CESifo WORKING PAPERS

8932
2021

March 2021

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CESifo

Impressum:

CESifo Working Papers
ISSN 2364-1428 (electronic version)
Publisher and distributor: Munich Society for the Promotion of Economic Research - CESifo GmbH
The international platform of Ludwigs-Maximilians University's Center for Economic Studies and the ifo Institute
Poschingerstr. 5, 81679 Munich, Germany
Telephone +49 (0)89 2180-2740, Telefax +49 (0)89 2180-17845, email office@cesifo.de
Editor: Clemens Fuest
https://www.cesifo.org/en/wp
An electronic version of the paper may be downloaded
· from the SSRN website: www.SSRN.com
· from the RePEc website: www.RePEc.org
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CESifo *Working Paper No. 8932*

Does Envelopment through Data Advantage Call for New Regulation?

Abstract

Envelopment is an effective form of market entry that facilitates competition among platforms. Nevertheless, many commentators have focused on the anticompetitive potential of envelopment, and some have argued for regulation of platforms because of that concern. These calls for regulation are not supported by robust formal analysis or comprehensive empirical evidence. We analyze a visible recent contribution by Condorelli and Padilla (2020a,b) and explain why the model that they put forward is not ripe for policy advice in relation to concerns with envelopment.

JEL-Codes: K210, L130, L400.

Keywords: envelopment, entry deterrence, data, competition of multi-market platforms.

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1. Introduction

Network effects and switching costs do not always shield incumbents from competition. Eisenmann et al. (2011) noted that, in fact, these market characteristics can be turned against incumbent platforms by entrants from adjacent markets. In what they term ‘platform envelopment’, the entrant bundles or ties its own platform’s functionality with that of the target to facilitate its entry in the target market. The bundling allows the entrant to extend, from its home market into the target market, the efficiencies stemming from network effects, combination of user data, or cost savings on common components of the service infrastructure. Dominant firms that are shielded from standalone entry may thus be vulnerable to an adjacent platform’s envelopment attack.

Platform envelopment is an effective form of market entry that introduces a competitive challenge to an entrenched incumbent. As such, it is generally pro-competitive. But platform envelopment may also be anti-competitive when the entrant platform forecloses a more efficient standalone rival to the detriment of consumer welfare. The harmful mechanisms are similar to those in traditional antitrust theories related to bundling or tying and can be addressed with existing antitrust instruments.

Some commentators have been arguing, however, that the anticompetitive potential of platform envelopment is especially pronounced, presumably because of network effects and the special role of user data; and that antitrust interventions are not speedy enough to prevent incumbent platforms from annihilating nascent rivals by enveloping them. Accordingly, the concern with envelopment should be addressed with regulation. This view is also gaining traction among some competition authorities.

A recent paper by the economists Daniele Condorelli and Jorge Padilla (henceforth CP) aims to provide a robust theoretical justification for this view. Condorelli and Padilla (2020b) consider a specific model of anticompetitive entry deterrence which they present as an anticompetitive case of envelopment. The model involves a dominant firm in a 'data-intensive' ('primary') market that enters a 'data-rich' ('secondary') market and engages in privacy-policy tying that allows bundling of user data. CP show that if the acquisition of data from the data-rich market confers an advantage that entrenches the position of the dominant platform in the data-intensive market, envelopment may reduce consumer welfare. On that basis, and because they view antitrust interventions as too slow to be effective in preventing irreversible harm, the authors call for the adoption of regulation involving asymmetric treatment of platforms.

We examine CP's arguments and other extant economic literature on envelopment and find no robust support for regulation of platforms. While the literature does identify some circumstances in which harm from envelopment could arise, it also leaves ample scope for pro-competitive effects, regardless of whether user data is involved or not. Indeed, in our view, the current state of knowledge is consistent with the intuition that, in the real world, the pro-competitive effects of envelopment are more pervasive than the anti-competitive effects.

Against this finding, the argument that ex-post interventions take too much time does not add much appeal to ex-ante regulation. If antitrust investigations tend to be lengthy in digital markets, this is probably because the conduct under scrutiny will only exceptionally be unambiguously anticompetitive. A careful ex-post antitrust assessment is the right approach because ex-ante regulation risks stifling effective competition.

In relation to the policy proposals of CP, we argue that they do not follow from the results of their formal analysis. First, like many other models in the antitrust literature, the CP

model is partial and so—while potentially useful for a case-by-case antitrust assessment—its results are not general enough for a broader policy advice. The analysis focuses on a highly specific market situation where two monopolists in adjacent markets consider entering each other's market. In this setup, CP identify conditions—which they argue will frequently be satisfied—where an entry of one monopolist into another monopolist's market preempts the reverse entry, thereby harming consumers.

But CP's is only one mode of competition among platforms. A more important mode may be the one where established platforms—each of them potentially entrenched in one or more markets—enter in and compete across multiple markets. In such competition mode, envelopment may be more accurately viewed as helping platforms overcome entrenchment when entering new markets, and as a part of the process of building capabilities that allow platforms to compete more effectively. In this view, envelopment is procompetitive despite an occasional foreclosure of a standalone rival. While the rival is harmed, for the society, such foreclosure is merely a collateral damage accompanying efficient competition.

Second, even if the most important mode of competition among platforms were like in CP's setup, the results of their analysis would still not be sufficiently general to justify ex-ante regulation. This is because the analysis hinges on further limiting assumptions which are frequently not satisfied in competition between platforms. Among those are the clear division of markets into data-rich and data-intensive; the existence of a critical data advantage in the data-intensive market that can be gained through cut-throat competition in the data-rich market; and the first-mover advantage held by the data-intensive market's monopolist.

The rest of the paper is structured as follows. In section 2, we discuss what envelopment is, what forms it takes, why it is generally pro-competitive, and why it can also be anti-

competitive. In section 3, we focus on the CP model of anti-competitive envelopment by means of data bundling. We discuss the limiting assumptions of this model in section 4. Section 5 is devoted to the discussion of policy implications that CP obtain from their model. In section 6, we argue that the policy proposals inspired by the CP model are not suitable for the real world.

