Merger Policy in Digital Industries

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Abstract. I present a cautionary note on the proposal to tighten merger policy in the high-tech space. The discouragement effect on innovation could be significant. This is not to say that increased policy enforcement is not called for. On the contrary. My point is that it should primarily take the form of checking for abuses of dominant position, tightening consumer protection, and directly regulating dominant firms.

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1. Introduction

Digital industries — or whatever definition includes GAFAM (Google, Amazon, Facebook, Apple, Microsoft) — have been the source of intense debate in academic, policy and political circles. This is not without reason: never in history have large corporations like the American giants been so much part of our daily lives and concerns, from privacy to security to quality of service to concentration of political power to freedom of speech.

Proposals to solve the "GAFAM problem" abound. In this paper I focus on the role of competition policy, in particular merger policy. Some argue that, when it comes to high-tech giants, antitrust has been "asleep". For example, Streitfeld (2019) remarks that

> For decades, antitrust regulation has been overwhelmingly focused on the welfare of the consumer. No cost to the consumer, no problem. That opened the door for Google, Facebook, Apple and Amazon — which offered digital services that were cheap or free — to become immensely profitable and powerful.

This may suggest that an "antitrust revolution" must take place in response to the "digital revolution" we've seen unfold. By contrast, a number of competition policy scholars argue that it's all a matter of tightening the screws on existing policy instruments. For example, Crémer, de Montjoye, and Schweitzer (2019) claim that

> 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.

In particular, there is a growing consensus among policy makers that we need to tighten merger policy in the digital space. See, for example, Scott-Morton et al. (2019) ("Stigler Report"), Furman et al. (2019) ("Furman Report"), and Crémer, de Montjoye, and Schweitzer (2019) ("EU Report").

In this paper, I agree with Crémer, de Montjoye, and Schweitzer (2019) and others that the current competition policy and law framework are fundamentally sound and useful. I also agree that vigorous enforcement is required in order to curb the increasing power wielded by GAFAM and otheer giants. However, in light of the very specific features of high-tech industries, I disagree with the Stigler, Furman and EU reports that merger policy is the area where substantial reform is required.

Specifically, I make six points regarding digital industries. First, these are industries where it's very hard to predict the evolution of business models. Second, related to the first point, preemptive actions are difficult to target, given the poor definition of markets and potential rivals. Third, IP rights are difficult to protect in the software space, so that imitation is a real threat. Fourth, related to the previous point, markets for technology transfer in the form of licensing work poorly.[1] Fifth, related to the two previous points, technology transfer is frequently accomplished by means of firm acquisition. Finally, the prospect of such acquisitions provides a strong innovation incentive for startups.

These considerations have important implications for competition policy, in particular for merger policy. Unlike other, more stable industries, where the business model is better defined and market positions easier to predict, in digital industries the pace of innovation is

1. By technology transfer I mean licensing-type transfer, as opposed to outright acquisition. See Gans, Hsu, and Stern (2002).

too fast for any serious long-run forecast to be possible. In this context, it makes sense for competition policy to be based primarily on ex-post remedies rather than on ex-ante rules and analysis as traditional merger policy is.

The above does not deny a role for merger enforcement in high-tech. If fact, considering that none of the GAFAM acquisitions were blocked, one must conclude that, if anything, there has been under-enforcement. In part, this results from the nature of high tech and of the current system, which allows most of the proposed mergers to fly under the regulatory radar (Wollmann, 2018).[2] My point is that the tone of the current proposals risks swinging the pendulum too far into the opposite direction of over-enforcement. Tightening merger policy not only is a relatively less efficient approach but also one that has enormous costs in terms of innovation incentives.

The above also does not preclude the closer scrutiny of digital industries. My point is that competition should primarily take the form of checking for abuses of dominant position, tightening consumer protection, and directly regulating dominant firms.

The rest of the paper is divided as follows. In Section 2, I argue that the pre-emptive motive of acquisitions varies across industries and is relatively lower in digital industries. In Section 3 I suggest that firm acquisitions may play an important role as a form of technology transfer, and that this is particularly true in digital industries. In Section 4 I touch on the issue of innovation, in particular incentives for "innovation for buyout". Section 5 presents the main argument regarding merger policy in digital industries, whereas Section 6 concludes the paper.

