

PLATFORM ANNEXATION

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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 use more than one platform, they are said to “multi-home.” For example, a ride-hailing platform that brings together buyers and sellers of an auto-transportation 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 platforms, and likewise sellers seek buyers across multiple platforms, 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

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who signs up with all platforms. This allows participants to experience the benefits of competing platforms without sacrificing the benefits of market-place liquidity. Further, competitive pressure on both sides of each platform (*ceteris 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. Multi-homing keeps prices low by putting pressure on take rates. Available and vibrant multi-homing is therefore a strong signal that there is competition between platforms in a market and that consumers have choices.

In order to avoid 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 article considers a category of conduct, which is designed to achieve this objective, that we call “platform annexation.” Platform annexation refers to a practice where a platform possesses or acquires complementary multi-homing tools and operates those tools in a way that restricts or lessens efficient multi-homing by platform users.¹ A “multi-homing tool” is any functionality that helps a consumer interact with the platforms of interest and is adopted in part because it lowers the cost of multi-homing. In pursuit of market power, the platform may attempt to exclude independently owned tools that promote multi-homing; for example, the platform may refuse to interoperate with such 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 and competition is harmed.

The anticompetitive manipulation of multi-homing tools often resembles or involves other more familiar types of conduct, such as bundling, tying, mergers, and more. These tactics can come in procompetitive versions as well as anticompetitive versions. Applying the traditional categories to platform annexation may be complex because multiple categories may apply simultaneously, while each category encompasses scenarios beyond platform annexation. In addition, within each category, there can be procompetitive and anticompetitive forces, not all of which are applicable to the specific case of platform annexation. In this article, we zero in on the economic forces specific to platform annexation, laying out the logic using basic principles from platform economics, and then relating the analysis to the traditional antitrust categories. Our main conclusion is that when a platform “annexes” a service that was aiding multi-homing, and then manipulates that service to impede multi-homing, that conduct lessens competition between platforms.

¹ Platform annexation can occur on either or both sides of the market, whether or not the other side primarily single-homes or multi-homes.

Unlike traditional vertical integration, which can align incentives among suppliers to the benefit of consumers, platform annexation creates a conflict of interest between tools providers and their constituents and harms (horizontal) competition between platforms.

How does this work? Platform annexation disrupts multi-homing by steering users 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 is often self-reinforcing because it generates further concentration of activity in the larger platform and marginalization or exit of the small platform. This kind of feedback loop often characterizes multi-sided platforms more than “old economy” businesses. And the feedback loop increases the efficacy of the platform’s strategy, enabling it to increase its profits and reduce welfare for platform constituents in the short and long run.

There are different types of multi-homing tools that might be relevant for different types of platforms, and thus might be candidates for platform annexation. Software tools (for example, those used to manage a supply chain or a retail operation or purchasing) are a relatively common feature of digital platform markets. In markets for physical goods, for example, software tools exist to help sellers run storefronts, 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 from a variety of sources, while consumer-facing applications like the Apple Wallet help consumers manage credit cards and pay with their mobile phones. A search engine is also a multi-homing tool that helps consumers find alternative platforms on the internet. Note that these tools provide access to the services that are the ultimate source of consumer surplus and profits and therefore become the locus of exclusionary strategy.

There are many examples among the “big tech” platform cases of recent years of platform annexation of multi-homing tools. The State of Texas accused Google of using its purchase of DoubleClick’s publisher ad server, a tool that helped publishers connect to advertising exchanges, to exclude rival publisher ad servers and benefit Google’s display advertising exchange.² The

² Third Amended Complaint ¶ 19, *In re Google Digital Advertising Antitrust Litig.*, 1:21-md-03010-PKC (S.D.N.Y. filed Aug. 12, 2021).

UK Competition and Markets Authority (CMA) articulated an annexation theory of harm for Facebook's purchase of Giphy whereby Facebook would make Giphy less interoperable across social media, and therefore degrade the functionality of rivals of Facebook.³ The U.S. FTC investigated Google for refusing to interoperate with tools that helped advertisers multi-home across search advertising platforms, leading Google to agree to modify some of its restrictions.⁴ Google's contractual restrictions on OEMs and carriers to prevent them from multi-homing across search engines and thus reducing Google's take rate are being litigated in the United States and the European Union.⁵