2. Envelopment

What is envelopment

The ideas central to today's notion of envelopment predate the formal development of the concept. In the business management literature, Wernerfelt (1984) pointed out that firms can deploy a resource from one market to enter another market that shares the resource's use. Such a resource can be—as in the case of boilerplate platform envelopment—the existing user base. Other precursory contributions (e.g., Eisenhardt and Martin, 2000) employ the concept of dynamic capability, that is, the firm's ability to recombine resources to create new value. Platform envelopment can therefore be viewed as both the deployment and, because it adds complementary assets to the platform's existing assets, the building of such dynamic capability.

By nurturing their dynamic capability, some firms have become serial entrants. Microsoft, Apple, and Google, for example, have each entered many adjacent markets – and some of these later became their core markets. Eisenmann et al. (2011) conjecture that these firms were developing strategic routines, like encouraging cross-unit coordination which can be leveraged for envelopment entry in adjacent platform markets. Wan et al. (2017) consider envelopment to be a normal platform business strategy, along with pricing, openness, integration and differentiation. The authors note that a platform owner can develop a new platform to

leverage the existing resources of an established platform and create synergies between them, even without bundling the offers of the two.[1]

Countering envelopment

Envelopment as an offensive strategy of market entry gives rise to defensive strategies employed by incumbents. These defensive strategies generally require the target firm to improve the value of its platform to consumers, so their availability further contributes to vigorous competition via envelopment. The literature has identified two defensive strategies: (i) opening the platform to enlist new allies, and (ii) matching the entrant's bundle.

Regarding (i), the owner of a proprietary platform vulnerable to envelopment may open it up, inviting other parties to co-invest in the platform's development and to create new compatible versions of the platform. This can, in turn, attract new complementing participants to the platform. Furthermore, the differentiated versions of a compatible platform can serve to expand the user base when users have heterogeneous preferences. The more innovative—or otherwise important—the service it offers, the more likely it is that the platform will be able to enlist allies to ward off an envelopment attack (West, 2003; Eisenmann, 2008; Parker and Van Alstyne, 2008; Eisenmann, Parker and Van Alstyne, 2009).

An example is Linux, an open platform that allows different parties to create various flavors of the operating system broadly compatible with each other. By opening access to the source code, Linux benefited from the input of a large developer community that continued to improve the core code and write compatible applications. Despite its humble beginnings, certain

[1] The authors provide an example of Alibaba boosting its business-to-consumer platform Tmall.com by building on and leveraging the installed base of its consumer-to-consumer platform Taobao.com.

flavors of Linux, especially Red Hat, today compete head-to-head with Microsoft for enterprise server operating systems. Linux is also the leading operating system for use in the cloud.[2] In response to the envelopment threat by Microsoft, in the early 2000s, IBM opened up some of its proprietary software and started aggressively promoting Linux for use with its hardware and software, as well as with its branded services. In 2019, as part of the battle between the large multi-market platforms for the cloud compute space, IBM acquired Red Hat.

As for (ii), the target can ward off an envelopment attempt if it has the requisite skills and resources to enter the entrant's core market and if entry barriers are not insurmountable. However, bundle-to-bundle competition can be intense (Bakos and Brynjolfsson 2000; Nalebuff 2000) and so accommodating entry will sometimes be more profitable than matching the enveloper's bundle.

Google's entry into mobile operating systems appears to be an example of a strategy aimed at countering or reducing the risk of envelopment that represents both (i) and (ii). Indeed, it is plausible—even if it might not look this way in hindsight—that before investing in Android, Google perceived a risk of being enveloped in mobile internet search or online map services by firms like Apple, Microsoft, Nokia, Palm, and Blackberry. Google has reduced this risk of being enveloped by investing large amounts in Android, with which it has bundled its services to match rival bundles. But, while limiting the risk of envelopment, Google also created a viable

[2] By 2014, it was clear that Microsoft would have need to endorse and commit to supporting Linux as well if it wanted to compete for enterprise cloud customers. In October that year, Microsoft CEO, Satya Nadella, announced that "Microsoft loves Linux" and that 20 per cent of Microsoft Azure cloud was already Linux. In our view, the success of Linux has not been enabled in a significant way by the antitrust cases in relation to the concerns with Microsoft's denial to provide interoperability information for work group servers. This is because Linux has only ever been used marginally (even after the interoperability information was made available) in heterogenous work group server architectures alongside Windows servers where such interoperability would be crucial. Instead, Linux has traditionally powered many web servers and moved from there to as the main operating system powering the public cloud. It is also the operating system of choice for the private cloud.

alternative to Apple's iOS with its Android bundle. The two went on to compete head-to-head, delivering great value to consumers.

Envelopment as a pro-competitive strategy

Envelopment—like its counterstrategies—has significant pro-competitive potential as it involves a period of increased platform competition, which may fail to occur without it. It starts with an entry of a platform established in one market to an adjacent market dominated by another platform. To facilitate entry, the entrant deploys some assets from its home market in the target market. After the entry, the incumbent platform may exit if it cannot withstand intense competition. However, the exit will not normally happen, and envelopment will then facilitate sustainable competition.

Indeed, despite the occasional market featuring a 'winner-take-all' dynamic, casual empirical evidence supports sustained platform competition.[3] For example, Shankar and Bayus (2003) study the home video game industry and conclude that the two main rivals, Sega and Nintendo, have been able to compete effectively in the long term despite the strong network effects. More recently, Inoue (2019) argues that gaming platforms coexist, in part because software providers (complementors) act to create an environment that allows more than one platform to thrive. Good examples can also be found outside the video game industry, such as the sustained rivalry between Apple iOS and Google Android in mobile operating systems, between Linux and Microsoft, and, more generally, between open and closed source software in enterprise compute environments.

[3] Eisenmann et al. (2011) show that, out of 42 envelopment cases in their study, only 4 resulted in displacement of the target, while entry failed in 8 cases. In 30 remaining cases, entrant and incumbent successfully compete in the target market.

Yet, envelopment can also be procompetitive in markets prone to tipping, as an attempt—not necessarily successful—to force the exit of the incumbent. In such markets, the threat of envelopment keeps incumbents on their toes and facilitates the replacement of those that cannot keep up with more efficient firms in terms of value they deliver. Indeed, where an incumbent fails to innovate for some time, a more innovative enveloper will challenge it and likely emerge as the new dominant platform after a period of intense competition. Such a dynamic, where a platform—be it a giant like Google or a small one—envelops and replaces another platform, whatever its size, is essential to effective competition.