2. Preemptive acquisitions

It is a truth universally acknowledged, that a firm with market power will do what it can to hold on to that position. In this regard, preemptive strategies play a crucial role. As Terry Malloy aptly put it, "Do it to him before he does it to you." And firm acquisitions are an important weapon within the incumbent's preemption arsenal. In this section I develop a simple model of entrant acquisition and use it to understand differences across industries. I also present two specific examples which help illustrate the main point.

■ **To acquire or not to acquire.** Consider an industry with an incumbent who must decide whether or not to acquire an entrant. If the incumbent decides to acquire the entrant, then Nash bargaining ensues and an equilibrium acquisition price p is determined. Once the incumbent decides whether to acquire the entrant, Nature decides whether the entrant poses a threat to the incumbent (probability λ) or not. Finally, incumbent and entrant's payoff are given by the following table, where the second payoff corresponds to the entrant's payoff.

		Nature	
		Threat (λ)	No Threat ($1-\lambda$)
Incumbent	Acquire entrant	$\pi^M - p,\ p$	$\pi^M + v - p,\ p$
	Ignore entrant	$\pi^D,\ \pi^D$	$\pi^M,\ v$

2. This also suggests that a change in the thresholds leading to US merger review may be called for to account for mergers in the digital sector.

Specifically, suppose that the incumbent acquires the entrant. If the entrant turned out to be a threat to the incumbent (probability λ) then the incumbent successfully keeps a monopoly position but at the price of p (acquisition cost). The entrant in turn goes home with p. By contrast, if the incumbent turned out not to be a threat, but rather a firm that produces value v from an unrelated source, then the incumbent owns assets worth $\pi^M + v$ but paid p in the process. The entrant, again, goes home with p.

Consider now the case when the incumbent ignores the entrant. If the entrant turned out to be a threat, then the incumbent must now share the market and gets a payoff of π^D, with the entrant getting the same payoff. By contrast, if the entrant turned out not to be a threat then the incumbent keeps monopoly profit π^M whereas the entrant's value is v (as discussed in the previous paragraph).

The above table makes a series of implicit assumptions, none of which is really important for the main point I will make. And the main point is simple: If λ is sufficiently high, then the incumbent is better off by acquiring the entrant, whereas if λ is sufficiently low, then the incumbent is better off by ignoring the entrant.

Since payoffs are continuous in λ, the result can be understood by considering the extreme values of λ. If $\lambda = 1$ (sure threat), then by acquiring the entrant the incumbent pays a price p. The value of p results from Nash bargaining, that is, p is the value that maximizes the product of buyer's and seller's gains from an agreement, that is, $(\pi^M - p - \pi^D)(p - \pi^D)$. It follows that p is equal to $\frac{1}{2}\pi^M$, leading to an incumbent firm's net payoff of $\frac{1}{2}\pi^M$. Any reasonable model of oligopoly competition with sufficiently homogenous products implies that $\frac{1}{2}\pi^M > \pi^D$, which in turn implies that acquisition is the incumbent's optimal choice.[3]

Consider now the opposite case, that is, $\lambda = 0$ (no threat). In this case, the Nash bargaining price is given by v, which implies that, regardless of whether or not the incumbent acquires the entrant, its payoff is given by π^M. At this point, we might add the reasonable assumption that an acquisition implies paying a fee f to Morgan Stanley or Goldman Sachs, in which case ignoring the entrant becomes a strictly optimal choice for the entrant.[4]

■ **Industry specific λ.** One of the distinguishing features of industrial organization — with respect to other fields of economics — is precisely the stress on *industry*. "All industries are not equal" should be our motto. IO economists are sometimes made fun of for their excitement about industries that represent a mere fraction of GDP, whereas macroeconomists,

3. As a referee rightly points out, "sufficiently homogeneous products" is a sufficient but not necessary assumption. The inequality holds if products are related (as substitutes or complements) and if a firm does not suffer significant diseconomies of scale or scope. Under such conditions, a firm's ability to set prices of related products and thereby internalize cross-product externalities should yield the familiar ranking, that industry profit is greater under monopoly than under duopoly.

