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PLATFORM ANNEXATION

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Introduction

The digital era has ushered in a wide range of innovative products and services that benefit consumers. Digital platforms have played a central role in helping entrepreneurs and service providers access those consumers, reducing barriers to entry by facilitating the process of matching consumers to service providers and suppliers. Yet, we have also seen new competition concerns arise. Given the importance that platforms play as intermediaries in an ever-larger share of our economic activity, it is worthwhile to study more carefully the different tactics, including acquisitions, platforms can use to obtain or maintain market power.

Since platforms are characterized by network effects (often across sides of the market) and scale economies, platform markets are frequently fairly concentrated. Despite this concentration, it is not uncommon for some types of platforms to be characterized by low margins because the parties they serve have other options. If those parties transact with or use more than one platform, they are said to “multi-home.” For example, a marketplace that brings together buyers and sellers of a ride-hailing service may find that both sides of the platform “multi-home,” or transact on a competing platform(s). Riders may have accounts and search for a given ride on Uber, Lyft, and Via, for example. Likewise drivers may have more than one app open, looking for riders. When buyers compare offers from sellers across multiple marketplaces, and likewise sellers seek buyers across multiple marketplaces, network effects often shift to operate at the market level rather than the firm level. For example, more drivers on any platform makes ride-sharing more valuable to a rider who signs up with all platforms. This allows participants to experience the benefits of competing marketplaces without sacrificing the benefits of marketplace liquidity. Further, competitive pressure on both sides of the market (*ceterus paribus*) keep quality and prices at competitive levels, benefiting market participants. In the platform context, the equilibrium price is known as the “take rate,” the gap between what the buyers pay and what the seller receives.

In order to avoid low take rates and strong competition, market leaders in platform markets often search for tactics that help them reduce multi-homing in the short run and thus deprive rivals of scale economies and network effects in the longer run. This paper considers a category of tactics that we refer to as “platform annexation,” designed to achieve this objective. Platform annexation refers to a practice where a platform takes control of adjacent tools, products, or services and operates them in a way that interferes with efficient multi-homing among platform users.² The platform may also exclude independently owned adjacent tools that promote multi-homing; for example, the platform may refuse to interoperate with such

² Platform annexation can occur on either or both sides of the market, whether or not the other side primarily single-homes or multi-homes.

tools, which in turn reduces the value of the tool to participants and reduces usage of the independent tool in favor of the platform's tool. The final result is that efficient multi-homing is impeded.

Platform annexation disrupts multi-homing in a way that steers users of its acquired tool to its platform and away from platforms of rivals. When a large platform deprives a smaller rival of participants on either side of the market, it reduces the competitiveness of the smaller platform (or deters entry by new, smaller platforms) and thus lessens the competitive pressure on itself. This advantage may be self-reinforcing and allow further concentration of activity in the larger platform and marginalization or exit of the small platform. The strategy increases profits for the larger platform and reduces welfare for platform constituents in the short and long run. We argue that the impact of platform annexation on competition is more like horizontal integration than it is a typical vertical transaction. Similar to other horizontal conduct, it is more likely to be anticompetitive when undertaken by firms in leading market positions or with substantial market power.

We argue that platform annexation is often anticompetitive and harmful to consumer welfare. The extent of harm depends on the market position of the platform as well as structural characteristics of the platform market and the tools market, as we detail below. But in a setting with network effects, annexation by a leading platform can lead to a situation where the leading platform has both the incentive and the ability to take actions to harm competition. For this reason, regulators that wish to protect consumers should scrutinize a merger of this type especially carefully. When annexation has already occurred, regulators should consider careful monitoring - or regulation - to ensure that tools and services are interoperable and are not used to interfere with the multi-homing that is crucial to preserve successful platform competition. In general, competition will be promoted when leading platforms are interoperable with independent tools, and platform-owned tools are interoperable with other platforms.

The Platform Annexation Narrative

The question we consider in this note is how regulators and enforcers should analyze a scenario where a platform buys tools, services, or agents of one of the user sides of a platform market and uses those assets to disable or disadvantage multi-homing. We call this type of merger "platform annexation." We argue that in contrast to traditional examples of vertical integration, platform annexation *creates* conflicts of interest rather than resolves them. Thus, it should not be considered a typical example of vertical

integration in a supply chain, where the frequent presumption is that integration eliminates conflicts to the benefit of consumers.³

According to the economic definition of a platform, a platform has more than one “side.” For example, there might be users, publishers, and advertisers, or there might be buyers and sellers of a good or service. In this setting, network effects (often across sides of the market) are usually critical. The buyers want to shop where there are sufficient sellers. The sellers want to post their goods for sale where there are sufficient buyers. A new platform will have a hard time attracting buyers when it does not have sellers and vice versa, which in principle makes for a significant entry barrier. On the other hand, this entry barrier can be substantially reduced if an independent business makes a tool that participants on one side of the market use to interact with multiple platforms. Such a tool allows participants to identify and transact with trading partners even on small entrant platforms.

A tool that enables frictionless multi-homing is thus a significant threat to a large incumbent platform because it empowers sellers to shift their business to other incumbents or entering platforms; a rival platform with a good offer will be able to take share away from the incumbent, and a multi-homing tool will substantially reduce the costs of attracting sellers to a new platform, reducing the barriers to entry and helping smaller platforms compete against larger ones. In particular, in the presence of effective multi-homing tools, a new platform can more easily attract participants since the participants can maintain their habits and their relationships with existing platforms while experiencing incremental value from a new platform. The new platform simply needs to offer an additional value proposition—for example, bringing a new segment of buyers or sellers to the market, charging a lower take rate or offering better quality—and an effective multi-homing tool should surface the value proposition to participants.