Envelopment does not seem to have anticompetitive potential to merit regulation

Envelopment has recently been attracting significant attention from academics, practitioners and regulators. Most of that attention focused on the envelopment's potential to harm competition. Some commentators went further and have made suggestions for regulation of platforms because of this concern. A visible contribution is Condorelli and Padilla (2020a), which provides a general discussion of the envelopment's pro- and anti-competitive effects. The paper identifies mechanisms familiar from established tying theories, where either the enveloper is leveraging existing market power from the tied good into the tying good market, as in Whinston (1990) and Jeon and Choi (2021), or the enveloper is protecting this market power from a potential entrant, as in Carlton and Waldman (2002), Choi and Stefanadis (2001), and Condorelli and Padilla (2020b). CP raise strong concerns with envelopment based on the collection and use of data across multiple markets, which they say merits ex-ante regulation.

In our view, while envelopment may generate anti-competitive effects, regulation is not an appropriate remedy. On the one hand, just like tying or bundling, envelopment comes with significant scope for efficiencies. As Ahlborn et al. (2004) explain, both economic theory and the

pervasiveness of tying in competitive markets provide support for the idea that tying is capable of generating important efficiencies. These authors identify benefits stemming from lower production costs, reduced transaction costs and increased convenience or variety that may accrue irrespectively of whether the firm that ties is dominant or not. All these efficiencies are also relevant to envelopment. In fact, with envelopment, the scope for efficiencies is greater because, unlike tying, it always involves a new market entry and a period of enhanced competition. The importance of envelopment for effective competition between platforms may be further enhanced by the network effects and the role of data a as these features often imply that envelopment is the only way a potential entrant can challenge the incumbent.

On the other hand—even though they are often identified as the vehicle for harm to competition—it is far from obvious that network effects in the context of multi-sided platforms are especially conducive to anti-competitive effects in envelopment. It is not even clear if network effects of this type typically stifle competition when competition is efficient. Indeed, Caillaud and Jullien (2003) show that concentration in internet-based intermediation markets does not necessarily cause inefficiencies; an entrant can displace the incumbent by using a "divide and conquer" strategy unless the incumbent offers competitive conditions. The network externalities, therefore, are not especially conducive to consumer harm in their setting. Weyl and White (2016) further show, in the context of Armstrong's (2006) two-sided single-homing model with an inefficient incumbent, that network effects do not significantly contribute to inefficient tipping.

Further, as Stummer et al. (2018) explain, a platform has access to multiple launch strategies that help it overcome the chicken-and-egg problem caused by network externalities. Specifically, it can (1) differentiate itself and focus on a single target group, marque users or

loyal users; (2) subsidize a user side that is targeted by the incumbent; and (3) enter exclusivity agreements to differentiate itself from the incumbent. These strategies can also be employed to defuse the foreclosure potential of envelopment. Yet another strategy that can be employed to this effect is automatic harvesting. This is the online collection of information already stored by other players that can be used to sustain competition in platform markets. Automatic harvesting is made easier by content providers like Amazon, Google, CNET, Facebook, or Twitter offering application programming interfaces (APIs). Managed service providers (MSPs) can use such APIs, but also web scraping in their absence, to develop content to attract users on one side of the platform before seeking to attract users on the other side.

Two insights relevant to the debate on regulation of platforms emerge from this analysis. First, envelopment can unlock important efficiencies in different scenarios of competition among platforms in the real world. Second, envelopment often does not lead to anticompetitive foreclosure. These two facts must be taken into consideration in the design of regulation, which requires a balanced assessment of the anti-competitive effects against the pro-competitive effects of envelopment in all relevant dimensions. Such analysis would have to be supported by comprehensive empirical evidence. Currently, both comprehensive formal analysis and empirical evidence seem to be lacking.

3. Summary of CP's model of data-based envelopment

Among the theoretical literature on the anticompetitive potential of envelopment, Condorelli and Padilla (2020b), which accompanies the Condorelli and Padilla (2020a) policy

paper, is a prominent recent example.[4] In the CP model, there are two markets, each occupied by a monopolist. A 'primary', data-intensive market is where data is used to improve services; a 'secondary', data-rich market is where data is harvested.

The authors hypothesize that control of the data from the secondary market confers a *data advantage* in serving the primary market that is reflected in higher profits there. The data advantage is a key driver of their analysis. It arises, for instance, when data improves the service quality, reduces costs, or enhances price discrimination. While the authors model competition for data advantage as an English auction or in Bertrand fashion, we understand that, in reality, the control of the data would be obtained by serving most or all customers in the secondary market. The second key driver of the CP's analysis is the assumption that the entry in the primary market is feasible if and only if the data advantage is accrued by the entrant and not by the incumbent of the primary market.

The authors put forward the example of the markets for online advertising and for wearable tracking devices. The advertising (primary) market is data-intensive. Its monopolist maximizes the value of ads by targeting them at specific groups of consumers and needs granular location data to do so. This data is generated in the data-rich tracking devices (secondary) market.

We use these same markets as an example to explain the intuition of the CP model. We will call the monopolist in the primary market Google, and the one in the secondary market Fitbit. Fitbit contemplates entry into search advertising. Thanks to the data collected through wearables, this entry will be profitable provided Fitbit remains dominant in its market. However,

[4] While the authors refer to 'envelopment', strictly speaking, they present a theory of anti-competitive deterrence of envelopment. The limitations of the model discussed in the remainder of the paper remain relevant irrespectively of interpretation.

Google is endowed with a first-mover advantage, because it is a well-funded tech giant that can react to the emergence of a nascent competitor in the wearables market before its own position becomes precarious. Google may thus enter the market for wearable devices before Fitbit could enter the search market.

Fitbit can obtain moderate competitive profits in search advertising in competition with Google. Under CP's assumptions, however, Google enters the wearables market and offers consumers larger value than Fitbit, winning them over and obtaining the data advantage. This prevents Fitbit from entering the search advertising market. Consumers (merchants) in the search advertisement market are worse off, but consumers in the wearables market benefit from competition for their data.