Our definition of platform annexation often involves an acquisition of some kind.⁶ But even without an acquisition, a dominant platform may engage in foreclosure of this type by restricting the interoperability of its tools or platform with rival tools or platforms. Such tactics include denying access to rivals, degrading the interconnection of rivals, or providing better interconnection to its own platform than to rival platforms. If the platform has enough market power, these tactics may cause users to abandon rivals and use the platform's own tools or services in order to obtain access to the platform. This strategy is sometimes a form of "open early, closed late," and can constitute monopolization.⁷ We argue for focusing on horizontal competition in platform annexation settings, even in situations where the conduct may appear to be vertical, or a transaction may be vertical. Annexation strategies lessen horizontal competition by lessening users' ability to multi-home through manipulation of a related (vertical) business. In other words, annexation is a vertical theory of harm that lessens competition between rival platforms. 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 explain that platform annexation is 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

³ Press Release, Competition & Mkts. Auth., CMA Directs Facebook to Sell Giphy (Nov. 20, 2021), www.gov.uk/government/news/cma-directs-facebook-to-sell-giphy.

⁴ Decision & Order, Motorola Mobility LLC & Google Inc., FTC File No. 121-0120 (Jan. 3, 2013) (consent order).

⁵ See generally First Amended Complaint, State of Utah v. Google LLC, 3:21-cv-05227-JD (N.D. Cal. filed July 2, 2021); Press Release, Eur. Comm'n, Commission Fines Google €4.34 Billion for Illegal Practices Regarding Android Mobile Devices to Strengthen Dominance of Google's Search Engine (July 18, 2020) (IP/18/4581).

⁶ The 2011 article on platform envelopment, discussed later, by Thomas Eisenmann, Geoffrey Parker, and Marshall Van Alstyne, also uses a definition that often involves an acquisition of some kind. See *infra* note 40.

⁷ *Arista Networks, Inc. v. Cisco Sys., Inc.*, No. 16-CV-00923-BLF, 2018 WL 11230167, at *2 (N.D. Cal. May 21, 2018).

tools market, as we detail below. But in a setting with network effects where the leading platform has both the incentive and the ability to take actions to harm competition, annexation is a natural strategy to expect. For this reason, regulators that wish to protect consumers should scrutinize especially carefully conduct or mergers that give platforms the ability to reduce multi-homing. When annexation has already occurred, regulators should consider careful monitoring to ensure that tools providing access to services and the services themselves are interoperable and are not used to interfere with the multi-homing that is crucial to the preservation of successful platform competition. Divestiture, if it is not too late, and regulation of the dominant platform are other useful policy options. In general, competition will be promoted when leading platforms are interoperable with independent tools, and platform-owned tools are interoperable with other platforms.

Platform annexation can be pursued under Section 7 of the Clayton Act when the platform purchases a related tool that gives it the ability and incentive to foreclose rivals. When the exclusionary conduct occurs without a merger, Section 2 of the Sherman Act applies. Annexation could create monopoly or it could facilitate monopoly maintenance, or both. In a second dimension to the analysis, both harms are possible in both markets: platform and tool. For example, control of the multi-homing tool can enable the dominant platform to obtain more market power or fend off a rival platform. Likewise, when a dominant platform controls one of multiple multi-homing tools in the marketplace, it can favor its own tool with better access to its platform, making the tool's rivals unattractive to consumers. This conduct increases the market power of the tool, creating or maintaining monopoly in the tools market. Under modern U.S. jurisprudence, proving an antitrust violation based on a vertical merger or monopolization is an uphill battle for plaintiffs; the analysis here attempts to lay out the problematic conduct and clarify the theory of harm.

I. THE PLATFORM ANNEXATION NARRATIVE

The question we consider in this article is how regulators and enforcers should analyze a scenario where a platform already possesses or acquires a multi-homing tool and uses it to disable or disadvantage multi-homing. We argue that this in turn reduces competition among platforms and harms consumers. We call this type of conduct "platform annexation." We argue that in contrast to traditional examples of vertical integration, platform annexation *creates* conflicts of interest rather than resolving 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.⁸ When undertaken by a dominant firm, platform annexation should instead be presumed anticompetitive.

According to the economic definition of a platform, a platform has more than one “side.” For example, a platform might bring together buyers and sellers of a good or service (a two-sided market) or readers, publishers, and advertisers (a three-sided market). 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 multi-homing tool allows participants to identify and transact with trading partners even on new or small platforms.

A tool that enables frictionless multi-homing is a significant threat to a large incumbent platform because it empowers participants to shift their business to other 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.