When acting independently, a tools business succeeds by giving its constituents a good service, for example, by helping sellers multi-home efficiently and maximize their profits across competing platforms. However, platform annexation, whereby the platform controls a popular tool, gives the platform the opportunity to avoid these competitive outcomes and reshape platform competition to its own advantage, especially when it comes to multi-homing between platforms that are relatively closer substitutes.⁴ The platform uses the tool to preference its own platform and deprive rival platforms of business on one or both sides of the market, thus interfering with the competitive process.

³ Platform annexation is more akin to a vertical merger where there is the incentive and ability to engage in foreclosure. See Salop (2020), who argues that vertical mergers can reduce horizontal competition, e.g. by raising rivals costs: Salop, Steven C., The 2020 Vertical Merger Guidelines: A Suggested Revision (March 26, 2020). Available at SSRN: <https://ssrn.com/abstract=3550120> or <http://dx.doi.org/10.2139/ssrn.3550120>

⁴ According to the Competition and Markets Authority, ‘Online Platforms and Digital Advertising: Market Study Interim Report’ p101

Often the most powerful change the platform can make, post-annexation, is to reduce interoperability. It can prevent rival tools from interfacing as effectively with its own platform as its own tool, and it can make its tools interface better with its own platform than the rival platform.⁵ The former creates a barrier to entry in the market for tools, while the latter deprives rival platforms of transaction volume, eventually reducing the incentives of participants to multi-home to rival platforms. With more volume, the large platform achieves lower cost and higher quality. The small platform is foreclosed by lack of access to customers who single-home on the tool and are now single-homing on the big platform.⁶ One can think of this kind of asymmetric interoperability as a kind of tying (as the Furman Report emphasizes).⁷

When Competition and Entry Fail to Constrain Annexation

Why don't users abandon the acquired tool once it stops prioritizing their needs? If user immediately switched tools, the dominant platform's strategy would not work because there would be no demand from tool users to steer. Starting from a situation where most platform users multi-home, and where most participants use the larger platform, steering users to the larger platform more often may impose relatively small harm on them in the short term. Users might not quickly notice small harm. The significant harm may occur in the long run when the smaller platform loses participation and economies of scale, multi-homing diminishes, smaller platforms no longer exert meaningful competitive pressure, and the larger platform can raise the take rate. Second, in many cases, the tools or the platform (or both) have some market power. For example, participants may have a switching cost to changing tools. Third, the platform may hide or obfuscate the decline in quality of the tool when used with rival platforms. Or improvements may be rolled out with 'delays' to rival platforms. The large platform might also worsen the terms of trade overall, while at the same time providing other financial or non-financial incentives for sellers to use

⁵ This point is made repeatedly in the Furman Report as well as the CMA Digital Report. (Furman Review (2019), Unlocking digital competition, paragraphs 1.84-1.88)

⁶ This dynamic and outcome are described in the antitrust complaint against Google by the Texas AG in the Eastern District of Texas ([Case 4:20-cv-00957-SDJ Filed 12/16/20](#)). [A theme of the allegations in that complaint is Google's acquisition of ad tech businesses and subsequent exclusion of rivals through withholding or degrading interoperability.](#)

⁷ Other preventions designed by platforms to limit multi-homing include:

- Anti-competitive terms – dominant platform businesses have strong bargaining power over their business users. They might use this to enforce unfair or anti-competitive terms onto them, with the effect of entrenching their position. Price-parity or exclusivity clauses are examples of these kinds of terms.
- Tying of services to other services or hardware. In many cases, this inability for tied systems and services to interoperate may have been introduced by design
- Inertia – consumers in digital markets display strong preferences for default options and loyalty to brands they know. The value of default roles in digital markets was illustrated by Google's agreement to reportedly pay \$1 billion to Apple to be the default search engine on the iPhone, despite little effort being required of consumers to switch.

Furman Review (2019), Unlocking digital competition, paragraph 1.87

the large platform's tools. For example, sellers might get less data or poorer insights into transactions with the platform when they use rival tools, whereas they might be advantaged over other sellers in their transactions if they use the platform's tool.

The tool's advantage with the large platform helps prevent entry by a competing tool provider. The large platform can ensure any such entering tool cannot access its platform with the same quality as its own tool, and that disadvantage makes the tool unattractive to users. If the large platform anticipates that its own tool will be effective at harming competition and preventing entry by competing platforms, it may be willing to give the tool away "for free," making it even harder for competing tool providers to enter.⁸ In this scenario the "low" price for the tool is part of a very profitable, and anticompetitive, platform annexation strategy.

If the large platform's control over seller tools is successful at reducing multi-homing by the users of its seller tool, then the competing platform will in turn attract fewer buyers, and thus the competing platform will provide less value to both sides of the market. This reduces the incentive of sellers to adopt alternative seller tools, since the main advantage of a competing tool would be its ability to facilitate multi-homing, but multi-homing is less valuable when the second platform has fewer participants and delivers less value. This in turn reduces the customer base for a new entrant in the tools market, reducing the likelihood that new tools will appear to close the gap.

For all of these reasons, we may not expect participants to switch tools, and thus new tools may not emerge. Fundamentally, the private incentives of market participants are not fully aligned with social welfare because there are externalities from participants switching tools and multi-homing. When a large enough share of participants is willing to switch tools and bear the costs of multi-homing, platform competition is enhanced, take rates fall, and welfare improves. But individual participants have the incentive to free ride on others, and market-wide competition suffers as a result.

