapter 2 of the 2011 Guidelines on horizontal cooperation[162] contains a thorough discussion of the competition law analysis. Based on this framework, some exchanges of commercially sensitive information (which entail volunteered, observed or inferred data) may constitute restrictions by object under Article 101(1). Other exchanges might be deemed anti-competitive by effect. Therefore, the data may have to be limited in scope, or aggregated and anonymised. In determining the risk of information-based anti-competitive coordination, existing insights on algorithmic collusion must be taken into account. There may be a need to revisit Chapter 2 of the 2011 Guidelines in light of the more recent case law, novel findings in economics and data science, and questions raised by the data economy.

Second, there may be concerns that a data pool constitutes a restriction by effect if it significantly aligns competitors' costs or product features and thereby limits competition on price, quality or innovation. While it may seem that the assessment of data sharing or pooling arrangements could be similar to the assessment of R&D agreements or patent pools in this regard, data pools arguably require a distinct assessment. While patents can – to some extent – be categorised as substitutable/non-substitutable and essential/non-essential, and can be categorised by field of use, these categorisations are much more difficult for data, at least to the extent that it is not “inferred data”, but essentially observed data that is being pooled. For

160 Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, OJ No. C 11, 14.1.2011, p. 1, from paragraph 55.

161 Outside of competition law, there may be of course other concerns with data pooling, such as cybersecurity and privacy.

162 Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, OJ 2011 No. C 11/01.

instance, two organisations pooling their data which bears on different patients or on different pathologies may well increase the quality of their innovations without raising issues of coordination.

Nonetheless, a data pool may discourage competitors from differentiating and improving their own data collection. This could be a concern where data is a significant input into the parties' product and/or when “inferred data” is pooled. In such a case, data pooling/data sharing may impact incentives to engage in independent data processing, and competition in the field of data analytics may be compromised. In this regard, the limits on coordination as developed for R&D agreements may serve as guidance.

Third, where the data pool has market power and gives its members a significant advantage, the pool may be under a duty to give access to others, perhaps on FRAND or similar terms.[163] This data access issue may be similar to the data access issues that arise in connection with dominant firms under Article 102 or with merging firms under merger control. Also, with regard to foreclosure concerns, established rules on R&D agreements and patent pools may provide useful guidance. However, due to the multi-purpose use of data, it may, at times, and depending on the type of pool, be more difficult to establish market power of a data pool based on market shares: the data may be of relevance in very different markets. In such cases, the access regime may need to differ depending on the type of use.

The duty to give access should be proportional to the pool's market power, i.e. a group of smaller players pooling their data to gain a competitive advantage should not be forced to give their pooled data to a much larger player.

At the same time, despite a large market share a sharing arrangement or pool may benefit from an exemption if, among other criteria, it is open to all, the data is licensed into the pool on a non-exclusive basis, and data is licensed out to all potential licensees on FRAND terms.

Fourth, where there is a FRAND or similar duty and the pool's data format standard is proprietary, the standard owner should not be able to raise its fees over time as the pool becomes more important in the market (by analogy to "patent ambushes"). Where there is a FRAND or similar duty, it should apply to both access to the data pool and the use of the data format standard.[164]

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163 By analogy, see Case C-7/95 P, *Deere v Commission*, EU:C:1998:256, at para. 98; Case C-238/05, *Asnef-Equifax*, EU:C:2006:734, at paras. 60-61; IBER, Article 3(2). See also Japan Fair Trade Commission, "Report of Study Group on Data and Competition Policy", 6 June 2017, from page 57, on the duty to provide access to pooled data.

164 See also Björn Lundqvist, "*Competition and Data Pools*", 2018 Journal of European Consumer and Market Law 146, at page 154, on a similar point: "the pool must utilize standard widely used technology for data storage and transfer".

All competition concerns remain subject to the efficiency defence under Article 101(3). As experience with the assessment of data sharing and data pooling arrangement grows, the Commission may need to contemplate adoption of a block exemption Regulation.

B. DUTIES TO GRANT ACCESS TO DATA UNDER ARTICLE 102 TFEU

While much debate currently is about promoting the firms' ability to share and pool data, there is, at the same time, a heated debate whether and, if so, when the refusal of a dominant firm to grant access to data may result in an abuse of dominance. The debate is mostly framed as a debate on whether the criteria of the so-called "essential facilities" doctrine (EFD) are met. We argue that the "classical" EFD may not be the right framework to handle refusal of access to data cases, as the doctrine has been developed with a view to access to "classical" infrastructures and later expanded to essential IPRs. Data is different in several important ways. We therefore propose to go back to the interest balancing criterion underlying the EFD to discuss these cases, but to stay away from the EFD as specified and applied in other areas (section 1 below). Secondly, we propose that – like under the "standard" EFD – an important precondition for access to data remedies under Article 102 TFEU is its indispensability to compete effectively. A distinction between different access scenarios is important in this regard (section 2). This distinction is, then, also relevant for the subsequent balancing of interests which needs to take into account - both the need to protect the dominant firm's investment incentives and the need to ensure that strongly entrenched positions of market power, protect by high barriers of entry, remain contestable. In some settings, such balancing of interest can then result in a duty to grant access to data in a form that allows competitors to compete effectively in neighbouring markets, which may include a duty to ensure data interoperability. In order to make this remedy effective, a regulatory scheme may be needed (section 3). On the other hand, the imposition of an access mandate under Article 102 TFEU is significantly more disputable in our scenario 3 as sketched above (i.e. where a firm requests data from data controllers for the purpose of training algorithms for uses that are completely unrelated to the fields of activity of the data controller). Where a broader imposition of duties to grant access is found to be desirable, it may be expedient to draw upon a different legal basis.

1. ACCESS TO DATA CASES: THE CASE FOR A "FRESH" INTEREST BALANCING OUTSIDE THE ESTABLISHED CONFINES OF THE "ESSENTIAL FACILITIES" DOCTRINE (EFD)

The EFD is a structured rule originally developed to decide under which conditions the denial of access to infrastructures should be considered anti-competitive. Under the test, a company with a dominant position in the provision of a facility, product or service which is indispensable to compete in a downstream market abuses its dominant position where, without objective justification, it refuses to grant access to this facility, product or service, with the effect that

all effective competition in a downstream market is eliminated.[165] The test has been extended to refusals to license intellectual property rights (IPR).[166] In those cases, the ECJ has established, as an additional precondition, that the access petitioner is in need of a license in order to offer a "new product".[167]

The EFD starts from the recognition that the right to choose one's trading partner and to freely dispose of one's property are generally accepted principles in the laws of the Member States, as well as under EU law.[168] Interfering with these rights on the basis of competition law requires a careful balancing of conflicting considerations. In particular, it is presumed that an interference into the decision and control rights of a property owner risks compromising his incentives to invest, and thus, while increasing competition in the short term, may reduce it in the long run.[169] Consequently, the threshold for interfering under the EFD is generally high.

In some settings, we can expect the foreclosure effects from a refusal to grant access to data to be high, in particular if a high degree of market concentration translates into a high degree of data concentration, and if that data yields an important competitive advantage in serving neighbouring markets. In such a setting, the need to ensure the possibility of entry may argue in favour of mandating access to data.

In access to data cases, additional considerations enter the balancing exercise. First, the fact that neither national laws nor EU law currently recognise a general property right in data may justify a more pro-active interpretation of Article 102 TFEU. Any legal definition of property rights is accompanied by a specification of their boundaries and limitations. Where no such property rights exist, the boundaries and limitations of the rights of a data controller are missing. Consequently, the responsibility to define such limitations is partly shifted to competition law, which should balance considerations of protection of investments and greater competition.

Furthermore, in some settings, the foreclosure effects following from a refusal to grant access to data may be particularly high, in particular if a high degree of market concentration translates into a high degree of data concentration, and if that data implies an important competitive advantage in servicing neighbouring markets. In such a setting, the need to ensure contestability may argue in favour of mandating access to data. In order for such a mandate

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165 Case C-7/97, *Bronner*, EU:C:1998:569; Case T-167/08, *Microsoft v Commission*, EU:T:2012:323.

166 Case C-418/01, IMS Health, ECLI:EU:C:2004:257 and Joined Cases C-241/91 P and C-242/91 P, *RTE and ITP v Commission*, EU:C:1995:98.

167 Case C-418/01, IMS Health, ECLI:EU:C:2004:257 and Joined Cases C-241/91 P and C-242/91 P, *RTE and ITP v Commission*, EU:C:1995:98.But see Case T-167/08, *Microsoft v Commission*, EU:T:2012:323.

168 See AG Jacobs' Opinion, para. 56, in Case C-7/97, *Bronner*, EU:C:1998:569; EU Commission, Guidance Paper on enforcement priorities in applying Article 82 of the EC Treaty (2009).

169 AG Jacobs' Opinion, para. 57, in Case C-7/97, *Bronner*, EU:C:1998:569.

to effectively promote competition, a regulatory regime may need to be installed that ensures speedy intervention in case of anti-competitive impediments of data access and day to day oversight.

