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HARNESSING PLATFORM ENVELOPMENT IN THE DIGITAL WORLD

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ABSTRACT

We revisit the economics of "platform envelopment strategies," whereby a dominant platform (the enveloper) operating in a multi-sided market (the origin market) enters a second multi-sided market (the target market) by leveraging the data obtained from its shared user relationships. In particular, we analyze the logic and effects of "privacy policy tying," a strategy whereby the enveloper requests consumers to grant their consent to combining their data in both origin and target markets. This may allow the enveloper to fund the services offered to all sides of the target market by monetizing data in the origin market, monopolize the target market, and entrench its dominant position in the origin market. We conclude by considering a range of possible policy interventions that may serve to limit such potential anticompetitive effects, while preserving the efficiencies generated by conglomerate platforms.

JEL codes: *K21* (Antitrust Law); *L13* (Oligopoly and Other Imperfect Markets); *L40* (Antitrust Issues and Policies: General)

I. INTRODUCTION

In their seminal paper, Eisenmann *et al.* (2011) explained that entry in platform markets subject to network effects and high switching costs can occur in two ways[1]: first, by offering drastically new functionality (that is, through

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"*Quid rides? Mutato nomine et de te fabula narrator.* [Why do you laugh? Change only the name and this story is about you.]" Horace, Satires, 65–68 BCE famously quoted by Karl Marx in Das Capital, 1867. Das.

[1] See Eisenmann *et al*. (2011).

Schumpeterian innovation) and second, through "platform envelopment." They noted that

> *Through envelopment, a provider in one platform market [the origin market] can enter another platform market [the target market] and combine its own functionality with that of the target in a multi-platform bundle that leverages shared user relationships. Envelopers capture market share by foreclosing an incumbent's access to users; in doing so, they harness the network effects that previously had protected the incumbent.*[2]

Platform envelopment thus involves the combination or bundling of the entrant's functionality in the origin market with that of its new platform in the target market. The goal is to leverage shared user relationships and/or common components. For example, Google entered into mobile operating systems by bundling Android with Google Search, two separate platforms, in order to, among other possible goals, leverage the data generated by users of both platforms. Such data were effectively monetized through Google's online advertising platforms. This strategy allowed Google to fund its entry in a way that could not be replicated by other competitors and contributed to its eventual dominance of the mobile operating system market.[3]

Importantly, platform envelopment strategies are viable not only when bundling platforms that are complements but also when they are weak substitutes or are functionally unrelated. Google entered online display advertising by bundling DoubleClick's online display platform and its own online search platform, which were regarded as complements by many advertisers and weak substitutes by others.[4] It entered into the mobile operating system market by combining two functionally unrelated platforms. And it may, like Facebook or Alibaba, successfully penetrate retail banking by combining a payment system platform with its online advertising businesses (De la Mano and Padilla, 2018).

Eisenmann *et al.* demonstrated that "an entrant that bundles a complementary platform is most likely to succeed when the platforms' users overlap significantly [. . .] an entrant that bundles a weak substitute platform is most likely to succeed when bundling offers significant economies of scope; [. . .] an entrant that bundles a functionally unrelated platform is most likely to succeed when the platforms' users overlap significantly and when economies of scope are high." [5]

Focusing attention on the bundling of functionally unrelated platforms, Eisenmann *et al.* explain that in this case the multi-platform entrant may benefit when (a) component overlap is meaningful *and* cost economies of scope

[2] *Id*. page 1270.

[3] European Commission, Case AT.40099—Google Android, 18 July 2018. Case under appeal. Of course, Google's dominance was driven by many other factors, including the open nature of Android as well as the vast number of apps available in Google Play Store. See Cusumano *et al.* (2019)

[4] European Commission, Case COMP/M.4731—Google/DoubleClick, 11 March 2008.

[5] See Eisenmann *et al.*, *supra* note 1, pp. 1280–82.

are significant, or (b) user overlap is large *and* there are significant demand economies of scope (and thus users prefer to concentrate their purchases on a single supplier), or (c) user overlap is large *and* the entrant can exploit negative correlations in valuations across platforms to price discriminate more effectively.[6]

In this article, we consider alternative conditions under which bundling unrelated platforms are likely to be profitable. In addition to the scenarios (a)–(c) identified by Eisenmann *et al.* and listed above, we find that enveloping of unrelated platforms can be profitable even in the absence of "direct" economies of scope in demand and/or supply[7] and when there is no component overlap. We show that this may occur when a firm operating in multiple platform markets with a common user side engages in "privacy policy tying," that is, when the (conglomerate) firm's privacy policies in each of those platform markets request users to grant consent so that it can combine the data they generate when using its multiple platforms to improve its offerings in one or more of them.

In particular, we show how a platform monopolizing a multi-sided market where *user data* are monetized (the origin market) can profitably envelop another platform market with overlapping users (the target market) by tying its privacy policies in both platform markets to (i) combine the data generated by the common users in both markets without infringing the privacy laws and (ii) monetize such rich and difficult-to-replicate data in its dominant origin platform.[8]

In this case, user data contribute to create "reverse" economies of scope,[9] which can be profitably exploited by the dominant enveloping platform in the origin market. The combination of data across multiple platforms allows the enveloper to fund the services offered to all sides of the target market by monetizing that data in the origin market. As a result of this and its position of dominance in a key primary market, it may be able to monopolize the target market and entrench its dominant position in the origin market.

The enveloping platform's advantage does not lie in any "deep pockets," because both the enveloper and its rivals may have the same profitability. Rather it flows from the enveloper's first-mover advantage granted by its

[6] *Id.* p. 1281.

[7] That is, even in the absence of subadditivities in the cost function or of one-stop-shopping advantages.

[8] See Condorelli and Padilla (2020), for a formal stylised model where this result is established rigorously. The mechanism described in our paper can be interpreted as a form of "pre-emptive invention," related to those analysed in the seminal paper of Gilbert and Newbery (1982). Our ideas are also related to Economides and Lianos (2019). They consider that a dominant platform may exploit consumers by forcing them to share personal data from different sources by bundling such data with its own platform services. The authors argue that such an exploitative conduct can have exclusionary implications. See Economides and Lianos (2019).

[9] That is, economies of scope that originate from the combination of data in the origin and target markets *but* influence competition in the origin market.

established monopoly on a key origin market. In fact, in challenging a young rival in a data-ripe market, the dominant enjoys a commitment to compete toughly to monopolize the target market. This is so because leaving the data in the hands of the rival may in turn trigger its entry in the origin and more profitable market. Crucial to our argument is the competitive advantage resulting from the combination of data from unrelated markets; a combination that is facilitated by a strategy of tying privacy policies.

Platform envelopment strategies may explain why "competition in the digital sector today is heavily shaped by competition between large digital competitors (Bourreau and Streel, 2019, p. 4)."[10] Such strategies can distort competition and cause consumer harm. In particular, we discuss how this strategy can be used to protect the origin market from potential entry by more efficient competitors that operate (or may operate) in the target market. We illustrate the use of this enveloping strategy by reference to an actual case study.

Finally, we discuss possible remedies, including *ex post* antitrust intervention, *ex ante* business-line regulation, limitations on the ability to combine user data from multiple platforms, data sharing, and so forth, seeking to constrain the potential competitive and consumer harm created by platform envelopment while allowing these strategies when they are likely to be welfare increasing.

We discuss two regulatory solutions in greater detail. The first alternative is to mandate data sharing conditional on customer consent so that dominant platforms provide consistent application program interface in an interoperable form on terms parallel to FRAND licensing. Platforms with market power in well-defined origin markets would be mandated to grant access to other platforms to access a subset of their data, including personal data, if the individual or business in question decides so. Because data are "non-rivalrous" and, therefore, can be shared without losing them, data sharing is likely to have a small disincentive effect on the incentives to collect data. Meanwhile, the benefits of mandated access or data sharing are bound to be large since those data can be used to foster competition in many related and unrelated platforms at once. It follows that, unlike it may be the case with physical assets, patents, and other intellectual property rights, the trade-off between the short-term and long-term effects on competition and innovation points in favor of mandatory sharing.

The second option is to enhance the privacy protection offered by dominant, conglomerate platforms by limiting their ability to combine user data across their platforms regardless of user consent. Of course, a potential drawback of this policy is that it may limit efficiency by preventing the creation of large and rich databases that could be mined in the interest of consumers

[10] A search engine is therefore a multi-sided platform: It is more attractive to users if the search results are relevant, fast, and if the ads are well targeted; it is more attractive to advertisers, vertical search engines and web publishers the more users they gain access to.

and business users. We thus consider less stringent alternatives, which however may fell short of the objective of limiting the data superiority of dominant multi-platform conglomerates.

The remainder of the article is organized as follows. In Section II, we provide a brief overview of the economics of platforms. This is a well-known topic; yet we believe it is important to ensure that the reader understands the basic principles and terminology used in subsequent sections. In Section III, we discuss the logic of platform envelopment. In Section IV, we particularize this discussion to consider platform envelopment strategies based on the combination of data from origin and target markets. We illustrate how such a strategy may work when the monetization platform (that is, the platform where the data are monetized) is an online advertising platform in Section V. In Section VI, we summarize the potential procompetitive and anticompetitive effects of such strategies, and in Section VII, we explore alternative ways to limit their possible detrimental effects on the integrity of the competitive process and consumer welfare. Section VIII concludes.

II. PLATFORM ECONOMICS: A PRIMER

Platform-mediated markets, or simply platform markets, consist of sets of users, individuals, or firms, whose interactions are subject to network effects, along with one or more intermediaries who provide platform facilitating users' interactions. Platform businesses are characterized by the existence of *within-group* and/or *cross-group network effects*. A communication platform (for example, a messaging app) is more valuable to consumers when the number of consumers that can be reached through that platform is greater. Such a platform features within-group network effects and constitutes an example of a one-sided platform. Amazon and Facebook were initially one-sided platforms. Instead, for example, an operating system platform (such as iOS or Android) links users with app developers. Users value the platform more, the greater the number of app developers and *vice versa*. Such a two-sided platform thus exhibits cross-group network effects.

Multi-sided platforms may have more than two sides. They enable two or more types of customers, who could engage in a mutually valuable exchange, to find each other through search and matching to transact, create, and exchange value. These platforms create value by reducing search frictions and transaction costs. Many businesses are based on multi-sided platforms—these include both tech platforms (for example, Google Search) and traditional firms (for example, physical newspapers and magazines). A one-sided firm turns inputs into outputs and sells them onto customers. Instead, a multi-sided platform recruits one type of customer and makes those customers available to another type of customer. Customers on either side of the platform are the inputs, and the output sold to each side is access to customers on the other side.