Anticompetitive forces are most likely to operate in a situation where either the tools provider, the platform, or both, start out with large market share, or where the platform has exclusive access to another asset such as a set of market participants or data. In contrast, a smaller platform typically benefits when multi-homing increases, and so has the incentive to promote interoperability. Tools provided by a smaller platform will have a difficult time attracting participants if they do not interoperate fully with a larger

⁸ Effective entry must then include both the platform and the tool, requiring greater investment and risk, see Carlton and Waldman (2002). Carlton, D.W. and Waldman, M., 2002. The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries. *RAND Journal of Economics*, pp.194-220.

platform in the industry. Thus, the market position of the platform is an important factor to consider when evaluating the ability of a platform to use tools for anticompetitive purposes.

Traditional Approaches to Horizontal and Vertical Conduct

Competition policy typically draws a distinction between horizontal and vertical conduct. When two firms in the same market merge, it is straightforward to see the harm to competition that follows, as the two firms no longer have an incentive to compete with each other in price, quality, or innovation. In contrast, vertical integration and vertical mergers, such as when a manufacturing firm and one of its suppliers merge, are often considered to be efficient.⁹ A manufacturer typically has a conflict of interest with its suppliers over the division of profits: each wishes to receive a higher share of profits, and the supplier recognizes that by charging a high price, it can take a larger share of profits. However, the manufacturer passes some of that cost onto end consumers, resulting in higher prices and lower output than if the manufacturer and supplier were vertically integrated.

To see an example, imagine if a rotisserie chicken supplier had market power and exercised it by charging Costco a markup. Costco would then consider the marked-up price of chickens as an input cost, and add its own markup before selling to consumers, in what economists call “double marginalization.” By vertically integrating into the production of chickens, Costco considers the true cost of chickens rather than the marked-up cost when setting the price to end consumers, and thus sets a lower price to the consumer, selling more chickens. The fact that vertical integration can solve the double marginalization problem is at the heart of the conventional view that vertical integration improves efficiency. These efficiencies (often referred to as EDM) are theoretically sound. Empirically, however, any individual merger may or may not exhibit these inefficient externalities and the merger may or may not be able to internalize them.¹⁰ But nonetheless, the main reason that vertical integration can be efficient is that it resolves a conflict of interest between the supplier and manufacturer.

Vertical integration has other potential efficiency benefits. For example, it may resolve hold-up problems that might otherwise arise when separate firms need to make investments that are specific to the supplier-manufacturer relationship. Consider an auto company that purchases steel fenders, seat assemblies and the like. Without vertical integration, the parties would have to rely on contracts to encourage the seat assembly manufacturer to undertake efficient relationship specific investments. These contracts might not

⁹ U.S. DEP’T OF JUSTICE & FED. TRADE COMM’N, VERTICAL MERGER GUIDELINES 2 (June 30, 2020), available at https://www.ftc.gov/system/files/documents/reports/us-department-justice-federal-trade-commission-vertical-mergerguidelines/vertical_merger_guidelines_6-30-20.pdf (recognizing that “vertical mergers often benefit consumers”).

¹⁰ See Baker, J.B., Rose, N.L., Salop, S.C. and Morton, F.S., 2019. Five Principles for Vertical Merger Enforcement Policy. *Georgetown Law Faculty Publications and Other Works*, 2148.

be able to fully align incentives, for example because it is difficult to specify all contingencies in a contract, leading in turn to inefficient investment.

A supply chain characterized by double marginalization and underinvestment will be inefficient and produce a product that is less attractive to consumers. Vertical integration is one tool that can resolve the conflicts of interest in the supply chain if it gathers all the parties that are part of the effort to make the car into one balance sheet and decision-making entity; though, again, whether this can be done is an empirical question. If a combined company can set up new incentives that track overall efficiency, then vertical integration will increase efficiency, leading to lower prices and higher quality that likely raise both profits and consumer welfare.

Inefficiencies from Platform Annexation

In our platform annexation context one might ask, why isn't the foreclosure of the small platform efficient? A platform in our setting will typically be an intermediary and will keep the difference between what the buyers pay, and the sellers receive. This is known as the take rate. When independent, seller tools focus on getting sellers greater profit, for example, selling at a higher price. The platform, by contrast, cares that the transaction occurs through it rather than a competing platform, and further wants to share less of the buyer's payment with the seller. Likewise, independent buyer tools focus on making sure buyers pay no more than necessary for quantity and quality desired. The platform has an incentive to raise sale prices to increase revenue from buyers, and to steer the buyer to its own platform even if a better price is available elsewhere. When buyers and sellers can switch between platforms, a platform that raises its take rate above competitive levels will lose customers to rivals, as either prices for buyers will be too high, or payments to sellers will be too low.

In a scenario where tools are independently owned and facilitate multi-homing on at least one, and preferably both sides of the market, platform markets can be very competitive, characterized by low take rates and robust competition in quality and innovation. When multi-homing is prevalent, network effects are experienced at the market level, rather than at the platform level, and thus do not impede competition between platforms. When multi-homing is cheap and convenient for participants, platforms must differentiate themselves to attract users through low take rates, high quality service, innovation in matching algorithms, protection for buyers and sellers, and other valuable services.¹¹ However, if multi-

¹¹ Note that in an extreme hypothetical case where all participants on one side of the market multi-home and platforms are not differentiated, participants on the other side are indifferent between platforms and have no reason to multi-home in response. However, under more realistic settings, there is some differentiation as well as some uncertainty about what participants will encounter. Multi-homing has benefits in expectation for many reasons, including the chance of finding a better match (due to some sellers single-homing, different matching algorithms,

homing is stymied, entry can be prevented and competition made less effective, and a dominant platform can extract most of the surplus created by the platform. High take rates in turn lead to reduced output, and lack of competition leads to reduced incentives for quality and innovation.