At the same time, there is a need to recognise the cost that requests for access can impose on dominant firms. As described at some length above, data is highly heterogeneous and can be used for a broad variety of purposes. This distinguishes access to data requests from access to infrastructure requests. Infrastructures have a clearly identifiable purpose, and the conditions of access – although they can be complex – can be standardised with a view to meeting that purpose. This remains true for IPRs, albeit with some caveats. Hence, the infrastructure or IPR owner will typically have a sound basis to assess the merits of an access request, i.e. whether access is indeed indispensable to compete, and which type of access is justified. The same does not hold true for data: the goals pursued by a given data access request can be highly diverse. For each type of goal, a different relevant market might need to be defined. In some – but by no means all – such markets, a given data controller may be dominant. Each single data access request might then necessitate a separate analysis whether an access denial would constitute an abuse. Data controllers can, however, not be generally required to perform such a case by case analysis. The Article 102 TFEU case law shows that it is burdensome for competition authorities. It would all the more be excessive to require firms to engage in such an assessment on an ongoing basis.

This argues for a clear delineation of the data access scenarios that should be considered relevant under Article 102 TFEU. Refusals to grant access should be subject to a more elaborate Article 102 TFEU assessment where (1) the data controller holds a gatekeeper position of some relevant kind, i.e. access to its data is essential for competing on one or more neighbouring markets; (2) data access requests for this purpose are somewhat standardised.

These requirements imply that denials of a data controller to consider access requests of firms that seek access to the data of other firms for analytics purposes unrelated to the market in which the data holder is active – i.e. our scenario 3 above — are difficult to bring under the scope of Article 102 TFEU. This finding is corroborated by the fact that the legitimacy of such access requests under Article 102 could only be examined by the data controller if the access claimant were to disclose its business goals. Such a disclosure might, however, itself meet concerns under Article 101 TFEU. For solving the data access problems implicated in scenario 3, the evolution of market solutions or – in case of market failures to supply access – a regulatory regime may therefore be preferable. We do not exclude, however, that in some settings, scenario 3-cases may legitimately be brought under Article 102 TFEU, in particular where the dominant firm is a large player in data markets and has an infrastructure for data access requests in place.

The data access scenarios that remain to be examined are our scenarios 1 and 2, i.e. cases in which claimants request access to individual level data to be able to serve a specific customer to which that data pertains, or cases in which access to bundled individual level data or aggregate data is needed in order to compete on a complementary market.

2. INDISPENSABILITY OF DATA ACCESS / SUBSTITUABILITY OF DATA

Under Article 102 TFEU, no duty to grant access should be mandated as long as such access is not necessary for competitors to compete: this is true under the EFD, and given that competitors should generally not be required to "help" competitors, this should also hold for "access to data" cases. Hence, the replicability or substitutability of the relevant data to which access is requested is a first, highly important test.

When access to infrastructures is requested, the substitutability analysis is typically straight-forward. We need to establish whether the dominant firm's final product or a neighbouring market is insulated from competition if access to the infrastructure is denied.

When it comes to access to data requests, the analytical framework is essentially the same, but the analysis can nonetheless be complex. We have already expressed some hesitation to bring data requests by claimants under Article 102 TFEU who pursue business purposes that are essentially unrelated to the market served by the dominant firm (see above). The main focus, under Article 102 TFEU, should rather be on data requests with the purpose of serving complementary markets or aftermarkets – i.e. markets that are part of the broader ecosystem that the data controller serves.

Moreover, the distinction between volunteered, observed and inferred data may be relevant for the indispensability analysis. Where firms or individuals are willing to volunteer very simple data such as name or e-mails, they will frequently be ready to volunteer it repeatedly. Inferred data has undergone a process of refinement. Normally, there will not be a duty to share such results and insights with competitors. Frequently, access requests will therefore zero in on observed data, which often cannot be replicated, and volunteered data that would take a significant amount of effort to volunteer again (e.g. calendar data).

Furthermore, a relevant factor in the substitutability analysis may then be whether access to individual level data of one specific person is needed which the data claimant wishes to serve (our scenario 1), or whether access to bundled individual level data or aggregate data is requested (our scenario 2).

Starting with scenario 1, we need to distinguish further between cases in which the data access request pertains to personal data and requests pertaining to non-personal data.

Personal data, in particular very simple volunteered data, for individual-level use may well be accessible to a multitude of firms from the data subject itself. The right to data portability under Article 20 GDPR may furthermore ensure that aggregated volunteered data as well as historical observed data is also accessible through the data subject. When these conditions suffice to service the data subject, access to the data through the dominant firm is not indispensable.

As explained above, data portability under Article 20 GDPR does not encompass continuous access, however. At times – but this must be verified case by case[170] – such access may be indispensable to provide an aftermarket or complementary service. For example, the possibility to offer a particular smart home application may depend on continuous access to a user's specific energy usage pattern and his or her online calendar. Importantly, the application of Article 102 TFEU in such cases will presuppose that the complementary service constitutes a separate aftermarket on which the data controller is dominant (for a general discussion of the aftermarket doctrine, see above). Where the conduct of the data controller on the secondary market vis-à-vis the individual to be served is disciplined by competition on the primary market, competitors of the data controller on the secondary market cannot rely on Article 102 TFEU for their data access request. If, however, a separate aftermarket is to be defined on which the data controller is dominant, a refusal to grant access to the relevant data may constitute an abuse. Yet, under the GDPR, the relevant data access will require the consent of the data subject. Similar to the case of data portability, a firm's right to access to personal continuous data is, in this sense, a "derived" right.

The competition law assessment is similar when the data access request pertains to non-personal data – for example, non-personal machine usage data generated by a specific machine. Again, Article 102 TFEU will only apply if the complementary service constitutes a separate aftermarket on which the data controller is dominant. As generally, a strict test is to be applied to establish these preconditions. Where they are met, access to the relevant data may be indispensable to compete on the aftermarket. Again, however, access to the relevant data should not be granted without the consent of the person to be served: even if the relevant data is non-personal, it may well contain sensitive business information. We should remind the reader that the data-driven aftermarket lock-in would normally not arise if the machine user were generally granted a data access right (see above).

We shall now turn to our scenario 2, namely access requests to bundled individual level data or aggregate data. In some markets, access to large and / or rich datasets of this kind may be needed to provide a competitive service. Typical use cases are machine-learning applications, e.g. a unique labelled medical imaging dataset for black skin cancer taken from a specific

[170] For example, location data of a specific individual may be accessible through different routes.

machine. With a view to such access requests, a strict indispensability enquiry will be in place: depending on the relevant use case, inferred data – which may be available from data analytics providers in the market – may sometimes be a viable substitute. Should market solutions, such as Personal Information Management Systems ("PIMS")[171] and/or "data collecting societies", emerge for the management of personal data, bundled access to individual level data or aggregated data may, in the future, be facilitated.

Yet, cases may arise where no substitutes exist for the access to such data. The non-substitutability of data used in the aggregate may result from the richness ("number of columns") and size ("number of rows") of a dataset.[172] This is true in particular where machine-learning algorithms play a role. In an increasing number of sectors, innovation and competition revolve around machine-learning algorithms. Their performance and efficiency largely depend on having been trained on large high-quality datasets.[173] While the development of new techniques such as deep and reinforcement learning and the availability of cheap GPUs (Graphics Processing Unit) have supported recent advances in machine-learning, data is the key limiting factor for the development of applications today.[174] Indeed, when training a machine-learning algorithm, the richer the data the better. When properly trained, machine-learning algorithms are very good at filtering out unnecessary information and using useful information. Combining datasets adds value, especially when the two datasets contain non-redundant information. This generates important competitive advantages.

Similarly, the larger (size) the dataset the better. While this heavily depends on the application and the algorithm used, the performance - and therefore value - of a machine-learning algorithm tends to increase quickly with size ("number of rows") up to a point where it plateaus and then displays decreasing return to scale.[175] While in some applications, the value

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171 For PIMS and other personal data management solutions see e.g. https://ec.europa.eu/digital-single-market/en/news/emerging-offer-personal-information-management-services-current-state-service-offers.

172 See, *inter alia*, CMA, Pricing Algorithms, 8 October 2018, at para. 2.22. For a brief description of machine learning see CMA, 2.10 et seq. See also Agrawal, Gans, Goldfarb, "*Prediction Machines: The Simple Economics of Artificial Intelligence*", 2018.

173 Halevy, A., Norvig, P. and Pereira, F., 2009, "The unreasonable effectiveness of data. IEEE Intelligent Systems", 24(2), pp.8-12. Andrew Ng, "*What Artificial Intelligence Can and Can't Do Right Now*", Harvard Business Review, 2016; Avigdor Gal, "*It's a feature, not a bug: on learning algorithms and what they teach us*", 2017; Matt Turck, "*The Power of Data Network Effects*", 2016; Manuel Ebert, "*AI's Big Trade Secret*", Medium, 2016; Boris Wertz, "*Data, not algorithms, is key to machine learning success*", Medium, 2016; Alexander Wissner-Gross, "*Datasets Over Algorithms*", edge.org, 2016.

