



Inequality

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Competition and the industrial challenge for the digital age?

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Competition and the industrial challenge for the digital age?

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The dominance of tech giants does not confront us with an unpalatable choice between laissez-faire and populist interventions. This paper takes stock of available knowledge, considers desirable adaptations of regulation in the digital age, and draws some conclusions for policy reform.

Introduction

The initial enthusiasm for the ongoing technological revolution has recently given way to a global 'techlash'. Many academics² and policymakers call for taming the large tech platforms, regulating large tech companies as public utilities, breaking them up, using a tougher antitrust enforcement, or engaging in industrial-policy programs in big data and AI. This paper investigates the merits of the various arguments.³

Economists' standard view on what has been happening is that numerous industries are now subject to substantial economies of scale or scope, a winner-take-all scenario, and widespread market power. Incumbents enjoy direct network externalities (our concurrent joining of Facebook or Twitter allows us to interact through these platforms) or indirect ones similar to those associated with urban amenities (I benefit from your using a search engine, an app such as Waze, or a delivery service because that improves their quality). Competition in the market may also be limited by the existence of large fixed costs. For example, designing a first-rate algorithm, web-crawling and indexing (all of which are necessary for a search engine to be effective, especially if it aims to respond satisfactorily to uncommon queries) is onerous; accordingly, there

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The paper is written as a background piece for the IFS Deaton Review on 'Inequalities in the Twenty-First Century', of which the author is a member of the panel. The evidence on increasing markups and their causes will be reviewed for the Deaton Review by John van Reenen. The dominance of tech giants is widely regarded as one of (a number of) drivers of the increase in top-income inequality (for empirical evidence that correlations between measures of innovation and top income inequality at least partly reflect a causality from innovation to top income shares, see Aghion et al., 2019).

² See, for instance, books by Philippon (2019) or Posner and Weyl (2018) – admittedly with a scope much broader than just tech – and the reports cited in the following footnote.

³ There have been several excellent academically oriented recent reports on the evolution of regulation of the digital economy. Particularly prominent ones include the European Commission's report (Crémer, de Montjoye and Schweitzer, 2019) for Europe, the Furman report (Coyle et al., 2019) and the subsequent Competition and Markets Authority (CMA) interim report for the UK (CMA, 2019), and the Stigler report (Scott Morton et al., 2019) for the United States. These reports, despite some differences, exhibit a fair amount of convergence. For French language readers, I recommend Combe, Hyppolite and Michon (2019).

are really only two players in the English-language segment, that is, Google and Bing,⁴ with Google overly dominant.

Limited competition stemming from network externalities and fixed costs generates large markups for winners and a concomitant willingness to lose money for a long time to buy some prospect of a future monopoly position. Firms accordingly need deep pockets, as is observed directly (Amazon lost money for a long stretch of time and Uber has engaged in expensive recruiting of drivers through bonuses) and suggested indirectly (firms that have never turned any profit reach phenomenal market caps).

Monopolies always raise concerns about high prices, low innovation and – if the monopoly position may be challenged – the possibility of abuses of dominant position against potential rivals. Tech giants are no exception.

The possibility of consumer harm through high prices is sometimes questioned by platforms on the ground that many services are available for free to consumers. This argument, however, ignores levies on the other side of the market. Advertisers pay hefty fees for advertising on the platforms; these fees raise their cost of doing business, with potential indirect harm to consumers. Similarly, the fees paid by the merchants, so their goods and services be listed and recommended by the platforms, increase consumer prices. The 'no-consumer-harm' argument also ignores the theoretical possibility that a zero price may still be too high, as data are extremely valuable to platforms (that is, the flow of payments should be toward consumers; this is discussed further below).

Yet high profits might be the cost to pay for the very existence of the very valuable services. In some way, the consumer must pay for the industry's investment costs. So, a better posed question is: 'are platform profits in line with investment costs, or do platforms enjoy "supranormal profits" or "ex-ante rents"?'

Whether the high profits made by Google, Facebook and other dominant platforms really constitute supranormal profits is debated; identifying supranormal returns requires data not only on profits currently made by a dominant firm, but also on the losses it incurred during the shakeout period leading to monopolisation, and on the probability of emerging as the winner of the contest. Needless to say, we have little data on the latter two variables.

Excessive prices are not the only issue with monopolies. As was recognised long ago, a monopoly's management enjoys an 'easy life' and may not keep its costs under control, as it is not spurred by competition. Monopolies also may fail to innovate, as they are loath to cannibalise their own products. They may even fail to adopt minor innovations. A case in point is provided by the taxi monopolies across the world. The very useful 'innovations' introduced by ride-hailing companies such as Uber, Didi and Lyft (geolocation, traceability, preregistered credit card, electronic receipt, mutual rating, etc.) were neither new nor rocket science. Yet, they had not been taken on board by traditional taxi monopolies, resulting in suboptimal service. Interestingly, in some cities, the very same taxi monopolists reacted to Uber's entry by introducing apps, accepting credit cards or offering a fixed price from the airport to the city centre. The virtues of competition in action....

Note, finally, that even if there were no supranormal profits, this would not mean that there is no scope for policy intervention. Firms might be playing dirty tricks in the marketplace, spending

⁴ Other players may use either, under a syndication arrangement. See CMA (2019, pp. 75–77) for more details.

money on killer acquisitions or hiring battalions of lobbyists and lawyers to acquire or preserve their dominant position. Contestability does not rule out social waste.

This paper considers desirable adaptations of regulation to the digital age. It considers, in turn, the merits of alternative institutions and policies to regulate the tech sector; data-related issues; the resurgence of industrial policy and trade-related issues; and institutional innovation. The final section concludes.⁵

Market power and regulation in the digital age

Merits of the various approaches

(a) Does old-style regulation apply to tech companies?

Shortly after the enactment of Sections 1 and 2 of the Sherman Act in the US in 1890, which created modern antitrust enforcement, the US also laid the groundwork for the regulation of public utilities (private companies in a monopoly position serving network industries such as telecoms, electricity or railroads). Regulatory agencies were set up to collect cost and revenue information about these natural monopolies and to guarantee a fair rate of return on their realised investment cost (technically, their 'rate base'). The regulatory apparatus was completed, already in the early 20th century, by a judicial review of the regulatory process and decisions; the review was meant to protect private investors in those utilities from an expropriation of their investment through low regulated prices, or conversely to protect consumers from regulatory capture and abusive tariffs (and later on from a lack of competition in non-natural-monopoly segments). Indeed, the AT&T 1984 divestiture, which aimed at facilitating competition in potentially competitive services, such as long-distance and international calls, was initiated by the US Department of Justice rather than by the regulatory authority (i.e. the Federal Communications Commission, FCC), and the application of the consent decree between AT&T and the FCC was supervised by Judge Harold Greene.

In the late 20th century, there emerged a growing discontent about the poor quality and high cost of public services run by (public or private) incumbent monopolies regulated by the government. Cost-of-service regulation often gave way to 'incentive regulation' (price caps, fixed price contracts and, more generally, performance-based regulation), which attempts to make firms more accountable for their performance and thereby give them incentives for cost reduction.⁶

⁵ The techlash admittedly has broader origins than the focus of these notes; citizens are also concerned about the future of work in the AI and robotics era, about tax optimisation by global platforms, about threats to their privacy or about the political power of large platforms. Conversely, some of the issues considered in these notes are broader than tech. Among the many omissions and limitations are the following.

- The treatment will be Western-economies centric. It should nonetheless be borne in mind that nine out of the top 20 tech companies are Chinese. While China has different institutions (a strong industrial policy, ownership through variable interest entities, political connections of state-owned enterprises, which may avail themselves of ministerial intervention when facing an investigation or benefit from a soft budget constraint, and the state's ability to mingle in the tech companies' operations) and therefore would require a treatment of its own right, it should nonetheless be noted that many of the concerns highlighted below (such as exclusivity requirements, own-brand favouritism, data as a barrier to entry, pre-emptive mergers) are also present in China.
- I omit the issue of privacy, and content myself with noting its occasional tensions with competition.
- I also ignore the issue of the political influence of platforms (not just in the form of conscious or unknown sharing of data with political organisations eager to better target their propaganda); some platforms are large media groups, and politicians may be concerned by a potential change in the coverage they would receive if they pushed for more regulation. This concern is particularly strong when the platform has 'unique viewers' (so it can shape opinions more easily).