In some cases, a platform market may be two-sided, with one side experiencing mainly within-group network effects and the other side cross-group

network effects. This is the case, for instance, of social network advertising platforms. In platforms such as Facebook or Twitter, there is one user side, usually populated by individuals, that receives value mainly through interaction with users on the same side. There is also an advertiser's side, populated by firms, whose value from using the platform increases the larger is the pool of users, but is not positively affected by the presence of other advertisers.[11]

A. Network effects, feedback loops, and chicken-and-egg problems

Platforms may feature membership and/or usage externalities.[12] A (positive) *membership externality* exists when the value received by a member of one side increases with the number of members on the same or another side. In the case of social networks, users benefit from being able to reach out to a larger number of users. As another example, consumers benefit more from a restaurant reservation platform if they have more restaurants to choose from when making a reservation. This is a traditional indirect network externality. A (positive) *usage externality* exists when the members of a group benefit when members of the same or the other group intensify their use of the platform. For example, users of a social network may benefit when other users post additional content.

Because for multi-sided platforms the demand by one customer group depends on the demand by the other customer group, they need to have both sides on board to create value for either side. But neither type of participant will join if the other type of participant is not already on board. This gives rise to a so-called chicken and egg problem (Caillaud and Jullien, 2003).

B. Pricing in multi-sided markets

To address the chicken-and-egg problem, platforms set prices for each side in a coordinated fashion (Rochet and Tirole, 2003). Setting a price on one side that is too high will reduce the number of customers on both sides of the platform. Platforms will thus choose their price structure considering both the price elasticity of each side and the magnitude of the externalities or network effects linking both sides. Hence, the profit maximizing price on one side may fall below its marginal cost. It may be zero or even negative. This is true in theory and in practice. The side where prices are below cost is known as the *subsidy side*, whereas the other, from which the platform derives its revenues, is the *money side*.[13]

[11] This also suggests that network effects may, in fact, be negative. This is the case of social network users who may not like advertising, even if advertisers are attracted by the number and quality of the audience.

[12] An externality arises when someone accrues a benefit (or a cost) as a result of the decision of others that have not been contracted upon by this other party.

[13] In some cases, both sides are charged a positive price but often below the prices offered by one-sided competitors. For example, Apple charges both app developers and consumers.

C. Competition and multi-homing

The intensity of competition among platforms normally depends on whether customers single- or multi-home. Customers "single-home" when they use only one platform and, as a consequence, restrict themselves to interact only with the customers on the other side of that platform (for example, many consumers use a single search engine). Customers "multi-home" when they use two or more platforms and therefore can access customers on any of the platforms they use (for example, many people go to multiple shopping malls or join several social networks). Whether there is multi-homing or not will often depend on how costly it is for users to do so. For instance, multi-homing is likely to be present if to use two different services it is sufficient to install two different apps. In other cases, such as when contracts have to be signed, multi-homing might be less common.

When customers single-home, competition for them is intense, because the platform they use has a monopoly on accessing them.[14] This bottleneck can lead to low prices for single-homing customers. They are likely to be subsidized. When customers on one side of the market single-home, customers on the other side are likely to multi-home (if they want to reach out to all the other side customers). Each platform may then be able to charge more to the multi-homing side. In other words, the single-homing side may benefit more than the multi-homing side, though both sides may benefit if multi-homing produces an expansion of demand on both sides of the platform (Armstrong, 2006; Belleflamme and Peitz, 2015; Hagiu and Wright, 2015; Belleflamme and Peitz, 2017).

III. PLATFORM ENVELOPMENT STRATEGIES

As mentioned, the notion of platform envelopment, first introduced by Eisenmann *et al.* (2011), refers to the entry of a platform with market power (in an origin market) into another platform's market (the target market). [15] For the purposes of our discussion in this article, we focus on envelopment strategies where the two platform markets have in common at least one side of the market with overlap among potential users. Normally, although not always, the enveloper ties its own services in the origin market with those offered in the target market. We will focus on product tying strategies of this sort in this section, while we discuss envelopment through privacy policy tying in Section IV.

Due to the network effects discussed in the previous section, competition in platform markets tends to be characterized by *winner-take-all* battles for

[14] This is not just a question of customers' behaviour. For some platforms, there is no choice for users. For instance, the OS is always associated to the device. So, a user can never multi-home. There are platforms that are by nature single-homing.

[15] See Eisenmann *et al.*, *supra* note 1.

dominance. Often, as Evans and Schmalensee (2002) put it, these battles are fought "through R&D competition to develop the 'killer' product, service or feature that will confer market leadership and thus diminish or eliminate actual or potential rivals." Platform envelopment provides a complementary theory on how dominance can be achieved. It suggests that platform markets often evolve, not through Schumpeterian innovation (that is, though the addition of new functionalities to existing products or the launch of totally new products or services), but rather through the leveraging of market power, user base, and resources into a target market by a platform who is already successful in another platform market (the origin market).[16]

According to Eisenmann *et al.*, platform envelopment has had a major role in shaping the ecosystem of platform-mediated network industries.[17] Looking at a time horizon of just a few years, they identified more than 40 cases of envelopment. Early examples include Microsoft entering the streaming media and browser markets, at the time dominated by Real Media and Netscape, respectively. Microsoft entered by bundling Windows with its new products, Windows Media Player and Internet Explorer, which at the outset were arguably inferior to those provided by the incumbents. Nonetheless, Microsoft quickly managed to conquer those markets and drive out the rivals. More recent envelopment cases involve online advertising platforms. The number of what we could classify as envelopment attacks conducted by Google is hard to keep track of. They include entry in several diverse markets, such as the market for operating systems (through Android), browsers (through Chrome), social media (through Google +), maps (through Google Maps), and payments (through Google Pay). Analogously, Facebook has entered, among others, the market for classified ads (through Facebook Marketplace) and dating (through Facebook Dating).

Broadly speaking, we say that two products sold in different platforms are demand-side complements if the value that customers attach to jointly consuming both products is higher than the sum of the values from consuming them separately. Otherwise, we say that the two products are independent or unrelated. A special case of complements is that of "system goods," that is, two or more goods that are always consumed in fixed proportions or not at all.[18] As we mentioned in Section I, while envelopment is most commonly successful when the products in the origin and target platform markets are complements (for example, operating systems and applications), it also occurs in cases where

[16] A third strategy to market dominance, which we do not discuss in this section, involves mergers and acquisitions.

[17] This is not to say that Schumpeterian innovation has not played any role. In fact, we have many examples of new companies taking over platform markets through killer innovation.

[18] Abusing the terminology, we will also speak of system goods when the primary product can be consumed separately but the complementary product is only valuable in conjunction with the primary one.

the products are weak substitutes or even unrelated (for example, mobile operating systems and PC search engines).

The objective of this section is to revisit the theory of platform envelopment with tying from a competition economics angle. The aim is to discuss a number of economic motivations for engaging in envelopment, with a focus on the leveraging of market power, which may represent a concern for competition authorities and courts.[19] In particular, we look at economic incentives that may make entry especially more convenient for the enveloper, a platform who is dominant in a related market, relative to a generic entrant firm with no prior platform operations. We will distinguish between static incentives and dynamic incentives, where the latter represent incentives that operate through a change in market structure. Of course, several incentives may simultaneously play a joint role in shaping entry decisions.

A. Forms of envelopment

Entry in the target market is typically accompanied by behavior that could be broadly characterized as "tying," that is, the concerted selling of two different products. For our purposes, we will distinguish between three types of common tying strategies employed in envelopment: bundling, virtual bundling, and self-preferencing.

1. Bundling

In entering the target market, the enveloper might decide to sell the products or services in the origin and target platforms to its overlapping customer base as a bundle, rather than separately. We speak of *pure bundling*, when the two products are only offered for sale jointly. We speak of *mixed bundling*, when the two products are also sold individually, in addition to being sold as a bundle. Envelopment through bundling is the most common case of envelopment among those surveyed by Eisenmann *et al.*

Bundling is accomplished either by product design or contractually. It is achieved by product design, when several products or services are combined by the seller into a single product that is impractical to unbundle or to reproduce from purchasing its components in isolation. For instance, a video editing software may be designed to also provide photo editing services, but, *ex post*, it would be very costly for the software company to unbundle the software and produce two separate applications.

Contractual bundling, which is instead more easily reversible, occurs when two products are kept separate but purchasing a product commits the client to also acquire a different one. As an example of envelopment followed by

[19] The list of incentives we discuss is not exhaustive. For instance, we do not consider motivation for conglomerate activities related to capital market imperfections, which may in practice play a role.

contractual bundling consider Google entering the news aggregation market. Google News, launched in 2002, is a service that links directly to selected articles by various publishers. Despite the concern raised by some publishers, Google required publishers that want to appear in its search results to also accept inclusion of their material into Google News (Edelman, 2015).

The distinction above pertains to the ease of unbundling on the supply side. It is relevant when it comes to evaluating how strong the commitment of the enveloper is to the bundling strategy. Instead, we say that consumers can undo the bundle if it is possible for them to unbundle the package sold by the enveloper and combine the origin (or primary) product with the target product of a different producer, while still enjoying the complementarities arising from joint consumption of both products.[20]

2. *Virtual Bundling*

The enveloper might enter the target market without linking the origin and target products or services explicitly. Even if each product is sold separately, price coordination might still achieve some or all the effects of tying if the products exhibit complementarities (for example, when consumers prefer to concentrate their purchases of interoperable software from a single supplier due to bundled discounts). Following Carlton and Waldman (2002), we speak of "virtual bundling" when this is the case.

This point is more easily seen in the case of *system goods*, where both products have no value unless consumed jointly, and when consumers can undo ties. (Consider, for example, the Android mobile operating system and a Google phone.) Then, quite generally, an enveloping platform (that is, the enveloper) that is dominant in the origin market achieves the same outcomes if it bundles the origin and target products together and sells them at a unique bundle price *or* if, instead, it sells the origin product at the bundle price and offers the second product for free (or possibly at a negative price).

3. *Self-Preferencing*

In some cases, the enveloper expands into a target market that is mediated by its own origin platform. For instance, when Amazon enters a market whose products are sold through its own website, Google offers an online service that is mainly accessible through its search engine; or Microsoft develops a software that competes with other software that can only be sold if it enjoys Windows interoperability.

What all these examples have in common is that the terms of trade in the target market, including the possibility of trade, are affected by the behavior

[20] Absent complementarities, whether consumers can undo ties is broadly irrelevant, to the extent that consumers can just avoid consuming either product in the bundle.

of the enveloping platform in the origin market. Hence, the enveloper might enter the target market and, at the same time, bend the origin platform's rules to provide a better outcome for its own products or services. This practice has been referred to as *self-preferencing* in a recent EU case.[21]

To provide a more concrete example, consider Google's conduct in search. Google provides special treatment in its search to many of its own services. In some cases, this is done in an obvious fashion: When someone search for an address, Google Search provides a box on the top right of the screen with a link to Google Maps that also includes a snapshot of the desired map, while results from competing map providers are only displayed as standard search results (blue links) below the box. In other cases, the self-preferencing behavior is more subtle. When Google entered the comparison-shopping services, it started favoring the shopping search results offered by its own comparison-shopping service over those of competitors in the organic portion of the search engine research page or SEPR. The promotion of Google's comparison service was accompanied by a demotion of competitive ones.[22] However, unless one possesses detailed information about Google's ranking algorithm, such a strategy is practically impossible to detect.