4. CP's analysis is not a solid basis for regulation because of restrictive assumptions

In the CP model, competition takes the form of an entry of one monopolist into another monopolist's market. The analysis is therefore limited to this mode of competition among platforms.[5] But even within this mode, the model does not provide a robust theoretical foundation for regulation. This is because assumptions of the analysis are also limiting in other important ways as follows.

Artificial breakdown of the markets into 'primary' and 'secondary'

CP characterize one of the two markets as 'data-intensive' ('primary') and the other one as 'data-rich' ('secondary'). A business in the data-rich market can collect extensive data on user behavior, while a business in the data-intensive market focuses on exploiting data.

[5] The model, for example, does not apply to situations where multi-market platforms compete among each other and with standalone ones across markets.

In reality, the distinction between data-rich and data-intensive markets is blurred, as many markets are characterized by both the collection and the use of data on both sides of participating platforms. As this distinction becomes blurred, so do the results of the model. With that, the correct policy advice becomes blurred too.

Critical data advantage

CP assume that the secondary market incumbent can enter the primary market profitably if and only if it holds the data advantage exclusively. It is unlikely that this assumption is systematically satisfied in real-life platform competition.[6] Even the 'leading example' (Google and a tracking device producer) identified by CP does not appear to satisfy it. In reality, Fitbit appears to be an unlikely prospective competitor to Google in search advertising, whether it has the granular geolocation data or not. Instead, other multi-market platforms, like Microsoft, Facebook, Amazon, or Apple appear much more credible competitors to Google.[7] Also, the secondary market incumbent will often be able to enter and compete in the primary market by focusing on collecting data from only a subset of users in both markets.

Moreover, the CP model contains an extreme assumption that the data advantage is binary – a firm cannot benefit from data unless it wins the auction for data. This assumption favors the preemption story. More plausibly, the collection of data allows the incumbent to improve its services in the primary market without granting it an insurmountable advantage over

[6] CP indirectly acknowledge this by considering, in the discussion of their policy proposals, instances of when this assumption is not satisfied. In that case, however, there is no anti-competitive foreclosure in their model.

[7] In fact, Apple, Samsung and Huawei have long been active in wearable devices, and have offered own Health applications and services in conjunction with other platform services before Google's acquisition of Fitbit. Much more likely than being an example of preemption of Fitbit's entry into one of its primary markets, Google's acquisition of Fitbit allows Google to compete more effectively with these (platform) providers of hardware, software and services.

its potential rival. In such circumstances, the incentives of the primary market incumbent to pre-empt via better data become less obvious.

First-mover advantage

In the CP model, the primary market incumbent is the first to make the entry decision. Yet, in many circumstances, the secondary market incumbent might instead be the first to make the entry decision, or both firms might make this decision simultaneously.[8] Further, CP assume that the length of time between the entry of the primary market incumbent (if it occurs) and the point at which the secondary market incumbent can make its entry decision is sufficient for the primary market incumbent to win the data advantage.

Both assumptions limit the scope of application of the model, ruling out cases in which a systematic source of the first-mover advantage cannot be identified. For example, if the period before the follow-up entry into the primary market is too short to win the data advantage (which in the real world would take time because it involves winning the customers away from the secondary market incumbent), the secondary market incumbent could still profitably enter the primary market and thus, in some circumstances, keep the data advantage to itself. In such cases without first-mover advantage, the primary market incumbent's entry into the secondary market would not be anticompetitive in the CP model.

No data advantage for the secondary market monopolist

The CP model is only applicable when the secondary market incumbent, despite being the incumbent, does not have any data advantage from the outset. If it did have this advantage,

[8] Note that size or availability of resources, cited by the authors as potential sources of first-mover advantage, do not automatically imply such advantage, but rather indicate asymmetry in the cost of entry for the two incumbents. In game theory, first-mover advantage (or disadvantage) stems either from the ability to commit or indeed to act prior to the other player(s) in time.

the entry-deterrence mechanism described by the model would lose its strength. In this case, even a successful entry by the primary market incumbent could not prevent the secondary market incumbent from deploying previously accumulated data in the primary market.[9]

This relates to the equally limiting assumption that the data advantage is not relevant to competition in the secondary market. If it were relevant, and the secondary market incumbent had access to previously accumulated data, it would be costlier for the primary market incumbent to outbid the rival in the secondary market. Since preemption only makes sense when the benefit of securing monopoly position in the primary market exceeds the costs of winning the auction, pre-emptive entry would then become unprofitable for an even larger set of parameter values.

Profitability of entry deterrence

Another assumption in CP's modelling is that entry deterrence is profitable. It is formulated as a restriction on the cost of entry and the potential profits in both markets. Apart from being restrictive, this assumption leaves the determinants of profit unaccounted for. Because of this, we know very little about the circumstances—are they broad or narrow—in which the modelling results can inform policy discussion.[10]

CP argue that entry deterrence will be profitable in a wide set of circumstances for the following reasons. First, the primary market incumbent can gain a positive profit by entering the secondary market.[11] Second, the industry profits in the primary market are higher under

[9] If the secondary market incumbent already has the data advantage, it may still decide to stay out of primary market, but not because of the entry deterrence mechanism featured by CP.

[10] To what extent is the data gathered in the secondary market unique and not collectible in any other market? To what extent does consumer demand in the primary market support the switching to a supplier with richer data? How strong are the scale economies in providing the service in each market?

[11] Precisely, the authors state that 'the right hand side [of assumption 2] will tend to be small due to $\Pi_c^G(c)$', which can be reformulated as 'the right-hand side will tend to be small due to the profits of the primary market incumbent from the secondary market being positive'

monopoly than under duopoly (once the data advantage is acquired). While CP consider these conditions uncontroversial, on closer inspection it becomes clear that they are, in fact, restrictive.

The first assertion is not sufficient for the deterrence profitability, as the profit from entering secondary market must be high enough, not just positive. The second assertion is uncontroversial only in the context of homogeneous goods competition. More generally, its validity depends on the extent to which the services offered by the competitors are substitutes for each other. When such substitution is weak, the statement may not hold.