⁶ In fact, there was a much broader reform, of which the introduction of mechanisms for sharing efficiency gains between customers (or taxpayers) and the operator was the first leg. The other reforms were: (1) the privatisation of

Despite this substantial improvement, there is still a sense in which profits are kept roughly in line with costs, for at least three reasons.⁷ First, profits that are completely disconnected from costs are not 'time-consistent': the public uproar triggered by 'abnormal profits' makes it difficult for regulators to abide by their initial incentive scheme, and this is particularly the case if regulators are not in a position to resist politicians' demands.⁸ Second, very powerful incentives tend to leave very high rents when the firm has key cost or demand information that is not available to the regulator. Third, the high-profit stakes that exist under incentive regulation create serious concerns about regulatory capture.

Today's tech companies exhibit natural-monopoly characteristics like those of the network industries of the 20th century – hence, the occasional suggestion to apply public utility regulation to the tech sector. Yet, cost-of-service and incentive regulations are hard to apply to the tech sector for two reasons. First, firms are not followed by the regulator over their life cycle, making it difficult to measure their 'investment cost' (the analogue of the rate base for public utilities) and therefore to grant them a 'reasonable rate of return', which incidentally would require also to factor in an (unobserved) probability of success.⁹

Second, and a novelty relative to traditional network industries,¹⁰ tech giants are global firms, operating with inputs that are shared across countries (intellectual property, data, servers, supply chain, logistics). The absence of a supranational regulator raises the question of who oversees the granting of a proper rate of return and the allocation of contributions to this rate of return across jurisdictions; one does not know how to coordinate regulators and to prevent transfer pricing optimisation.¹¹

(b) Structural policies and breakups

An alternative approach to full-scale regulation consists in insulating a 'natural monopoly' (or 'bottleneck' or 'essential facility') segment, as became popular in the late 20th century. This segment remains regulated and is constrained to provide a fair and non-discriminatory access to competitors in segments that do not exhibit natural-monopoly characteristics and therefore can sustain competition. This was the rationale for the 1984 AT&T divestiture: the 'baby bells' remained in charge of the local loop, which at the time was perceived as being hard to duplicate, while competition was enabled for long-distance and international calls. Similarly, in power markets, the high-voltage grid is a natural monopoly, while competition in generation developed in many countries. In the rail industry, the tracks and stations are obvious essential facilities, while operating companies can compete for passengers and freight.

This is an intellectually appealing approach. The devil is in the detail, though.

operators in Europe; (2) the possibility for natural monopolies to rebalance their tariffs (raising prices on market segments with inelastic demand to cover network's fixed costs); (3) the opening to competition of activities that do not have natural monopoly characteristics (by granting licences to new entrants and regulating the conditions of their access to the incumbent operator's essential infrastructures); (4) the independence of regulatory authorities.

⁷ Developed in Laffont and Tirole (1993).

⁸ Interestingly, high prices seem to be politically better tolerated (a) if the industry is not run by a regulated monopolist, and, relatedly, (b) if people believe that the firms 'deserve' their rewards. In the pharmaceutical industry, high prices, while always unpopular, seem to be less contentious for new drugs than for off-patent drugs, which seems consistent with this conjecture. But we know little about the formation of public opinion in the matter.

⁹ The same issue arises for innovative drugs.

¹⁰ Developing countries offer exceptions to this rule, as public utilities there may be subsidiaries of foreign suppliers.

¹¹ As is familiar from tax optimisation, accounting tricks are bound to exploit differences in regulatory treatments across jurisdictions.

In the tech industry, the first challenge is to identify a stable essential facility. It must be stable because divestitures take a while to perform, and the cost of implementing them would not be worthwhile if the location of the essential facility kept migrating. This condition may not be met, though. While the technology and market segments of electricity, railroads and (up to the 1980s) telecoms had not changed much since the early 20th century, digital markets are fast-moving. This makes it difficult for regulators to identify, collect data on and regulate essential facilities, if the corresponding technologies and demands keep morphing.

The second challenge is that one wants to break up the incumbent without destroying the benefits of network externalities. For example, breaking a social network into two or three social networks might not raise consumer welfare. Either consumers will be split into separate communities, preventing them from reaping the benefits of network externalities; or separated from their friends, they will re-join on one of the broken-up sites, creating the monopoly again. Relatedly, if the essential facility is data, and data are much more powerful when different data sets obtained as a byproduct from multiple activities are combined, a breakup might deteriorate performance.

Finally, dominant firms may strategically intertwine different services to make it difficult for authorities to 'unscramble the eggs';¹² in this respect, it may well be easier to prevent a merger than to undo it (we will return to this later).

These obstacles need not be daunting, but the bottom line is that only a detailed plan, with a clear description of the associated costs and a comparison with alternative ways of reducing market power, will do.

(c) Competition policy

Absent clear plans for regulation and breakups, competition policy (abuses of dominant position, cartelisation, including merger review) and consumer protection (including data privacy) may remain the main games in town, although perhaps not in their current form (as we discuss next when we cover 'light-touch regulation'). However, this does not mean that competition policy is costless either. For one thing, it is slow. A fine on an incumbent for anticompetitive behaviour may serve as a deterrent for future such behaviour, but it does not really help the entrant that went belly up in between.

Competition policy is mostly backward- looking;¹³ as such, it may expose incumbents to legal uncertainty, unless the issue has arisen sufficiently often that a clear doctrine has emerged. Put differently, dominant firms may not be able to avail themselves of clear guidelines on what they can and cannot do. While competition policy will always embody a retrospective component, this raises the question of a more prospective approach based on a code of competitive conduct, indeed one that is adapted to the speed of digital markets. Competition policy in the digital age must achieve speedy and decisive resolution and must be agile to react to new environments and benefit from learning-by-doing. We will return to these points in the 'Institutions' section.

¹² For example, Mark Zuckerberg, Facebook's chief executive, announced in January 2019 that he plans to integrate the social network's messaging services – WhatsApp, Instagram and Facebook Messenger – unifying their technical infrastructure.

¹³ An exception is merger policy, which is a reason to give it a bigger role in preventing further concentration.

(d) Competition policy crossed with regulation, or light-touch regulation

Several reports call for the creation of a specialised regulatory agency, a 'Digital Markets Unit' (Furman report for the UK) or a 'Digital Authority' (Stigler report for the US). This specialised authority will focus on the digital economy and oversee only the large incumbents; according to the Furman report, perhaps a dozen of companies would be given 'strategic market status' (SMS) and thereby be designated as falling under its authority. The agency will be a mix between a competition authority and a regulator.

Like classic antitrust, the Digital Markets Unit will shun the exercise of setting a rate base and determining a fair rate of return; as we discussed, this is almost infeasible in a free-entry world and with global firms. It will also refrain from setting prices, even in the flexible form of a price cap.

From the regulatory paradigm, it will borrow its 'sectoral'¹⁴ focus. Accordingly, it will have a more forward-looking approach than current competition authorities in several ways. And, like a regulator, it will collect data about dominant firms and build up industry-specific knowledge on how the sector works. Large firms will have to pre-notify their acquisitions. In addition, the Digital Markets Unit will define a code of conduct;¹⁵ in this setting of rules for digital platforms, the Digital Markets Unit will be similar in spirit to European Union (EU) regulation on platform-to-business relations ('P2B regulation'), which entered into force in July 2019. The P2B regulation instituted a transparency requirement meant to limit platforms' self-preferencing in favour of their private label brands, and to thereby promote competition among merchants.

Enunciating a code of conduct and collecting industry information, however, will not be effective unless the Digital Markets Unit is endowed with enforcement power. The CMA interim report suggests a few directions for such a reform. The authority would have the 'ability to suspend decisions of SMS firms pending the result of an investigation, including the imposition of interim measures, to block decisions of SMS firms at the end of an investigation, and to appoint a monitoring trustee to monitor and oversee compliance by an SMS firm.'¹⁶

Light-touch regulation is appealing, but it also has its limits. First, it does not cover abuses in which smaller firms are equally involved (like the most-favoured-nation clause that we will later review); these presumably will still be handled by the competition authority.