An independent multi-homing tool succeeds by giving its constituents a good service, for example, by helping sellers multi-home efficiently and maximizing their profits across competing platforms. Platform annexation, however, gives the platform the opportunity to avoid these competitive outcomes and reshape platform competition to its own advantage, especially when it

⁸ Platform annexation is more akin to a vertical merger where there is the incentive and ability to engage in foreclosure. See Steven C. Salop, *A Suggested Revision of the 2020 Vertical Merger Guidelines* 20 (Geo. Univ. L. Ctr., Working Paper, Dec. 31, 2021), scholarship.law.georgetown.edu/facpub/2381/ (arguing that vertical mergers can reduce horizontal competition, e.g., by raising rivals’ costs).

comes to multi-homing with platforms that are relatively close substitutes.⁹ The platform manipulates the formerly independent multi-homing 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.

Often the most powerful change a platform can make after annexing a multi-homing tool is to reduce the tool's interoperability with rival platforms. 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.¹⁰ 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 use 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, as a consequence of annexation, are artificially induced into single-homing on the big platform.¹¹ If these tactics are viewed narrowly, they might fit in a "refusal to deal" framework, where the question is whether a dominant firm can be held liable for a refusal to interoperate with a rival. Today in the United States, "refusal to deal" claims are subject to extremely stringent requirements that courts have created over time and provide a relatively weak constraint on the anticompetitive behavior at issue. Our platform annexation analysis is more expansive; we better explain the full extent of horizontal competition between platforms and how it can be harmed. Thus, even a court that was skeptical of a "duty to deal" requirement on its own could find it embedded in a broader course of conduct of platform annexation which satisfies the criteria for liability. Our analysis paves the way for legal theories of liability that are more likely to be successful than "refusal to deal" claims under Section 2.

II. WHEN COMPETITION AND ENTRY FAIL TO CONSTRAIN ANNEXATION

A natural first question to consider is whether competitive forces will prevent a firm from engaging in platform annexation. Why don't users abandon the manipulated multi-homing tool once it stops prioritizing their needs? If users immediately switch tools when this strategy begins, the dominant plat-

⁹ UK COMPETITION & MKTS. AUTH., ONLINE PLATFORMS AND DIGITAL ADVERTISING: MARKET STUDY INTERIM REPORT 101 (July 1, 2020) [hereinafter UK ONLINE PLATFORMS AND DIGITAL ADVERTISING].

¹⁰ DIGITAL COMPETITION EXPERT PANEL (UK), UNLOCKING DIGITAL COMPETITION 35–36 (Mar. 2019), assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785547/unlocking_digital_competition_furman_review_web.pdf.

¹¹ See generally Third Amended Complaint, *In re* Google Digital Advertising Antitrust Litig., 1:21-md-03010-PKC (S.D.N.Y. filed Aug. 12, 2021) (describing this dynamic and outcome). 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.

form's strategy would not work because there would be no demand to steer. Starting from a situation where most platform participants multi-home, and where most participants use the larger platform, steering users to the larger platform more often may impose relatively small, short-term harm that users may not even notice. The more significant harm occurs in the long run when the smaller platforms lose 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.

In many cases, the multi-homing tool or the platform (or both) have some market power. For example, participants may face a switching cost to change tools. The platform can manipulate its own multi-homing tool in various ways to steer customers toward it. The platform may hide or obfuscate the decline in quality of its own multi-homing tool when used with rival platforms, or delay improvements of its multi-homing tool that would benefit rival platforms, or simply worsen the terms of trade overall, while at the same time providing other financial or non-financial incentives for sellers to use the large platform's tools. For example, sellers might get less data or poorer insights into transactions with the platform when they use rival multi-homing tools, whereas they might be advantaged over other sellers in their transactions if they use the platform's tool.

By manipulating its own multi-homing tool to steer customers toward itself, a large platform helps prevent entry by a competing multi-homing tool provider. The large platform can ensure any such entering multi-homing tool cannot access its platform with the same quality as its own tool, and this disadvantage makes the new tool unattractive to users. If the large platform anticipates that its own multi-homing 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.¹² In this scenario the "low" price for the multi-homing tool is part of a very profitable, and anticompetitive, platform annexation strategy.