4. Some readers may find a parallel with the innovation dynamics literature. In a seminal paper, Gilbert and Newbery (1982) argued that, due to the preemption effect considered above, incumbent firms have greater incentives to innovate than entrants. Reacting to this argument, Reinganum (1983) claimed that Gilbert and Newbery's (1982) result relied on lack of uncertainty in the innovation process. She considered an alternative innovation model with uncertain innovation and showed that Arrow's (1962) "replacement" effect dominates, that is, the incumbent spends less on innovation than the entrant. Subsequent work by Budd, Harris, and Vickers (1993), Cabral and Riordan (1994), and others shows that it's perfectly possible to have equilibrium preemption with uncertainty in the innovation process. The key uncertainty element that separates preemption from replacement is whether the entrant poses a threat or not (not uncertainty regarding the outcome of innovative effort). In this regard, the above model resembles more closely Section 15.3 of Cabral (2017).

by contrast, deal with GDP itself. However, specific-industry focus is necessary if one is to understand a variety of issues, including in particular the issue at hand: how should an incumbent react to entry, preemption-wise.

Different industries correspond to different values of λ, and as the above result suggests this leads to different strategies. A good example of a high-λ industry is given by pharma. Therapeutic markets and submarkets are reasonably well defined. Therefore, I know when a rival's drug poses a threat to my own drug. Not surprisingly, we observe multiple instances of preemptive behavior, from pay-for-delay to outright killer acquisitions (Cunningham, Ederer, and Ma, 2018). By contrast, digital industries correspond to significantly lower values of λ. If pharma is like war, digital is like terrorism: You rarely know where the next attack will come from. You don't even know who your enemy really is, let alone where it's located. In sum, one would expect the preemption motive to be much more significant in industries like pharma than in digital industries.

■ **Eli Lilly.** A picture is worth a thousand words, and a couple of examples are worth many hundreds of complicated models. Exhibit A of my high-λ case is given by Eli Lilly and the discovery of synthetic insulin (Barese, Brandenbuerger, and Krishna, 1992; Hall, 1987). Advances in biology during the 1970s, in particular the development of "gene-splicing" technology, opened the possibility of producing new medically useful substances. One obvious candidate was insulin, a protein that is used in the treatment and control of diabetes.

The US insulin market was then dominated by Eli Lilly & Co. If a new firm were to enter the market with synthetic human insulin, it would be competing against Eli Lilly. On August 24, 1978, Genentech completed all of the steps required for the synthesis of human insulin (ahead of two other rival labs). One day after Genentech's last experiment, Eli Lilly signed an agreement with the recently formed biotech firm.

Eli Lilly's acquisition of Genentech's patent provides a good example of a preemptive strategy. Before any other pharma giant got into the insulin market, the incumbent acquired the patent for the new, revolutionary product discovered by Genentech. The threat of synthetic insulin was quite clear. In other words, this is a $\lambda \approx 1$ case.

■ **AltaVista.** It is considerably more difficult to find a good example of the low-λ case — the case when an incumbent "ignores" an entrant — for the simple reason that we're looking for the absence of an event. That said, one good candidate is AltaVista and Google.

AltaVista, a highly successful web search engine, was created in 1995 by researchers at Digital Equipment Corporation (DEC). It was one of the first search engines based on the idea of crawling the web and indexing its content, and it claimed to be "an order of magnitude faster" than the competition (Lewis, 1995). AltaVista was an instant success. Traffic increased from 300,000 hits on the first day to more than 80 million hits per day by 1997.

In 1998, Larry Page and Sergei Brin offered to sell their small startup, by then still housed at google.stanford.edu, to AltaVista for $1 million so that Page and Brin could resume their studies at Stanford (Derrick, 2016). The offer was, of course, turned down.

The close substitutability and clear superiority of the Google search engine was not immediately apparent. By 2000, two years after Google's offer to sell, AltaVista was still used by 17.7% of Internet users, against a mere 7% using Google search.

Some may argue that the business model of AltaVista was different from Google's, but it's hard to find a clearer case of a potential threat to a strong incumbent. Still, the uncertainty as to whether Google would go anywhere was likely one of the reasons why AltaVista decided to ignore the entrant's threat, or at least consider it a threat not worth paying $1 million price. In other words, it's a case of $\lambda \approx 0$.