In data-fueled markets, the data often only becomes valuable if used in some novel value-creating service. This service will have the potential to disrupt the market only if it is sufficiently differentiated from the primary market incumbent's offers. With enough differentiation, the combined profits from the two products sold in competition may exceed the monopoly profits from the older product alone. Then entry deterrence may well become unprofitable.

Data is not an auction prize

In the CP model, data is an auction prize. To enter the primary market, the secondary market incumbent must win that auction. There can be only one winner and under CP's assumptions, this will be the primary market incumbent.

But data often does not work like that. By offering differentiated service, two businesses can obtain data from different sets of consumers even if these are single-homing; and they can always obtain it from all multihoming consumers. Therefore, the secondary market incumbent will often be able to access data despite aggressive competition from the primary market incumbent. When novel ideas are important in designing competitive products, the secondary market incumbent will also be able to use that data to obtain (or preserve) the advantage it needs

to enter the primary market. Then, the primary market incumbent will not be able to prevent the entry.

5. CP's results and policy implications

Under the assumptions in the CP model, the entry of the primary market incumbent into the secondary market *may* be harmful to consumers. Only when competition in the primary market is more important to consumer welfare than competition in the secondary market is such entry *necessarily* harmful.[12]

In a companion policy paper, Condorelli and Padilla (2020a) apply this result to analyze the competitive effects of 'privacy policy tying'. The authors define privacy policy tying as 'the strategy of linking the enveloper's privacy policies in the origin and target markets to extract the user's consent to the combination of data generated in both markets for commercial policies'. The authors list two potential efficiencies associated with privacy policy tying:

- Data collected in the origin market can be used to provide services more efficiently in the target market, and vice versa.
- Data collected in the origin market can be used to reduce asymmetric information associated with an entry decision.

Despite acknowledging these efficiencies, CP argue in favor of platform regulation to address what they view as a strong potential of envelopment mediated by data-tying to deter a more efficient competitor from entering the enveloper's primary market.

[12] The consumer welfare ranking assumption may be unjustified when viewed against some other implicit assumptions of the model. Indeed, the primary market incumbent is assumed to be protected by network effects. Yet, in the presence of network effects it may in fact be efficient to have a single (i.e. dominant) player in the market. Whereas, the benefits from competition may then well be systematically higher in secondary markets.

CP discuss four policies: entry restrictions, prohibitions to data tying, data sharing obligations, and mandated data portability. They recognize that all these policies may harm consumers even within the context of their model, especially in the secondary market. However, in CP's view, asymmetric versions of them, imposed only on the monopolist in the primary market, can preserve competition in the primary market without risking harm to consumers elsewhere.

We disagree. While CP's analysis and arguments are informative for a case-by-case effects-driven antitrust analysis, they cannot be cast as a basis for more general policy advice.

Entry restrictions

CP consider entry restrictions that would eliminate entry into a data-rich market, while allowing entry into the adjacent data-intensive market. The authors acknowledge that this policy is not suitable in two sets of—potentially empirically relevant—circumstances: if entry into the primary market (i) will not take place even when the primary market incumbent does not gain the data advantage; or (ii) will take place despite the attempts of the primary market incumbent to gain the data advantage. In scenario (i), the restriction may harm consumers and at best has no effect; in (ii), it reduces competition in secondary market harming consumers there without any compensating benefits.

Prohibition of data tying

The prohibition of data tying, as CP prescribe it, would force the unbundling of privacy policies, making it impossible to pool consumer data across markets. CP recognize that, if imposed on both incumbents, the policy would likely harm consumers when the data advantage is 'essential for competition in the primary market'. CP introduce this term to consider a situation

when none or both firms have data advantage.[13] The data advantage is called essential when the secondary market incumbent would not enter the primary market in this situation.

With essential data advantage, the secondary market incumbent enters the primary market only if it holds the data advantage exclusively, so it will not enter when data tying is prohibited, which would be harmful for consumers. Conversely, the policy might benefit consumers when the data advantage is non-essential, because it would stop the primary market incumbent from developing the data advantage to deter entry.

CP acknowledge that it might be hard to verify if any data advantage is essential. Therefore, they recommend that the prohibition of data tying be imposed only on the primary market incumbent. This would allow the secondary market incumbent to enter the primary market both when the data advantage is essential and when it is not. CP concede that the policy may leave the primary market incumbent unable to exploit its data to the benefit of consumers, but state that this 'monopolistic firm (…) is anyway unlikely to translate most of its gains to consumers'.

This reasoning is problematic for several reasons. First, a monopolist that cannot effectively price-differentiate—and many platforms cannot—will pass on efficiency gains in the form of lower prices or better service to consumers, potentially to a significant extent. As a result, the prohibition of data tying could harm consumer welfare. Second, even though the primary market incumbent cannot gain the data advantage under this policy, it might still enter the secondary market to ensure the incumbent of that market does not gain it either and therefore

[13] This situation does not arise in the CP model but is relevant to the discussion of the proposed policies.

does not enter the primary market when data advantage is essential. Therefore, the prohibition may not be enough to prevent foreclosure in any case.

Third, when the data advantage is non-essential, data tying will result in the more intense competition triggered by the availability of better data. The latter happens whenever data is 'unilaterally procompetitive' (UPC), which is not unusual, as discussed by de Cornière and Taylor (2020), who provide a unified approach to modelling the competitive effects of data. Under the uncontroversial assumption that better data leads to higher revenue, de Cornière and Taylor define data to be UPC when this data leads a profit-maximizing firm to provide higher utility to the customer at any level of utility provided by a rival firm.

Data sharing

CP do not favor a symmetric market-based data sharing requirement because it could discourage entry when the data advantage is essential, resulting in the preservation of monopoly in both markets.[14] Instead, they consider a data sharing obligation that would compel only the dominant undertakings in primary markets to make the data they have collected available at zero price. CP argue that this eliminates foreclosure potential in case the data advantage is not essential. However, the policy increases the regulatory burden and discourages investment into data collection. It therefore imposes certain and potentially large cost in exchange for the uncertain benefit of preventing foreclosure that may be unlikely to occur in the first place. The policy also gives rise to serious privacy concerns since consumers may not wish to make their data available to everyone.