If the large platform is successful at reducing multi-homing by the sellers who use the platform, then competing platforms will in turn attract fewer buyers and provide less value to both sides of the market. This reduces the incentive of sellers to adopt different and better multi-homing tools—because 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

¹² Effective entry must then include both the platform and the tool, requiring greater investment and risk. See generally Dennis W. Carlton & Michael Waldman, *The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries*, 33 RAND J. ECON. 194 (2002).

entrant in the multi-homing 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; specifically, these behaviors in aggregate enhance competition among platforms. Those users who respond to quality changes and bear the switching costs to incentivize entry create a positive externality for other users. The incentive for users to free ride (i.e., not to switch multi-homing tools and thereby create market discipline) may mean that too many of them do not respond and an exclusionary annexation strategy succeeds.

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 a multi-homing tool provider, a platform, or both, start out with large market share, or where a platform has exclusive access to another asset such as a set of market participants or data. In contrast, multi-homing tools offered by a smaller platform will have a difficult time attracting participants if they do not interoperate fully with a larger platform in the industry. A smaller platform typically benefits when multi-homing increases, and so has the incentive to promote interoperability. 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. Entrants or smaller competitors may need to create or improve tools in order to facilitate multi-homing, and this is generally a pro-competitive activity.

III. PLATFORM ANNEXATION EXAMPLES

In this section, we will consider several platform annexation examples, beginning with a case study of platform annexation of multi-homing tools for digital advertising, motivated by the recent interest of regulators in this example.¹³ In the advertising industry, a variety of software products exist to help

¹³ E.g., UK ONLINE PLATFORMS AND DIGITAL ADVERTISING, *supra* note 9; Cecilia Kang et al., *Justice Dept. Case Against Google Is Said to Focus on Search Dominance*, N.Y. TIMES (Sept. 22, 2020); Keach Hagey & Vivien Ngo, *How Google Edged Out Rivals and Built the World's Dominant Ad Machine: A Visual Guide*, WALL ST. J. (Nov. 7, 2019); Fiona M. Scott Morton & David C. Dinielli, *Roadmap for a Digital Advertising Monopolization Case Against Google*, (Omidyar Network Policy Paper, May 2020); *In re Google Digital Advertising Antitrust Litig.*, 1:21-md-03010-PKC (S.D.N.Y. filed Aug. 12, 2021).

advertisers engage in digital marketing. Publishers also use multi-homing tools called publisher ad servers to help sell space on web pages. Consider a publisher such as the *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 multi-homing tool was used by *The New York Times* to manage its inventory, compare offers (advertisements and willingness to pay) from different advertising exchange platforms, and analyze data about the monetization possibilities 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 multi-homing 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 advertising exchange platforms. For this reason, DoubleClick would have no incentive to degrade its multi-homing capabilities. If a new advertising exchange were to enter the market, then DoubleClick would incorporate access to the new platform so that sellers, including *The New York Times*, could also sell there if they wanted to; it would be natural for sellers to gain from more choice, better prices, or features provided by the entrant platform. Since sellers value having easy access to these alternative platforms, a multi-homing tool designed to provide value to sellers will naturally support multiple platforms equally, creating as many options for the seller as it can. This leads to efficiency in the advertising market, with competitive returns to both advertisers and publishers like the *New York Times*.

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 article. Prior to its purchase by Google in 2007, DoubleClick offered the publisher ad server services (i.e., a multi-homing tool) described above.¹⁴ DoubleClick also launched its own platform, an advertising exchange that matched publishers (sellers of inventory) to advertisers (buyers of inventory), around the same time the company was acquired by Google.¹⁵ At the time of acquisition, DoubleClick’s share in the market for multi-homing tools was large (estimated to be at least 60 percent of the market), while its advertising exchange platform was new

¹⁴ David Lawsky, *Google Closes DoubleClick Merger After EU Approval*, REUTERS (Mar. 11, 2008), www.reuters.com/article/us-google-doubleclick-eu-idUSBFA00058020080311.

¹⁵ *Google Launches DoubleClick Ad Exchange*, BLOOMBERG (Sept. 17, 2009), www.bloomberg.com/news/articles/2009-09-18/google-launches-doubleclick-ad-exchange?sref=UK3enbiC.

and had minimal share.¹⁶ It is easy to see that an owner of both a multi-homing tool and an 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 rival platforms of traffic reduces competition in the platform market, deters entry or expansion, and increases the future take rate by the dominant platform. After acquiring DoubleClick's multi-homing tool and platform, Google altered its newly acquired tool to incentivize sellers to transact on its newly acquired platform more than its rivals' platforms. Specifically, Google's publisher ad server gave Google's advertising exchange informational advantages over rival exchanges, and allowed Google's exchange to view competing bids before placing its own bid.¹⁷