174 https://medium.com/machine-intelligence-report/data-not-algorithms-is-key-to-machine-learning-success-69c6c4b79f33, https://www.edge.org/response-detail/26587, and http://www.spacemachine.net/views/2016/3/datasets-over-algorithms.

175 See *e.g.* Fig 2 in Jahani, E., et al., 2017. Improving official statistics in emerging markets using machine learning and mobile phone data. EPJ Data Science, 6(1), p.3. https://epjdatascience.springeropen.com/articles/10.1140/epjds/s13688-017-0099-3.

of a 0.5% increase in accuracy is negligible, in others even the smallest increase in accuracy might make a difference. In general, the more complex an algorithm is and the richer the data it uses is, the more data ("rows") are needed to reach the level of decreasing returns.

As these algorithms "learn by example", size alone is not enough. Representatively, ensuring that the dataset accurately reflects the composition of the population of interest, is often necessary and can be a relevant factor in competition analysis when assessing the quality of the data.[176]

The frequency of data generation needs to be taken into account when discussing data access both for providing a service to the person who generated the data and for aggregated applications. For numerous applications, real-time or very frequent access can indeed be needed - for instance a navigation app needs nearly continuous access to traffic information and road condition data. Similarly, for both cases again, access to historical data might be necessary. This needs to be taken into account in assessing the indispensability of data access under Article 102 TFEU, distinguishing access to a data set from access to the data in close to real-time.

Where access to bundled individual level or aggregate data is found to be indispensable, and such data constitutes personal data, a tension with the GDPR may seem to arise. Under the GDPR, access to personal data can only be mandated where either data which is originally personal can be made accessible in an anonymised way without such data access losing its competitive relevance, or where the processing of such data as it is requested by third parties is permissible based on one of the grounds set out in Article 6 GDPR.

Where access to personal data was required, the UK and French competition authorities have solved this in past cases by ordering data access on an opt-out basis after taking advice from their respective data protection authorities.[177] In other cases, access to data for specified purposes and specified acts of processing may be mandated by a competition authority based on an interest balancing (Article 6 lit. f GDPR) or based on Article 6 lit. e GDPR which, *inter alia*, allows processing that is necessary for the performance of a task carried out in the public interest. Again, a previous consultation with the data protection authorities will be expedient. Sometimes, a third option may be expedient and preferable, namely the implementation of technical tools that enable anonymous use of bundled individual data (see box on the

[176] See, *inter alia*, CMA, Pricing Algorithms, 8 October 2018, at para. 2.22. For a brief description of machine learning see CMA, 2.10 et seq. See also Agrawal, Gans, Goldfarb, "*Prediction Machines: The Simple Economics of Artificial Intelligence*", 2018.

[177] See the French competition authority's interim measures decision no. 14-MC-02, of 9 September 2014, concerning Engie, at paras. 289 and 293-294; and the UK CMA's Final Report on its Energy Market Investigation, dated 24 June 2016, at para. 233 of the summary, and in more detail in paras. 11.64 to 11.66.

anonymous use of individual level data above). The cost of putting such procedures in place may be imposed on access petitioners.

Where access to bundled individual level non-personal data or aggregate non-personal data is at issue, the GDPR is inapplicable, but concerns regarding an anti-competitive information exchange (Article 101 TFEU) may arise (for relevant criteria see above). Where this is the case, a refusal to grant access will be objectively justified.

3. INTEREST BALANCING: INCENTIVES TO INNOVATE AND INVEST VS CONTESTABILITY

Competition is driven by the search for opportunities for profitable investments. Irrespective of dominance, competition law must not kill economic actors' incentives to invest and innovate. In a data-driven economy, this is also true with regard to investment in data collection and processing. Thus, competition law must take the incentive effects into account before imposing a duty to deal, or more specifically a duty to grant access to data. At the same time – in particular if the dominant data holder is a platform – the interest balancing needs to figure in the importance of protecting competition *for* the market, as we have emphasized in chapter 4. We will address both issues in turn.

A) PROTECTING INCENTIVES TO INVEST

In the debate on the application of the EFD to data access, some have argued that the threshold for granting access to data should be lowered as compared to access to infrastructure or access to IPR cases – at least in those settings where data is produced as a by-product of another activity and incentives to generate such data will persist irrespective of a possible access mandate.[178] The sharing of data with competitors may then promote competition and innovation in the industry, considering the non-rivalry of data use.[179]

This argument may hold true, to some extent, when access to machine-generated sensor data in the Internet of Things context is at issue. While the value of the data to the dominant data controller may be considered in the calculation of the price for the machine (or the renting of the machine), the aftermarket monopoly value is not to be protected by competition law. Where access to such data is at issue, it may, therefore, not be the incentive effects on the dominant firm that weigh most heavily. When access to bundled individual level data or aggregate data is at issue, competition authorities will need to carefully consider potential anti-competitive effects of an information exchange, however.

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[178] For a discussion see, *inter alia*, Schweitzer / Haucap/ Kerber / Welker, "*Modernisierung der Missbrauchsaufsicht*", 2018.

[179] See also Prüfer / Schottmüller, "*Competing with big data*", TILEC Discussion Paper No. 2017-006.

The situation is different when it comes to requests for access to usage or behavioural data that a dominant platform has observed and collected, in particular where the essential business model of the platform is premised on acquiring a large user base, and hence a large amount of data. In such cases, data collection cannot be considered a mere by-product of another activity. Rather, the incentives to invest in new products and acquire consumers is intrinsically linked to data acquisition.

However, in these platform settings, another aspect may gain in relevance, namely the strong indirect network effects that such platforms – and in particular dominant ad-funded platforms – seem to be able to generate through their superior ability to monetise data. This ability appears to generate huge incentives to invest; incentives which do not vitally depend on engaging in a data-driven leveraging of market power to additional aftermarkets. Given, firstly, the importance to be accorded to the protection of "competition for the market" in such highly concentrated markets with high and non-transitory barriers to entry (see chapter 4), and, secondly, the data-driven feedback loops that tend to further entrench dominance, the benefits for competition and innovation to be expected from a mandated data sharing may then outweigh the negative effects on the dominant firm. In particular when it comes to access to data held by dominant platforms, there may, therefore, be a case for mandating data access.

B) DO WE NEED A "NEW PRODUCT RULE" IN DATA ACCESS CASES?

Another aspect in the balancing exercise between the dominant firm's incentives to invest on the one hand, ensuring contestability on the other hand, could be whether data access is needed to compete with the data holder directly, or whether it is needed to offer complementary services. The EFD case law provides precedents for both settings.[180] However, in the case law dealing with a possible duty to license essential intellectual property rights, the ECJ has initially found that only if a refusal to license were to impede the appearance of a "new product" should a duty to license be recognised. Yet, the "new product rule" has subsequently been weakened. In *Microsoft*,[181] the GC clarified that the prevention of a "new product" is but one case in which a refusal to license can be found to limit production, markets or technical development to the prejudice of consumers (Article 102 lit. b TFEU). "Exceptional circumstances" that justify the imposition of a duty to license may likewise exist where a refusal to deal would eliminate competition for innovation or quality to the detriment of consumers.

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180 See cases quoted above, IMS Health (access to compete with the dominant firm in its own primary market) and Microsoft (access to compete with the dominant firm in a secondary market) on the one hand and Magill on the other (access to offer a complementary product that does not yet exist).

181 Case T-201/04, *Microsoft v Commission*, EU:T:2007:289.

We do not think that the "new product rule" should be revived for data cases. Its goal – very imperfectly implemented by the "new product" criterion – has been to ensure a sufficient degree of appropriability of profits for the dominant firm. In the cases we have, with all constraints, highlighted as potential "access to data"-cases here – both scenario 1 and scenario 2 – the cost of completely closing neighbouring markets for competition may well outweigh the loss of incentives to invest on the part of the dominant firm, while the danger that the relevant firm will forfeit all relevant incentives to invest in data collection and innovation is comparatively lower. Nonetheless, any application of Article 102 TFEU to "access to data" cases should verify that an access mandate will not eliminate the appropriability of benefits resulting from successful investments. This consideration may gain in importance where access to data is requested outside the platform context, and without the consent of the individual and potentially machine user.

4. DATA ACCESS: COMPETITION LAW VS REGULATION

Where the refusal to grant access to data is found to be an abuse, competition authorities or courts will need to specify the conditions of access. This, and the concomitant necessity to monitor, may be feasible were dealing with a setting in which access requests are of a relatively standardised kind and where the conditions of access are relatively stable. Where this is not the case, a regulatory regime may be required. This may be true in particular where a dominant firm is required to grant access to continuous data, i.e. to ensure data interoperability. Where access to data is truly indispensable to compete, efficient and fair access must be ensured at great speed. The user base of a firm that is blocked from data access may otherwise erode in a matter of days. A competition authority's oversight will not suffice in such a case.