[14] The possibility of trading data allows the incumbents in both markets to internalize their strategic externalities; both incumbents can be made better off when the primary market incumbent buys data from the secondary market incumbent, instead of acquiring it through entry (at least in case the joint profits are highest when monopoly is preserved in both markets). Essential data advantage implies that, in selling its data, the secondary market incumbent also sells a credible commitment to stay out of the primary market.

Data portability

Data portability gives consumers control over their data, which they may transfer to any platform, potentially for a fee. When the policy is applied symmetrically, consumers could well be left with a monopoly in both markets when the data advantage is essential. This is because, as CP explain, upon entering the primary market with the data advantage, the secondary market incumbent would see its consumers transfer this advantage to the primary market incumbent. Foreseeing this, it will not enter. In turn, this removes the incentive of the primary market incumbent to enter the secondary market preemptively.

Acknowledging the problem, CP suggest an asymmetric data portability requirement imposed only on the incumbent in the primary market, and not on its nascent rival in the secondary market. Furthermore, they posit that the regulatory agency operates on consumers' behalf, with the goal of maximizing the aggregate consumer surplus. This objective is necessary to overcome the externality problem, noted, among others, by Acemoglu et al. (2020). The problem arises because consumers' information is correlated, leading them to sell it at a price below its social value.

In our view, this policy suggestion is not practical because it would impose an impossible informational and computational burden on the agency evaluating whether the policy, on average, benefits consumers. Among other things, the agency would have to establish the quantum of competitive gain from sharing the data of the dominant platform, weigh this gain against the (unspecified) privacy costs, and obtain the permission of consumers to use their individual data to maximize aggregate welfare.[15]

[15] It also bears mentioning that the privacy costs to consumers who participate in this arrangement include the costs of uniting the information of several digital platforms within a single agency.

6. General problems with implementation of proposed policies

While the CP model does not provide a robust basis for the regulatory proposals reviewed above, it is also not ripe for policy advice more generally.

Uncertainty about model applicability leads to regulatory errors

The concept of data advantage is central to anti-competitive envelopment in the CP model and its application to privacy-policy tying. Yet, CP do not model the source of data advantage, making it difficult to identify, in terms of either observables or exogenous preference/technology parameters, the situations in which the pre-emption story might be relevant. Moreover, as discussed in section 4, there is no clear distinction between data-rich and data-intensive markets. This contributes to the identification problem that the model faces.

Such uncertainty about the relevance of any particular subset of parameter space of the model to a particular real-life situation makes the application of the model risky. It is easy, in particular, to misjudge a pro-competitive entry for an anti-competitive entry deterrence. As we discussed, envelopment is often procompetitive (section 2), and anti-competitive pre-emption arises but for a very limited set of parameter values (section 4). In such circumstances, the uncertain benefit of an attempt to correct a market failure that might not even exist (anti-competitive envelopment) could easily be outweighed by the harm from inappropriate application of an asymmetric policy (restricting competition by prohibiting pro-competitive entry/envelopment). In the next subsection, we present an example of a situation in which such harm arises.

Data sharing obligation may have a reverse effect

The data sharing obligation as proposed by CP may help incumbents to avoid a low profit equilibrium with intense competition, as we show formally in Appendix. This is likely to happen whenever a clear distinction between data-rich and data-intensive markets cannot be made.

In a nutshell, when data in each of the two markets may be useful for creating value in the other market, the incumbents face a prisoner's dilemma type of situation. For each firm, remaining a monopolist in its own market is more attractive, in terms of profit, than competing with the other incumbent in both markets. However, each incumbent has an incentive to enter the other's market, because competition in the new market provides the firm with the data that allows it to increase monopoly profits in the old market. Each firm, acting unilaterally, will therefore enter the new market, and end up competing with the other firm both in the new and in the old market.

This need no longer be the case if data sharing or data portability obligations are in place. In such case, when the price of data is sufficiently low, the incumbents will purchase the data from each other and get the increased monopoly profits in their old markets without entering the new markets. Therefore, the data sharing will conserve the market power of the incumbents instead of fostering competition.[16] This is particularly dangerous when there is little competition for user engagement other than for the sake of collecting data.

[16] Hagiu and Wright (2020) also find that a policy of mandatory data sharing may reduce consumer surplus. In their model, firms subsidise consumers in order to obtain data about them, with which they hope to reinforce their market position. By effectively removing data as a dimension of competition, mandatory data sharing also pre-empts price competition that benefits consumers.

Data sharing obligation may discourage innovation

As already discussed, CP advocate asymmetric data sharing at low or even zero price. The problem with such a proposal is that data collection is costly—for a platform to be able to collect data from users, these users must be willing to use its service—and the potential data collector will only invest in data collection if it expects a return on its investment. When the data must be sold to a competitor at some arbitrary low price, it may not generate sufficient returns for the collector because it will trigger stronger competition from the data-enhanced rival. The non-rivalry property of the data itself does not obviate the need to consider the trade-off between static efficiency (more competition) and dynamic efficiency (more innovation based on data collection).

Furthermore, collecting data is an uncertain endeavor in the sense that, while collecting it, firms often do not know how and in what form it will be used. In part, data is collected for its 'option' value as it is often only once an opportunity, triggered by a novel idea, arises that a firm capitalizes on the data it has collected. The data sharing obligation may suppress the platforms' incentive to collect data for its option value because the right idea may come to the competitor rather than to the collector.[17] In that case, the collector will be mandated to provide the data to rivals to its own detriment.

CP seem to be aware of the issue of costly data collection and thus propose, in Condorelli and Padilla (2020a), that data sharing should be mandated on fair, reasonable and non-discriminatory (FRAND) terms. It is not clear, however, how FRAND terms in this context are different from unregulated solution whereby the parties are free to negotiate data sharing on

[17] Moreover, the ecosystem in which digital platforms operate is a complex privately governed place. Any firm's own effort in sharing data insights with the wider community and providing data access via APIs may be discouraged by the proposed policy.

mutually beneficial basis. Possessing data does not create a standard, and it is unclear whether there is a specific market failure, like hold-up in standard settings, that needs to be remedied by a FRAND access obligation. There may therefore be no difference between ex-ante and ex-post negotiation usually exploited in the FRAND rate setting.