Post-acquisition, Google also used its search engine to connect advertiser demand to its own exchange and did not surface that demand to other exchanges. Google's exchange grew substantially in size and provided access to advertisers who were not available through other exchanges.¹⁸ DoubleClick's 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 Google's annexation of the tool, however, Google not only manipulated the tool to steer customers to its own advertising exchange, but Google also deployed its search engine to capture 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 DoubleClick's multi-homing tool after Google acquired and manipulated it, since competition among multi-homing tools providers could in principle provide a constraint on anticompetitive effects from annexation. If entry into tools were easy, if there were few switching costs, and if all exchanges were willing to interoperate on equal footing with all tools, then it seems likely that substantial degradation of the quality of the tool would induce entry by competing tools and switching by publishers. However, in the case of publisher ad servers that are deeply integrated into the user experience, switching costs can be substantial. In addition, Google had the power to prevent its advertising exchange from operating with any newly-introduced multi-homing tools and could deprive publishers who did not use Google's subverted multi-homing tool of access to the large set of advertisers who are

¹⁶ Am. Antitrust Inst., *Google Acquisition of DoubleClick: Antitrust Implications* 8 n.30 (Nov. 6, 2007), www.antitrustinstitute.org/wp-content/uploads/2018/08/Google_DoubleClick_memo_110620071437.pdf.

¹⁷ UK ONLINE PLATFORMS AND DIGITAL ADVERTISING, *supra* note 9.

¹⁸ Steve Lohr, *This Deal Helped Turn Google into an Ad Powerhouse. Is That a Problem?*, N.Y. TIMES (Sept. 21, 2020); Keach Hagey, *Publishers Feel Validated by States' Google Antitrust Lawsuit*, WALL ST. J. (Dec. 22, 2020).

uniquely accessible through Google's advertising exchange. Further, a lack of transparency about pricing and take rates on Google's advertising exchange made it harder for publishers to understand the costs they were bearing from the lack of interoperability as well as the potential benefits of investing in new tools. This uncertainty likely contributed to the lack of entry by competing tool providers.

If an advertising exchange is treated preferentially by a multi-homing tool over a period of time, it can accumulate more data and attract more advertisers than rival platforms. Eventually, other exchanges will 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. The effectiveness of the exclusionary strategy is enhanced by the fact that, without prevalent multi-homing, it can be difficult for a smaller platform to effectively compete with a larger one. After the market has tipped to a dominant platform, participants do not benefit as much from multi-homing tools. A publisher may not want to switch multi-homing tools if the potential benefit is fairer comparisons between a large exchange and a smaller exchange but the potential cost is restricted access at the largest exchange. Anticipating that consumers will be deterred by these risks, new multi-homing tool providers may be deterred from entry. Ultimately, publishers may receive less revenue from advertising, and publishers may have less incentive to create content.

In the foregoing example, as in many others, a dominant platform reduces the incentives of market participants to invest in multi-homing in the future by steering business to its own platform today. Platform annexation thus features a harm from lower quality service in the short run, lower quality 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.

As described in various government cases against Google in digital advertising, successful platform annexation by Google leveraged one part of the digital advertising business into market power in the other major parts, causing harm to users. 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.¹⁹

¹⁹ Scott Morton & Dinielli, *supra* note 13, at 2; *see also* Third Amended Complaint ¶¶ 60–63, *In re Google Digital Advertising Antitrust Litig.*, 1:21-md-03010-PKC (S.D.N.Y. filed Aug. 12, 2021) (describing the way Google sells digital ads).

Indeed, when it analyzed Google's acquisition of DoubleClick at the time, the American Antitrust Institute foresaw these results:

[A]dvertisers 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 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.²⁰

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.²¹ The framework of platform annexation we present here creates a unifying framework for these concerns.

Our second example is a hypothetical one. Imagine a multi-homing tool that users could employ to optimize their travel via train services, subway services, and car services platforms. 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 platform X purchased the tool and went on to maximize profits of the combined entity by using the tool to foreclose rival car service platforms. X would want its tool to benefit its own platform relative to rivals by, perhaps, listing its own platform's offerings first in its tool's user interface, offering rides to X's own drivers before the drivers of rival platforms, not sharing its tool's applications programming interfaces (APIs) with other transportation service platforms, and so forth. These tactics would benefit car service platform X,

²⁰ Am. Antitrust Inst., *supra* note 16, at 11–12.