5. SUMMARY

To sum up, where competitors request access to data from a dominant firm, a thorough analysis will be required whether such access is truly indispensable, and in addition, the legitimate interests of both parties need to be considered. Access to individual level data of a particular user to serve that user should only be granted if that user consents. This is irrespective of whether personal or non-personal data is at issue (including for data pooling). Furthermore, a dominant position of the data holder vis-à-vis the relevant user must be established. Where the user can switch his/her service provider with sufficient ease if access to data is withheld, no mandated access is required. Where access to bundled individual level data or aggregate data is requested, the indispensability of data access must first be established. If access is necessary to compete effectively on a neighbouring market, an interest balancing is nonetheless in place. If the data holder is a dominant platform, access to data requests may carry particular weight, provided that the platform's dominance is – as frequently – strongly entrenched and exclusive data control may reinforce such power and

contribute to its further expansion. The same may be true for Internet of Things platforms. Limits to data access follow from the GDPR (where personal data is at issue), from the need to protect business secrets and from the competition rules on information exchange. Some of the relevant concerns can be dealt with by technically delimiting the relevant data use.

V. DATA-DRIVEN MARKET POWER – LIMITING ACCESS TO DATA?

As the discussion above of data sharing and data pooling has shown, it is not only the denial of data access that may raise concerns. Sometimes, access to data may be a problem.

One concern we have dealt with above is the risk of an anti-competitive information exchange. In principle, it may also result from a mandated access to data under Article 102 TFEU. Competition authorities and courts must be mindful to impose limits on mandated access to effectively preclude this risk, and to monitor compliance with these constraints.

Another concern may be that, where access to data is imposed based on Article 102 TFEU, such access may also benefit the large data conglomerates; in some settings, it may even allow them, based on the economies of scope they can realize when combining their own data troves with that of another firm that is dominant in a separate market, to expand their own dominant position. The expansion of the power of established platforms with a strong user base and a conglomerate profile into new markets pioneered by other platforms or firms is currently debated under the heading of “platform envelopment”.[182]

The debate on how to deal with this new form of “conglomerate power” is only just starting, and we do not have a conclusive solution for it. When it comes to personal data, the combination of different data sets may need a separate act of permission, whether consent or interest balancing.[183] On both grounds, the existence of market power may matter (see above). Yet, more discussion on these settings will be needed.

Such data-related theories of harm are well-known from the field of merger control. In various cases the European Commission has assessed whether a merger or acquisition will alter competition due to the access to novel data troves and, possibly, the combination of this data with the data that is already under the firms’ control. Within the context of merger control, a combination of different data troves will raise competition concerns if this combination allows the dominant firm to extract information that provides for a significant competitive advantage

182 Bourreau/de Streel, "*Digital Conglomerates and EU Competition Policy*", 26 February 2019, p. 16 et seq., with further references.

183 For this, see also Bundeskartellamt's Facebook decision of 7 February 2019 – *Facebook*.

but is impossible for competitors to replicate[184] or if the combination may the basis of the leveraging of market power.

Beyond the field of mergers, the question arises whether the combination of different datasets by a dominant firm can constitute an abuse within the meaning of Article 102 TFEU.

VI. CONCLUSION

Drawing the various threads of this chapter together, competition law can contribute to the further development of the data economy in two important ways:

- it can provide more guidance to firms regarding the conditions under which data sharing and data pooling could be considered pro-competitive, especially with regard to aggregated data. With more experience in the field, a block exemption regulation on data sharing and data pooling may become feasible.

- it can specify the different scenarios and conditions under which dominant firms – and in particular dominant platforms – are required to grant access to data.

Even where a dominant firm is under a duty to grant access to data, such access can take different forms. In some cases, data portability of some sort will suffice. In other cases, there will be a duty to ensure data, and therefore protocol, interoperability through a standard interface (API). Different techniques may be required to ensure anonymous use – in the case of personal data, or aggregate use of some sort in the case of non-personal data in order to exclude an anti-competitive information exchange. The monetary cost of providing interoperability could be recovered from those companies benefiting from data interoperability in the form of a license fee or, when low enough, be internalized by the platform.[185] Also, there may be a need to oversee that data access is granted on fair, reasonable and non-discriminatory (FRAND) terms – which need to be specified case by case.

Very likely, mandated data access will therefore, in the end, be a sector-specific regime, subject to some sort of regulation and regulatory oversight. Nonetheless, competition law can specify the general preconditions and give a more fundamental, pro-competitive orientation to the regulatory regimes that are likely to arise.

184 Autorité de la Concurrence and Bundeskartellamt, Joint report "*Competition Law and Data*", 2016, p. 16.

185 Henri Piffaut, "*Platforms: A call for data-based regulation*", Antitrust Chronicle, Spring 2018, volume 1, number 2.

6 MERGERS AND ACQUISITIONS IN THE DIGITAL FIELD

I. THE ACQUISITION OF POTENTIAL COMPETITORS AT AN EARLY STAGE

A. ACQUISITIONS OF YOUNG, LOW-TURNOVER TARGETS IN THE DIGITAL FIELD — NEW "GAP CASES" IN EUROPEAN MERGER CONTROL?

The largest digital firms have intensively engaged in mergers and acquisitions over the last decade,[186] and many observers have voiced concerns at this trend. Remembering that many mergers raise no concerns, or raise concerns which are not specific to the digital environment, in this chapter we will focus on one specific topic in this debate: the acquisition of start-ups which still have very low turnover and may not be "caught" by traditional merger control.

One concern that is gaining in importance in the digital era is whether and when the acquisition of targets with specific data resources can significantly impede competition, through horizontal, vertical or conglomerate effects.[187] These mergers can have pro-competitive consequences, by allowing the provision of new services thanks to the access to richer sets of data, but they sometimes bring about a concentration in control over valuable and non-replicable data resources and result in better data access for the merging parties than for their competitors; when they lead to a particularly valuable combination of different data troves, they may strengthen a dominant position or allow the acquiring entity to leverage market power, and sometimes raise foreclosure concerns. The European Commission has analysed such effects in depth in recent cases.[188] We find that the theories of harm used are generally sound.

Some of the relevant cases have raised another issue, however, which has not yet been fully addressed either in theory or in practice: a debate has emerged on how to deal with acquisitions of small, but successful start-ups with a quickly-growing user base and significant competitive potential by dominant platforms. More particularly, the debate is also whether the current regime of EU merger control is in need of modification in order to enable it to better address concerns relating, *inter alia*, to the early elimination of a potential rival. These

186 See OECD, "Data-Driven Innovation: Big Data for Growth and Well-Being", Paris, 2015.

187 For a general discussion see, inter alia, Autorité de la Concurrence / Bundeskartellamt, Competition Law and Data, 2016, p. 16-17.

188 See, for example, Commission decision of 6 September 2018 in Case M.8788 – *Apple/Shazam*; Commission decision of 6 December 2016 in Case M.8124 – *Microsoft/LinkedIn*; Commission decision of 3 October 2014 in Case M.7217 – *Facebook/WhatsApp*; Commission decision of 4 September 2012 in Case M.6314 – *Telefónica UK/Vodafone UK/Everything Everywhere/JV*; Commission decision of 11 March 2008 in Case M.4731 – *Google/Doubleclick*.

concerns have been reinforced by the importance of network externalities in the digital economy.

In many cases, such acquisitions will be pro-competitive. Generally speaking, the search for the optimal boundaries of the firm – whether by way of internal or external growth – is an important part of the competitive process. In the digital field, mergers between established firms and start-ups may frequently bring about substantial synergies and efficiencies: while the start-up may contribute innovative ideas, products and services, the established firm may possess the skills, assets and financial resources needed to further deploy those products and commercialise them. Simultaneously, the chance for start-ups to be acquired by larger companies is an important element of venture capital markets: it is among the main exit routes for investors and it provides an incentive for the private financing of high-risk innovation.

Concerns may, however, arise notably when such acquisitions result in a strengthening of dominance and thereby a significant impediment of effective competition, e.g. by eliminating a competitive threat and/or by raising barriers to entry for other (potential) competitors, thus further reducing the risk of attacks on a strongly entrenched market position from the fringe. Such concerns may be particularly serious if there is a systematic pattern of such acquisitions by dominant platforms.

As it currently stands, the European merger control framework may have difficulties in catching such acquisitions for a number of reasons. First, such acquisitions may escape the Commission's jurisdiction where the acquisition of start-ups takes place at a time when they do not yet generate sufficient turnover to come under the current turnover thresholds set out in Articles 1(2) and 1(3) of the European Union Merger Regulation ("EUMR")[189]. Many digital start-ups attempt to build a successful product and attract a large user-base without much regard for short term profits: they hope either to be acquired or to begin monetising their user base at a relatively late stage. For a period of time, the competitive potential of such start-ups will therefore not be reflected in their turnover. This runs counter to the assumption underlying the jurisdictional test of the EUMR that the "Community dimension" of a merger, i.e. its potential competitive significance for the internal market, is roughly related to the turnover of both the acquirer and the target. This apparent divide was already considered in the Commission's merger control consultation of 2016-2017.[190]

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189 Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings (the EC Merger Regulation), *OJ L 24, 29.1.2004*.