Second, it will have to avoid regulatory capture, which is one of the reasons why multi-industry regulators and competition authorities were created in the past. This raises the issue of where the new agency should be located. It could be part of the competition authority, part of another agency (the plan is to locate it within Ofcom in the UK¹⁷), or a stand-alone entity. Making it part of the competition authority would slightly reduce the risk of capture and would also avoid the

¹⁴ By 'sectoral', I mean that large firms outside the digital sector will remain under the current regime. Of course, firms such as Google or Amazon are found in many industries (health, mobility, telecommunications, retail and e-commerce, advertising, search, etc.).

¹⁵ Adherence to the code of conduct will not be voluntary, though. Rather, it will resemble a law written up by the regulator, and, like a law, will be stated in broad terms (such as 'non-pro-competitive self-preferencing is prohibited') rather than in detailed, specific terms.

¹⁶ This approach is consistent with US antitrust tradition, which puts relatively more emphasis on remedies than on fines, relative to the EU.

¹⁷ The Stigler report (Scott Morton et al., 2019, p. 18) suggests locating the agency within the FTC: 'we envision—at least initially—to have the Digital Authority as a subdivision of the FTC, an across-industry authority with a better-than-average record of avoiding capture. Most importantly, the Digital Authority will have to be very transparent in all its activities.'

lengthy debates about which companies are really digital; this might arise if the Digital Markets Unit is located within a sectoral regulator. One thing is clear, though: turf wars must be avoided.

The importance of preserving contestability

An alternative to competition in the market is competition for the market, namely 'dynamic competition'. Because network externalities imply that a monopoly is more efficient than multiple non-interoperable firms, a substitute to creating multiple competitors might be to keep incumbents on their toes through the threat of entry and to rely on their eagerness to keep their monopoly rents. This is indeed the line taken in the public discourse by some of the tech giants. There is a grain a truth in the argument. Theoretically, monopolies are fine as long as (a) incumbents compete in prices and innovation (which benefits consumers) and not through dirty tricks (which do not), and (b) innovative firms do enter the market. The market is then said to be 'contestable'; if so, *potential* competition keeps incumbents on their toes – they innovate to avoid being replaced, and they charge low prices so as to enjoy network externalities and thereby deter entry.¹⁸ The important caveat is that, for 'competition for the market' to operate, efficient rivals must (a) be able to enter and (b) enter when able to. They may not.¹⁹

(a) Preserve multihoming/limit exclusivity requirements

Suppose, first, that the entrant challenges the incumbent directly in its core, monopolised market. The issue for the entrant in this frontal attack is to overcome its scale handicap. The incumbent may make its life miserable by demanding exclusivity from third-party providers or apps. Take the case of ride-hailing platforms. Suppose Uber imposed exclusivity on its drivers. Then its larger consumer base would encourage most drivers to pick Uber over Lyft. With a decisive driver-base advantage, Uber would also be much preferred to Lyft by consumers; and so on. The absence of multihoming confers a strong network-externalities advantage on the incumbent. Similarly, today, most large apps multihome in the mobile operating system market,²⁰ which is essential in keeping more than one platform alive. Similarly, multihoming is key to reducing 'applications barriers to entry' in the platform business.

(b) Secure fair access for complementors

It often makes more sense for an entrant to enter as a complementor first rather than challenging the core business of the incumbent firm, which benefits from inertia in this core segment. Consider therefore a less direct attack on the monopoly's position, in which a firm, whose entry in an adjacent space²¹ (as a complementor) by itself does not threaten the incumbent, may later expand its product line and grow into a substitute for the monopoly segment.

The fact that competition often comes from initial complementors has been alleged for a long time. In the browser case in the 1990s, Microsoft was accused of favouring its Internet Explorer browser over the Netscape browser. Parties agreed that at the time Netscape was a complementor to Windows; so, there was no short-run incentive for Microsoft to eliminate

¹⁸ See Fudenberg and Tirole (2000).

¹⁹ What follows focuses on the incumbent's conduct. Switching costs and behavioural biases favouring known brands may also protect the incumbents and must be addressed through specific instruments.

²⁰ See Bresnahan, Orsini and Yin (2015), who show that the most popular apps end up on mobile platforms iOS and Android, preventing tipping in favour of one of them.

²¹ Because it is costly to enter multiple segments at a time, such entry most often concerns a single niche segment: Google entered in the search business; Amazon initially sold books online; and Uber's strategy was to start by entering the taxi business.

Netscape, as a strong browser, regardless of the identity of its owner, made Windows more attractive. Competition authorities (as well as Microsoft's CEO in an internal memo) however viewed Netscape as a potential competitor for Windows in the longer run, as it was alleged that Netscape apps, which were Unix-based so mainly open source, could have been delivered via the browser outside the Windows OS.²²

Today, it is commonplace for platforms to operate markets but also compete in them: Amazon marketplace serves Amazon Basics or Whole Foods as well as third-party products; Apple's app store supports both Apple's own apps and independent apps. Such dual presence as owner of, and seller in, the marketplace raises concerns about self-preferencing. The European Commission's Google shopping case was based on the claim that the Google search engine favoured its own offerings. Regarding advertising intermediation services, there was a debate prior to the 2007 acquisition of DoubleClick's ad server by Google; the impact of Google's vertical integration in the intermediation services (running both ad servers, which serve publishers on one side and advertisers on the other, and the ad exchange standing in between) is still very much of a concern today.²³

Competition authorities are concerned about the dominant platform creating market power for in-house complementors. Unfair competition may take the form of a display preference for own services, a tie-in or loyalty rebates; alternatively, the platform may prey on a rival app to force it out of the market.²⁴ In some cases, the dominant platform may legitimately want to avoid the double marginalisation that naturally stems from high app prices in rather non-competitive complementary segments. Thus, more of a concern for the competition authority is the platform's desire to protect its natural-monopoly segment (the platform business) by depriving alternative platforms from the apps that they need to compete with the incumbent platform; put differently, by supplying key apps internally, the incumbent platform makes an entering platform depend on its goodwill.

To be certain, the issue of self-preferencing is ancient (consider private labels in supermarkets). But there is a feeling that the new digital platforms have an unprecedented ability to (a) favour their own brands when making a recommendation to consumers, and (b) cheaply gather substantial information about third-party products and selectively create copycats for the most successful ones (a behaviour that is not covered by the EU regulation on the P2B regulation, which focuses on favouritism and transparency). Such strategies are particularly harmful to rival brands as the latter may have no other place where they can sell.

In 2018, India issued regulations for foreign e-commerce platforms; besides their protectionist bent, it is worth noting the prohibition of (a) exclusivity requirements (the e-commerce platform cannot prevent or discourage the merchant from selling goods on other platforms, which may be reasonable requirement in the case of a dominant platform), and (b) sales by platforms of products from companies in which they have an equity interest. This second aspect of the Indian structural remedy is extreme; private labels may result from serendipitous innovations; and they also have the potential to eliminate double marginalisation. One would want to design less

²² This reasoning was also at the heart of the European Commission's case against Microsoft in workgroup servers. The degradation of interoperability between the Windows OS and rival server OS (Unix, Linux, Novell, etc.) was viewed as a way of inhibiting dynamic competition (e.g. reducing risk of apps being delivered on server side without needing Microsoft on the desktop). See Kühn and van Reenen (2009).

²³ Google is alleged to have a last-look advantage over rival ad servers and therefore to be able to apply only a tiny margin when overbidding rivals for publisher impressions. The possibility of self-preferencing is analysed in detail in Geradin (2019).

²⁴ The standard references here are Choi and Stefanadis (2001) and Carlton and Waldman (2002).

intrusive/more flexible interventions. However, the remedy illustrates the overall concern about tech companies competing with their customers.

(c) Prevent 'defensive acquisitions' and 'entry for buyout'

We noted earlier that, for contestability to operate, it does not suffice that efficient entrants are able to enter. It must also be the case that they do enter. If instead they sell out to the incumbent, little value is created for the consumer. Rather, the entrant makes money out of the threat to compete with the incumbent and 'ransoms' the latter. Overall, development costs make the entry-for-buyout a socially negative-sum game. There is a second social cost: innovation is incentivised away from new functionalities and toward me-too innovations.