The sellers and the platform do not share all the same goals, and therefore when platforms annex adjacent businesses in this way they *create* conflicts of interest. The seller tool stops functioning in the interest of the sellers. The buyer tool stops functioning in the interest of the buyers. Rather, in either case the tool is working to maximize platform surplus. The conflict between platform participants and the platform is resolved in favor of the platform when buyers pay more and/or when sellers receive less. These are exactly the opposite of the goals of the dedicated tools that existed before the annexation. Another way to look at this is that multi-homing creates positive externalities for platform constituents in both the short and long run, and the benefits to platform constituents come at the expense of the larger platform's profits.

It is clear that conflicts will be rife if a platform owns the buyers' services, the sellers' services, sets the rules that determine prices, keeps the difference between the two prices along with other fees, and limits transparency into how the process works -- as Google does when it sells digital ads.¹² The parallel to financial services is instructive. Would investors agree to trade stocks on an exchange set up in this way? Stock exchanges and financial services more generally are regulated to provide a variety of protections and disclosures that prevent conflicts of interest of this type, and to ensure that agents have a fiduciary duty to the constituents they serve (or at least disclose when they do not).¹³

Overall, when a platform buys the tools that serve its constituents, that generates a conflict of interest within the platform that was not previously present when the tools were independent. Independently-owned tools serve their constituents, and are incentivized to create value for them, including facilitating multi-homing across platforms. Tools owned by a dominant platform have conflicted interests; they are incentivized to prevent multi-homing and to favor their own platform, and will include the profits of the platform in their objective function. Platform annexation increases the market power and profits of the platform, and harms constituents and competition just the way the market power of a simple monopolist harms consumers and competition.

different policies, different data, or different timing in participation decisions). Tools that make multi-homing frictionless make multi-homing common even when platforms are similar.

¹² Scott Morton and Dinielli (2020) "A Roadmap for a Digital Advertising Monopolization Case against Google" Omidyar Network paper; also, see the description of the way Google sells digital ads in *State of Texas v Google* 4:20-cv-00957-SDJ filed 12/16/20.

¹³ Srinivasan, Dina, *Why Google Dominates Advertising Markets* (December 9, 2019). 23 STAN. TECH. L. REV. (2020, Forthcoming), Available at SSRN: <https://ssrn.com/abstract=3500919>.

Platform Annexation Examples

First, let us consider examples of the types of tools that might be relevant for different types of platforms. Software tools are a relatively common feature of digital platform markets. In markets for physical goods, for example, a price comparison tool might help buyers compare across ecommerce marketplaces, while software tools exist to help sellers optimize prices, manage inventory, and track shipping. For operating systems and application stores, development tools can be used by software programmers to facilitate developing applications, and these tools may be used to develop for a single platform or to facilitate cross-platform development. For example, platforms like Unity help developers write mobile games for multiple platforms. In payments, companies like Stripe help online merchants accept payments, while consumer-facing applications like the Apple Wallet help consumers manage credit cards and pay with their mobile phones. One can consider a search engine to be a tool to help consumers find information on the internet. In this section, we will consider a case study of platform annexation of tools for digital advertising, motivated by the recent interest of regulators in this example.¹⁴

In the advertising industry, a variety of software products exist to help advertisers engage in digital marketing. Publishers also use tools called publisher ad servers to help sell space on web pages. Consider a publisher such as the New York Times that wishes to sell digital ads on certain blocks of space on its site, that is, to monetize its “inventory” of space. A company called DoubleClick provided the leading publisher ad server in the mid-2000s, and this tool was used by the New York Times to manage its inventory, compare offers (advertisements and willingness to pay) from different advertising exchanges, and analyze data about the monetization possible for different types of content, users, etc. Acting independently, DoubleClick had the incentive to serve the needs of publishers. If DoubleClick’s quality fell because it could not support publisher multi-homing across advertising exchanges and the market for tools was competitive, the New York Times would have the incentive to augment DoubleClick with other tools, or perhaps even move to a competing tool. A competing tool could differentiate itself by more efficiently enabling the New York Times to offer inventory and compare monetization across all the platforms (advertising exchanges). For this reason, DoubleClick would have no incentive to degrade its multi-homing capabilities. If a new competing ad exchange were to enter the market and compete with the Google exchange, then DoubleClick would want to adjust so that sellers, including the Times, could also sell on the new exchange; it would be natural for sellers to gain from more choice, better prices, or

¹⁴ Competition and Markets Authority, Online Platforms and Digital Advertising Market Study, 1 July 2020. <https://www.nytimes.com/2020/09/22/technology/justice-dept-case-google-search-dominance.html> ; <https://www.wsj.com/articles/how-google-edged-out-rivals-and-built-the-worlds-dominant-ad-machine-a-visual-guide-11573142071>; Scott Morton and Dinielli (2020) “A Roadmap for a Digital Advertising Monopolization Case against Google” Omidyar Network paper; State of Texas v Google 4:20-cv-00957-SDJ filed 12/16/20.

features provided by the entrant. Since sellers value having easy access to these alternatives, a tool designed to provide value to sellers will naturally support multi-homing in that way, creating as many options for the seller as it can.