■ **Summary.** The contrast between Eli Lilly and AltaVista could hardly be greater. In the first case, less than 24 hours mediated between the entry event (Genentech patents synthetic insulin) and the preemption event (Eli Lilly acquires the patent). In the second case, a clear and present danger (in probability terms) is ignored by an incumbent. More generally, my theoretical analysis suggests that industries where products and markets are better defined are more susceptible to preemptive acquisitions.

3. Acquisitions as a form of technology transfer

Since the 1980s and 1990s we have observed an increasing number of joint ventures, research and development alliances, licensing deals, and other outsourcing arrangements involving firms, universities and tech start-ups (Arora, Fosfuri, and Gambardella, 2001). In other words, we have observed the creation of markets for technology which effectively provide for a "division of labor" between the creation and the deployment of innovation.[5]

The importance of these markets is not uniform across industries. In the biotech industry, it is common to observe cooperation between start-up innovators and established firms. By contrast, in digital industries frequently innovators earn their rents by means of market entry and possibly acquisition by incumbents (Gans, Hsu, and Stern, 2002). What makes startups take one path or the other? First, a well-functioning market for technology (namely one with well-defined property rights) makes licensing-type technology transfer a relatively better strategy. For example, Gans, Hsu, and Stern (2002) show that, based on a survey of 118 startups, licensing is a more likely outcome when IP rights are better established (which they measure by the innovator having at least one patent associated with the technology in question). Second, if product market entry costs are very high, then technology transfer is again a relatively better strategy.

Biotech patents are considerably less vague than software patents. For example, (Bessen and Meurer, 2008) state that "economists have long understood that the patent system works substantially better in the chemical and pharmaceutical industries than in most other industries," precisely because software patents are noticeably more vague than biotech patents.[6] Moreover, the costs of bringing a new drug to market are typically higher than

5. Gans, Hsu, and Stern (2002) use the term "market for ideas". For the purpose of this paper I consider the meaning equivalent to "markets for technology".

6. Also, Burk and Lemley (2011) state that, "while patent law is technology-neutral in theory, it is technology-specific in application. ... In biotechnology cases, the Federal Circuit has bent over backwards to find biotechnological inventions nonobvious, even if the prior art demonstrates a clear plan for producing the invention. On the other hand, the court has imposed stringent enablement and written description requirements on biotechnology patents that do not show up in other disciplines. In computer software cases, the situation is reversed. The Federal Circuit has essentially excused software inventions from compliance with the enablement and best mode requirements, but in a way that raises serious questions about how stringently it will read the nonobviousness requirements."

the costs of bringing a new digital product to market. As a result, arm's length technology transactions between would-be entrants and incumbents should be more common in industries like pharma than in digital industries. (Recall, for example, that Eli Lilly preempted potential competition by acquiring an entrant's patent, not the entrant.)

In sum, whenever markets for technology are imperfect, firm acquisition may be the simplest path for an incumbent to acquire the technology created by a an entrant.[7]

■ **Google Ads.**[8] To illustrate the complex world of IP, technology copying and firm acquisitions in industries with weak markets for technology, consider the case of Google. Google Ads, the online advertising platform where advertisers pay to display brief advertisements, is Google's main revenue source. Although Google was the first company to be widely known for this service, it was certainly not the first. That honor goes to Overture and its founder Bill Gross. Gross was a leader in the concept of paid search in the late 1990s / early 2000s. The idea was that, instead of paying for page views — then the common business model — advertisers would pay only when people actually clicked on their ads. Moreover, the ad's placement would be determined as the result of a first-price auction.

In late 2000, Page and Brin (Google's founders) met with Gross at a TED (Technology, Entertainment, Design) Conference, and Gross suggested a merger. Google turned down the offer. There were also talks of a partnership, but these too fell through. Instead, Google went on to launch its own pay-per-click, auction-based search-advertising product, called AdWords Select. It followed Overture's with some differences (e.g., a Vickrey auction instead of a first-price auction).

Overture had not patented the idea of pay-per-click, so Google was free to copy it. Overture did file for a number of other patents related to its system, and sued Google for infringement. The case was settled in 2004.