For instance, concerns about a potential suppression of competition surfaced when Facebook purchased Instagram and WhatsApp, two social networks. There is also evidence that the new product itself, and not only competition with the incumbent product, may be suppressed in 'killer acquisitions'. Some empirical work following pharma projects pre-and post-acquisition finds evidence of such killer acquisitions.²⁵

Incumbents react to such claims in several ways. First, they rightly point out that fully conclusive evidence that the merger is anti-competitive is hard to obtain; it is hard to prove that the acquired companies *will* compete with the incumbent in the but-for world without the merger. Indeed, it is a feature of early acquisitions that empirical evidence is lacking; the competition, if any, has not yet taken place at the time of the merger. Relatedly, the trajectory of the entrants' projects is often unpredictable.

Second, incumbents note that there are many more acquisitions than initial public offerings (IPOs). They argue that restraints on acquisitions would impose costs, by limiting the set of potential buyers. To understand why, recall that there are two exit mechanisms for start-ups and their venture backers: IPOs and a sale to an existing company. The incumbents' claim is therefore that a prohibition of early acquisitions by dominant firms would restrict exit possibilities. However, if Instagram and WhatsApp had been prohibited from selling out to Facebook, many other acquirers, including tech giants without a strong social network, could have acquired them; so, the exit-channel argument does not seem that strong.

Third, another efficiency defence is also sometimes brought forth: the incumbent firm is really acquiring talent when purchasing the start-up. True enough, but this talent could be equally purchased by other tech companies searching for talent, but not owning directly competing products.

Why are such early mergers not challenged? The answer is two-fold. First, most mergers are below the radar of competition authorities, as most jurisdictions have turnover thresholds over which the merger should be notified and the competition authority can review them. Obliging large tech companies to notify would be a first step. The second issue can be found in the current burden of proof, which under judicial review largely lies with the competition authority.²⁶ This

²⁵ Cunningham, Ederer and Ma (2021).

²⁶ This discussion oversimplifies. Competition practitioners distinguish between burden of proof and standard of proof. Typically, in antitrust, the plaintiff or the authority must show that the conduct or the merger have an anticompetitive effect. Only if they succeed does the burden of proof shift to the defendant or merging parties to demonstrate procompetitive effects of the behaviour or merger (efficiency defence). In that sense, the current burden of proof favours the defendant or the merging parties.

The standard of proof is more about what constitutes convincing evidence or reasonable likelihood. Of course, the effects of the allocation of burden of proof hinge strongly on the associated standard of proof.

burden of proof provides incumbents with a strong incentive to perform pre-emptive acquisitions, as no empirical evidence can be brought against such mergers. This would suggest shifting the burden of proof to the dominant firm if the merger occurs early in the acquired entity's life. The platform would be asked to explain (e.g. provide tech trends and technological evidence) why the merger is procompetitive. This alternative approach is appealing, if only because it is not easy to find an alternative *modus operandi*.

Of course, acquisitions by incumbents need not be anti-competitive, i.e. suppress competition or kill the product outright.²⁷ But it makes sense to force large incumbents to notify their acquisitions and to assign the burden of proof upon them when there is a suspicion that the acquired entity might become a competitor in the absence of merger.

Finally, following the astronomical sums paid by Facebook for WhatsApp and Instagram, many have wondered whether one could not use the acquisition prices as signals that the merger is anti-competitive. The starting point for this argument is well taken: because competition destroys profit, an incumbent is willing to pay more for suppressing it than a third-party investor is willing to pay for an entrant that will compete with the incumbent. There are serious obstacles concerning the use by competition authorities of acquisition prices as screening devices, though. First, a high absolute acquisition price may be due to a high level of innovation; this would suggest looking instead at the relative price that the incumbent and third-party acquirers are willing to pay for the entrant. Second, to assess this relative price, there must exist observable bids, while acquisitions may be the object of opaque negotiations. Third, even if the incumbent and the entrant are on a trajectory to be substitutes²⁸ and there are observable bids, the differential between the bids of the incumbent and of third-party investors may be small for multiple reasons, even though the difference in willingness to pay is large. In an ascending auction, the winning bid is by definition the second-highest bid. Neither can we assume that bids will remain invariant when the regulatory framework makes use of acquisition prices. The incumbent can arrange accomplice bids that lie just below its own. Moreover, even in the absence of fake bids, the threat of investigation may make the entrant less greedy when negotiating with the incumbent.

Data

Data raise multiple issues, including some related to the protection of privacy. I will here focus on competition-related issues, on which our knowledge is still unfortunately quite patchy.

Who should own the data?

The current, ubiquitous arrangement is the so-called 'services-for-data' arrangement. We enjoy great e-mail, search, video, social network, maps and other services, which are paid for with the data we provide to the platform.²⁹ In turn, the platform makes money by selling targeted advertising or by using data to produce new services (data are needed, for instance, to produce recommendations or to develop autonomous cars, delivery drones, health-care diagnostics and

²⁷ Suppose, for example, that products have multiple attributes and that the new product is overall equally attractive as the incumbent's product, but along different dimensions. Its development will be hard to fund through the financial market, as the absence of global comparative advantage will have the entrant compete head-to-head with the incumbent. By contrast, the incumbent may be interested in acquiring the product and combine the entrant's superior functionality into its own, delivering a better overall product, which raises both profit and consumer welfare. See Motta and Peitz (2020) for other reasons why an acquisition by a powerful incumbent may still be welfare-enhancing.

²⁸ If complements, then price differentials might reflect the higher or lower degree of complementarity with the various buyers, the willingness to eliminate double marginalisation, etc.

²⁹ Posner and Weyl (2018) note that the payment may be in the wrong currency if the user does not like the free services offered by the platform.

treatments). There is discontent with this model, and yet no straightforward alternative to free services has yet emerged. There have been proposals nonetheless.

- *No or little data collection.* The website can refrain from collecting data, or there may be short-term data collection, for example one that allows only for contextual advertising, which is based on what the user is looking at or searching for (as is the case for DuckDuckGo's search engine). The issue then is whether the protection of privacy would not hamper functionalities (e.g. lead to poor recommendations or non-personalised advertising). In any case, the lack of data collection, which is currently the major source of income for platforms, is likely to require content pricing for the services they offer.
- *Compensation of user through micropayments.* In this alternative, the platform would still own the data it collects but would pay users in cash rather than in kind. There are obstacles to payments in cash, though. First, it may be subject to gaming (i.e. be vulnerable to bots if activity on the website is remunerated through positive payments). The second issue concerns pricing: users are unaware of the value (for the firm) and cost (for themselves) of their data, and how these are affected by the feasibility of portability and other considerations. For example, the platform can learn about me directly from me, or indirectly from people like me.³⁰ The solution of compensating users through micropayments probably requires a trusted intermediary to guarantee the quality of data to firms and to extract value for these data on behalf of consumers. However, this would add an extra layer into the system, which would take its cut.
- *Data licensing and data trusts.* It is a common and reasonable view that data are the ultimate public good and should be shared among potential users. Unless the law declares data to be an essential facility, though, forcing Google, Apple or Uber to share their data without compensation might amount to an expropriation of their investment and would likely be challenged in court.³¹

Some have therefore proposed that data be shared through a licensing system in which the data owners would be remunerated on a fair, reasonable and non-discriminatory (FRAND) basis. The idea is the same as that underlying the treatment of essential patents in most standard setting processes. FRAND payments to data owners seem conceptually reasonable, but a host of practical questions arise, such as the nature and format of data to be licensed in this manner or the price (or prices in the case of field-of-use pricing) fetched by the licence. Anyone familiar with the complexity of the FRAND licensing system will identify the intricacies involved in designing such an approach.³² The intricacies are compounded, as asymmetries of information about what is in a data set are even higher than in understanding what a patent licence exactly delivers.

The third possibility would be to have data-using institutions create their own data trust. So far, most, but not all, existing data trusts have been initiated by authorities in regulated industries (mobility, energy).

³⁰ For a study of the consequences of such data disclosure externalities, see Choi, Jeon and Kim (2019). Internalities are studied in Liu, Sockin and Xiong (2020).