Ex-ante prohibitions should not be justified by the complexity of ex-post analysis

The discussion in Condorelli and Padilla (2020a) also features suggestions to prohibit mergers across platforms. They justify such a prohibition by the complexity and opaqueness of digital markets and the excessive effort that a proper assessment would require. In our view, to prohibit something because it is too complex to assess quickly is the wrong path. The analysis is complex because a conduct in real life situations involves multiple opposing effects, and efficiencies may well prevail. Policymakers should be encouraged to analyze the effects on a case-by-case basis in such circumstances. If they were to skip such analysis just because it is difficult, and decide to regulate competition instead, they might well find themselves blocking many Pareto-efficient developments.

Moreover, it is not clear that antitrust investigations systematically take too much time in digital markets to prevent irreversible anticompetitive outcomes. While this may be a well-established hypothesis in some circles, it has not, as far as we know, been tested properly. anecdotal evidence we have seen so far is not convincing. In particular, we are not aware of any systematic analysis of cases of monopolization which were predominantly a consequence of anticompetitive envelopment (as opposed to, e.g., innovation or competition on merits) and where antitrust failed to restore—albeit with some delay—effective competition.[18]

[18] Note also that this concern cannot apply to merger assessments which are speedy and effective at restoring competition.

7. Concluding remarks

Platform envelopment is an effective form of market entry that introduces a competitive challenge to an entrenched incumbent. As such, it is generally pro-competitive. However, envelopment can also facilitate anticompetitive foreclosure. Many commentators and academics have focused on this anticompetitive potential of envelopment, arguing that it, and the fact that antitrust interventions are not speedy enough, justify regulation.

In their two papers, CP aim to provide a theoretical basis for such a view. The CP model describes conditions under which an increase in competition in one market, due to the entry of a dominant platform into an adjacent market, reduces overall competition and harms consumer welfare. This remarkable result is obtained through a set of limiting assumptions. Nevertheless, CP interpret it as a justification for far-reaching ex ante regulation that targets digital platforms selectively.

We have emphasized three problems with this approach. First, CP's stated assumptions are very restrictive such that they will seldom apply in practice. Second, as the authors recognize, the policies they advocate—a prohibition on privacy-policy tying or mandated data portability—may harm consumer welfare when their assumptions do not apply. Third, CP's proposed policies have additional effects that lie outside the scope of their model, notably with respect to digital platforms' incentives to collect data and innovate.

Most important, the CP model only captures a highly specific dynamic in competition among platforms—the potential entry of a secondary market monopolist into a monopoly primary market. This cannot be the only, or even the most relevant, mode of competition among platforms. In the real world, much of the effective competition occurs between multimarket

platforms such as Google, Microsoft, Apple or Amazon. As these platforms compete with one another, they also compete with their standalone rivals, and the less efficient of them will wither. The exit of standalone rivals, however, does not justify regulatory interventions designed to shield them from the threat of entry. Far from enhancing competition, such regulation may have the effect of curtailing competition where it matters most.

Acknowledgements

We thank Florian Peiseler, Arvid Viaene and especially Taco Prins for excellent research assistance. We are thankful to Eliana Garces and Damien Neven for their insightful comments and suggestions. Financial support from Facebook inc. is gratefully acknowledged. The opinions and judgements expressed in the paper are the authors' views. All errors are the authors'.

References

Acemoglu, D., A. Makhdoumi, A. Malekian, and A. Ozdaglar (2019): Too Much Data: Prices and Inefficiencies in Data Markets, NBER Working paper 26296.

Ahlborn, C., D. Evans, and J. Padilla (2004): The antitrust economics of tying: a farewell to per se illegality, The Antitrust Bulletin 49, 287-341.

Armstrong, M. (2006): Competition in two-sided markets, RAND Journal of Economics 37(3), 668-691.

Bakos, Y., and E. Brynjolfsson (2000): Bundling and Competition on the Internet, Marketing Science 19(1), 63-82.

Caillaud, B., and B. Jullien (2003): Chicken & egg: competition among intermediation service providers, RAND Journal of Economics 34, 309–328.

Carlton, D., and M. Waldman (2002): The strategic use of tying to preserve and create market power in evolving industries, RAND Journal of Economics 33 (2), 194-220.

Choi, J.P. and C. Stefanidis (2001): Tying, Investment, and the Dynamic Leverage Theory, RAND Journal of Economics 32(1), 52-71.

Condorelli, D., and J. Padilla (2020a): Harnessing Platform Envelopment in the Digital World, Journal of Competition Law & Economics, forthcoming.

Condorelli, D., and J. Padilla (2020b): Data-driven Envelopment with Privacy-Policy Tying, available at SSRN: https://ssrn.com/abstract=3600725 or http://dx.doi.org/10.2139/ssrn.3600725

de Cornière, A., and G. Taylor (2020): Data and Competition: a General Framework with Applications to Mergers, Market Structure, and Privacy Policy, TSE Working Paper 20-1076.

Eisenhardt, K. and J. Martin (2000): Dynamic capabilities: what are they?, Strategic Management Journal 21, 1105-1121.

Eisenmann, T. (2008): Managing Proprietary and Shared Platforms, California Management Review 50 (4), 31-53.

Eisenmann, T., G. Parker, and M. Van Alstyne (2009): Opening Platforms: How, When and Why? in Platforms, Markets & Innovation (ed. Gawer), Edward Elgar Publishing, 131-162.

Eisenmann, T., G. Parker, and M. Van Alstyne (2011): Platform Envelopment, Strategic Management Journal 32, 1270-1285.

Hagiu, A., and Wright, J. (2020): Data-enabled learning, network effects and competitive advantage, mimeo.

Inoue, Y. (2019): Winner-Takes-All or Co-Evolution among Platform Ecosystems: A Look at the Competitive and Symbiotic Actions of Complementors, Sustainability 11, 726.

Jeon, D.-S., and J. P. Choi (2021): A Leverage Theory of Tying in Two-sided Markets with Non-Negative Price Constraints, American Economic Journal: Microeconomics, forthcoming.