In the meantime, Google's pay-per-click model was greatly enhanced by its acquisition of Applied Semantics in 2003. With the acquisition came AdSense, a product that allows Google to scan a page for keywords and then display the relevant ads. "It all went so quickly that I didn't have much time to process any of it," recalls Eva Ho, then Applied Semantics marketing director.

■ **Summary.** Similarly to preemptive acquisitions, the role of acquisitions as a form of technology transfer varies from industry to industry. In industries like pharma where IP is well defined, arm's length IP transactions work well. By contrast, in digital industries such transactions are considerably more difficult, and a combination of imitation and firm acquisition is the more common means by which technology is transferred.

This last consideration — the relative role of imitation and of firm acquisition — serves as a natural segue into may next section, dealing with innovation incentives, particularly in digital industries.

7. The limitations of the patent system in protecting software is also reflected in patent litigation rates. For example, the data presented in Bessen and Meurer (2008) implies that, in the 1996–1999 period, the ratio of annual US litigation cost divided by annual US patent profits was 38.8 for software patents and .50 for chemical patents (my calculation based on Table 6.3 in Bessen and Meurer (2008)).
8. Adapted from Oremus (2013) and Dickey (2013).

4. Innovation

As we look into digital industries, we find that neither monopoly nor perfect competition provide a good characterization. Rather, these industries are characterized by one or two dominant firms that compete with a host of smaller ones. Examples include applications software, smartphones and online advertising, where dominant firms such as Microsoft, Apple, Google and Facebook compete with small, highly innovative rivals.

As far as innovation incentives are concerned, is this market structure closer to monopoly, perfect competition or "creative destruction"? Sir Isaac Newton acknowledged that, "if I have seen far, it is by standing on the shoulders of giants." Some commentators claim that, in many high-tech industries, the opposite is true: large, dominant firms benefit from the innovation of smaller startups. A very partial list of innovation transfer from startups to "giants" includes Google acquiring Applied Semantics (Adsense), Android and YouTube; Microsoft acquiring Hotmail and Forethought (Powerpoint); and Facebook acquiring Instagram. Is this a good thing? Lohr and Hansell (2006) note that

> In some niches of the software business, Google is casting the same sort of shadow over Silicon Valley that Microsoft once did. "You've got people who don't even feel they can launch a product for fear that Google will get in."

In other words, some view the dominant firm paradigm as that of "giants standing on the shoulders of dwarfs." However, when it comes to innovation effort by "dwarfs" (e.g., technology startups), it's not clear whether "giants" provide a positive or a negative incentive. Some startups have cashed in billions of dollars when sold to dominant firms. Would they have made the same kind of money if there were no industry "giants"?

In order to understand the innovation effect of the presence of giants, it is helpful to distinguish two different extreme cases, one where there are no acquisitions and one where there are.[9] Absent acquisitions (or technology transfer), payoffs upon entry are given by π^I for the incumbent firm (the "giant") and π^E for the entrant (the "dwarf"). We would expect $\pi^I > \pi^E$. Moreover, we would expect that, the greater the gap between "giant" and "dwarf", the lower the value of π^E. In this sense, firm dominance detracts from innovation incentives by entrants. It's the "shadow of Google effect."[10]

Suppose now that acquisitions are possible. Specifically, suppose that incumbent and entrant engage in Nash bargaining over the acquisition of E by I. In order to compute the sale price we need to say something about post-acquisition market payoffs. In its simplest form, firm E exits the market and the incumbent becomes a monopolist. Payoff-wise, this situation looks very much like the case of a pre-emptive acquisition. The Nash bargaining price p is given by

$$p = \tfrac{1}{2}(\pi^M - \pi^I + \pi^E)$$

where π^M is profit by the incumbent after acquiring the entrant and its technology, whereas π^I and π^E denotes pre-acquisition profits by incumbent and entrant, respectively (which

9. The following discussion follows elements of Cabral (2018).

10. This is also related to the so-called "kill zone" effect, the idea that start-ups hesitate to invest due to the fear of being copied or bought up easily. See Kamepalli, Rajan, and Zingales (2019).

also form the outside options to a negotiated agreement).[11] What is special about many acquisitions is that the "giant" is not simply "killing" a potential rival but rather acquiring a technology that complements the incumbent's assets. For example, AdSense in the hands of Google is worth a lot more than AdSense as a standalone entity. In this sense, we would expect the difference $\pi^M - \pi^I$ to be substantially greater than π^E. To the extent that the entrant gets a share of that increase (one half, under the assumption of Nash bargaining), we would expect a considerable boost to innovation incentives from the option to sell out to the incumbent. Specifically, the innovator receives a prize p and this prize is greater the greater the asymmetry between "giant" and "dwarf", for the same reason that in Gilbert and Newbery (1982) and in much of the literature that followed it one assumes that monopoly profits are greater than the sum of duopoly profits.