When looking at it from a competition policy perspective, we can see self-preferencing as a practice involving tying in one side of the market, which also manifests itself as vertical restraint in another side. For instance, in the case of Google Maps, consumers are offered the bundled product of search and maps, while on the advertiser side Google offers the advertising input (that is, access to Google's search engine research page) on non-equal grounds to its own subsidiaries and to competitors.

B. Static incentives to envelopment

A platform may decide to expand from its origin market to other platform markets for a variety of reasons even when its entry is unlikely to change the market structure of the target markets.

1. Supply-Side Economies of Scope

The possibility of cost savings or increases in product quality or, more generally, of shifts in its production function stemming from expanding the scope of the firm, will make expansions into new platform markets by the enveloping platform more attractive, *ceteris paribus*, than it would be otherwise. Following the traditional definition by Panzar and Willig (1981), there are economies of scope where "it is less costly to combine two or more product

[21] European Commission, Case AT.39740—Google Search (Shopping), 27 June 2017. Under appeal.

[22] *Id.*

lines in one firm than to produce them separately."[23] Often, this is the case if the assets that the enveloper uses to produce in the origin market are not being used at scale or full capacity and can be usefully deployed in the target market, or when there are learning by doing/asset sweating advantages.

Economies of scope tend to be stronger for tech platforms than they are for traditional companies. We argue this is due to their reliance on three specific asset classes: software, consumer relationships, and user data.[24] First, thanks to modular programming, platforms are often able to reuse big chunks of software in different projects. Sometimes, the same software can be used to supply services for two different platforms. For instance, Facebook and Instagram advertising can be purchased using a single online facility. Second, if the user bases of the origin and the target market overlap considerably, the enveloper might be able to leverage its user relationships and reputation to minimize customer relationship costs and the cost of marketing activities. Finally, data that have been collected in the origin market can be reused to provide services in the target market and *vice versa*.

Economies of scope may arise independently of whether bundling takes place or not. Nonetheless, the decision to bundle may further enhance them. For instance, through bundling, firms may save in consumer acquisition and marketing efforts by having a single campaign for the bundled product. Or, through integrated design, they may more easily leverage shared components (Evans and Salinger, 2005, 2008).

2. *Demand-Side Economies of Scope and Business Ecosystems*

We have defined supply-side economies of scope as shifts in the production function that take place when the scope of the firm is extended. An analogous concept can be defined for changes to the demand function. We speak of demand-side economies of scope when expanding the scope of the firm generates a shift in demand. Positive economies of scope raise the value that consumers attach to consuming the origin product or, more frequently, to consume both the existing and the new product jointly.

Economies of scope in the supply side make entry more convenient for the enveloper if it can appropriate part of the cost savings, which is likely to be the case if the markets where the enveloper operates are not perfectly competitive. The same logic applies to demand side economies of scope. Normally,

[23] See Panzar and Willig (1981). Economies of scope also manifest themselves as the ability to produce higher quality products at the same cost. In general, economies of scope represent a positive shift in the production function.

[24] These are termed as "key shareable assets" by Bourreau and de Streel (2019). All these assets may be equally important, in principle. Yet in this paper, we will focus specially on the latter, given that it has received much less attention in the economics literature and, as we explain in detail below, its impact on market outcomes is likely to be as significant as the impact of the other two.

substantial demand-side economies of scope arise from the introduction of entirely new products or services, for which no close substitutes are available, when they can be used in conjunction with the origin product. For instance, the invention of consumer printers increased the value of personal computers. Nonetheless, synergies can be relevant also in cases of envelopment, where entry is into a market where an incumbent product already exists.

According to theories that emphasize "one-stop shopping," consumers may benefit from a reduction in transaction costs when both products are sold by a single firm (Klemperer and Padilla, 1997).[25],[26] Lower transaction or shopping costs may come in various forms. For instance, consumers may prefer having a single bill to keep track of or they might be especially keen in learning as little as possible about how to use a new product. This latter idea might, for example, explain why people tend to use several products within the Microsoft Office Suite, as opposed to procuring each software in isolation from different producers.

Other authors emphasize the ability of tech platforms to produce business ecosystems where interconnectedness among products becomes relevant for consumer choice (Jacobides *et al.*, 2018). For instance, Apple consumers tend to prefer Apple products because of the feel they have for the user experience and their expectation that further Apple products will be designed to interoperate smoothly with the existing ones.

3. *Price Discrimination*

Even in cases where the available surplus is not substantially affected by economies of scope, entry in the target market may nonetheless allow the enveloper to extract a larger share of consumer surplus than what two independently operating platforms would be able to.

We distinguish three channels through which this may happen: *third-degree price discrimination* (that is, offering different prices to different consumer groups), *discrimination across sides of the market* (that is, optimizing the price and matching structure in a multi-sided market), and *second-degree price discrimination* (that is, offering different prices for different selling conditions), typically performed through bundling.

The first and second channels operate through the enveloper's acquisition of data in the target market and therefore apply primarily to envelopment with "privacy policy tying" and will thus be discussed in detail later (see Sections IV and V below). The third one relies specifically on real bundling and is discussed next.

[25] See also Chen and Rey (2019) for a related theory of conglomerate mergers.

[26] Transaction costs may actually be lower, or consumers may perceive they are lower even when that is not necessarily the case.

At least since Stigler (1968), economists have recognized that bundling may serve as an effective tool for second-degree price discrimination (Adams and Yellen, 1976). In some circumstances, entry followed by bundling might increase the surplus that the enveloper is able to extract from consumers, as opposed to what an independent platform would obtain entering the target market only.

To understand how bundling can improve a seller's profit, let us henceforth focus on the case of a monopolist in two markets who can bundle its two products A and B.[27] First, observe that variability in consumer valuations reduces the ability of the monopolist to extract consumer surplus. To see this point, consider a simple example of a market populated by two consumers, one with a high valuation for the monopolist's product, equal to €100, and another with a low valuation, equal to €50. The average valuation on the market is then €75. If the monopolist is not allowed to price discriminate on the basis of the consumer identity, or, simply, it is not able to distinguish them, then it must offer a single price to both. The monopolist can then either set a price of 50, in which case it will sell to both consumers, or set a price of 100 and only sell to one consumer. Either way, the monopolist makes 100, leaving surplus of 50 on the table. It would therefore prefer two consumers with valuation equal to 75.

So, if bundling can reduce heterogeneity in valuations, it can help the monopolist to earn greater profits. As it is easy to see, this advantage is especially strong when the values of the tying and tied product are perfectly negatively correlated and disappears with perfect positive correlation. In the context of the numerical example above, suppose that the monopolist introduces a second product, which the first consumer values at €50 and the second at €100. Thus, by selling the two products as a bundle at price 150, the monopolist can extract the full consumer surplus in both markets.[28],[29]

C. Dynamic incentives to envelopment

Envelopment may also have *foreclosure effects*. That is, it may result in a market structure with fewer competitors, favorable to the enveloper. Despite the potential unlawfulness, the advantages conferred by successful foreclosure are

[27] As shown in Nalebuff (2004), the price-discrimination advantages provided by bundling remain true also if the tied product market is not monopolistic, although they are normally surpassed in magnitude by the dynamic ones that we will describe in the next section.

[28] Note that the monopolist would still find (weakly) convenient to produce the second product even it costs €100. Therefore, bundling also may entail an inefficiency to the extent that some consumers will receive the second product even if they value it less than what it costs to the producer.

[29] The logic outlined above extends widely and profits can be even higher if the monopolist is able to use mixed bundling, that is, selling the two products also individually. McAfee *et al*. (1989) show that a monopolist generically does better by (mixed) bundling even when valuations of products are completely independent and the products are not complementary.

substantial. Hence, we will treat potential foreclosure as a further incentive for envelopment.

We distinguish between two forms of foreclosure: First, *leveraging market power*, that is, using the market power in the origin market to drive out competitors from the target market to acquire market power and extract profits in that market. Second, *protecting market power*, that is, protecting the origin market, where the enveloper holds market power, from potential entry by competitors that operate in the target market.[30]

1. The One Monopoly Profit "Theorem"

Before discussing how platform entry with tying of platforms, that is, envelopment, may lead to foreclosure, it is instructive to begin by rehashing the classical argument, attributed to the Chicago School, as to why tying cannot be a way to leverage market power from monopolistic to otherwise competitive markets (Posner, 1976). For the case of independent products, the argument goes as follows. If the origin market is monopolistic, then the enveloper is already extracting the entire consumer value generated by consumption of the origin product. This implies that the price cannot be raised further as, at the prevailing price, consumers are indifferent between buying the origin product or not. On the other hand, if the target market is perfectly competitive, by purchasing the second product at marginal cost, it is consumers who appropriate all the gains from consumption of that product. It follows then that consumers will never pay for a bundle of the two products more than what they are paying already for the origin product plus the marginal cost of producing the second product, if the second product remains available individually at the competitive price. If the bundle price was higher, then they would just buy the second product in the competitive market. Hence, as the argument goes, as long as firms have already sunk their investments, are producing at marginal cost, and there are constant returns to scale (hence lower demand does not increase their costs), entry with bundling by the monopolist cannot have any effect on the market structure in the target market.

For the case of complements, and in particular for the case of "system goods," the logic is more robust.[31] Since the added value of consumption of the two system products can be fully extracted by using the price of the good sold monopolistically, while pricing at cost the competitive complement, there would no point in bundling even if the monopolist was able to monopolize the target market. In fact, a higher price, or worse products available in the target market, would reduce the demand for the system good, thus ultimately

[30] We do not discuss *predation*, by which we mean attempts of driving out competitors from a single market.

[31] We remind the reader that these are goods for which consumers derive value from the entire system of components (as for example, mutually compatible charging systems and vehicles, or hardware and software), also known as strict complements.

reducing sales of the monopolistic product and therefore the enveloper's profits. For system goods, there really is, as it has been said by various authors, only one monopoly profit to extract. Hence there is no point in leveraging market power.

2. *Foreclosure of the target market through tying*

Whinston (1990) was the first to formally observe, for the case of unrelated markets, that, when we depart from the assumption of constant returns to scale and a competitive target market, committing to sell a bundled product may reduce competitors' profits and thus make their continued operation unfeasible. Whinston argued that because the missed sales on the monopolistic product arising from bundling are particularly damaging to the enveloper, bundling will force the enveloper to price more aggressively in the target market. Increased price competition will tend to reduce the profits of the incumbents in the target market, potentially making them unprofitable if there are increasing returns to scale. At the same time, it will also deter further entry. Hence, as the theory goes, the monopolist in the origin market could be able to leverage its market power into the target market through bundling.

Whinston's argument appears especially relevant for platform markets. In Whinston's analysis, the ability of the enveloper to reduce competitors' profits stems from their production technology being characterized by economies of scale. This is indeed a natural assumption in platform markets, where a reduction in scale can have substantial negative consequences due to network effects.