³¹ Data are notoriously hard to value. For a discussion of why this is so, see Coyle et al. (2020). For one thing, one must distinguish between potential profits for data users and social value. Profits hinge on forecasts about hard-to-predict future uses and privacy and competitive-access regulations; furthermore, markets for data may not be thick. On the consumer side, there have been so far widely diverging estimates of willingness to pay for privacy; and these willingnesses to pay are probably formed under very incomplete information about what is and will be done with the data, and about whether the same data can be obtained through multiple channels. Other contributions by economists include Acemoglu et al. (2021) and Bergemann, Bonatti and Gan (2019).

³² For a description of these intricacies and a proposal for reform, see Lerner and Tirole (2014, 2015).

- *Consumer-centric data*. Finally, initiatives such as Tim Berners-Lee's Solid have consumers control their own data storage and access. The challenge will be to design a value proposition for consumers and data-users alike.

The first use of an individual's data is targeted to the individual himself/herself. It is straightforward to envision users controlling which doctors and institutions they will provide their medical data to. Similarly, one presumes that some consumers will be willing to give their data for targeted advertising purposes against a lower price for services. For such uses, the issue is mainly one of information and transaction costs, although there may be externalities as well, which reduce social welfare (as when the individual communicates personal health information to obtain a better deal from insurers, raising the cost of insurance for other consumers).

The second use of data is to create a pool of data that enables firms to create better algorithms; with some exceptions (say rare diseases), the marginal value of an individual's data is near zero, but there is large value in the collective amassing of the data to analyse (as when the collection helps medical diagnostics or the drug approval process). This raises a pricing problem, as the average value largely exceeds the marginal one.

Data as a barrier to entry?

A related debate stems from the concern that data might soon act as a barrier to entry into new services. There is no question that Google and Facebook in particular have access to very large sets of data not available to others; this gives them dominance in search advertising (Google) and display advertising (Facebook, and to a lower extent Google through YouTube). Platforms use social plug-ins to track users across the web (i.e. outside their ecosystems³³) and develop full browsing profiles of them. The platforms also use caching; caching improves the external content's loading speed, but also forces external content providers to share data with the platforms. This deprives the content providers from access to unique data, which, subject to privacy regulation, they could monetise at higher prices. Finally, if privacy regulation is strengthened and consumers feel more engaged in monitoring websites' privacy policies (which amounts to the consumers' incurring a fixed cost of checking whether to grant consent), large platforms may have an advantage over smaller ones, as their consent forms apply over a much larger set of services or to more important ones; relatedly, privacy regulation may make it easier to share data internally (within a 'walled garden') than across firms. The question then is, how critical is it to have access to massive data sets to supply targeted advertising or to develop new products and services?

Some authors argue that there are diminishing returns in the amount of data.³⁴ The underlying argument is the law of large numbers. To predict the time that cars will take to travel from A to B, a GPS navigation software app does not need thousands of cars. Others object to this argument on the grounds that, while the law of large numbers indeed applies to a given use, new and more complex uses emerge regularly, which invalidate the effect of the law (see Figure 1). Alternatively, economies of scope rather than scale may be at work. There may be complementarities between sources of data; for example, a search engine may have a better predictive performance when the search combines information about the keyword as well as user characteristics.³⁵

³³ Google also shares data with mobile suppliers through Android, and platforms often share data with their third-party apps.

³⁴ See Bajari et al. (2019), and references therein.

³⁵ See Schaefer and Sapi (2019).

Figure 1. Data needs for different services

Source: Posner and Weyl (2018).

Data may also create a switching cost and deny users a costless migration to a new platform. That is, user switching between platforms is difficult if data transfer is infeasible or time-consuming. To be certain, General Data Protection Regulation (GDPR) creates data portability rights based on an open standard. However, it does not define a technical standard. Its portability requirement applies only to data that consumers provide directly. And it is not dynamic; the latter may have no consequence if the user has decided to switch to another platform, but this is not so if the user wants to multihome or is still uncertain about wanting to switch and just wants to try an alternative platform. In this respect, the 2019 Furman review argues that content that should be portable in a dynamic fashion includes past purchases, music playlists and other entertainment consumptions, and social network data (profile, contacts, and shared contents). The higher the portability cost for the consumer, the less likely users are to coordinate to switch to a superior platform.

Hagiu and Wright (2020) discuss when data create a barrier to entry. The value of the marginal data depends on the required accuracy of the forecast. When accuracy is key (they cite disease prediction systems, online search engines), firms with a data advantage may have a strong competitive advantage. Of course, how big is big enough is an empirical matter; they note that Apple Maps starts competing with Google Maps in the US, but not in countries where it has a smaller user base. Other determinants of data as a source of important competitive advantage are the absence of substitute data in the marketplace and the availability of unique data-analytics capability. By contrast, data whose value is rapidly depreciating do not confer any lasting competitive advantage.

While the data-barrier-to-entry argument will surface in many contexts, it has so far focused on the large profits made by Google on search advertising (in response to the consumer's expression of interest) and by Facebook on display advertising (partly geared toward raising brand awareness). Google's extensive data collection (reinforced by its contracts with Apple and Android mobile phone manufacturers to set Google search as a default on the browser³⁶) allows it to personalise advertising and generate much more revenue for the advertiser than other outlets. And Google can capture a sizeable 'ad tech tax'.³⁷ Accordingly, interventions such as forcing third-party access to Google's click and query data are being considered.³⁸

As for Facebook, (limited) data portability already exists, enabling the possibility of an individual's migration toward another social network. 'Social graph APIs'³⁹ would further allow users to invite their friends to join the new platform and multihome; cross-posting ability would allow a

³⁶ With costless thinking and decision-making, the default would be irrelevant. Research in behavioural economics, including in the tech industry, shows that defaults do matter.

³⁷ See CMA (2019, pp. 40, 52–53).

³⁸ See, for example, CMA (2019, p. 228).

³⁹ See CMA (2019, p. 99).

user to stay on multiple social networks at low cost. As was the case for telecommunications or open banking standards, such interoperability standards probably could only be set by governments or neutral not-for-profit bodies.

Industrial policy

A virtuous process for industrial policy

Governments may apply two broad types of interventions to correct market failures. *Non-targeted policies* do not attempt to choose winners and losers. Rather, the government uses technology-neutral policies, such as carbon pricing or R&D tax credits. By contrast, *industrial policy* refers to policies targeted towards specific sectors, technologies, and even companies.

It is easy to find arguments in favour of industrial policies. They may create cluster effects through infrastructure sharing, the informal sharing of information⁴⁰ (as when Steve Jobs and his developers learned about graphical interface while visiting nearby Xerox Park), and common learning by doing. As important, but less emphasised, is the existence of a labour market; most start-ups are bound to fail, and even if they do not, entrepreneurs and their collaborators look for new challenges; a cluster allows for a low-personal-cost job mobility provided that distress occurs at the firm and not industry level.

State aid to industry is not just about creating clusters; it is also about avoiding losing them. Indeed, it is allowed for EU disadvantaged areas. Criscuolo et al. (2019) examine a policy change increasing the weight of community unemployment and per-capita GDP in deciding on the eligibility of areas in which (mostly manufacturing) projects can access public subsidies.⁴¹ They find a substantial impact of subsidies on employment and activity in the case of small firms (replicating thereby some studies concerning different interventions), and that these effects do not come at the detriment of employment and activity in neighbouring areas. There is no effect for large firms by contrast, which the authors interpret as stemming from the higher ability of large firms to game the system (by moving jobs across areas to benefit from public subsidies).

A different argument refers to public R&D and its spillovers. The idea is that fundamental and applied research by the public sector irrigates the private sector, and especially so through the cluster effects just described. Public research generates explicit knowledge, a global public good transmitted and available worldwide through international conferences, scientific publications, open source initiatives and expired patents, and tacit knowledge embedded in the researchers.⁴² This tacit knowledge combined with limited mobility (family and social graph, culture, language, etc.) implies that the spillovers from public research benefit the country more than the rest of the world. The empirical question, though, is 'how much?'. We lack empirical evidence on this. On the anecdotal side, we know that many breakthrough technologies that emanated from the work of the Defense Advanced Research Projects Agency (DARPA), the National Institute of Health (NIH) and the National Science Foundation (NSF) benefited Silicon Valley and the broader US industry

⁴⁰ As developed in AnnaLee Saxenian's celebrated 1994 book on Silicon Valley (Saxenian, 1994). See also Gruber and Johnson (2019) for a recent proposal on how to encourage the formation of clusters.