However, the digital advertising market is not characterized by the competitive conditions described above, and the evolution of the industry reflects the concerns about platform annexation outlined in this note. DoubleClick offered publisher ad server services as we describe above prior to its purchase by Google in 2007.¹⁵ DoubleClick also launched an advertising exchange, a marketplace that matched publishers (sellers of inventory) to advertisers (buyers of inventory), around the same time the company was acquired by Google.¹⁶ At the time of acquisition, DoubleClick's share in the market for tools was large (estimated at least 60% of the market), while its exchange was new.¹⁷ It is easy to see that an owner of both the tools and the advertising exchange would want to steer volume to its exchange, where it could not only capture a portion of the payments advertisers made to publishers, but further tilt future competition among exchanges in favor of its own exchange. Depriving rivals of traffic causes there to be fewer effective competitors in the future, increasing the future take rate and reducing incentives for future entry and investments by rival exchanges. Post-acquisition, Google altered the seller tool so that it recommended that sellers transact on its own exchange more than rival platforms. For example, the tool gave Google informational advantages over rival exchanges, and allowed Google's exchange to view competing bids before placing its own bid.¹⁸

Post-acquisition, Google further connected advertiser demand from its search engine to the exchange and did not surface that demand to other exchanges, so that the exchange grew substantially in size and provided access to advertisers who were not available through other exchanges. The publisher ad serving tool originally operated in service to the sellers and optimized their interactions with platforms for the benefit of the sellers only. After annexation, however, the tool was owned by the same company that also owned an exchange, and where that exchange was a gatekeeper for a set of participants on the other side of the market (small advertisers from Google's search business).

In this example, it is important to consider carefully why the publishers would continue using the tool, since competition among tools providers could in principle provide a constraint on anticompetitive effects from annexation. If entry into tools is easy, there are few switching costs, and all exchanges are willing to interoperate on equal footing with all tools, it seems likely that substantial degradation of the quality of

¹⁵ <https://www.reuters.com/article/us-google-doubleclick-cu-idUSBFA00058020080311>

¹⁶ Bloomberg News, 'Google Launches DoubleClick Ad Exchange' Sept 17, 2009. <
<https://www.bloomberg.com/news/articles/2009-09-18/google-launches-doubleclick-ad-exchange?sref=Uk3enbiC>>

¹⁷ https://www.antitrustinstitute.org/wp-content/uploads/2018/08/Google_DoubleClick_memo_110620071437.pdf

¹⁸ Competition and Markets Authority, Online Platforms and Digital Advertising Market Study, 1 July 2020

the tool would induce entry by competing tools and switching by publishers. However, in the case of publisher ad servers, switching costs can be substantial. In addition, Google has the power to prevent its exchange from operating with any newly-introduced tools. In that case the publisher would lose access to the large set of advertisers who are uniquely accessible through Google's ad exchange. Further, a lack of transparency about pricing and take rates on Google's ad exchange made it harder for publishers to understand the costs they bear from the lack of interoperability as well as the potential benefits of investing in new tools. This uncertainty (anticipated by potential entrants in tools as well as potential customers of those tools providers) likely contributes to the lack of entry by competing tool providers.

If an ad exchange is advantaged by the tools over a period time, it can accumulate more data and attract more advertisers. Subsequently, other exchanges may not provide access to as many advertisers, and the advantaged exchange may be the one most likely to serve a publisher's need in the short run. In such a case, participants do not benefit as much from tools that promote multi-homing. A publisher may not want to take the risk of switching tools if the benefit is fairer comparisons between a large exchange and a smaller exchange, and the cost is a risk of facing restrictions in accessing the largest exchange.

Anticipating that consumers will be deterred by these risks, new tools providers may be deterred from entry. Ultimately, publishers receive less revenue from advertising, and thus have less incentive to create content or invest in content such as reporting.

A key element of this example, which is common across other applications as well, is that by steering business to its own platform today, the platform reduces the incentives of market participants to invest in multi-homing to other platforms in the future. Platform annexation thus features a harm from lower quality service in the short run, a short run sacrifice that is borne by other market participants, not the platform. But the short run harm leads to a long run, larger, harm when rival platforms are marginalized or exit. Thus, both consumers and competitors are harmed somewhat in the short run and substantially in the long run, when competitors no longer constrain the dominant platform, and consumers do not have meaningful choice.

Similar, parallel issues can arise on the advertising side of the market. Indeed, when Google's acquisition of DoubleClick was analyzed at the time by the American Antitrust Institute (AAI, 2008), the following considerations were highlighted:¹⁹

...advertisers using [Google-owned] ...advertiser tools may be unable to get the same quality of access to data and reporting on their search or other campaigns with non-Google search engines or ad networks as they can with Google search or AdSense. Moreover, advertisers that use ... advertiser tools [not owned by Google] may be unable to get the same quality of access to data

¹⁹ https://www.antitrustinstitute.org/wp-content/uploads/2018/08/Google_DoubleClick_memo_110620071437.pdf

and reporting on their Google search or AdSense campaigns that is available to advertisers using [Google-owned] ...advertiser tools. In these cases, Google's dominant position in search (and contextual) advertising will be further entrenched, and... [its] leading position in advertiser tools will be cemented. As a result, the lessening of competition in the search market and advertiser tools market may outweigh whatever efficiency benefit may result from integration.

Similarly, it has been suggested that Google might use its control over... [Google-owned publisher tools] to raise the costs of rival advertising networks... those networks may be unable to compete with AdSense, and potentially could wither due to a lack of scale.

Finally, the merger raises the question of whether Google might use competitively sensitive information from publishers about their advertising programs or from advertisers about their advertising campaigns to gain a competitive advantage for Google's search or AdSense offerings.

Notably, all of the issues previewed in these passages have been raised by regulators investigating competition issues surrounding Google's advertising business practices in recent years.²⁰ The framework of platform annexation we present here creates a unifying framework for these concerns.