It should be remarked that commitment to bundling before entry, for instance achieved through product design, is key to the argument above. Absent commitment, firms in the target market might not find the strategy of the enveloper credible. That is, unless the enveloper can achieve substantial static gains from doing so, bundling is normally unprofitable for the enveloper given the presence of competition.

Another, perhaps more subtle, reason why an exclusionary strategy may work in platform envelopment cases is highlighted by Amelio and Jullien (2012) and Choi and Jeon (2018).[32] As we have previously discussed, in platform markets, the competitive price on one side might be a negative one, due to indirect network effects and heterogeneity in the elasticity of demand across sides (that is, the optimal pricing policy for the platform might require providing a subsidy to one side of the market). However, implementing a negative price (for example, providing a subsidy to consumers) could be impractical or illegal. In this case, competition between platforms can bring the price down to zero, but not lower. Indeed, we observe a zero price for many platform products, including search engines and social networks, which

[32] Caffarra and Etro (2017).

only monetize on the advertiser side of the market. In this context, Choi and Jeon argue that bundling might help the enveloper circumventing the non-negative price constraint and result in foreclosure. In particular, the enveloper can offer additional value to customers in the target market, through bundling, thus defying competition by other platforms that only operate in the target market. Crucially, bundling is beneficial to the enveloper even if it does not force competitors to exit. Hence, in these circumstances, commitment is not essential for envelopment through bundling to have foreclosing effects.

3. Foreclosure of the Target Market through Self-Preferencing

The exclusionary strategy described above operates through tying of the origin product with the target product. It is not obvious, however, whether the same incentives are in place for self-preferencing. When participating in the origin market is necessary to operate in the target market, the theory of harm expounded above has less bite. In fact, in the vein of another classical Chicago School critique of vertical foreclosure, the enveloper should be able to monopolize the target market by applying appropriate pricing conditions to the platforms that operate in it, rather than foreclosing rivals while entering with a possibly inferior product.

Nonetheless, incentives to foreclose through self-preferencing might still be present, as in the case of vertical foreclosure, when the enveloper is unable to fully control surplus extraction in the downstream target market. For instance, in some cases, it will be possible to make an argument akin to that developed in Ordover *et al.* (1990). Potential for platform competition in the origin market, or an oligopoly market structure, might make the enveloper unable to fully extract rents from the downstream market. Hence, by self-preferencing, the enveloper may raise the cost of its rivals in the target market,[33] thus potentially increasing the market price and the enveloper's profit in the target market or, possibly, leading competitors to exit the market.

4. Protecting Market Power in the Origin Market

In addition to leveraging market power, envelopment might also help to protect market power in the origin market. As we have outlined above, when the origin and target products are complements, especially when they are system goods, it is unlikely that foreclosing the target market might result in higher profits to the enveloper in the long term. Nonetheless, as various authors have argued, bundling as an exclusionary strategy might still be useful to the enveloper if it helps to prevent entry in the origin market.

[33] Forcing them, for example, to distribute their products through more costly or less attractive distribution channels.

In particular, Carlton and Waldman (2002) argued that bundling the origin and the target products may serve to deny scale to a firm operating in the target market who may, in a subsequent period of time, enter the origin market. If consumers demand system goods, tying (either virtual or real) has the effect of completely foreclosing the rival. As we have showed, this will tend not to be profitable for the enveloper. However, if due to economies of scale or scope, entry in the target market makes future entry in the origin market possible; then the enveloper has a strategic incentive to foreclose even in the case of system goods.[34]

One possibility, which is especially relevant in the case of platform markets, is that of network effects in system goods. In particular, by bundling the two products or services, the enveloper makes it harder for the firms operating only in the target market to build a critical mass of consumers. Therefore, it makes entry in the origin market more difficult (assuming of course that competitors in the target market are potential competitors in the origin market). This argument was used by the U.S. Department of Justice in their case against Microsoft.[35] According to this theory of harm, acquiring a critical mass of consumers in the browser market would have led developers to write Java programs that operated within the browser system. In turn, the availability of apps and users would have made it possible for a company with a dominant position in the market for browsers to develop an operating system that would have enjoyed the necessary critical mass of users and developers.[36]

To conclude this section, we present a second argument, put forward by Choi and Stefanadis (2001), for why entry with bundling, especially if it results in foreclosure of the target market, may serve to protect market power. The key observation is that entry is often risky. That is, for instance, to enter the market, a firm might need to invest in R&D, but ultimately it is not certain of being able to produce a valid innovation. If this is the case, then bundling by the enveloper increases (non-additively) the overall risk of entry, thus reducing the value of succeeding in any given market, as success in a single market is not sufficient to allow the entrant to recoup its fixed costs.

To see this point, assume that the probability of having a successful innovation in each market is one-half and that the fixed costs of entry are equal to F in both markets. Now consider two cases. First, assume that the enveloper does not bundle its products and that entry in any of the two markets produces

[34] A related argument emphasizes that, even if entry in the origin market cannot be deterred, the enveloper would still benefit from a monopolized complementary market. See Fumagalli and Motta (2019).

[35] See United States v. Microsoft Corporation, 253 F.3d 34 (D.C. Cir. 2001).

[36] As in Whinston (1990), the benchmark argument in Carlton and Waldman (2002) requires the enveloper to be able to commit to bundling, as bundling entails a loss if entry takes place, and therefore it is not credible. However, this is not necessarily the case in the presence of network effect or when economies of scope, for instance due to the pooling of data, make bundling advantageous despite entry.

profit equal to $2F$. Then, a risk-neutral firm would be willing to sustain the cost of entry in both markets, expecting a total profit equal to zero. However, if the enveloper decides to bundle, then the entrant will make an expected negative profit from trying to enter both markets. In fact, it will pay $2F$ in fixed costs while receiving $4F$ only with probability one-fourth, thus expecting a loss of $-F$. In light of this, entry will take place without bundling, but not if the enveloper decides to bundle. Again, commitment by the enveloper is needed for this argument to work, unless economies of scope make bundling convenient regardless of entry.

IV. ENVELOPMENT BY PRIVACY POLICY TYING

The platform envelopment strategies discussed in the previous section are not novel. Many of them concern complementary platforms, such as operating systems and browsers and media players or search advertising and display advertising platforms; or platforms that are weak substitutes, such as social media and instant messaging platforms or and search engines and vertical search engines (for example, comparison-shopping sites).

In this section and the following one, instead, we focus on a different envelopment strategy, involving potentially unrelated platforms with overlapping users, where the enveloper operates a platform that monetizes user's attention by means of user data. We denote as "privacy policy tying" 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 purposes. As we envisage it, the enveloper's goal is to monopolize the data generated in the target platform and combine it with those in the origin platform to monetize the combined data (the static incentive) and obtain an insurmountable data advantage in the origin platform market (the dynamic incentive).

To begin with, we take a brief detour to discuss the economics of data and the role of privacy policies as an instrument to extract and manipulate data.

A. The economics of data

In the last decades, we have witnessed a tremendous decrease in the cost of storing, processing, and transmitting information. Casual evidence suggests that the cost of data storage has gone down from $1 M per GB in 1967 to $0.02 per GB in 2017. Analogously, the cost of data processing has gone down in the same period from billions of dollars per GFLOPS (giga floating point operations per second) to $0.03.[37]

As we would expect, when the cost of an input decreases, its use increases. An indication of the growth in the use of data can be provided by looking at the

[37] For back of the envelop calculations, see http://www.mkomo.com/cost-per-gigabyte.

amount of installed (digital and analogical) storage and processing capacity. Some estimates suggest that storage capacity has passed from 2.6 (optimally compressed) exabytes in 1986, when storage capacity was mostly analogic, to 295 exabytes in 2007. Analogously, the installed computational capacity has gone from 0.06 MIPS (millions of instructions per second) per capita in 1986 to 968 MIPS in 2007, showing a whopping 58% annual growth (see Hilbert and López, 2011 for more information).

While the cost of storing and transmitting information has decreased enormously, the cost of collecting, polishing, and turning data into information remains high and requires substantial investments. Observing data on user behavior, and especially being able to run experiments on them to generate relevant data, requires providing users with a product or service that they are willing to use. The scope for observing user behavior has kept up to speed, given the ample digitalization of traditional markets and the emergence of new online markets. Activities that were difficult to capture in the past, such as listening to specific music, are now widely tracked.

Of course, data need not be always directly collected. They can be also bought from third parties. Or data-aggregator companies using proprietary datasets can, in some cases, replicate the prediction services that could be obtained in-house through data collection. There are many examples of commercially available datasets and data services.[38] However, it is important to remark that there are limitations to the value of third-party data. For example, they may be effective to achieve an efficient targeting of consumers on the advertising side (see Section V), but they are normally ineffective for improving the products or services that platforms provide to consumers in exchange for their attention.

Platforms may, in some cases, obtain individual-specific datasets directly from consumers or from other platforms thanks to *data-portability* provisions. That is, for instance, consumers may be able to export their data from a platform and import them into another. To date, many platforms have been reluctant to volunteer portability of their data. While, in Europe, privacy regulation, GDPR, mandates a general right to portability of personal data, it is still unclear whether new-entrant platforms will be able to benefit from it. They may not, since the right is for individuals to demand their own data in a standard format, but not an interoperable format. And, furthermore, new entrants may not be able to use the data thus obtained other than for the specific purpose for which it was collected.

As may be obvious from the previous discussion, a particularly important type of data is "user data," that is, the data that platforms collect and store about their users' characteristics or behavior. Any categorization of user data may appear somewhat arbitrary. Nonetheless, for our purposes,

[38] For instance, LiveRamp (formerly known as Acxiom) and Datalogix are companies that provide such services.

a first important distinction should be made between datasets that contain *individual-level data* from those that do not. Tracking users with individual identifiers allows platforms to formulate predictions based on the user's past behavior.[39] Platforms that do not track users, instead, must rely only on contextual information (that is, the information provided by the user in the specific observed session) and population-wide data about behavior.[40]

A second relevant distinction between data types is the level of *intentionality and awareness* with which they are contributed by users. At one end, there are data that are explicitly volunteered and whose intended use is largely understood by users themselves. For instance, data that platforms require at sign-up (for example, name, email, date of birth, and so forth). At another extreme, there are data that users are often unaware the platform is even collecting and that they provide unintentionally, such as, for example, a full record of the location of the mouse pointer within the screen while they are browsing or the constant tracking of their location through the phone's GPS. In general, however, user data will lie somewhere in this spectrum.[41]

A third and last important distinction, especially from a legal standpoint, must be made between *personal and anonymous data*. In short, personal data allow direct or indirect identification of individual persons, anonymous data do not. The list of personal data includes health records, photos, national security numbers, and so forth. However, according to the definition given, what stands for personal data may depend on the context. For instance, first names of users should not be considered personal data if recorded in isolation. They become personal data when accompanied, for instance, by date of birth and address.[42]

There is no doubt that user data are essential to provide a good product or service to consumers and, therefore, to retain and acquire a large user base to begin with. Data generated by running experiments on consumers are essential to test new product designs and are often hailed as the key to a start-up's success.[43] Naturally, users may benefit when platforms use their data to provide a better product. However, this need not be always the case. Sometimes, the reduction of information asymmetries produced by the

[39] Tracking is usually achieved by means of cookies, explicit user login or, through more complex inferences. For instance, it is known that Facebook is able to identify its users even when not logged in, when they visit a third-party site that contains Facebook's code.