⁴¹ Their focus is the Regional Selective Assistance programme in the UK, which funds, in disadvantaged areas, projects that would not have occurred otherwise (additionality criterion).

⁴² In between stands the knowledge gained by others in bilateral discussions, courses and conferences; this form of knowledge diffusion usually involves more local participants than foreign ones.

more than the rest of the world.⁴³ However, the fundamental discoveries in deep learning made in the US seem to benefit Chinese firms at least as much as US ones.⁴⁴

Finally, industrial policy (which may well operate against competition) may occasionally serve to preserve competition. A case in point is Airbus, which created a credible competitor to Boeing.

With such solid arguments, why are most economists⁴⁵ wary of industrial policy? The standard quip here is '*the State picks winners, losers pick the State*'. My own country is chock-full of bad experiences: Concorde, Bull, Thomson, Agence de l'Innovation Industrielle, 1984 contaminated blood, diesel subsidies... a mix of hubris, capture, protectionism and just very poor information. Meetings discussing projects or industries to be selected as beneficiaries of the government's largesse can be frightening; participants, except advocates of their own industry, hold very little information.

However, there is a concern that the evidence both for and against industrial policy is only anecdotal. But there are two good reasons for identifying best-practice approaches. First, a well-designed industrial policy offers the earlier-discussed benefits. Second, politicians are going to do industrial policy anyway, so it is incumbent on experts to give some advice on how to do it right. In Tirole (2017), I make, and explain the rationale for, eight recommendations if one is to engage in industrial policy:

- (1) identify the market failure to design the proper policy;
- (2) use independent high-level experts to select projects and recipients of public funds;
- (3) pay attention to supply-side (talents, infrastructure) and not only to demand side;⁴⁶
- (4) adopt a competitively neutral policy;
- (5) do not prejudge the solution – define objectives;
- (6) evaluate ex post, disseminate the results, and include a "sunset clause" in each programme, forcing its closure in the event of a negative assessment;
- (7) involve the private sector in risk-taking to avoid white elephants;
- (8) strengthen universities and bring them closer to the start-up world.

Such a code of conduct for industrial policy raises the question of how one ensures sure that authorities (say, the EU) obey these principles, all the more that some recommendations stress the need for independent decision-making in an era when populism and calls to reaffirm the

⁴³ See, for example, Moretti, Steinwender and van Reenen (2016). The US is an unexpected industrial-policy role model, with DARPA, the NIH and the NSF, which laid the foundations for many of today's biotech and information technologies. See Azoulay et al. (2019a, 2019b) for further analyses of US industrial policy.

⁴⁴ See Lee (2018).

⁴⁵ With notable exceptions, such as Mariana Mazzucato, Dani Rodrik or Joe Stiglitz.

⁴⁶ Regions and municipalities may want to start a cluster, in biotech, green technologies or AI, but not have the people who are going to make it happen. Clusters should avoid the 'field of dreams' mindset. (This is from the movie in which the main character, played by Kevin Costner, builds a baseball field in the middle of Iowa following a voice saying 'if you build it, he will come', where 'he' refers to a famous baseball player, Shoeless Joe Jackson. Unfortunately, in reality 'they' often do not come if they are not already there.)

primacy of politics in public decision-making are running high. At a minimum, there should be a clear description of these principles (an analogue might be the Directive on public contracts) and the monitoring by an independent agency of compliance with this code.

International trade, dumping and state aid

Is industrial policy better justified when there is a (long-lasting) trade war and a failure of the World Trade Organization (WTO) to straighten things out? When a country exhibits a particularly close relationship between its firms and the government? If so, should we have any safeguards?

In international matters, multilateralism is the economists' preferred approach to conflict resolution. Alas, the WTO has not always been very agile, not to mention that the concept of multilateralism is not flying high in these populist days.⁴⁷

There is a widespread feeling that Europe shoots itself in the foot by being stricter in its application of WTO rules on state aid and dumping, as compared to China and the US, which more eagerly engage in state aid (especially China), and in the case of the US are more prone to using compensatory measures. First, Europe adds to the list of criteria identifying unfair competition the notion of interest of the EU; low import prices benefit importers and consumers, making it more difficult to identify harm. This (combined with an intertemporal vision, which already lies within the mandate) intellectually does make sense, but puts the EU at a disadvantage with regards to countries that content themselves with the minimal compliance with the WTO rules; my gut feeling is that a WTO change of rules, if feasible, would be more appropriate than a renunciation to the concept of EU interest.

Second, the European Commission needs approval by the European Council. The infringing countries can try to use 'divide and conquer' strategies to prevent the European Council from going along with the European Commission. Combe et al. (2019) propose to eliminate the veto of the European Council to make anti-dumping and anti-state-aid policies more effective and comparable with other countries; they further suggest that decision-making with respect to commercial practices take place at DG Competition, which seems to make sense but would require an increase in the number of case handlers, which is particularly small in the EU. They also propose to increase the presumption of prejudice for state subsidies that have not been notified to the WTO, and to align the WTO rules on services with those relative to merchandise.

Institutions

Finally, institutions must be strengthened to reflect the new economic environment. Two remarks before we review possible changes. First, this strengthening, which may require new degrees of freedom for independent agencies, is not a foregone conclusion given the current mood regarding the primacy of politics. Second, what is needed is not a drastic change in antitrust law; indeed, the age-old statutes are worded in a broad enough manner that many of the behaviours we are concerned about are somehow already embodied in law. In contrast, the regulatory apparatus must be made more agile and in tune with evolving economic thinking in the digital age.

⁴⁷ Indeed, the WTO's appellate body has recently lost its ability to arbitrate trade disputes, due to the US administration's blocking of new nominations. Losers of a trade dispute currently can appeal, with the guarantee that no decision will be made.

Independence

The independence of competition authorities is being questioned in some countries. Proposals often stop short of calling for a return to old-style ministerial decision-making; but they may put competition authorities on a tight leash by conferring on politicians the ability to overrule the decisions of competition authorities.⁴⁸ There are also calls for excluding certain industries or firms from the scope of competition policy, as well as political demands to grant broader missions to competition authorities: stakeholder protection (employment, environment), industrial policy, etc.⁴⁹

We should remind ourselves of why we have independent agencies in the first place. The rise of independent agencies historically grew out of a discontent with the political process. Politics indeed are subject to capture and electioneering. Independent agencies also face the risk of capture, but they are immune to electioneering.⁵⁰ For instance, because politicians' eagerness to be re-elected led to credit booms, central banks were made independent to tame inflation and, later, to avoid lax prudential supervision. Relatedly, independent regulatory authorities were set up to oversee the telecoms, electricity and other network industries in order to protect private investors in those utilities from an expropriation through low prices, or conversely to protect consumers from abusive tariffs (and, later on, from a lack of competition in non-natural-monopoly segments). Political economy constraints can be tackled by designing institutions that resist political pressure, at least on a specific policy move.⁵¹

A corollary to independence is its greater acceptance of evidence-based public decision-making. Consequently, independent agencies are more often populated with high-expertise staff (for example, PhDs and the like).⁵² A related corollary is greater transparency as to the motives: publications of minutes for central banks, public consultations for regulators, majority and dissenting opinions for supreme courts, etc.

Agencies furthermore can develop a sense of mission – conglomerate agencies do not (accordingly, well-managed agencies may resist being granted new tasks). In addition, professionals and narrow specialists are instrumental in creating this sense of mission (internally), intertemporal consistency, and legal certainty (externally). As agency theory shows, clear missions and advocacy create focus and accountability. They also reduce the likelihood of challenge to the agency's independence.

Improving processes

It is easy to point at the drawbacks of classical approaches: self-regulation (which is self-serving), competition policy (whose processes are too slow, and decisions accrue too late) and utility regulation (mostly infeasible in the tech industry as we earlier argued).

⁴⁸ In 2019, France and Germany issued a joint manifesto to protect their industrial champions. They proposed a reform of EU competition law, which would for instance allow member states to overturn merger decisions made by the European Commission.