190 The European Commission requested comments on whether the current regime of purely turnover based jurisdictional thresholds fails to capture transactions with a significant potential to have an impact on competition in the internal market. Respondents have reacted differently. Several stakeholders (including some national competition authorities, other governmental bodies, some telecommunications companies

Second, even if the acquisition falls under the jurisdiction of the EUMR, it is frequently difficult to distinguish pro-competitive or neutral deals from anti-competitive deals. At the time of the acquisition there may not yet be a substantial horizontal overlap between the "core" market dominated by the acquirer and the separate (but typically related) market served by the start-up. While the elimination of potential competition may suffice to raise competitive concerns, it may be difficult to prove the existence of potential competition with a sufficient degree of certainty.

Where the merger is qualified as a vertical or conglomerate merger, the integration of complementary products or activities may at first sight be considered as a pro-competitive efficiency. Established theories of harm are then essentially constrained to foreclosure effects – where actual or potential rivals' access to supplies or markets is hampered or eliminated as a result of the merger – or to coordinated effects where the merger significantly raises the likelihood of coordination.[191]

In a market environment characterised by a few large firms with highly entrenched positions of dominance in some core markets and which simultaneously serve as a focal point of an expanding digital ecosystem, new theories of harm may need to be explored. In that environment, the acquisition of a start-up may lead to the strengthening of the dominance of the ecosystem even if the overlap is not within the more narrowly defined product market where the acquirer is dominant, or if the overlap in this separate product market as such would not raise competitive concerns.

In the following chapter, we argue that the thresholds of the EUMR should not be changed at the moment. As some Member States have introduced additional transaction value-based thresholds, their practicability – and the workability of the EUMR's referral system – should be closely monitored instead. However, we need to revisit substantive theories of harm under the significant impact on effective competition (SIEC) test.

We want to emphasise that the competitive concerns outlined below relate to a clearly circumscribed set of circumstances: they emerge from, and are limited to, a market setting characterised by a high degree of concentration and high barriers to entry, resulting, *inter alia*, from strong positive network effects, possibly reinforced by data-driven feedback loops. It is in

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and associations) perceive an enforcement gap that would warrant a reform of the EUMR's jurisdictional thresholds. Conversely, the vast majority of private stakeholders and a number of responding public stakeholders consider that there is no significant gap and/or that referral mechanisms are sufficient: in their view, it would be disproportionate to expand EU merger control. In any event, respondents consider that any new threshold(s) should only capture a limited number of transactions that have the potential to distort competition and have a local nexus to the EEA, as well as a cross border dimension. See the summary of replies and their non-confidential versions here: http://ec.europa.eu/competition/consultations/2016_merger_control/index_en.html.

191 EU Commission, Guidelines on the assessment of non-horizontal mergers, *OJ C 265, 18.10.2008*.

such cases in particular that the acquisition of start-ups – even without an actual market overlap between the acquirer and the target (or without competitive concerns regarding that partial overlap as such) – may further raise barriers to entry and/or expand the ecosystem controlled and dominated by the acquirer and reduce the prospect of independent, decentralised innovation. Because our concerns are limited to acquisitions by a dominant acquirer, we frequently refer in the following analysis not to the SIEC test in general, but to the strengthening of dominance in particular.

B. JURISDICTIONAL THRESHOLDS FOR MERGER CONTROL

As mentioned above, jurisdiction under the EUMR is currently based on turnover thresholds.[192] Considering that start-ups in the digital realm frequently focus on building up a large user-base first to monetise the innovation at a later stage, turnover-based thresholds do not appear to be a good proxy of the competitive significance of such transactions. The acquisition of a target with an innovative business idea, millions of users, and great business potential, but no established, well-functioning business model and therefore a small turnover, will escape European jurisdiction – unless the merger is referred to the European Commission under Article 4(5EUMR) at the request of the parties to the concentration[193] or under Article 22(1) EUMR at the request of a Member State.[194]

Different policy conclusions may be drawn from this situation. If the disconnect between the merging parties' turnover and the potential competitive relevance of a transaction for the EU's Single Market is considered to be of significant relevance, this might, at first sight, argue for a modification of the EUMR's jurisdictional thresholds, and in particular for introducing a new and supplementary transaction value[195] or a market share test. Relying on national referrals may be unsatisfactory and insufficient given that the number of national jurisdictions that make use of non-turnover-based thresholds is limited and therefore that referrals to the EU level will not necessarily be predictable. Also, in referrals under Article 22 EUMR, the

192 For the relevant turnover thresholds see Article 1 EUMR.

193 Article 4(5) EUMR sets out two main conditions for a referral: the transaction at issue must qualify as a concentration within the meaning of Article 3 EUMR; and it must be capable of being reviewed under the national competition laws of three Member States. In these cases, it is the parties to the merger or those acquiring control which request the referral.

194 According to Article 22(1) EUMR, one or more Member States may request to Commission to examine any concentration with no Community dimension within the meaning of Article 1 EUMR when it affects trade between Member States and threatens to significantly affect competition within the territory of the Member State or States making the request.

195 Bourreau/de Streel, "*Digital Conglomerates and EU Competition Policy*", 26 February 2019, p. 33.

Commission will examine the impact of the concentration within the territory of the referring Member State(s).[196]

Yet, broadening EU's merger control jurisdiction to cover competitively relevant transactions irrespective of turnover raises a set of difficult issues. Any new, non-turnover-based jurisdictional threshold would need to take seriously the market need for legal certainty in determining whether a given transaction must be notified, the need for minimising the administrative burden and transaction costs brought about by an extension of jurisdiction, and the fact that principles of public international law require the showing of local nexus (in order to establish jurisdiction, an immediate and substantial effect of the concentration in the European Union must be shown).[197] Simultaneously, care must be taken to ensure a harmonious co-existence of a non-turnover-based threshold for EU merger control with national merger control regimes.

Designing a jurisdictional threshold that meets these requirements is by no means trivial. Considering that the number of transactions that will raise competitive concerns is arguably small, there is a fine line between introducing a transaction value threshold which is too low and captures too many transactions and one which is too high and does not capture enough. In order not to capture too many irrelevant transactions, a new threshold could be limited to transactions with specific characteristics, for example to acquisitions by dominant firms in markets characterised by strong network effects. However, defining such a jurisdictional threshold in a way that meets the requirements for legal certainty is, at the very least, a challenging task.

While none of these concerns excludes the possibility to amend the EUMR's jurisdictional thresholds, the complexities of doing so are substantial enough to do so only if the existing regime exhibits serious gaps. Whether this is so depends, to a large extent, on whether those potentially problematic low-turnover transactions that may negatively affect competition are nonetheless brought under the jurisdiction of the Commission by way of the referral system.

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196 Therefore, the Commission will not examine the effects of the concentration in the territory of Member States which have not joined the request, unless this examination is necessary for the assessment of the effects of the concentration within the territory of the requesting Member States (for example, where the geographic market extends beyond the territory/or territories of the requesting Member States). This is different in referrals under Article 4(5) EUMR, where the Commission acquires jurisdiction over the whole transaction.

197 See Case T-102/96, *Gencor v Commission*, EU:T:1999:65; Case T-286/09, *Intel v Commission*, EU:T:2014:547, at para 233; confirmed by Case C-413/14 P, *Intel v Commission*, EU:C:2017:632, at paras. 40 et seq.

Some of the digital mergers that the Commission has recently analysed have come to it via the referral system – this was the case notably for Apple/Shazam[198] and Facebook/WhatsApp.[199] Both mergers were caught, *inter alia*, by Spanish merger control: according to Spanish law, a merger must be notified whenever either the relevant turnover test is met or when the concentration results in or increases a market share equal to or greater than 30 % in the relevant product market within the national territory or a defined geographical market therein.[200]

Mergers that have escaped the Commission's scrutiny include Facebook/Instagram[201] and Google/Waze[202]. Both were, however, caught by UK merger control under a "share of supply test"[203] and subsequently scrutinised by the OFT.

Recently, Austria and Germany – which have traditionally relied on turnover thresholds – have widened the jurisdictional coverage of their merger control regimes by introducing transaction value-based notification thresholds.[204] The idea is to close the perceived gap in cases where the purchase price is a large multiple of the present turnover of the target, thus indicating a high market potential of an innovative target in the future. France, on the other hand, has opted against the introduction of a transaction value-based notification threshold, but is considering an *ex post* notification requirement for a limited number of transactions that may raise competition concerns.

We consider that, against this setting and in light of the difficulties that the introduction of a non-turnover-based threshold into the EUMR would raise, the EU should wait and assess a) how the new transaction value-based thresholds in Austria and Germany play out in practice, and b) whether the referral system would ensure that transactions of EU-wide relevance are ultimately analysed at EU level. Only if major gaps arise should the EUMR be

198 Referral by the Austrian competition authority; referral request joined by the national competition authorities of France, Iceland, Italy, Norway, Spain and Sweden.