Our second example is a hypothetical one. Imagine a transport tool that users could employ to optimize their travel to a destination across train, subway, and car services Y and X. The tool would succeed by making itself attractive to consumers - which would mean including many convenient transportation options and integrating them into its algorithm. Suppose this tool was popular and had a large user base. Now imagine that car service X engaged in platform annexation by purchasing the tool and went on to maximize profits of the combined entity. The tool would want to design the tool to benefit its car service X relative to rivals by, perhaps, listing it first in the user interface, offering rides to its own drivers before others, not sharing its APIs with public transportation, and so forth. These tactics would benefit car service X, particularly relative to its closest competitor car service Y, but would not be in the interest of consumers.

Whether this tactic would be successful (and have negative welfare consequences) depends on several other factors. If the tool's bias makes travelers decide to seek alternate tools, then it might not succeed. In general, however, developing software usually has scale economies, through research and development, or perhaps optimization based on user data. If those scale economies are substantial, entry by new tools might be deterred entirely, or delay the entry response. A delay might provide the time for the tool to use its existing market power to achieve a new equilibrium with higher share for car service X. Second, if the tool tilts the users towards car service X, drivers seeking those riders may join car service X which creates

²⁰ Competition and Markets Authority, Online Platforms and Digital Advertising Market Study, 1 July 2020. Additional issues surrounding transparency in pricing have also been noted in regulatory hearings. <https://www.wsj.com/articles/google-executive-gets-grilling-on-capitol-hill-11600219717>

a benefit to X's users only. After this adjustment period travelers might not experience any cost from the steering behavior. Without a cost, they would not find it worthwhile to switch (this is a collective action problem: as a group, the consumers lose in the long run when the competing platform disappears, since it leads to high take rates later). Third, if consumers have a hard time realizing that some drivers were being preferred, or the reason why the public transit options were poorly integrated, they might not leave the tool, thereby cementing the market power of the acquiring firm. Fourth, the tool might deploy a nonlinear loyalty scheme that rewarded consumers for not riding the competitor's services. Such a scheme could incentivize single-homing on X by making multi-homing on Y and others more expensive through the pricing in the tool. Car service X could also choose a quick and direct approach by refusing to fully interoperate with any competing or newly created tools, so that the annexed tool provides better functionality for car service X's own platform. Foreclosure of car service Y, the smaller platform, occurs too quickly for rival tools to enter as complements or for users to learn and switch. Anticipating all of these forces, new entrants may be deterred from attempting to create new tools.

The welfare impact of platform annexation would be negative if, for example, car services have indirect network effects and scale economies. Then, the foreclosure of car service Y would allow car service X to increase its take rate and reduce innovation. In a hypothetical scenario where the owner of a mobile operating system also owned either car service X or Y, the situation could become even more concerning. Tools could be integrated into mapping software, or competing tools could be disadvantaged or prohibited from application stores. The platform's tools could be given a data advantage. In general, market power in adjacent markets can be used to enable or reinforce the platform annexation strategy.

Related Work

Our analysis in this paper builds on an extensive literature in economics on issues surrounding vertical integration in general, as well as platforms specifically. In this article we emphasize the conflict of interest between the platform and its constituents. This conflict explains why the "single monopoly profit" critique does not apply to cases of platform annexation.²¹ In the single monopoly profit view, a firm with market power in a core market cannot profit through behavior such as bundling its product with a product in an adjacent markets. As the argument goes, if a monopolist charges more for a product in an adjacent market, it would need to charge less in the core market. This argument relies on market power being predetermined in the core market, as well as a lack of market power in adjacent markets, and ignores factors such as economies of scale as a barrier to entry. In our setting, market power in both the primary

²¹ Salop, S.C., 2017. Invigorating vertical merger enforcement. *Yale LJ*, 127, p.1962; Krattenmaker, T.G. and Salop, S.C., 1986. Competition and cooperation in the market for exclusionary rights. *The American Economic Review*, 76(2), pp.109-113.

and adjacent markets are influenced by the conduct at issue; using a tool for manipulation changes the long-run ability of the platform to extract the surplus from transactions. Another way to look at it is that the platform does not internalize the negative impact of its behavior on constituents' utility from other platforms in either the short or the long run. The manipulation undertaken by the tool creates a negative externality, since participants benefit in the short and long run when other participants multi-home to competing platforms.²²

In response to the Chicago school perspective that emphasized efficiency benefits from vertical integration, scholars have pointed out that there are a variety of important settings where vertical integration can be anticompetitive. Salop (1983)²³ formalized the idea that raising rivals' costs can be anticompetitive. In a recent paper, Salop (2020)²⁴ summarized the implications of these and related theories for policy towards vertical mergers, highlighting that upstream firms indirectly support competition between downstream firms, so that "vertical" behavior affects competition and welfare. Whinston (1990)²⁵ shows that when there are scale economies for a related product, a monopolist may tie or bundle its own version of the related product, reducing the available market size for competitors and successfully deterring entry. Tools for multi-homing would be expected to have such scale economies. Carlton and Waldman (2002)²⁶ show that these forces are also present in dynamic settings and with newly emerging adjacent markets, where again the analysis emphasizes the importance of scale economies and entry costs in adjacent markets. More broadly, a literature considers investments by a monopolist in complementary products. Choi and Stefanadis (2001)²⁷ show that when there is uncertainty about returns to investment, a monopolist's entry in complementary market allows it to engage in a "price squeeze" that reduces investment and innovation by rivals. These perspectives are consistent with our analysis.

Scholars at the intersection of law and economics have also considered the questions that arise around vertical mergers and platforms. Farrell and Weiser (2003) contrasted the Chicago school view, which focused on the efficiency of vertical mergers, with judicial and regulatory decisions (e.g., by the FCC) that developed and promoted open architectures and interoperability, in an attempt to prevent firms that

²² See the Gavil et al casebook, *Antitrust Law in Perspective*, 2016 and the related note, Baker, Jonathan (2014) "Note on Single Monopoly Profit Theory" (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2496932)

²³ Salop, S.C. and Scheffman, D.T., 1983. Raising rivals' costs. *The American Economic Review*, 73(2), pp.267-271.