■ **Summary.** In industries where arm's length technology transfer is difficult, as is the case in digital industries, acquisitions play an important role as a form of technology transfer. When the entrant's technology is a complement with respect to the incumbent's assets, anticipated acquisition provides a significant innovation incentive.

5. Merger policy in digital industries

The previous sections build up to the main point of the paper, namely that merger policy in digital industries raises specific considerations, namely the importance of acquisitions as a means for technology transfer. For this reason, a restrictive merger policy runs the risk of inefficiently dampening entrants' innovation incentives. As Crémer, de Montjoye, and Schweitzer (2019) put it,

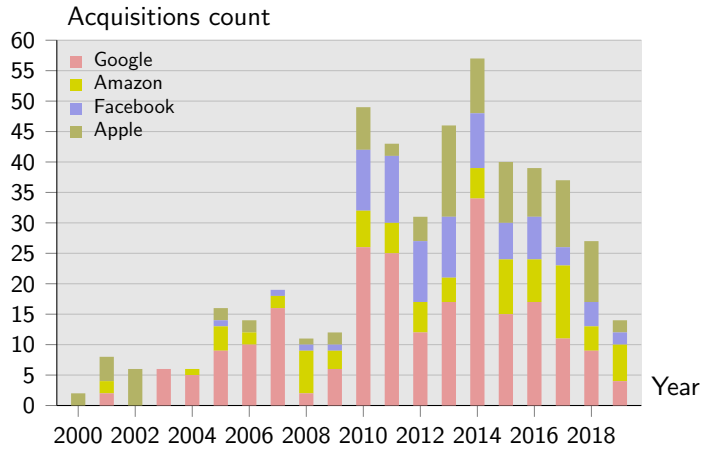
> In the digital field, mergers between established firms and start-ups may frequently bring about substantial synergies and efficiencies: while the start-up may contribute innovative ideas, products and services, the established firm may possess the skills, assets and financial resources needed to further 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.

Ultimately, it's a tradeoff between false positives (disallowing a merger that didn't really have a pre-emption motive) and false negatives (allowing a merger that did have a pre-emption move). The main argument of Sections 2 and 3 is that, in digital industries, the relative weight of technology transfer is greater than that of preemption. This implies that, under a common merger regime, false positives are relatively more likely than false negatives in the digital space when compared to other industries such as pharma.

By means of illustration, Figure 1 shows the number of acquisitions by the GAFA giants (Google, Amazon, Facebook, Apple) since 2000. It's notable that, out of about 800 acquisitions, only two or three got and continue to get any significant airtime (Waze,

11. The Nash bargaining price maximizes the product of the gains from an agreement for each of the parties. In the present case, the acquirer stands to gain $\pi^M - \pi^I - p$ from a negotiated agreement, whereas the entrant stands to gain $p - \pi^E$. The above value of p is the maximand of $(\pi^M - \pi^I - p)(p - \pi^E)$.

Figure 1
Standing on the shoulders of dwarfs (source: Wikipedia, author's calculations)



WhatsApp, Instagram). The vast majority of mergers likely fall under the category of complementarities between incumbent and entrants. In this context, proposals for a stricter merger policy in digital industries raise concerns. Scott-Morton et al. (2019) suggest that

> Antitrust law might be revised to relax the proof requirements imposed upon antitrust plaintiffs in appropriate cases or to reverse burdens of proof. ... Mergers between dominant firms and substantial competitors or uniquely likely future competitors should be presumed to be unlawful, subject to rebuttal by defendants. This presumption would be valuable, not because it would identify anticompetitive mergers with precision, but because it would shift the burden to the party with the best access to relevant information on issues of competitive effects and efficiencies from the merger.