199 Referral upon a request by the notifying party under Article 4(5) EUMR.

200 Law 15/2007.

201 See OFT, ME/5525/12.

202 See OFT, ME/6167/13.

203 See section 23 of the Enterprise Act 2002. According to the "share of supply test", the enterprises which cease to be distinct supply or acquire goods or services of any description and, after the merger, together supply or acquire at least 25 % of all those particular goods or services of that kind supplied in the UK or in a substantial part of it. The merger must also result in an increment to the share of supply or acquisition.

204 See Sec. 35(1a) GWB (Germany) and Sec. 9(4) KartG (Austria). On both, see Bundeskartellamt / Bundeswettbewerbsbehörde, Guidance on Transaction Value Thresholds for Mandatory Pre-merger Notification (Section 35 (1a) GWB and Section 9 (4) KartG, July 2018).

amended. Even then, there will remain a choice between strengthening and improving the referral regime or amending the EUMR's jurisdictional thresholds.[205]

C. SUBSTANTIVE CRITERIA FOR ASSESSING MERGERS BETWEEN DOMINANT PLATFORMS OR ECOSYSTEMS AND INNOVATIVE, QUICKLY-GROWING START-UPS

Whether or not the jurisdictional thresholds of the EUMR are amended, the substantive criteria for analysing such acquisitions need to be rethought. The competitive concern explored here is limited to a relatively small group of cases, when a dominant platform and/or ecosystem which benefits from strong positive network effects acquires a target with a currently low turnover but a large and/or fast growing user base and a high future market potential. It is in such cases that competition law should be particularly concerned about protecting the ability of competitors to enter the market (see chapters 3 and 4 above), as competition *in* the market will typically be reduced. Competitive threats will typically come from the fringe (see chapter 2 above). Buying up promising start-ups that offer fringe products or services may therefore result in early elimination of potential competitive threats – which may be particularly problematic if done systematically.

However, in merger control proceedings, this scenario poses significant conceptual challenges. The horizontal overlaps between the acquirer and the target may look rather innocuous, where the target has only been entering a separate fringe market of the ecosystem that the dominant acquirer is operating. The target may be considered as a potential competitor on the acquirer's core market – but frequently, the uncertainty of whether the target will truly turn into a competitor in that market will be high and the relevant time horizon rather long.

Frequently, the merger will then need to be considered as a conglomerate merger. According to the current case law and the non-horizontal merger guidelines, conglomerate mergers are generally less likely to raise competition concerns, as they provide substantial scope for efficiencies.[206] Theories of harm are essentially limited to the foreclosure of actual or potential rivals who may be hampered in their access to supplies or markets, or to coordinated effects.[207]

We submit that the SIEC test in general – and the "strengthening of dominance" criterion in particular – remain a sound basis for assessing the type of mergers that concern us, but that

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205 In a second step, and depending on the outcome of the first step of the assessment, it may also be worthwhile assessing whether a mandatory *ex ante* notification system is advisable or whether systems requiring a light transparency notice or allowing for ex post review are more suitable. In that context, it may be useful to also include in the assessment and monitoring the developments in the UK, US and (depending on future reform proposals) French jurisdictions in this respect.

206 EU Commission, Guidelines on the assessment of non-horizontal mergers (2008), at para. 13.

207 *Ibid.*, at para. 17-19.

there exists a gap in currently accepted theories of harm. When it comes to — according to established categories — conglomerate mergers where the operator of an ecosystem with a dominant position in a core market buys up a firm that is active in a separate, but related market and has the potential to grow into a competitive threat beyond that market, competition authorities should inquire whether acquirer and target operate in the same "technological space" or "users' space". We believe that this analysis should rather follow the logic of the analysis of a horizontal merger: is the target a potential or actual competitive constraint within the technological/users' space or ecosystem? Does its elimination increase market power within this space? If so, is the merger justified by efficiencies – for which, however, the merging parties bear the burden of proof?

D. TECH ACQUISITIONS: TYPICALLY, NO KILLER ACQUISITIONS

The type of acquisitions discussed in this chapter have repeatedly been compared to the so-called "killer acquisitions" that have been observed in the pharmaceutical industry. In a "killer acquisition", an incumbent acquires a potential competitor with an innovative project that is still at an early stage of its development and subsequently terminates the development of the target's innovation in order to avoid a replacement effect.[208] By doing so, the incumbent pre-empts competition from innovating firms that potentially threaten their market position.[209] According to some business analysts, a "kill zone" of a somewhat different kind also exists for innovative tech firms vis-à-vis the tech giants, namely a zone established by the large digital firms in which start-ups hesitate to invest due to an anxiety that successful innovation might be copied or bought up easily.

According to Bourreau/de Streel, this calls for a new innovation-based theory of harm in merger control. Essentially, the Commission should explore whether the merger brings about a risk of a "cannibalisation effect": is there a plausible scenario in which the target, using its innovation, could "eat into the market of the acquirer"? If yes, would the acquirer then have an incentive to delay or cancel potential innovation?[210]

There may indeed be cases in the digital realm where a dominant acquirer buys up innovative targets but later shuts down the relevant innovation.

This is, however, not the typical scenario. Frequently, the project of the bought up start-up is integrated into the "ecosystem" of the acquirer or into one of their existing products. Such

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208 See Cunningham, Colleen and Ederer, Florian and Ma, Song, "*Killer Acquisitions*", August 28, 2018. Available at SSRN: https://ssrn.com/abstract=3241707 or http://dx.doi.org/10.2139/ssrn.3241707.

209 More precisely, by merging the acquirer and the acquired firm share the proceeds of monopoly rather than compete with each other. Because monopoly profits are higher than the sum of the profits of two competing firms, this leaves a surplus they can share.

210 Bourreau/de Streel, "*Digital Conglomerates and EU Competition Policy*", 26 February 2019, p. 33.

acquisitions are different from killer acquisitions as the integration of innovative complementary services often has a plausible efficiency rationale. In these cases, the theory of harm becomes more complex.

E. ANALYSING THE ACQUISITIONS OF START-UPS AS HORIZONTAL MERGERS

The mergers discussed here are acquisitions of start-ups by an already dominant firm. Under Article 2(3) EUMR, such a concentration will be prohibited where it significantly impedes effective competition – *inter alia*, by eliminating an important competitive constraint. This may, in particular, be the case if the target is an – actual or potential – direct competitor of the acquirer and if the removal of this competitive threat is unlikely to be replaced by the remaining competitors.

1. ACTUAL COMPETITION – WIDENING THE MARKET BOUNDARIES?

As discussed above, the targets acquired in the mergers that we focus on here will typically not compete directly with the dominant acquirer in its core market. WhatsApp was not offering a fully-fledged social networking service, but a consumer communications app for smartphones. Instagram was offering a mobile phone photo app. In both cases, the target competed with the acquirer in a segment of the acquirer's ecosystem, which at the same time constituted a standalone separate market. And in neither case did the relevant competition authority find a significant impediment of effective competition in that separate market as such. As the Commission found in its Facebook/WhatsApp decision:[211]

"[T]he consumer communications sector is a recent and fast-growing sector which is characterised by frequent market entry and short innovation cycles in which large market shares may turn out to be ephemeral."

Looking at the broader market for social networking services, the Commission found a "certain overlap and a blurring of lines in the functionalities" when comparing these services with those offered by consumer communication apps, but also a number of important differences, as social networking services offer a much broader and richer set of services and social experience.[212] At the time of the acquisition, the target was not a close competitor in this broader market, given its limited set of functionalities.

A broader market definition, that would have included messenger services like WhatsApp in a market for networking services and that would thereby have acknowledged some degree of substitutability for some users given different user needs and highly differentiated bundles of services would, simultaneously, have risked over-estimating the competitive constraints that

[211] Commission decision of 3 October 2014 in Case M.7217 – *Facebook/WhatsApp*, at para. 99.
[212] Commission decision of 3 October 2014 in Case M.7217 – *Facebook/WhatsApp*, at paras. 52-54.

WhatsApp and other messenger services imposed upon Facebook at the time. To generalise, where the acquirer operates a broader ecosystem with differentiated services and partial overlaps with the target, a qualification as straightforward horizontal mergers will frequently fail to represent the core of the strategy driving the merger.

2. POTENTIAL COMPETITION

According to the Horizontal Merger Guidelines, a merger may have significant anti-competitive effects not only when it eliminates present constraints, but also in cases where there is a significant likelihood that the target would grow into an effective competitive force in the future (para. 60). In the Facebook/WhatsApp merger, the Commission found no documentary evidence that WhatsApp was planning to become a fully-fledged social network in the future.[213] Such proof that the start-up is planning to enter the acquirer's core market will generally also be difficult to obtain in other cases. Clear plans for doing so will rarely exist when start-ups are being bought up at an early point of their life. In addition, the Commission looked at the closeness of the competitive relationship – but found that the services offered by Facebook and WhatsApp offered considerably different functionalities (para 158). In the mergers discussed here, this will indeed frequently be the case.