⁴⁹ For instance, the EU Competition Commissioner's mandate now includes industrial policy objectives; while this dual mandate may avoid a turf war and no one knows how it will play out, the temporal proximity of this change in mandate with the Franco-German rejection of the Commission's Alstom-Siemens decision raises the concern that competition policy in Europe has been weakened in the process.

⁵⁰ Political interference into agency decision-making may indirectly reintroduce electoral concerns; as I later emphasise, 'independence' is never absolute and is a matter of degree.

⁵¹ Overall agency policy is another matter.

⁵² There may be an issue with causality here. In Maskin and Tirole (2004), 'technical decisions' – on which the electorate is likely to be poorly informed about its own interests – is best left to independent agencies, while societal issues should be conferred to majority voting (with protection of the minority on specific issues).

We need more reactive antitrust, which involves (but remains independent from) actors, and establishes guidelines that are not cast in stone and evolve as our knowledge progresses. Put differently, the regulations should be adaptive,⁵³ elicit industry and academia's information, and minimise legal uncertainty. Again, new institutions may not be needed, but the existing toolkit could be used more systematically.

A case in point is business review letters,⁵⁴ insufficiently used in the US and unused in Europe. The flagship application of such letters is the Department of Justice's 1997 business review letter dealing with patent pools. Patent pools exemplify practices that have the potential to both substantially improve industry efficiency and allow the industry to cartelise. Oversimplifying, patent pools are desirable when patents are complements and reduce competition if they are substitutes (as they then allow cartelisation); but it is hard to know whether patents are complements or substitutes, all the more that this pattern may depend on uses and also may evolve over time. No wonder that competition authorities tread carefully.

However, neither the broadly laissez-faire approach taken before World War II nor the quasi-prohibition of patent pools that followed the famous 1945 Supreme Court Hartford-Empire decision⁵⁵ is acceptable. In reaction to the developing patent thicket, the Department of Justice, with the help of Berkeley economists, adopted a balanced point of view, saying that the *presumption* was that patent pools were legal provided they satisfied several (mostly information-light) conditions. These conditions were later refined as knowledge evolved, and were enshrined in guidelines in the US, Europe and Japan, among other countries. Note the use of 'presumption'; this presumption does not mean that the practice then meets a per-se approval standard, but that the legal uncertainty has been much reduced.

Collective negotiations in mobile payments are another case in point. The issue is that wallet providers control near-field communication (NFC) and can impose terms and conditions to card issuers. The latter have little bargaining power as platforms may develop a reputation for not negotiating, and cardholder multihoming further weakens the bargaining position of card issuers. Accordingly, countries such as Canada and China have allowed collective negotiations. Yet we may shudder at the thought that buyers of a service gang up to negotiate favourable terms from a supplier. Indeed, the hazard of an anti-competitive boycott had been identified early in the history of antitrust (in Section 1 of the 1890 Sherman Act⁵⁶). Accordingly, such a process at the very least must be approved and supervised.

Yet another instrument is regulatory sandboxes, which are testing grounds for new business models that are not protected by current regulation or supervised by regulatory institutions.

The production of guidelines

Industry more and more faces difficulties in knowing whether certain actions are licit or not. This is partly because technological innovation is rapid, partly because our knowledge is fragmented, and clear-cut rules are not always available.

⁵³ Traditional regulations are changed in a very slow, formal, notice-and-comment kind of way. They are not quickly adaptive in the way a broad principle such as 'don't self-preference' could adapt to a new kind of platform.

⁵⁴ A business review letter allows 'persons concerned about the legality under the antitrust laws of proposed business conduct' to ask the Department of Justice for a statement of its current enforcement intentions with respect to that conduct' (<https://www.justice.gov/atr/what-business-review>).

⁵⁵ Justice Hugo Black declared that 'The history of this country has perhaps never witnessed a more completely successful economic tyranny over any field of industry than that accomplished by these appellants.'

⁵⁶ Corresponding to Article 101 in Europe.

There are two potential objections to the call for more guidance. First, and as we have already noted, guidelines exist and are used in various forms already: business review letters, block exemptions, various guidelines on vertical and horizontal agreements. The second is that competition authorities would be overwhelmed with requests for letters of comfort if it had to answer each and every of them; in this respect, the competition authority must be able to pick its fights.

Let me give two illustrations involving current practices that have potentially very detrimental consequences, but for which efficient remedies must be found that do not introduce their own inefficiencies.

(a) Common ownership by institutional investors

There is currently much concern in the US about the power of institutional investors (diversified mutual funds, asset managers, etc.). Vanguard, Fidelity, Blackrock, State Street, Berkshire Hathaway and others have accumulated substantial holdings in oligopolies (airlines, banking, etc.). Because institutional investors are active in governance, they may exercise direct control to prevent competition among industry participants: they may deter a firm's management from invading other firms' turfs or from sinking competitive investments. They can, to this effect, engage in not-so-subtle pressure, threatening not to re-appoint the manager, rejecting her nominations to top positions or stopping managerial pet projects. They may refuse to tender shares to raiders who would increase competition. They may design managerial incentive packages oriented toward absolute performance evaluation rather than relative performance evaluation schemes that would make managers more aggressive competitors.

There are good reasons for this common ownership development, though. Investors demand low-cost, diversified funds. Besides, there is evidence that investor activism, if not short-term oriented, can discipline management. So, the concern for not throwing the baby out with the bathwater must be addressed.

One thing is clear: there is no need for new laws. For instance, in the US, the Sherman Act (1890) and Section 7 of the Clayton Act (1914) long ago worried about such cartelisation though cross shareholdings. These statutes define the spirit and objectives of the law, but they do not address the details of what is allowable and what is not; neither have they pondered about the enforcement (as an institutional investor's responsibility might depend on what portfolio other investors select).

But there is a clear need for guidance. Asking diversified investors to be passive investors would deprive many firms from the voice of outside investors. An alternative would be to restrict diversification to operate only across and not within industries, or to limit the holdings of these large institutional investors to a single firm per industry for concentrated industries.⁵⁷ My point here is not to make specific recommendations, but rather to insist on the need to develop guidelines that help institutional investors to know what they are entitled to do and to benefit from some legal certainty, at least in the short run. Such guidelines may be updated over time as new knowledge accrues about their consequences.

⁵⁷ See, for example, Posner, Scott Morton and Weyl (2017), for a proposal of such guidelines.

(b) Best price guarantees (most-favoured-nation clauses) and excessive merchant fees

Much work has been performed in the last two decades to understand the implications of most-favoured-nation (MFN) clauses in platform markets. These clauses offer the platform's customers a guarantee that they will enjoy the lowest possible price when buying on the platform; this promise is backed contractually by the merchant's commitment not to offer lower prices either on competing platforms or on its own website or other direct sale outlet. Such practices are ubiquitous in the tech industry and have been banned partly or totally in several cases (involving Amazon or Booking.com) in the UK, Germany, France and other European countries.

The concern with MFN clauses is that they allow platforms to tax their competitors. A platform that signs up a wide range of merchants on the MFN clause can impose its fees, terms and conditions: because the platform's customers have no incentive to look elsewhere, the platform is the unique route for the merchant to reach these 'unique customers' (in the industrial organisation jargon, the platform is a 'bottleneck' for the access to these customers). The platform can then demand hefty fees. These hefty fees, however, might not benefit the platform if they were passed through to the platform's customers, who would then find the platform less attractive.

The key point, though, is that this fee is passed through to all customers purchasing from the merchant, and not only to the platform's customers. In this sense, the MFN clause enables a platform to levy a tax on its rivals. The merchant would want to charge Booking.com customers a higher price than to other customers if Booking.com's merchant fee is 25% of the transaction; but it cannot do so as it is bound to giving Booking.com customers the best available price. Put differently, the merchant is stuck with a choice between paying the hefty fee and forgoing the platform's customers. In addition, this feature has nothing to do with the platform's being 'dominant'. For instance, if the platform has a 20% market share, 80% of the cost of the merchant fee is passed through to customers not using the platform.

Again, while intervention is warranted, one should remember that there are efficiency rationales for MFN clauses. First, one would not want the platform itself to be expropriated from its investment. The hazard here is that we use the service of Booking.com to find the hotel we like and then go directly to the hotel's website to enjoy a lower price. This may be an issue if search costs are low. A 'narrow' MFN in principle protects online travel agencies against such opportunistic behaviour by preventing the hotel from undercutting on their websites and possibly for walk-ins as well.