[40] This difference is best explained by means of an example involving two search engines. One, Duck-Duck-Go, does not store users' past information. Therefore, it must provide recommendations based only on the query made by users in that specific session and on the aggregate data it has about how consumers who have made similar queries have responded in the past. Another search engine, Google, uses past searches from the user to improve its performance.

[41] For instance, a social network user might volunteer a written piece with the aim of sharing it with friends but may not be aware that it will be subject to textual analysis with the objective of identifying the sex of the user.

[42] Personal data can in principle be used in an anonymized way.

[43] See Ries (2011), on how A/B testing is crucial for the success of early stage companies.

disclosure of user data to the other side of the platform, rather than benefitting consumers, reduces their surplus. For instance, user data may allow sellers in an online market place to estimate precisely the user willingness to pay for a product and therefore ask a higher price than they would have asked having no information. While, in general, price discrimination might be welfare enhancing, this need not to be always the case and typically will not be the case when output falls as a result. In those circumstances, consumers may lose money overall from providing information about themselves.

Because the informative content of a dataset increases with its size and richness, platforms usually collect as much relevant data as possible, within the limits posed by regulations, technology, and economic and business considerations. As a result, user datasets held by platforms are usually very large and heterogeneous across firms.[44],[45]

Not all data confer a significant competitive advantage though. Some data are easily *replicable* (Lambrecht and Tucker, 2013a), since they can be obtained from multiple sources. Furthermore, some data are not very *valuable*. In fact, the incremental value of certain data declines with the amount of that type of data available in the first place.[46] However, it would be wrong to conclude that data asymmetries across platforms play no role in determining market structure. Firstly, some data lose value quickly over time. Secondly, some of the data generated in real time may be difficult to collect and will not be easy to replicate. Thirdly, the main advantage of multiple platform entrants is that they can combine updated data from many different sources seamlessly to create unique consumer "super-profiles." Combining data from different sources in real time is costly but may be crucial to provide the best possible service or product available at the time it is demanded. Being able to combine many sources of data in real time at a reasonable cost may only be possible for platforms that have access to such data directly because they are part of a large conglomerate of platforms.

B. The role of privacy policies

Normally, information about the processing of personal data is delivered to users by means of *privacy policies*. These are documents that clarify how user data are collected, securely stored, processed, used, and shared with third parties. Consent is provided by the user by agreeing, more or less explicitly, to the privacy policy, either only once at sign-up or every time the service is used.

[44] See https://www.theguardian.com/commentisfree/2018/mar/28/all-the-data-facebook-google-has-on-you-privacy for a journalistic description of the wealth data collected by Google and Facebook.

[45] Firms sometimes collect data beyond the point at which severely diminishing returns set in, as often a smaller dataset may serve as a good sufficient statistic of consumer behaviour.

[46] *Id.*

To what extent agreeing to a privacy policy represents an unambiguous and freely given expression of consent is debatable. In fact, survey data show that users rarely read privacy policies and, even when they do, they have little understanding of their terms.[47] Moreover, the problem of consent is exacerbated by several factors, including a general lack of privacy awareness, dark patterns implemented by the tech companies (for example, the practice of hiding within the screen non-consent buttons), and the fact that refusing to accept all the terms of the privacy policy normally prevents the user from using the platform services.[48]

In addition, consent may be meaningless in cases where the privacy policy is made part of the terms and conditions of usage and the platform holds a dominant position. In that scenario, consumers may be de facto coerced into accepting onerous privacy policies because usage of the underlying services is contingent upon consent and there is no realistic alternative to the dominant platform.[49] Economides and Lianos (2019) explain that companies such as Facebook and Google typically impose the requirement of personal data provision to receive online services through "opt-out" clauses, which de facto limit the ability of consumers. They refer to these arrangements as "exploitative requirement contracts."[50]

Some argue that coercion is not a problem because platform users do not care about privacy. We disagree. First, as reported by Liza Lovdahl Gormsen in a recent paper, survey data show that consumers are concerned about their personal data.[51] Second, Turow *et al.* (2015) investigated the reasons why people claim to be concerned about the ways companies access and use their private data, while at the same time they release a lot of information about themselves in ways that suggest much less concern about disclosure

[47] References abound. https://www.tandfonline.com/doi/abs/10.1080/1369118X.2018.1486870

[48] On the diffusion of dark patterns, see Mathur *et al.* (2019). On the fact that users tend to skim through privacy policies unless they are explicitly presented with them, see Steinfeld (2016).

[49] See Bundeskartellamt (2019). Decision suspended by Court of Appeals, currently under appeal in the German Supreme Court.

[50] See Economides and Lianos, *supra* note 8.

[51] See Gormsen (2019). She explains in page 13 that "For example, a survey published in August 2018 by the UK Information Commissioner's Office, 53% of British adults are concerned about their '*online activity being tracked.*' Moreover, the European consumer protection organisation BEUC has reported that 70% of EU consumers are worried about how their data are being collected and processed. Similarly, in a study commissioned by IAB Europe in which 11,000 people across the EU were surveyed about their attitudes regarding online media and advertising, it was reported that only '*20% would be happy for their data to be shared with third parties for advertising purposes.*' In the same vein, the 2016 Eurobarometer survey of 26,526 people across the EU found that '*[s]ix in ten (60%) respondents have already changed the privacy settings on their Internet browser and four in ten (40%) avoid certain websites because they are worried their online activities are monitored. Over one third (37%) use software that protects them from seeing online adverts and more than a quarter (27%) use software that prevents their online activities from being monitored.*' This is consistent with the 2011 Eurobarometer survey which found that disclosing personal data is a big issue for 63% of respondents at EU level and for 67% of UK respondents."

and collection of their personal data than they claim. The authors present the results of a survey of U.S. customers aimed at testing whether the explanation for this apparent paradox is (a) users value better targeted advertising more than privacy, or (b) they are "resigned" to lose their privacy. They find that most respondents rejected the logic that people trade their data for better services (for example, targeted advertising). They also find that most respondents consider having no control over what online marketers can learn about them and, therefore, have come to accept that their data are no longer private.[52]

For the avoidance of doubt, whether user care about privacy or not is not relevant for the competitive assessment of privacy policy tying below, since that theory of harm is based on exclusion and, therefore, on consumer harm induced by the distortion of the competitive process rather than on exploitation.

C. Data and their monetization

By entering multiple platforms with overlapping user bases, the enveloper may be able to collect and combine data about their common users by tracking their behavior across platforms. This is true even if the products sold to users through those platforms are unrelated from a demand viewpoint. The enveloper may monetize data in both markets if consumers have agreed to privacy policies that permit the commercial use of data.

There are at least three channels through which user data may provide static benefits that may encourage multi-platform entry. First, as we already mentioned, data collected in the origin market can be used, once the enveloper has entered the target market, to provide products more efficiently in the target market. Second, data collected in the origin market can be used to reduce the asymmetric information to which an entrant is typically subject when deciding to invest (for example, in R&D) to enter a new market. For instance, a search engine could be able to predict new trends from consumer searches and therefore face less uncertainty in product design. Third, and most importantly for our purposes, reverse economies of scope are also possible. That is, user data acquired in the target market may allow the enveloper to provide a better product or service in the origin market or extract more surpluses there. As an example, the entry of Facebook and Google in the market for user authentication and analytics, which are services currently offered for free to

[52] In particular, they find that most adult U.S. consumers (66%) do not want marketers to tailor advertisements to their interests. When they are informed of three common ways that marketers gather data about people in order to tailor ads, even higher percentages—between 73 and 86%—say they would not want such advertising. Even among young adults (18–24 years old), whom advertisers often portray as caring little about information privacy, more than half do not want tailored advertising and are as averse to being followed across websites and offline as do older adults.

app developers, may be a way to improve their tracking of consumer behavior across different apps.[53] As Schepp and Wambach (2015) explain: "The linkage of [. . .] data can give companies more insights into user habits, enabling them to further improve their services and reinforce their market position. Generally speaking, the more data a company can combine, the better its chances to gain knowledge that can be used to strengthen its market position." In the remainder of this subsection, we will focus on this last set of effects. We make two observations.

First, the data obtained in the target market can contribute to increase profits in the origin market by helping the enveloper to optimize its price and matching structure in that market. Consider, for example, the case of an online advertising platform. These platforms usually sell services for money on the side of the market about which they collect relatively little information, advertisers. Meanwhile, they offer their services for free to consumers, on which they focus their data collection effort. Hence, the channel for third-degree price discrimination, which we discussed later on, can only play a limited role. Nonetheless, the advertising platform may use the information acquired in the target market about the users of both platforms to improve the matching between advertisers and users in the origin market in a way that increases its profits by extracting a larger share of the available consumer surplus.

To see how this may work, consider a platform that operates as intermediary between buyers and sellers, such as a marketplace or a search engine. A key role of the platform is to provide consumers with valuable purchasing suggestions. Then, the platform might be able to leverage the monopoly power it has on consumer attention to provide a biased set of recommendations (for example, more costly products), thus effectively altering competitive forces. It could then collect the newly conferred monopoly rents through higher advertising prices.[54]

There are several economics papers that highlight how intermediaries can use information to affect the matching between their users (Bergemann and Bonatti, 2011; Hagiu and Wright, 2015; de Cornière and de Nijs, 2016). A message that emerges almost universally from this literature is that seldom the platform will find in its interest to implement a socially optimal matching (Acquisti *et al.*, 2016). It follows that the enveloper is likely to be able to use additional information gained in the target market to raise its profits in the origin market.

Second, in addition to creating economies of scope, combining data may improve monetization through price discrimination. The data acquired in the

[53] As another example, after acquiring WhatsApp, Facebook started offering friend suggestions based on telephone numbers of WhatsApp contacts.

[54] This argument has the same flavour of one developed by Rey and Tirole (2007) to explain why patent holders may have an incentive to vertically integrate to avoid rent dissipation in the downstream market.

target market can be used to improve (third-degree) price discrimination in the origin market.[55] Additional data can be used to produce more precise estimates of the willingness to pay of different consumer groups for the origin market. In turn, this information can be used by the enveloper to demand prices that extract a larger share of the product's value.[56] For instance, an online travel agent might be able to demand higher prices for a hotel or a flight (sold in the origin platform) depending on the location of the user (information obtained through the target platform). Or a retailer could condition prices offered to its customers in the origin platform both on past purchases of the user (information available in the origin platform) and further information about its preferences (obtained in the target platform).[57]

D. Dynamic effects of privacy policy tying: Protecting market power

We are now ready to explain the enveloper's incentives to tie its privacy policies to monopolize the target platform market, capture all data generated in such a platform, and entrench its dominance in the origin platform. The discussion will be based on our companion paper, Condorelli and Padilla (2019), which formally emphasizes the potentially exclusionary effects of entry followed by privacy policy tying.[58]

By engaging in "privacy policy tying," the enveloper ensures that users of the origin platform grant access to data generated in the target platform, which allows the enveloper to combine the data from both platforms without the need for additional consent. This, in turn, implies that controlling the target market provides the enveloper with data superiority in the origin platform, where such data are monetized. To control the target market and prevent the target market platform to possibly obtain data superiority by entering the origin market, the enveloper is prepared to price aggressively, often providing the product for free. This strategy is profitable because it allows the enveloper to offer a better product or service in the origin market and, more to the point, because it can protect the origin market from entry.