If one accepts the analysis that precedes, a broadening of the concept of potential competition to include all types of products and services that are, on the basis of their current functionalities, not yet close substitutes but could possibly expand in the future such as to become close competitors – e.g. because they serve similar user groups, the functionalities overlap and the markets are somewhat interlinked – would seem to meet important concerns. However, if the concept of competitors is expanded in this way, this could again lead to an underestimation of the market power of the incumbent in its core market as the estimate of the number of potential competitors would be vastly increased. It may then be difficult to show that the number of other potential competitors remaining in the market after the merger would not exert sufficient competitive pressure in the future. This may be true even if the Commission were to consider, on the basis of a proven long-time practice of the incumbent, the possibility that other, emerging challengers might be bought up, too.

Ultimately, the result of a broadened concept of potential competition could be more "false negatives" instead of fewer.

Real and sufficiently concrete potential competition may result from a target if the counterfactual to being acquired by the dominant platform or ecosystem is that the target is acquired by another player in the market who would thereby expand its user base and

[213] Commission decision of 3 October 2014 in Case M.7217 – *Facebook/WhatsApp*, at para. 145.

spectrum of services and could then become a realistic challenger. The plausibility of this counterfactual will need to be tested case by case.

3. ELIMINATION OF INNOVATION COMPETITION?

In the pharmaceutical and agro-chemical markets, the Commission has addressed early elimination of competitive threats by looking at competitive relationships in an innovation phase that precedes product market competition, i.e. by identifying potentially competing research poles.[214] Bourreau/de Streel have proposed to adopt a similar approach in digital markets: the differences between the innovation process in pharma and in digital markets notwithstanding, "innovation markets" should be defined based on an analysis of the main capabilities and inputs needed, *inter alia* data, engineering skills, high computation power and risk capital.[215]

We will come back to this idea a bit later – but propose that, in the tech sector, it will frequently be useful in a different guise. In the pharmaceutical and the agro-chemical industry, the concept of "innovation competition" allows restrictions of competition to be captured at an early point of time, i.e. before an effect on a relevant product market can be predicted with a sufficient degree of certainty, because R&D in these sectors typically takes the form of a distinct, well-structured process preceding product market competition. The situation in digital markets is frequently different. The research driving digital innovation is often closer to the market and therefore closer to the product competition itself. Where clearly identifiable research poles are absent, the concept of innovation competition cannot help to reduce the uncertainties related to the future developments of product markets.

Therefore, the concept that is needed must not separate innovation competition from product market competition, but rather capture emerging threats to entrenched market power in a conglomerate market setting.

Obviously, this does not exclude that, in some circumstances, the concept of innovation competition as developed in the pharmaceutical and agro-chemical sector may be relevant also in the digital field, in particular where only some very large and data-rich digital players are able to engage in certain types of (possibly heavily data-driven) research, or when the markets involve some physical, i.e. hardware, component. However, it will, we believe, rarely be relevant for the acquisition of potential competitors at an early stage, which is the focus of this chapter.

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214 Commission decision of 27 March 2017 in Case M.7932 - *Dow/Dupont*; Commission decision of 11 April 2018 in Case M.8084 - *Bayer/Monsanto*.

215 Bourreau/de Streel, "Digital *Conglomerates and EU Competition Policy*", 26 February 2019, p. 27-28.

E. ACQUISITIONS OF START-UPS AS CONGLOMERATE MERGERS

Where the horizontal overlaps between the acquirer and the target as such do not amount to a significant impediment of competition, harm to competition may nonetheless result from the conglomerate aspects of the merger. According to the current Guidelines on Non-Horizontal Mergers, non-coordinated effects and coordinated effects need to be analysed. Non-coordinated effects capture the risk of foreclosure that may arise where actual or potential rivals' access to supplies, data, or markets is hampered as a result of the merger.[216] Coordinated effects arise where the transaction changes the nature of competition in such a way that coordination between firms becomes significantly more likely (or, if it was already taking place, easier, more stable or more effective) after the merger (para. 17-18).

Non-coordinated effects may follow, *inter alia*, from the pooling of competitively relevant resources, including data. The Commission already considers such theories of harm.

F. SUGGESTED MODIFICATIONS TO EXISTING THEORIES OF HARM

In this section, we propose some modifications to the theories of harm for the cases where the acquirer operates a multiproduct platform and/or an ecosystem that benefits from strong positive network effects, which act as a significant barrier to entry. This theory of harm should be limited to cases of highly entrenched dominance when the possibility of entry is limited. In order to make the analysis clearer, we have pushed most of the discussion of efficiencies, which can be substantial, to the next section — but the two sections should be considered concurrently.

A multiproduct platform or ecosystem, i.e. an acquirer that is simultaneously active in other markets, will typically build on the (frequently data-related) economies of scope that its core services offer and the consumption synergies that result for consumers.[217] These complementary activities may reinforce the quality of the service it offers as well as its dominant position in the core market. Buying up successful start-ups within this "zone of interest" may then act as a barricade for potential attacks on the core market. This is all the more true where the position of the acquirer allows it to identify emerging trends in consumer consumption patterns early on and react to them – whether by way of copying new products or services or by acquiring successful start-ups.

In this setting, the risk to competition resulting from an acquisition is not limited to the foreclosure of rivals' access to inputs, but extends to the strengthening of dominance as it

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216 For such an analysis, see Commission decision of 6 December 2016 in Case M.8124 – *Microsoft/LinkedIn* (http://ec.europa.eu/competition/mergers/cases/decisions/m8124_1349_5.pdf).

217 For these two characteristics of digital conglomerates see Bourreau/de Streel, "*Digital Conglomerates and EU Competition Policy*", 26 February 2019, p. 23.

fortifies the dominance of the ecosystem, in part because the new services add value to the consumers for which they are complements and in part because they help retain other users for which they are partial substitutes.[218]

Even though the incumbent may not be dominant in a complementary service market when that market is analysed as a separate market, a broader view of the position of the incumbent in a "market for the digital ecosystem" may justify a finding of a significant impediment to effective competition, as the acquisition both expands the scope of network effects that protect the incumbent's core service to the complementary services, and "appropriates" the network effects that the target has managed to establish to the benefit of its own customers in such a way that, after the merger, they further strengthen the ecosystem as a whole. Customers of the dominant ecosystem can be "leveraged" to the newly integrated service; customers of the target are integrated into the ecosystem; and due to the stronger network externalities, all customers are less likely to leave the ecosystem afterwards. For the added value of the broadening of network effects to be considered an efficiency in a competition law sense, the competition authorities will, case by case, have to determine in particular whether those effects could be realised by other means, such as ensuring the interoperability of the ecosystem with the outside service, and, when this is not possible, to compare the value of the efficiency to the loss of competition.

A focus on the effects of the merger on the market position of the (conglomerate) ecosystem and the barriers to entry protecting it may facilitate a better understanding of defensive acquisition strategies. It is not an "innovation space" that needs to be defined in these cases, but a "users' space" that may encompass a broad variety of user needs. The incumbent attempts to expand existing network effects, which make its services more valuable to both its users and those of the target, but also eliminate the risk that the target attracts away its users. This, and the concomitant raising of barriers to entry by combining the acquirer's and the target's positive network effects, may well justify a high purchase price for a target with no or low turnover and a product or technology that the incumbent, in principle, possesses itself or could develop on its own. It significantly impedes effective competition if in the counterfactual, i.e. without the merger, the target could have succeeded as a stand-alone business or would realistically have been bought up by another competitor.

With this theory of harm, the uncertainty concerns that arise when analysing the existence of potential competition in the acquirer's core product market do not arise. The controversial acquisitions concern start-ups with a fast growing user base, such that the competitive threat is already present. Also, the theory of harm proposed here is likely to reduce error costs (see chapter 3), in particular a heightened risk of false positives, without a need to modify the

[218] In this context, think of Commission decision of 3 October 2014 in Case M.7217 – *Facebook/WhatsApp*.

standard of proof, by providing a theory that is better tailored to the changing market environment. It remains essential, however, to compare the competitive conditions that would result from the notified merger with those that would have prevailed without the merger (counterfactual). Consequently, a prediction may be required – among other things – whether the target can survive and grow in the market as a self-standing competitive force if not acquired by the incumbent, or if other companies may be realistically interested in buying up the target.

G. EFFICIENCY DEFENCE

Even if an acquisition of the type dealt with here leads to a significant impediment of effective of competition, it may simultaneously create substantial efficiencies. In such cases, EU merger control recognises an efficiency defence.[219] The notifying parties may show that the efficiencies brought about by the merger counteract the adverse effects on competition, such that, based on an overall appraisal, there are no grounds for declaring the merger incompatible with the EU's Single Market. However, efficiency claims will only change the assessment where they – cumulatively – benefit consumers, are merger-specific and verifiable.[220] The acquirer may, therefore, show that, *inter alia*, the users of its services will benefit from more attractive services after the merger, and that the users of the target will benefit from greater network effects.[221] Yet, these efficiencies would not be considered merger-specific if, for example, they would be achievable also via non-exclusive access or interoperability agreements. Also, the cumulated efficiencies must offset the possible long term anti-competitive effects of the merger. The challenge of balancing these different effects, which are hard to estimate with any degree of certitude, should not be underestimated. There will be uncertainty in all directions and making a balanced error cost analysis will require great care and intellectual discipline.