Nalebuff, B. (2000): Competing against Bundles, available at SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=239684.

Parker, G., and M. Van Alstyne (2008): Managing Platform Ecosystems, ICIS 2008 Proceedings, 53.

Shankar, V., and B. Bayus (2003): Network effects and competition: an empirical analysis of the home video game industry, Strategic Management Journal 24, 375–384.

Stummer, C., D. Kundisch, and R. Decker (2018): Platform Launch Strategies, Business and Information Systems Engineering 60, 167-173.

Wan, X., J. Cenamor, G. Parker, and M. Van Alstyne (2017): Unraveling Platform Strategies: A Review from an Organizational Ambidexterity Perspective, Sustainability 9, 734.

Wernerfelt, B. (1984): A resource-based view of the firm, Strategic Management Journal 5, 171-180.

West, J. (2003): How open is open enough? Research Policy 32, 1259-1285.

White, A. and G. Weyl (2016): Insulated Platform Competition. Available at SSRN: https://ssrn.com/abstract=1694317 or http://dx.doi.org/10.2139/ssrn.1694317

Whinston, M. (1990): Tying, Foreclosure, and Exclusion, American Economic Review 80, 837-859.

Appendix

Here, we present a simple stylized model in spirit of Condorelli and Padilla (2020b). Rather than assuming that only one of the adjacent markets generates a positive externality for operation in the other market, we suppose that both adjacent markets have this property. Further, these adjacent markets are dominated by a single platform, and each of the platforms contemplates entry into the other's market. There are no asymmetries in our setting.

In particular, there are two firms, G and F. At the outset, both G and F are monopolists in their respective "primary" markets, G and F. We call a primary market for firm i secondary for firm j.

No intervention

Firms play the following two-period entry game. In the first period, firms simultaneously decide whether to enter into their respective secondary markets. In the second period, competitive outcomes in both markets are determined.

Some outcomes can be treated as exogenous. We denote with π_i^j the non-negative profit that firm $i \in \{F, G\}$ (subscript) makes from competing with firm j in market j (superscript), gross of entry costs. If firm i remains a monopolist in its primary market, it makes profit π_i^i. A crucial feature of our analysis is that the presence in the secondary market confers an advantage (reflected in superior profit) in serving the primary one. We let π_i^{i+} denote i's profit from its primary market if it enjoys a monopoly position there and has an advantage gained from operating in its secondary market. Finally, we denote with $\pi_i^i(c)$ i's profit from its primary market if it faces competition but did not get any advantage from entry into its secondary market. Analogously, $\pi_i^{i+}(c)$ is i's profit from competing in its primary market while also getting advantage from entry into its secondary market.

The payoff matrix of the game can be represented by

	stay out	enter
stay out	π_F^F, π_G^G	$\pi_F^F(c), \pi_G^{G+} + \pi_G^F - f$
enter	$\pi_F^{F+} + \pi_F^G - f, \pi_G^G(c)$	$\pi_F^{F+}(c) + \pi_F^G - f, \pi_G^{G+}(c) + \pi_G^F - f$

Clearly, the "stay out" situation is preferred by both firms whenever $\pi_i^i > \pi_i^{i+}(c) + \pi_i^j - f$. This is a reasonable condition whenever entry is potentially pro-competitive, i.e. when the direct gain from entering the secondary market $\pi_i^j - f$ does not exceed the net effect on profit in the primary market $\pi_i^i - \pi_i^{i+}(c)$.

However, "enter, enter" is a unique subgame-perfect equilibrium of this game whenever $\pi_i^i < \pi_i^{i+} + \pi_i^j - f$, which holds for any non-prohibitive level of entry costs (i.e. when there is an entry opportunity). In other words, whenever the "data advantage" $\pi_i^{i+} - \pi_i^i$ is greater than the direct loss from entering the secondary market $f - \pi_i^j$ (which is negative if there is a direct gain from entry).

The equilibrium benefits consumers to the extent competition is effective: instead of two monopolized markets there are two competitive markets after entry.

Obligation to sell data

Now, suppose there is a data sharing obligation as envisaged, for example, by Condorelli and Padilla (2020a, p. 40-43). In our context, imagine that the gain from operating in the adjacent market comes from data collection. This allows creation of enhanced user profiles for both markets that enable the firm to offer better service and obtain higher profit in the primary market. With data sharing obligation, an alternative to entry in the adjacent market is to buy data from the incumbent in the adjacent market.

The payoff matrix in such regime can be represented by

	stay out	stay out and buy data	enter
stay out	π_F^F, π_G^G	$\pi_F^F, \pi_G^{G+} - p$	$\pi_F^F(c), \pi_G^{G+} + \pi_G^F - f$
stay out and buy data	$\pi_F^{F+} - p, \pi_G^G$	$\pi_F^{F+} - p, \pi_G^{G+} - p$	$\pi_F^{F+}(c) - p, \pi_G^{G+} + \pi_G^F - f$
enter	$\pi_F^{F+} + \pi_F^G - f, \pi_G^G(c)$	$\pi_F^{F+} + \pi_F^G - f, \pi_G^{G+}(c) - p$	$\pi_F^{F+}(c) + \pi_F^G - f, \pi_G^{G+}(c) + \pi_G^F - f$

We observe that the equilibrium in which both players choose "stay out and buy data" arise (and is also unique) whenever $\pi_i^{i+} - p > \pi_i^i$ and $\pi_i^j + p - f < 0$. The first condition has to be satisfied for the data sharing obligation to have any bite; the second condition is likely to be satisfied when entry cost is substantial and the purchase price of data is low. For example, if the purchase price is negligible ($p = 0$) and standalone entry would not be profitable ($\pi_i^j < f$), staying out and purchasing data is a unique equilibrium.

Therefore, proposed selling data obligation has a potential of removing competition rather than fostering it. Indeed, when $f - \pi_i^j \in [p, \pi_i^{i+} - \pi_i^i]$, this regulatory intervention will deter entry and essentially serve as a collusion device to share markets among competitors. Note that the range of parameters for which this result holds is especially broad whenever the price of data sharing is low and the data advantage is high (data from an adjacent market is an important source of value creation in the primary market).