The strategy has the potential to exclude because a more efficient competitor might not be able to compete with the enveloper in target market, due to dynamic incentives. That is, the enveloper stands to lose monopoly profit in the origin market by giving up the target market, while the platform operating in

[55] Third-degree price discrimination: offering different prices to different consumer groups.

[56] See Taylor (2004), for an analysis where consumers are also able to respond to price-discrimination by firms.

[57] It has been argued that practicing third-degree price discrimination may result in consumer backlash and ultimately lower profits. As documented by Anderson and Simester (2010), consumers who discover that others paid a lower price than them tend to retaliate against the retailer, especially loyal and high-value consumers. Nonetheless, third-degree price discrimination is not a novel phenomenon and this practice is likely to be employed by many sellers, in one form or another.

[58] See Condorelli and Padilla, *supra* note 8

the target market would find itself competing with the enveloper in the origin market in any case.

To sum up, first, the origin platform (or enveloper) ties its privacy policies so that users grant access to their data when collected and used by the origin platform irrespective of the product or service where the data originate. Second, the origin platform enters and monopolizes the target market by offering products and services for free to all sides. It funds the free products and services in the target platform by monetizing the combined data set in the origin platform. Last, it entrenches its leading position in the origin market by impeding entry by the target platform.

Our theory of harm thus relies on the idea that achieving control of the user base in the target market provides an efficiency advantage in running the origin market: For example, data from the target market can be used to improve the service offered in the origin market or to engage in efficient price discrimination. Thus, a platform operating in the target market represents a credible potential competitor for the enveloper in the origin market. The enveloper can pre-empt this threat by entering the target market and pricing low enough to acquire dominance in it. This is convenient for the enveloper if it avoids entry into the origin market. The enveloper can outbid the incumbent in the target market because it is prepared to price more aggressively. In fact, the enveloper stands to lose monopoly profits in the origin market in case of entry by the incumbent, while the incumbent in the target market would face competition there in any case and can save on further entry costs.

Privacy policy tying thus facilitates platform envelopment and the distortion of the competitive process in both the origin and target markets. Whether such a distortion ends up reducing welfare for platform users will require balancing, on the one hand, any potential positive welfare effects if the tie makes it possible to develop better products and services and, on the other, the negative effects on welfare caused by the reduction in competition: higher prices, lower quality, loss of privacy, and reduction in innovation.[59]

V. PRIVACY POLICY TYING BY ONLINE ADVERTISING PLATFORMS

Hitherto, we have explained the possibility of platform envelopment through privacy policy tying *in abstracto*. In this section, we consider an actual case study: platform envelopment by online advertising platforms. Before doing so, we provide a brief overview of the business model of online advertising platforms.

[59] Prufer and Schottmüller (2017) develop an alternative model leading to similar conclusions. They assume that the amount of data collected for consumers reduces the marginal cost of innovation. A platform will thus have the incentive to expand into new markets to acquire new data on attached consumers in order to become more competitive in its origin market.

A. Online advertising platforms

Online advertising is a two-sided business. Online advertising platforms connect advertisers, publishers, and consumers. Advertisers demand "inventory" (that is, the space times the views of that space) and publishers offer that inventory. Advertisers are interested in dealing with platforms that have access to lots of valuable inventory. That is, platforms that can place the advertisers' ads on publishers with access to lots of consumers of the right type—that is, consumers who are likely to be interested in the products or services that are being advertised.

So, to attract advertisers, the platform needs to attract popular publishers (that is, offering space) with the right sort of viewership (that is, offering views of that space). The more publishers available through a platform, the more advertisers will be willing to do business with that platform. Likewise, the more advertisers are intermediated by that platform, the more publishers will be interested be part of the platform. Sometimes, as in the case of social networks, users represent both viewers and those who provide the content, typically for free. Online advertising platforms internalize these positive feedback effects or cross-group network effects and adopt a pricing structure with balanced commissions for publishers, or free products for users providing content, and fees for advertisers.

Some online advertising platforms are vertically integrated, that is, they sell inventory in their own websites. This is the case of Facebook, which sells inventory in its own social media properties or of Google, when it sells inventory in the SERPs of Google Search. In this case, which is referred to in the industry as "first-party" online advertising,[60] the platform connects users of its online services (for example, Facebook's social media platform) and advertisers. Users may or may not be interested in the number and type of the advertisers that use the platform, but advertisers do care about the number and type of the platform's users. First-party online advertising platforms attract users by offering their services for free and then monetize their user base by selling ads at higher prices.

Advertisers' willingness to pay for ads placed in a given platform depends on the number of viewers it can reach through that platform and, in particular, on the number of viewers that it can reach *exclusively* through that platform. Hence, online advertising platforms have the incentive to enter into exclusive relationships with publishers and, in the case of first-party platforms, to ensure that their (end-) users do not multi-home.

Advertisers will also be willing to pay more for ads that are targeted to the right consumers' group. This is because the return on investment of such "targeted" ads is greater, since the ads are viewed by consumers with an interest in the underlying product and service and, therefore, more likely to

[60] As opposed to the case where the platform sells inventory held by third-party publishers, which is referred to as "third-party" online advertising.

convert the ad into a sale. For this reason, online advertising platforms have the incentive to gather and process data concerning consumers visiting their websites or their affiliated publishers to be able to place the right ad when a given consumer visits a given webpage.

B. User data and targeted advertising

Because of the growing importance of targeted advertising, online advertising platforms with access to more, more up-to-date, and richer data about those consumers who will be exposed to the ads served in that platform enjoy a competitive advantage over their peers.

Advertising platforms obtain user data directly from users or by tracking their activity. Such data may be collected from the webs of the publishers served by that platform (for example, by assessing how consumers navigate within publishers' websites) but may also originate from unrelated businesses owned by the online advertising platform. Data may also be acquired from third parties. For example, Google may use search patterns in Google Search, website visits collected from Google Chrome, email information obtained by monitoring Gmail, location and app usage data from Android smartphones, and so forth to offer better targeted ads to advertisers. Often, the raw data are combined and processed to produce new data, such as "user super-profiles."[61]

User data are valuable for online advertising platforms. First, data allow them to provide their services (for example, retrieving content uploaded by the user in the past or provided targeting capabilities to advertisers). Data are collected, stored, and processed by advertising platform to optimize the provision of their services to the various sides of the platform. Second, data improve predictions about user behavior (for example, about click-through rates for different types of ads). On the advertisers' side, value is provided by using data (i) to forecast which types of ads consumers will respond better to, (ii) to target specific populations of users that advertisers want to reach with their ads, and (iii) to provide measurable data on the success of specific ads, which allow advertisers to directly experiment with their messages. This is the side of the market where advertising platform obtain their main revenue from. Hence, given the limited consumer attention, the ability to predict user behavior from user data better than competitors is key for platforms to reduce prices and obtain a competitive advantage.

As explained in Section IV, not all data confer a significant competitive advantage though. Some data can be replicated and there may be diseconomies of scale in data. Furthermore, it is unclear how much advertisers value targeted advertising. In fact, the determination of the value of data for improving

[61] Both the World Economic Forum's report "Personal Data: The Emergence of a New Asset Class, January 2011" and the EC report "Competition Policy for the Digital Era" (see https://ec.europa.eu/competition/publications/reports/kd0419345enn.pdf) categorize data between volunteered, observed and inferred.

advertising performances is not a settled question. Farahat and Bailey (2012) estimated back in 2012 that targeted advertising generated twice the revenue per ad as non-targeted advertising. But more recent empirical evidence depicts a less rosy view (Lambrecht and Tucker, 2013b; Blake *et al.*, 2015).

C. Privacy policy tying by online advertising platforms

While it is hard to identify whether with exclusionary intent or not, the strategy described in Section IV.D appears to have been used by Google and Facebook—the two leading online advertising platforms—in the past. Let us consider a well-known example of Google's platform envelopment strategies: entry into the mobile operating systems market. This is a multi-sided market; a mobile operating system is a platform which, among other things, connects users of smartphones and app developers. It features strong cross-network effects and switching costs.

Google entered the mobile operating services market offering its Android operating system to original equipment manufacturer, such as Samsung and LG, for free. Google monetized its entry by combining *inter alia* the search histories it collects in Google search (and data from other Google properties) with the location data obtained from Android smartphones to construct user super-profiles and using that data to sell better targeted ads.

It was able to engage in this strategy because it held a dominant position in the search online market with Google Search.[62] Users of Google Search must accept Google's privacy policy,[63] which is embedded into its terms of service.[64] In doing so, they allow Google not only to collect and process data generated as part of their search history but also to collect, process, and combine data from other Google's properties or services, including Android.

As we discuss in Section VI, platform envelopment strategies of this sort may be procompetitive or anticompetitive. This strategy allowed Google to offer better targeted ads, which likely benefited advertisers and may have also benefited users of its services.[65] But it also facilitated the monopolization of the merchant market for mobile operating systems market.[66] And it may have also allowed Google to entrenching its dominant positions in search and search advertising.

[62] See *supra* note 3 and note 21.

[63] See https://policies.google.com/privacy.

[64] See https://policies.google.com/terms.

[65] Of course, Google has clawed back a significant proportion of those efficiencies. A monopolist improving the quality of its services and facing a linear demand for its services claws back about 50% of the incremental value generated.

[66] Note that the one monopoly profit theorem does not apply in this scenario, since mobile operating systems and search services are not consumed in fixed proportions, none of those markets are perfectly competitive, and so forth.

VI. IMPLICATIONS FOR COMPETITION OF ENVELOPMENT THROUGH PRIVACY POLICY TYING

The envelopment strategies discussed above can have both procompetitive and anticompetitive effects.

A. Procompetitive effects

On the one hand, platform envelopment strategies may facilitate the entry of new players in target platform markets where entry would otherwise be difficult, or even blockaded, due to significant network effects and switching costs.[67] Platform envelopment may thus result in increased competition in the target market to the ultimate benefit of customers from all sides of that market, at least in the short term.

Moreover, the enveloper will price very aggressively, since it will not only factor in the usual trade-off between margins and volumes in the target market but will also internalize the positive effect on the origin platform's profits of additional volumes in the origin market. Entry by the enveloper is thus bound to be disruptive, that is, have a significant impact on market structure.

In addition, as discussed above, the user data obtained in the target market, when combined with the enveloper's data from the origin market (and possibly other third-party data), can be used to improve the services offered to one or more of the sides of that market and hence their well-being.