Second, there is a potential 'reverse expropriation problem', this time when search costs are high. The merchant may apply a high surcharge for using the platform; this problem is known in the payment card industry as excessive surcharges. The customer may go through a low-cost airline's lengthy reservation process, coordinate with friends and family, and in the last screen find out that there is a €10 surcharge for using a credit card. Such hold-ups do not exist under a no-surcharge rule, which is the payment-card equivalent of an MFN clause.⁵⁸

Regulating MFN clauses is not straightforward. Consider a prohibition. The online-travel-agency (OTA) platform may recreate an implicit MFN clause by moving down the recommendation list hotels that do charge lower prices on another platform or on its own website. Because the algorithm that delivers recommendations is somewhat opaque (if only because ratings must be curated in order to be useful, say by deleting apparently self-serving ones, and higher weights

⁵⁸ For studies of optimal surcharging, see, for example, Gomes and Tirole (2018) and Bourguignon, Gomes and Tirole (2019).

must be given to more accurate raters), it is difficult for a regulator to demonstrate that a hotel that takes advantage of the price freedom associated with a prohibition of MFN clauses has been discriminated against.

My last caveat is that we cannot today avail ourselves of guidelines allowing merchants to know what admissible surcharges they can impose on consumers, assuming MFN clauses are made illicit. Accordingly, policy interventions in Europe have taken the form of a prohibition, either of narrow or of broad MFN clauses.⁵⁹

An exception concerns payment cards, for which the EU uses some implementation of the 'tourist test', which caps the merchant fee at the merchant's convenience benefit from using the card.⁶⁰ The logic is a Pigovian one: provided the card is accepted, the customer picks the method of payment (cash, cheque, digital payment, etc.), and so no externality is exerted if the merchant's convenience benefit is equal to his fee. The 'tourist test' terminology stems from the fact that when facing a one-shot customer and deciding whether to accept or turn down the card, the merchant would compare the fee and the convenience benefit; by contrast, with a repeat customer, the merchant is concerned with the customer's not returning if the merchant turns down the card.

Despite these difficulties, it seems worth doing something about MFN clauses considering their ubiquity and the gigantic amounts of money involved.

Agency coordination

(a) International aspects

The first possible inter-agency coordination failure is the lack of international cooperation among competition authorities or sectoral regulators. I earlier emphasised that Big Tech are global players, so a coordinated response would be ideal. At the very least, the sharing of information across national agencies is called for. Less regulatory heterogeneity around the world would most often be desirable as well. Take privacy regulation or competition policy (for instance, even countries that were like-minded on the issue of MFN clauses, such as France, Germany and the UK, did not coordinate their regulatory response.). No much new on that front. It has long been recognised by industry and authorities alike that multinational firms incur costs of conforming with multiple, inconsistent regulations; imagine, say, that different authorities agree on breaking up a firm, but demand the divestiture of different segments. Finally, there may be forms of hidden 'tax competition', as when a regulator or court designs remedies in order to bring investments and activity on its soil.

On the enforcement front, a global firm may react to an adverse decision by boycotting the country in question. For instance, Google News withdrew from Spain when a new law forced aggregators to pay news publishers. Also, there is the issue of extraterritoriality when domestic customers are served through websites located abroad. Finally, the monitoring of compliance by the firm exhibits some returns to scale, further stressing the need for international cooperation.

⁵⁹ A narrow MFN clause prohibits the merchant from charging a lower price on its own platform (or by phone or mail order); a broad MFN clause applies the prohibition to all sales, that is, on other intermediating platforms (e.g. Expedia) as well.

⁶⁰ See Rochet and Tirole (2011) for the theoretical derivation of the tourist test. The merchant's convenience benefit includes the reduced occurrence of robberies, the speed of payment at the point of sale, and accounting benefits.

(b) Jurisdictional overlap and externalities

All regulatory institutions face complex coordination issues. Cross-agency conflicts may result from ill-defined mandates; for example, when a hotel's ranking on Booking.com depends on the commission paid by the merchant and the consumer is unaware of this relationship, the issue is more one of consumer protection (misleading representation of relative attractiveness) than one of competition, even though the case may be subject to a review by the competition authority.

The conflict may result alternatively from externalities among different forms of regulation. The regulation of competition interacts with data protection and labour market regulation for instance. The fact that some labour practices selected by companies may be anticompetitive is well known (think of non-compete clauses). But labour laws themselves have the potential to be anticompetitive; if making Uber drivers employees, perhaps for worker protection purposes, prevents them from multihoming, competing ride-hailing platforms will have a hard time keeping an installed base of drivers, and therefore of customers as well.

Data protection regulation may also interfere with competition in two ways. Data protection that makes it harder to resell data (which may have a legitimate privacy rationale) may strengthen the dominance of large data collectors.⁶¹ Moreover, cumbersome privacy regulation augments the unit cost of small and medium companies relative to their bigger competitors.

These externalities among public policies may not be internalised because of turf wars. And it is not straightforward to design institutions that promote coordination. One possibility is to create a special instance or process that will lead to exchange of information; this is useful, but there is only so much we can expect from this. Competition and protection agencies already know that their policies interact yet may not act on this knowledge.

Summing up

The dominance of tech giants does not confront us with an unpalatable choice between laissez-faire and populist interventions. While the purpose of the paper was to take stock of knowledge in the matter and investigate the existing trade-offs, a few conclusions emerge. The first is that public policies can be much improved within the confines of existing laws. Indeed, many current concerns were anticipated by our legislative apparatus. But implantation lags the evolution of technology, business and society. I have argued that old-style regulation is impractical in an era of global firms, rapid technological progress and contestable markets; information is just lacking for a proper regulation. I have also raised reservations about divestitures, more on practical than on theoretical grounds; a fast-moving technology, the incumbents' habit of scrambling the eggs, and (again) the global nature of tech companies make it hard to identify a stable essential facility, split it from the rest of the company and regulate it. For sure, a clear and coherent plan must be drawn if policymaking is going to take this route. For the moment, preventing the eggs from being scrambled in the first place sounds like a simpler policy. However, it requires forcing the tech giants to notify their acquisitions and, for early acquisitions raising a suspicion that the acquired company might one day become a competitor, shifting the burden of proof toward the tech company.

Regarding the need for contestability, I have stressed the competitive benefits of multihoming, and the concomitant surveillance of exclusivity contracts imposed by dominant platforms. Competition authorities should remain wary of self-preferencing by these dominant platforms,

⁶¹ In the EU, the competition authority viewed the preparation of GDPR as a privacy issue.

although there is here no silver bullet. Firms that are both a marketplace/technological platform and a merchant supplying this marketplace/apps cannot treat equally a rival offering that is inferior to its own. But self-preferencing has the potential to be anticompetitive, and economists should put more work into designing guidelines that would facilitate the authorities' dealing with such behaviours.

Regarding data ownership, I have discussed alternatives to the current 'services-for-data' arrangement: limited data collection, micropayments, data licensing and data trust, consumer-centric data; and the implications of these for data as a barrier to entry. My view here is that, as in the case of GDPR-like privacy regulation, academic thinking lags the technological and business evolution. The same holds for industrial policy and state aid, whose popularity in Europe, China, the US and several other parts of the world has grown in recent years. Economists do have some useful theoretical and empirical knowledge on these issues, but by and large have under-invested in the area.

Institutional change will be crucial to make competition policy more agile and effective. The balance between anticipating evolutions and reacting ex post should tilt more toward the former. This requires collecting information about dominant firms and their markets, designing codes of good conduct (and making more use of business review letters, provided that the competition authority can pick its fights), and the agencies' being given the ability to impose interim measures. And, as earlier discussed, the process for merger reviews must be amended.

Finally, economists must develop knowledge that will percolate and guide antitrust practitioners. The antitrust world is often neither black nor white. We discussed corporate strategies, such as common ownership and best-price guarantees that have perfectly acceptable rationales but can also be strongly anticompetitive. Structural approaches, such as prohibition of behaviours, run the risk of throwing the baby out with the bathwater. We therefore must strive at designing rules that do not require too much regulatory information and enable more selective interventions.

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