²⁴ Salop, Steven C., The 2020 Vertical Merger Guidelines: A Suggested Revision (March 26, 2020). Available at SSRN: <https://ssrn.com/abstract=3550120> or <http://dx.doi.org/10.2139/ssrn.3550120>.

²⁵ Whinston, M., Tying, Foreclosure, and Exclusion, *The American Economic Review* 80(4), pp. 837-859.

²⁶ Carlton, D.W. and M. Waldman. 2002. "The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries." *Rand Journal of Economics*. 33: 194-220.

²⁷ Choi, J. P. and C. Stefanadis. 2001. "Tying, Investment and the Dynamic Leverage Theory." *Rand Journal of Economics*. 32: 52-71.

are powerful at one level from leveraging that power into adjacent segments.²⁸ The paper argues that vertical mergers can be efficient when they internalize complementary efficiencies, but that there are a variety of settings where vertical mergers do not accomplish that goal and are instead anticompetitive, notably when vertical mergers are used to deter entry or nascent competitive threats. Another type of exception concerns incomplete complementarity, as when applications might serve consumers on more than one platform. In this setting, a platform attempting to integrate into applications does not internalize harm to users that access the application through other platforms.²⁹ The article also argues that the presence of scale economies in adjacent markets contributes to the potential for harm.^{30,31} Our analysis is consistent with these themes; as we discussed above, a platform engaging in platform annexation will create negative externalities on users of other platforms in the short and long run.

Moving to models that address platform annexation more specifically, Eisenman et al (2011) consider a model of “Platform Envelopment.”³² Their model allows the two platforms to be substitutes or unrelated, as well as complements. Our setting focuses on the case of complements. They describe how when two platforms are serving the same set of users (or have substantial overlap), one can foreclose the other platform’s access to the users. The winning platform harnesses the network effects that formerly belonged to the now foreclosed rival.³³ Our discussion of platform annexation highlights a subset of this strategy space; the way the foreclosure is effectuated is through the acquisition of the complement, in this case, the adjacent market for tools.

²⁸ Farrell, J. and Weiser, P.J., 2003. Modularity, vertical integration, and open access policies: Towards a convergence of antitrust and regulation in the internet age. *Harvard Journal of Law and Technology*, 17, p.85.

²⁹ See Farrell and Weiser (2003) op. cit. p. 119.

³⁰ See also Elhauge (2009) and Iacobucci and Ducci (2019) who discuss the strong assumptions required for the “single monopoly profit” theory, and further review the economics literature that shows that it can be anticompetitive under realistic assumptions. Since the set of consumers with whom a firm interacts and their volume of activity changes as a result of platform annexation, economic theory supports the idea that vertical integration can be anticompetitive. See: Elhauge, E., 2009. Tying, bundled discounts, and the death of the single monopoly profit theory. *Harv. L. Rev.*, 123, p.397; Iacobucci, E. and Ducci, F., 2019. The Google search case in Europe: Tying and the single monopoly profit theorem in two-sided markets. *European Journal of Law and Economics*, 47(1), pp.15-42.

³¹ Khan (2019) presents arguments regarding current technological platforms, highlighting that third parties that depend on a platform for access to customers face important risks, including manipulation or discrimination to direct consumers to a platform’s own products rather than the ones that best serve consumers, reducing the incentives to provide quality, as well as appropriation. The paper suggests regulatory action, in particular structural separation, to prevent harms arising from platform annexation. Khan, Lina, *The Separation of Platforms and Commerce* (May 15, 2019). 119 *Columbia Law Review* 973 (2019), Available at SSRN: <https://ssrn.com/abstract=3180174>.

³² Eisenmann, T., Parker, G. and Van Alstyne, M., 2011. Platform envelopment. *Strategic Management Journal*, 32(12), pp.1270-1285.

³³ A related literature examines scenarios where a monopolist wishes to commit not to enter into complementors’ markets in order to induce complementary firms to make platform-specific investments, e.g. Gawer and Cusumano (2002); these authors also observe that a firm might enter an adjacent, complementary market if existing complementors are poor quality. See Cusumano, M.A. and Gawer, A., 2002. The elements of platform leadership. *MIT Sloan management review*, 43(3), p.51.

We should be sure to observe that a platform may help consumers by entering the tools market, or vice versa, when options for consumers are poor. Because platforms and tools are important complements, insufficient investment in one may lower demand for the other. Amazon introduced the Kindle reader device because innovation in hardware had the potential to substantially improve consumer experience reading digital books, and Amazon could internalize the complementarity between the products. It is also worth noting that platforms that are trying to induce platform-specific innovation by third parties are often very careful and deliberate about not entering the space themselves. A complementor is unlikely to invest in a firm-specific project if it expects to be expropriated. Davis et al (2002) uses the case study of Microsoft to illustrate the idea that platforms can benefit by creating applications programming interfaces (APIs) to reduce the cost of complementary investments by applications developers; they also show that in addition to cost reduction, the release of APIs facilitates complementary innovation.³⁴ Gawer and Henderson (2007) argue that Intel also made a variety of investments in intellectual property that it shared with complementors in order to increase the incentives of complementors to invest, arguing that a more “open” architecture benefits innovation. They further argue that Intel historically invested when its capabilities were strong relative to complementors, and various organizational constraints were used to commit Intel to a policy of not “squeezing” its complementors. Zhu (2019) surveys the studies that have considered how a platform responds to the possibility of supplying its own complement.³⁵ Many chose not to do that, often for the reasons identified above, but the paper identifies several case studies where the platform offers the complement, then bundles it together with other platform services in some way and is able to exclude rival complements.