B. Anticompetitive effects

However, as we also explained in previous sections, we cannot rule out possible anticompetitive effects. Fighting the enveloper in the target market may be very difficult, if not impossible, for firms which operate only in that market, even when they are as efficient or even more efficient than the enveloper. As all their revenues originate from that market, they may not be able to afford adopting a price structure where their revenues fall short of their long-run incremental costs. Instead, the enveloper can use the rents derived in the origin market to cross-subsidize its offerings in the target market. The enveloper's advantage does not lie in its deep pockets, but rather in its unique position to combine and monetize data from the origin and target markets, which is the result of its market power in the origin market, and its policy of linking its privacy policies in both markets.

A dominant player in the origin market may have the *ability* to cross-subsidize its entry into the target market to monopolize it. It may be able to do

[67] See Klemperer, Paul and Joseph Farrell. "Coordination and Lock-In: Competition with Switching Costs and Network Effects." In Armstrong, Mark and Robert Porter (eds.), *Handbook of Industrial Organization*, Chapter 11, for a discussion of the impact on entry of both switching costs and network effects.

so because its market power in the origin market will provide the funds needed to invest in the target market.[68] Perhaps more importantly, by entering and monopolizing the target market, the dominant player in the origin market may be able to entrench its dominant position in that market in the long term.

Of course, whether an exclusionary *incentive* to envelop exists needs to be established on a case by case basis. It will depend, among other factors, on the cost of entry into the target market, the value of the incremental data in the origin market, the risk of entry into the origin market in the counterfactual (that is, in the absence of entry in the target market), the reaction of users, and so forth.

When the enveloper succeeds in monopolizing the target market and entrench its dominant position in the origin market, the reduction in competition may harm platform users by exposing them to higher prices, lower quality, loss of privacy, and reduction in innovation. The envelopment will only be anticompetitive when (a) it distorts the competitive process, because the enveloper's actions cannot be contested by an as-efficient competitor in the target market, and (b) the envelopment results in consumer harm.

VII. POLICY IMPLICATIONS

Does this mean that the right legal standard for the assessment of the competitive effects of platform envelopment and privacy policy tying is the *rule of reason*? Or can we instead adopt *presumptions* to increase legal certainty and improve administrability? And, finally, what should we do in case we conclude that privacy policy tying is anticompetitive? In this section, we provide some preliminary answers to these questions.

A. Applying the error cost framework

Let us consider the first two questions using the error cost framework first introduced into competition law by Judge Easterbrook (Easterbrook, 1984; Beckner and Salop, 1999; Evans and Padilla, 2005). He argued that a properly designed competition enforcement system must select legal rules (that is, presumptions and standards) to minimize the expected costs of decision errors and make enforcement predictable for businesses and easy to administer. Such rules would help maximize the long-run welfare generated by the competitive process.

In assessing firms' unilateral practices, such as platform envelopment, enforcers are bound to make mistakes. In some cases, the practice will be considered anticompetitive when it is not (a type I error), whereas in others it

[68] However, it may face opposition from other multi-platform entrants also capable to engage in platform envelopment. Some of those may even operate a similar business model where data are monetized in their origin platforms.

will be regarded as legitimate when it should have been considered harmful (a type II error). The expected costs of those two kinds of errors are a function of their welfare costs and the prior probabilities with which those errors occur.

A "tighter" standard (for example, a rebuttable presumption of illegality) makes it easier to establish that a practice is anticompetitive and therefore reduces the expected cost of error when type II errors are more costly and likely. A *per se* illegality standard only makes sense when type I errors are regarded as extremely unlikely *a priori*, since the practice in question would always be anticompetitive. The opposite would be true under a *per se* legality standard. A rule of reason standard is justified when both type I and type II errors are likely and costly. A rebuttable presumption of illegality (resp. legality) rule is optimal when type II errors (resp. type I errors) are more costly and likely but type I errors (resp. type II errors) may in some exceptional circumstances be more costly.

We have seen that platform envelopment, through privacy policy tying or otherwise, may produce both procompetitive and anticompetitive effects. It would seem therefore that no *per se* rule is appropriate.[69] Because we are skeptical about the use of the rule of reason, due to the difficulties associated with its implementation and the associated risks (Ahlborn and Padilla, 2007), we are left to choose between a rebuttable presumption of legality and a rebuttable presumption of illegality. This means deciding first between a legality and an illegality prior and then establishing the conditions under which such a prior can be rebutted.

When the expected cost of the type I errors is large relative to that of the type II errors, error-cost minimization requires a more lenient standard—for example, a presumption of legality. The opposite is true when the expected cost of type II errors is large relative to that of type I errors. The cost of the type I error in platform envelopment cases is equal to the efficiencies (that is, welfare) lost if a lawful envelopment strategy is prohibited; efficiencies that stem from the economies of scope that the envelopment strategy would generate. The cost of the type II error in turn is instead given by the welfare cost resulting from the monopolization of the target market and the entrenchment of the enveloper's dominant position in the origin market.

It is difficult to determine *a priori* which cost is greater. In most envelopment cases, like in many tying or bundling cases in one-sided markets, we expect the cost of type I errors to be greater than those of the type II errors and, therefore, we would advocate for a *rebuttable presumption of legality*, which could be rebutted showing evidence of likely (or actual) effects (Evans *et al.*, 2004; Evans and Padilla, 2005, and references therein). This conclusion is supported

[69] Our position should be contrasted with that of authors, such as Lina Khan, which propose a form of "no fault" antitrust where firms may be found infringing the antitrust laws if their actions increase concentration, regardless of their consumer welfare implications. See Khan (2017) and Wu (2018).

by the observation that even platforms with limited or no market power have engaged in privacy policy tying.[70]

However, the conclusion might be different if (i) tipping is likely or (ii) the envelopment strategy involves coercively tying the privacy policies in the origin and target markets. In that last case, the cost of the type II error may be particularly large if (a) the common users of the origin and target platforms are coerced into accepting the tie and (b) combining the privacy policies of the origin and platform markets generates no, or at least limited, transaction cost savings to users and no, or at least limited, economies of scope. To the standard adverse price effects resulting from monopolization, we would need to add the potential welfare loss associated to the extraction of user data caused by the enveloper's tying strategy.[71] Evidence of *coercion* may or may not be sufficient to tip the balance between a legality prior and an illegality prior, but at least suggests that the evidential standard required to rebut the presumption of illegality should be lower in such cases. If, on the contrary, the tie involves no coercion—that is, if those users whose data are extracted and combined benefit from the tie[72]—then, the presumption of legality is justified, and the evidentiary standard required to rebut it should be set high.

B. The limits of antitrust enforcement

The most obvious option to foster market diversity and rivalry in platform markets is antitrust law enforcement. Antitrust agencies are currently overseeing the commercial activities of platforms to deter anticompetitive behavior. They should be concerned with platform envelopment, especially, as we said above, when it concerns coercive privacy policy tying strategies giving rise to no, or limited, economies of scope and/or the risk of tipping is high.

This form of envelopment may involve a potential exploitative abuse—the coercive tying of privacy policies—and a possible exclusionary abuse—the monopolization of the target market and the entrenchment of the dominant position in the origin market. It may be assessed as a pure exclusionary conduct (as it is likely to be the case in the United States) or as a combination of exploitation and exclusion (more in line with the EU case law). But, one way or the other, the agencies will have to gather enough evidence of (a) coercion in data extraction and (b) likely effects to effectively overcome the presumption of legality.

This is of course a challenging prospect. We are thus somewhat pessimistic about the effectiveness of this policy option. Antitrust agencies have intervened only in connection with the most egregious abuses. Furthermore, antitrust

[70] Though it is unclear whether they would be able to profit from that strategy if their larger competitors did not use the same policy.

[71] Which may be large if users value the loss of privacy more than they enjoy access to better targeted ads.

[72] Because, for example, they value targeted ads more than the loss of privacy.

intervention takes time: By the time an infringement is condemned, and remedies imposed, the target market may be monopolized, and no remedies may be reasonably available to restore the conditions of competition existing before the infringement in either the origin and target markets.

These problems are particularly significant in platform markets. These are complex and typically opaque markets. Understanding the ways in which they work and, therefore, being able to disentangle a legitimate concern from an efficiency offence allegation is not easy. Thus, the time required in any *ex post* investigation is bound to be long. This is indeed the lesson from cases involving platforms on both sides of the Atlantic.

Remedying anticompetitive platform envelopment is not an easy job either. A mere "cease-and-desist order" will not restore conditions of competition. Structural remedies, such as "divestments" or "line of business prohibitions," may destroy considerable value[73] and may not solve the problem at all, since platforms and platform conglomerates may be able to grow their broken bodies like starfish do.[74] Other remedies, such as "data portability," "data sharing," or "privacy regulation," require continuous monitoring by personnel with a rigorous understanding of the platform markets at issue. These are the sort of problems that are best dealt with using *ex ante* regulation.

Competition agencies may want to focus instead on preventing envelopment *ex ante* by stopping mergers across platforms and preventing acquisitions that may have the objective of eliminating the threat posed by disruptive innovators (that is, the so-called killer acquisitions; Cunningham *et al.*, 2019). They may also arm themselves with different tools, such as the *ex post* market investigation tool often used in the United Kingdom.[75],[76] Given the novel character of the conducts that they likely will have to assess and the fact that some of them may be privately profitable even in the absence of exclusion (thus failing the so-called *profit sacrifice test;* Salop, 2006), it may be preferable to approach them using a quasi-regulatory framework rather than a fining mechanism.

[73] Though not everyone agrees. See *The Economist*, Big Tech and Antitrust: How to Dismantle a Monopoly, 26 October 2019.

[74] Starfish regenerate their limbs to reproduce. They are able to regenerate because they have an abundance of stem cells.

[75] See e.g. UK Competition and Markets Authority (2017): *Market Studies and Market Investigations: Supplemental guidance to the CMA's Approach*.

[76] The German Federal Ministry for Economic Affairs and Energy has recently proposed modernizing the law on abuse of market power to address some of the limitations of *ex post* antitrust intervention. For example, it recommends amending the competition statutes in order to introduce the notion of "intermediation power." Importantly, it notes that "[t]here are good reasons to think that, depending on the exact setting, the threshold for finding that a refusal to supply data constitutes an abuse may be somewhat lower than the threshold for finding that a refusal to grant access to infrastructures or to intellectual property rights. This is true in particular if and to the extent that the refusal to grant access relates to data which is generated virtually incidentally and without special investment." See German Federal Ministry for Economic Affairs and Energy (2018): *Modernising the Law on Abuse of Market Power.*

C. Data sharing and data portability

While data sharing and data portability may be appropriate antitrust remedies in some circumstances, they may be better thought as *ex ante* regulatory instruments whose aim is not to restore conditions of competition *ex post* but rather secure a level playing field *ex ante*.