Similarly, Furman et al. (2019) state that

> The principal alternative considered by the Panel has been the introduction of a legal presumption against acquisitions by large digital companies, with the burden placed on parties involved to provide proof that the merger will not be anti-competitive.

Finally, Crémer, de Montjoye, and Schweitzer (2019) propose that antitrust authorities

> 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.

The idea that "a merger with a uniquely likely future competitor should be presumed unlawful" is not particularly controversial. The problem of course, is the definition of "uniquely likely future competitor." This is particularly problematic in industries where business models are extremely hard to predict, including by industry participants themselves.

■ **The case for reversing the burden of proof.** It's not a coincidence that many of the leading antitrust experts propose such a drastic shift in merger policy as the reversal of the

burden of proof. There are various valid arguments in favor of this shift. I next address what I perceive as the three most important ones.

First, there is a tremendous asymmetry in resources between the tech giants and regulatory agencies such as the US DOJ or the EU DG Comp. Reversing the burden of proof would considerably alleviate the pressure on the resource-constrained agencies. However, reversing the burden of proof is a rather inefficient way to solve the resource problem. It would seem much easier simply to transfer resources from the firms to the agencies, for example in the form of merger review fees.[12]

Second, there are asymmetries in terms of information and expertise: the merging parties know more about their business and have more computer scientists, etc, who can understand the nature of the proposed deal. This asymmetry is not specific to digital companies, it is also present in other industries. One may argue that differences in technical skills are more apparent in high-tech, but there is no reason why the required skills cannot be acquired by the agencies (other than lack of resources, for which the reader is referred to the previous paragraph). Regarding genuine information asymmetry (i.e., privileged information about the merger rationale), the argument can be made (cf Sections 2 and 3) that, given uncertainty, the asymmetry is relatively less important than in other industries.

Finally, there is the argument that reversing the burden of proof would considerably raise the merger-approval bar, thus reducing the number of preemptive mergers. This is true, but as I try to argue in this paper the opportunity cost of such a shift would be significant. This is especially true in the US, where the government agency must prove in Court the anti-competitive nature of a merger. This creates a bias in favor of the default (no anti-competitive effects were proven) and thus sets a very high bar for the plaintiff. But precisely for this reason, placing the burden of proof on the merging parties would correspond to an enormous shift in approval rates, and the (limited) benefit of cancelling a few anti-competitive mergers would come at a (very high) cost of reduced efficiency gains and innovation incentives.

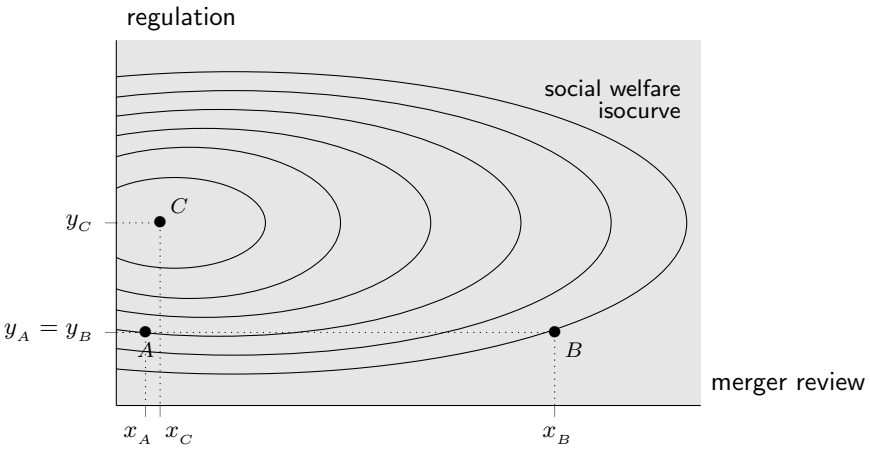
■ **Antitrust is more than merger policy.** The above discussion does not imply that high tech firms should be free of antitrust scrutiny. On the contrary. The point is that, of the various instruments available to government agencies, merger review is likely the least efficient (again, when considering high-tech firms).