Manipulation by tools has economic consequences similar to those of exclusive contracts between platforms and platform participants, since exclusive contracts also result in a reduction of multi-homing by platform participants. Exclusive access to an important set of participants can be procompetitive when it enables entry by giving participants on the other side a reason to adopt an entering platform, but exclusive contracts can be anticompetitive when they help a dominant firm deter entry. Lee (2013)³⁶ empirically studies these effects in the gaming market.

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³⁴ Davis S.J., J. MacCracken, and K.M. Murphy, 2002, “Economic Perspectives on Software Design: PC Operating Systems and Platforms”, in *Microsoft, Antitrust and the New Economy: Selected Essays*, ed. Evans, D.S., 361-419. Springer. Previous version available for download at <http://gsbwww.uchicago.edu/fac/steven.davis/research/>

³⁵ Zhu, F., 2019. Friends or foes? Examining platform owners’ entry into complementors’ spaces. *Journal of Economics and Management Strategy*, 28(1), pp.23-28.

³⁶ Lee, Robin (2013) “Vertical Integration and Exclusivity in Platform and Two-Sided Markets” *American Economic Review*, vol 103, no 7, pp 2960-3000

When a platform competes against others, it is incentivized to keep all sides of the platform happy by ensuring its tools serve their needs and by improving quality and price. Some mergers involving platforms will be designed to this end and will therefore be procompetitive. By contrast, when a dominant platform wishes to lessen competition, it is incentivized to control the tools of its constituents to prevent them from multi-homing or sponsoring entry. These are the harmful platform annexation transactions. In addition to blocking entry, annexation of services and tools allows the dominant platform to exercise market power. The asset acquisitions that characterize platform annexation thus often feature strategies that prevent multi-homing with competing products as well as adoption of strategies that help the acquirer block or impede entry.

Platform annexation is not best thought of as “vertical,” with all the connotations that brings. The manufacturer of a car that needs a seat and fender is a classic chain of production. Combinations between a platform and its tools have more in common with horizontal integration than vertical integration. The central platform can expand out to annex all the surrounding tools and functions, ensuring that multi-homing does not arise and that barriers to entry are maintained. Because platform annexation creates the incentive and the ability to engage in foreclosure and reduce (horizontal) competition in the platform market, these transactions deserve the additional level of scrutiny horizontal mergers receive.

The logic of competition policy towards horizontal competitors can also be used to identify cases where antitrust enforcement is *not* necessarily appropriate. For example, platform markets characterized by strong scale economies and network effects are often fairly concentrated, and it is natural for a second or third place firm to invest in tools in order to promote multi-homing. Just as a horizontal merger between two weaker competitors can promote competition in platform markets, it can be pro-competitive for a smaller firm to develop tools. And even a platform that has low market share or faces other types of competitive constraints from adjacent markets may build tools in order to promote usage of its platform. Both incentives and efficiency depend on the platform’s market position: smaller firms have the incentive to promote multi-homing in order to attract participants from larger platforms, while large platforms have the incentive to inhibit multi-homing. Since multi-homing is a key component of effective competition, smaller firms have incentives more aligned with social welfare in this case. And observing which firms and tactics try to harm multi-homing is a good guide to where the anticompetitive conduct may lie. Other factors to consider include whether a platform and the related tools have sufficient market share to have a meaningful impact on competition and barriers to entry in either the platform market or the tools market, or whether competition will discipline the platform to provide constituent-friendly tools that promote multi-homing and interoperability.

Some economists have advised for caution in applying antitrust regulation to multi-sided platform markets,³⁷ because it is natural in *some* types of these markets to subsidize one side of the market (e.g. consumers) and then extract surplus from the other side for access (e.g. sellers), perhaps exploiting what has been termed a competitive bottleneck. However, in the case of platform annexation, the platform is reducing the quality of the tools on one side of the market (e.g. sellers), *without* passing on the surplus to buyers. Instead, buyers are harmed in the long run, as competing platforms attract fewer sellers, thus reducing their utility to buyers. Competition among platforms helps end consumers in the short run, by constraining the take rate, and also in the long term, by lowering entry barriers. A platform facing competition with multi-homing participants will be forced to innovate in terms of quality and services in order to attract constituents.

Remedy

One obvious remedy for platform annexation is mandatory interoperability. Of course, other remedies may also be appropriate, such as divestiture. However, requiring interoperability is attractive in the cases where interoperability was the characteristic the dominant firm degraded to achieve its market power. If the market was interoperable prior to the anticompetitive conduct, it may not be technically difficult to make it interoperable again. In the type of settings we have in mind, interoperability is fairly straightforward. Whatever the APIs are the are shared between the platform and its own tool simply need to be shared externally also. Access to the APIs of the dominant firm is often sufficient for tool developers to create tools that multi-home.

Conclusion

Traditional antitrust often falls back on a simple categorization of conduct into horizontal and vertical. We introduce the concept of platform annexation, whereby a platform annexes tools or other adjacent markets in a way that interferes with multi-homing and competition. We argue that platform annexation bears more resemblance to horizontal conduct than vertical and is capable of horizontal foreclosure that harms consumers. In particular, while traditional vertical integration in a supply chain has the potential to reduce conflicts of interest and may favor efficiency, platform annexation creates conflicts of interest and has the potential to reduce efficiency, particularly when undertaken by a market leader who has the

37 David S. Evans, The Antitrust Economics of Multi-Sided Platform Markets, 20 *Yale Journal on Regulation* 325, 364 (2003).

incentive to reduce multi-homing. Thus, it should be viewed with substantial skepticism by regulators and enforcers.