One way to deal with the potentially anticompetitive effects of platform envelopment and privacy policy tying is to mandate data sharing conditional on customer consent so that platforms provide consistent APIs on terms parallel to FRAND licensing. Platforms with market power (that is, dominant platforms) in well-defined origin markets would be mandated to grant access to other platforms to access a subset of their data, including personal data, if the individual or business in question decides so.

As stated by De la Mano and Padilla (2018), and consistently with the principles underlying the "Consumer Data Right" (CDR) proposed by the Australian government (Beaton-Wells, 2018),

> "any mandated data sharing scheme ought to respect the following principles. First, customers (whether individuals or businesses) should be able to exercise control over the data about them and their transactions that is shared with third parties. Their consent must be required prior to any data transmission. Or, perhaps, they should be the ones to choose whether such data should be provided to another company. Secondly, the nature and scope of the data exchange should be transparent to customers. They should be able to readily understand the purpose of that exchange and the terms and conditions under which it takes place. Thirdly, the information exchange must happen through secure methods. The parties to the exchange should take the necessary steps to prevent data leaks that may compromise the privacy and security of their customers. Fourthly, the data should be accessible through standardized APIs, ... so that the exchange takes place efficiently and without undue delay. Finally, the sharing scheme must provide incentives so that the party in control of the data actually shares the data and the party which receives it builds value added propositions with such data."

Most importantly, data sharing may only work in practice if the data are shared in an interoperable form (that is, through standardized APIs) and on FRAND terms, as it is the case under the recent payment service directive (PSD2),[77] which requires banks to provide access to customer data to all authorized competitors in digital form and free of charge. This is very different from the obligation to facilitate the porting of data in a standard form and when it is technically feasible under GDPR.[78]

[77] Directive (EU) 2015/2366 of The European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010 and repealing Directive 2007/64/EC.

[78] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data and repealing Directive 95/46/EC (General Data Protection Regulation). Data portability requires direct transmission between companies (that is, controllers) and such transmission is only compelled where technically feasible.

Some may argue that data sharing will undermine the incentive to collect and process data to the ultimate detriment of platform users. We disagree. As explained by Bourreau and de Streel (2019), the underinvestment concern that is commonly raised against mandatory access remedies may be insignificant when the underlying asset is data. This is partly because data are "non-rivalrous" and, therefore, can be shared without losing them. Furthermore, as they claim, the benefits of mandated access or data sharing are bound to be large since those data can be used to foster competition in many related and unrelated platforms at once. Data sharing may not only strengthen price and quality competition in the short term but also encourage innovation by competitors and the conglomerate platform sharing the data in the long term. It follows that, unlike it may be the case with physical assets, patents, and other intellectual property rights, the trade-off between the short-term and long-term effects on competition and innovation points unambiguously in favor of mandatory sharing subject to consumer consent.

This position is consistent with the views of Schweitzer *et al.* (2018, para 10): "the threshold for finding that a refusal to supply data constitutes an abuse may be somewhat lower than the threshold for finding an abuse in cases of a refusal to grant access to infrastructures or to intellectual property rights." And it is also consistent with the letter and spirit of the EU's regulation of electronic communications networks and services, which imposes obligations to supply even in situations where there would be no grounds for intervention under competition law (Cave, 2004).

The emphasis on access-based entry has been endorsed by claiming that there is no trade-off between promoting access-based entry in the short term and maintaining the option of sustainable competition in the long term because of the operation of the so-called ladder of investment.[79] This theory claims that no entry into electronic communication markets will occur without mandatory access to key infrastructures and that in practice only access-based entrants can grow into infrastructure-based competitors in the long term.

Our claim in support of mandatory user data sharing does not rely on this theory because, as explained above, we believe that such a policy is not likely to impact the ability and incentive to collect and process data given its non-rivalrous nature. Yet, even if such a disincentive was present, we believe that the ladder of investment theory is much more likely to apply in data-driven platform markets than in electronic communication markets. This is because, as we showed in the preceding sections, platform envelopment strategies may deter successful entry in the absence of data sharing, and competitors will realistically be able to challenge entrenched conglomerate platforms unless there is a level playing field in data.

[79] See Cave and Vogelsang (2003). The idea of a ladder of investment was also presented in an earlier paper (Cave and Prosperetti, 2001).

This is, in fact, the same logic that underpinned the introduction of PSD2 in the EU or the launch of Open Banking in the United Kingdom. Economists studying competition in retail lending have demonstrated the role of information as a barrier to entry (Hauswald and Marquez, 2003), and banking regulators have come to realize that entry into retail banking will only be possible by reducing or eliminating the data advantage enjoyed by incumbent banks.

In any event, the possible disincentive effect created by mandatory data sharing can be mitigated. Regulators may set the price at which the data are transferred to encourage data collection. If they chose to follow this path, however, they must acknowledge that those platforms have an incentive to price high and to supply imprecise information to their competitors, even if the precision of information can be increased at no cost, to relax price competition in the downstream markets where such data are relevant (Kastl *et al.*, 2018).

Some may argue that the obligation to share data will harm privacy.[80] In fact, users may not be able to exercise control rights over their own personal data in practice, since the option of not sharing their data may make them de facto second-class digital citizens. That may be true, though not necessarily if the sharing is initiated by the customer. Yet, as explained by Mayer-Schönberger and Ramge (2018), "preventing a small number of digital superstars from monopolizing data would better distribute the power that flows from exclusive access to information."

D. Privacy regulation

Another possible intervention would be to enhance the privacy protection offered by platforms with market power. Regulators could mandate conglomerate platforms to obtain explicit consent for data sharing on a platform by platform basis. They could also require dominant platforms to allow their users to opt-out of targeted advertising altogether. Both options could be exercised at sign-up, and perhaps periodically, and dominant platforms should not be able to condition provision of their services on consent. These asymmetric regulations would make it more difficult to coerce users and, therefore, limit indirectly the ability of the dominant platforms to combine data.

Alternatively, regulators could directly limit the ability of dominant, multi-platform conglomerates to combine user data across platforms (*mandatory data unbundling*). All these interventions would cap the data superiority of dominant platforms with presence in several markets; open to competition the (origin) platforms where the data are monetized; and eliminate their incentives to enter other (target) platforms to capture additional and complementary user data. In short, such a remedy, which can be imposed *ex post*, but which is

[80] This need not be the case if competitors are granted API access to the enveloper's analysis of the data without the underlying data.

likely to be more effective *ex ante*, will open both origin and target platforms to competition on the merits.

A drawback of the mandatory data unbundling policy is that it may limit efficiency by preventing the creation of large and rich databases that could be mined in the interest of consumers and business users. On the other hand, there are powerful reasons to support an outright ban on the ability to combine data from different platforms. While consumers do care about privacy (Acquisti *et al.*, 2013; Regner and Riener, 2017), they seem to be resigned about having to surrender their personal data to be able to make use of the largest and most popular tech platforms.[81] As a result, they spend little or no time checking the privacy policies of online platforms and, even when they do so, they seem unable to understand their implications.

Furthermore, data on a user can be used not only to tailor the platform's products and services to satisfy the needs of that user but also to adjust the service, including its price, to other users who are related. Hence, individual consent by a user may generate (positive or negative) externalities on other users. In other words, data have a social value (Bergemann and Bonatti, 2019). As noted by Choi *et al.* (2019), because this externality may be negative in many circumstances, "excessive loss of privacy emerges even with costless reading and perfect understanding of all privacy policies." In other words, informed consent may prove insufficient.

For those reasons, self-regulation or other less interventionist forms of regulation may fail,[82] and the potential benefits of competition in privacy policies may be limited. Platform users may not devote sufficient time and effort to evaluate the privacy consequences of their actions and choices if the platforms they patronize face no effective competition, due to their incumbency advantages in markets featuring direct and/or indirect network effects. Such users have no option but to accept whatever privacy terms presented to them, so their inattention may be fully rational. Furthermore, even if they do spend the time needed to understand the consequences of adopting the privacy policies of incumbent platforms, they may not internalize the negative externality imposed on other users when they decide to share their data. And, moreover, they may be resigned to the fact that others will also ignore the negative externality imposed on them. Why would a user switch to pay for a privacy-protecting service, if other users, seduced by greater convenience, may in any event share the sort of data that can be used to target her? (Acemoglu *et al.*, 2019).

[81] See Turow *et al.* (2015).

[82] "Policies claiming compliance with third-party or co-regulatory privacy standards are, on close reading of the text of the policies, usually far from complaint. ... It appears that firms can and often do put official-looking budges on their websites or privacy policies that have the potential to falsely reassure consumers into thinking that their privacy policies conform to a vetted external standard (Marota-Wurgler, 2016)."

VIII. CONCLUDING REMARKS

Our main concern with platform envelopment, in general, and privacy policy tying, in particular, is that it may foreclose the possibility of Schumpeterian innovation in platform markets. Privacy policy tying may not be abusive *per se*, but it facilitates the implementation of data-driven platform envelopment strategies. Privacy policy tying allows firms with a dominant position in a platform market to combine and monetize data across platforms in a way that is not replicable or contestable.

Platform markets tend to be highly concentrated and may even tip to monopoly. Some authors have argued that this should not be a matter of concern for policy makers and regulators because, in these markets, monopoly positions can be built at the same speed with which they are lost (Evans and Schmalensee, 2017–2018). New entrants can threaten to displace the existing leaders by offering innovative services and/or operating drastically different business models, we are told. These authors refer to the exit of Altavista's search engine and its replacement by Google Search, the way in which Facebook leapfrogged Myspace in social media, or how Google Chrome took the browser market from Microsoft's Internet Explorer, as examples of Schumpeter's "creative destruction" dynamics. However, those examples are becoming dated. Google's market power in search engines, search advertising, mobile operating systems, browsers, email, and so forth does not seem to be transient. Same could be said about Microsoft's market power in PC operating systems and productivity suites, Facebook's own market position in social media platforms, and so forth.

Because many platform markets are likely to tip into monopoly, it is the threat of potential competition that ensures that incumbents continue innovating and the terms and conditions they offer to users are fair and reasonable. But the threat of potential competition is undermined by platform envelopment. Consider, for example, Google's market power in search. Unlike the days in which Google fought and won over Altavista, a challenger to Google Search may now have to enter many other platforms to match Google's data bundles. Alternatively, it will have to buy all that data from third parties, which may not be possible in practice or, in any event, will be very expensive. Or it may have to devise a new business model where search is no longer funded through targeted advertising.

The risk is thus an online world dominated by digital conglomerates operating platform thickets. Best-of-breed platforms, that is, platforms with innovative technologies or business models, may not be able to displace the conglomerates because doing so requires multi-platform entry, which is very risky and costly. Thus, we fear that firms operating multiple platforms, linked between them by user data, end up generating the gravity of a black hole.

Those black holes may control many different platforms and be able to generate a "kill zone" around them.[83] This is not merely a theoretical concern.[84]

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[83] See, e.g., *The Economist*, "American tech giants are making life tough for startups." June 2018. See also Kamepalli *et al*. (2019).

[84] Wen and Zhu (2019) find that app developers reduce innovation and raise prices for apps threaten by Google's entry and shift their innovation efforts to unaffected lines of business.

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