In order to better explain my main point, Figure 2 depicts the regulator's problem within a simple indifference-curve mapping in the (merger, regulation) space. Suppose the government wishes to maximize some social welfare function and has two instruments at its disposal, merger review and regulation. Social welfare increases all the way up to point C, that is, the utility-maximizing levels of merger review and regulation (ignoring enforcement costs) are given by x_C and y_C. For simplicity, I measure each of these as a level of stringency. For example, a higher level of "merger" corresponds to a higher bar in merger approval.

The current situation in the high-tech sector might be represented by point A, where the merger bar is low and so is the level of regulation. Regarding merger policy, Figure 2

12. Since first writing this paper, I learned that, in March 2020, Senator Amy Klobuchar announced she would sponsor a bill requiring higher merger review submission fees. "In an era of megadeals that reach tens or even hundreds of billions of dollars, we need a new category of fees that reflects the complexities of mega-mergers and their serious impact on consumers." Currently, would-be merging parties in the US must pay a filing fee ranging from $45,000 for a deal less than $161.5 million to $280,000 for a merger valued at $807.5 million or more.

Figure 2
Public policy in the (merger,regulation) space



makes three points. First, a stricter merger policy would likely increase welfare. This can be seen by the fact that the iso-social-welfare curve through A is negatively sloped. Second, the benefit of a more stringent merger policy is likely small. In the graph, this corresponds to the fact that the iso-social-welfare curve is very flat. The idea is that — as explained in the previous sections — when it comes to the digital space the efficacy of a stricter merger policy is low and its opportunity cost high. Finally, I argue that a reversal of the burden of proof of the pro-competitive effect of a merger would likely imply — especially in the US — a movement to a point such as B, associated with lower social welfare than point A.

In contrast to merger review, I see the marginal benefit of regulating high-tech firms as considerably high. In fact, the point of highest social welfare, point C, results primarily from an increase in regulation, not an increase in the stringency of merger review.

I did not plot any iso-cost lines in Figure 2. The argument can be made that raising the merger bar by reversing the burden of proof would be relatively inexpensive. After all, it's the merging parties who must pay the cost. This would mean that the iso-cost lines are relatively flat. However, even if that is the case a drastic increase in the stringency of merger review would be a bad idea. Even if it came at no cost at all for the merger authority — which is not true — it would likely imply a drop in social welfare.

6. Conclusion

When a pendulum is let go of a very asymmetric position, it does not move to a balanced (equilibrium) state, rather it moves to the opposite asymmetric position. It's important to make sure this doesn't happen to merger policy in digital industries. Furman (2019) states that

> To date, there have been no false positives in mergers involving the major digital platforms, for the simple reason that all of them have been permitted. Meanwhile, it is likely that some false negatives will have occurred during this time. This suggests that there has been underenforcement of digital mergers, both in the United States and globally.

Furman (2019) is careful to use terms such as "likely" and "suggest": The fact — if it can be proved — that there were some false negatives does *not* imply that there has been underenforcement *with respect to the optimal level of enforcement*. In other words, in the digital space the argument can be made that an optimal merger policy on average leads to ex-post "underenforcement". Moreover, even if the level of enforcement has been lower than optimal, one must be careful not to swing to the opposite side, especially in high-tech industries. The chilling effect on innovation could be significant.

Everyone seems to agree that innovation is important. In every paper, in every report, in every set of guidelines, there is always a paragraph acknowledging the importance of innovation. But perhaps because it's so difficult to measure the type of innovation found in digital industries, in practice we continue to focus primarily on market dominance effects. Merger policy, in particular, seems to be motivated primarily by market dominance considerations, with relatively less weight given to implications for innovation.

To conclude, although I would recommend caution when it comes to reforming merger policy, this is not to say that increased policy enforcement is not called for. On the contrary. My point is that it should primarily take the form of checking for abuses of dominant position, tightening consumer protection, and directly regulating dominant firms, not preemptive merger policy.[13]

13. I write "primarily" because there are cases when a large network-based firm attempts to acquire another large network-based firm, as was the case with the Internet backbone mergers in the 1990s. In these cases, with its expanded share of users, the merged firm's incentives may change from favoring compatibility with rivals to favoring incompatibility. And blocking a merger may be preferable to dealing with complex ex-post access regulation. See, for example, Crémer, Rey, and Tirole (2000) and Malueg and Schwartz (2006). I am grateful to a referee for pointing this out to me.

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