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219 See EU Commission, Horizontal Merger Guidelines, Sec. VII (paras. 76 et seq.); EU Commission, Non-Horizontal Merger Guidelines, at para. 53, 118.

220 See EU Commission, Horizontal Merger Guidelines, at para. 78; EU Commission, Non-Horizontal Merger Guidelines, at para. 53.

221 For further relevant efficiencies see EU Commission, Non-Horizontal Merger Guidelines, at para. 118: Conglomerate mergers may "produce cost savings in the form of economies of scope (either on the production or the consumption side), yielding an inherent advantage to supplying the goods together rather than apart. For instance, it may be more efficient that certain components are marketed together as a bundle rather than separately. Value enhancements for the customer can result from better compatibility and quality assurance of complementary components. Such economies of scope however are necessary but not sufficient to provide an efficiency justification for bundling or tying. Indeed, benefits from economies of scope frequently can be realised without any need for technical or contractual bundling".

II. CONCLUSION AND RECOMMENDATIONS

To summarise, we do not believe that the EUMR currently needs a legislative update.

As far as jurisdiction over the mergers discussed here is concerned, the functioning of the referral system between the Commission and the Member States' authorities should be closely monitored. Also, it will be of particular interest to monitor the performance of the transaction value-based thresholds recently introduced both in Austria and in Germany. Should systematic jurisdictional gaps arise in the future, a "smart" amendment to the European thresholds may be justified.

As far as the substantive assessment of mergers is concerned, the significant impact on effective competition test continues to provide a sound basis. However, a new theory of harm may be needed to capture the potential adverse effects on competition of the mergers analysed in this chapter. In the future, the analysis must include an analysis of the strategic relevance of such mergers in shielding broader ecosystems from competitive threats from the fringe.

A reinforcement of European merger control in this regard is all the more relevant because it relates to the preventive and structural arm of European competition policy. Where network effects and strong economies of scale and scope lead to a growing degree of concentration, competition law must be careful to ensure that strong and entrenched positions remain exposed to competitive challenges. The test proposed here would imply a heightened degree of control of acquisitions of small start-ups by dominant platforms and/or ecosystems, as they would be analysed as a possible defensive strategy against partial user defection from the ecosystem as a whole. Where an acquisition plausibly is part of such a strategy, the burden of proof is on the notifying parties to show that the adverse effects on competition are offset by merger-specific efficiencies.

This theory of harm does not create a presumption against the legality of such mergers. But it is informed by new business strategies and the competitive risks they raise, and should help to minimise "false negatives" in the future in a setting where the costs of systematic false negatives are particularly high (on this more generally: see chapter 3).

7 CONCLUSION

Digitisation is profoundly changing our economies, societies, access to information, and ways of life. It has brought welcome innovation, new products and new services, and has become an integral part of our daily lives. However, there is increasing anxiety about its ubiquity, political and societal impact and, more relevant to our focus, about the concentration of power by a few very large digital firms.

In Europe, competition law has come to play a special role in shaping both the public perception of the digital future, and the legal environment in which it is developing. Part of this role stems from its empirical focus and the thoroughness of the investigations by the competition authorities. The extensive investigation and analysis, along with the discussions that have accompanied the intervention of the European Commission in cases such as Microsoft (2004)[222], Google Shopping (2017)[223] and Google Android (2018)[224], including the contributions of the defendants, have contributed to our understanding of digital markets. The case law has also raised awareness of the need to adjust the analytical tools, methodologies and theories of harm to better fit the new market reality. However, these investigations take lots of time and there is growing awareness of the need to process cases with sufficient speed. Theories of harm must be designed with a view both to the relevant error costs and with a view to the practicality of applying them. In particular, with a view to the conduct of dominant platforms, we have tried to propose some theories of harm that are aligned with the requirement that they can be applied in practice – including some relevant presumptions. Likewise, for the much-debated issue of acquisitions of start-ups by dominant platforms or ecosystems, we have proposed to strengthen and re-design conglomerate theories of harm. As regards data access, we have argued that the aftermarket doctrine needs to be re-examined to better reflect the new relevance of data-driven lock-ins.

We have discussed the role that data interoperability may play: with a view to dominant platforms, it can be a remedy against anti-competitive leveraging of market power into markets for complementary services. Where vertical and conglomerate integration and the rise of powerful ecosystems may raise concerns, requiring dominant players to ensure data interoperability may be an attractive and efficient alternative to calling for the break-up of firms – a way that allows us to continue to benefit from the efficiencies of integration.

In our report, we have focused on what competition policy can contribute to ensuring that the new realities of the digital economy work to the benefit of European citizens. But we are well

222 Commission decision of 24 March 2004 in Case C-3/37.792 – *Microsoft*.
223 Commission decision of 27 June 2017 in Case AT.39740 – *Google Search (Shopping)*.
224 Commission decision of 18 July 2018 in Case AT.40099 – *Google Android*.

aware of the complementarity that exists between competition law and other legal regimes. With digitisation, new needs for coordination between these regimes emerge, and adjustments and/or re-interpretation of contract law, consumer protection law, or unfair trading law will be part of the shaping of the legal order in reaction to a different economic reality. Some of these rules may lessen the likelihood of specific types of conflicts arising in the future, or may dampen the incentives to strategically abuse new positions of power. In some respects, competition law would then return to its original role: to function as a background regime of an otherwise well-ordered marketplace based on the general rules of both private and public law that addresses the specific tensions that arise in the light of economic power. In other respects, the economic rules of the new economy may be different enough that competition policy will need to be vigorously enforced, even after the adjustments to the other legal regimes have been conducted. In our report, we allude to the need to devise the general legal rules (as opposed to competition rules) such as to meet the new challenges of the digital economy.

In some areas, we propose that a regulatory regime may be needed in the longer run. In particular, competition law enforcement may be overburdened to deal with the implementation and oversight of interoperability mandates imposed on dominant players. However, we do not envision a new type of "public utility regulation" to emerge for the digital economy. The risks associated with such a regime –rigidity, lack of flexibility, and risk of capture – are too high.

At the same time, competition agencies can contribute to the better functioning of the digital economy by providing more guidance. For instance, guidance may be needed on the definition of dominance in the digital environment, or on the duties of conduct for dominant platforms. The guidelines on non-horizontal mergers should be updated with a view to specifying when novel conglomerate theories of harm would apply. Likewise, guidelines on data sharing and data pooling on the one hand and on data access and interoperability requirements on the other would create more legal certainty for companies. Given the fast evolution of the sector and our still imperfect understanding, these guidelines might need to be updated with some frequency.

We have highlighted the promotion of innovation as a major goal of competition law: innovation is a particularly prominent feature of the digital economy, and, effects on innovation will frequently be more important than price effects in the assessment of the effects of entrepreneurial strategies. Nonetheless – or rather therefore – we have not devoted a separate chapter to innovation. Instead, we have considered innovation as a cross-sectional topic, for instance in our discussions of consumer welfare, platforms, or access to data. Indeed, in the digital context innovation is frequently a predominant and integral part of competition on product and services markets and not a separate and discrete process. Consequently, we believe that, as a general rule, the definition of specific innovation markets

or innovation spaces is not needed to effectively protect innovation in the digital economy. The challenge is to systematically integrate innovation in competition policy practice, and, in doing so, to consider that erring to the disadvantage of innovation is likely to be particularly costly in the longer run. In a setting in which the barriers to entry are high and the position of dominance is entrenched, we may, therefore, be less concerned about appropriability of profits and more concerned with behaviour that fortifies or expands positions of power and that decreases both possibilities and incentives for disruptive and complementary innovation. Attempts to precisely compute and balance innovation effects will frequently be futile and we consider that ensuring the persistence of competitive pressure to the benefits of users is a sound pro-innovation competition policy.

A significant part of our report focuses on how to identify and constrain the abuse of market power. However, innovation may also depend on cooperation, and – within the emerging data economy – on the accessibility of data. Here, our primary emphasis has been on providing some guidance on how well-functioning data markets may be promoted. This includes pro-competitive cooperation in the field of data and the need to break up data bottlenecks where they impede effective competition and impede innovation. Mandated data access may sometimes be needed.

Finally, we have become, over the course of writing this report, increasingly aware of the need for the competition policy academic community and for regulatory agencies to gain a better understanding of both the technologies that underpin the digital sector and the relevance of data for competition and competition enforcement. In particular, we believe that it will be important, in the coming years, for regulatory agencies to develop internal technological capabilities to help guide policies moving forward and help in their enforcement.

Despite the ambitious title of our report, it certainly cannot be, and is not intended to be, the final word on how competition policy should adapt to the digital era. Rather, we hope that it is a useful contribution to the ongoing conversation between competition policy practice and academia on the ways competition policy can best shoulder its part of the responsibility for defining and applying a new legal framework for the digital world, which ensures that it serves the interests of European citizens.

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