²¹ UK ONLINE PLATFORMS AND DIGITAL ADVERTISING, *supra* note 9, at 211. Additional issues surrounding transparency in pricing have also been noted in regulatory hearings. See Keach Hagey, *Google Executive Gets Grilling on Capitol Hill*, WALL ST. J. (Sept. 15, 2020).

particularly relative to its closest competitor, car service platform Y, and X's share would grow. Subsequently, X could refuse to make its multi-homing tool fully interoperate with any competing or newly created tools, so that X's annexed tool provides better functionality for X's own platform. Foreclosure of Y, the smaller car service platform, occurs too quickly for rival multi-homing 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.

Whether these tactics would be successful depends on several factors. First, if the bias of X's tool makes travelers decide to seek alternate tools, then the annexation strategy 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 delayed. A delay might provide the time for X to use its existing market power to achieve a new equilibrium with higher share. Second, if X's tool steers users towards X's car service platform, drivers seeking those riders may join X's platform, which creates a benefit to X's users only. When old and new users of X do not face any costs, they have no incentive to multi-home and try to support Y. (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 observing the low quality of X's offerings—e.g., that some drivers were being preferred, or that alternate transit options were poorly integrated—they might not leave the tool, thereby cementing X's market power.

Platform annexation would benefit X, particularly relative to its closest competitor Y, and might even benefit users of X in the short run. If X's platform has indirect network effects and scale economies, it will benefit, but it will not have as much incentive to pass on those benefits to users after it has the market power that comes with excluding Y. Because platform annexation will harm users of Y, reduce entry, and lead to less competition in car services, it will not be in the interest of consumers.

Then, the foreclosure of Y would allow X to increase its take rate and reduce innovation. Furthermore, in a scenario where the owner of a mobile operating system (a type of platform) also owned either car service X or Y, the situation could become even more concerning. Tools could be integrated into the operating system's mapping software, or competing tools could be disadvantaged or prohibited from distribution through 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.

Our third example is derived from a general ecommerce setting. Suppose a software business springs up that helps merchants set up a storefront, develop layouts and content, track inventory, set prices, and mail out purchases. This storefront might be tightly integrated with the merchant's enterprise software and include a multi-homing tool to help the merchant choose prices and marketing campaigns on different ecommerce platforms. If many ecommerce platforms integrate with this storefront multi-homing tool, a merchant user can sell its wares on all of those platforms with one fixed cost, namely by deploying its single storefront software. The storefront multi-homing tool might further help the merchant analyze the fees of each platform relative to sales volumes and types so that the merchant can shift effort to platforms that are low cost or most profitable. Suppose next that a large ecommerce platform acquires this storefront multi-homing tool. The combined firm now rolls out an "improvement" to the tool that initially only works on its own ecommerce platform. The "improvement" renders sales on the home platform more lucrative, so merchants prefer to transact there. In addition, the tool's rankings and choice architecture steer business to its own platform. Rival ecommerce platforms lose some volume and liquidity, and merchants begin to drop off them, or fewer sign up, as a result. The storefront multi-homing tool's new capability is eventually made functional on the rival platform, but by that time there is an even newer functionality that, again, is exclusive to the dominant platform. The smaller platforms continue to shrink. Sophisticated merchants search for a tool that will let them sell successfully on all platforms. But no developers create new multi-homing tools because they foresee the dominant platform will not share its APIs and will refuse to interoperate with the entering tool. Established merchants must be able to sell on the dominant platform; and merchants face significant costs of running two tools, each with its own sales and inventory and so forth.

Competition authorities could use the framework we describe to develop a useful screen: ask whether any given change in well-functioning markets helps or harms user multi-homing. Conduct that harms multi-homing and lessens the ability of users to engage in it is likely worth further investigation.

IV. INEFFICIENCIES FROM PLATFORM ANNEXATION

Why is platform annexation inefficient? We start by explaining the logic from first principles and then relate this logic to the analysis of efficiency from the literatures on vertical integration, raising rivals' costs, and tying and bundling.

When multi-homing tools are independent, they have an incentive to serve the constituents of as many platforms as they can and to incorporate different platforms in ways that benefit their users. Seller multi-homing tools focus on improving seller profits. Buyer multi-homing tools focus on making sure buy-

ers have access to desired quality and liquidity and pay no more than necessary for quantity and quality desired. Independent multi-homing tools therefore engender competition. 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.

Platform annexation of a multi-homing tool, in contrast, creates a conflict of interest between the platform and its constituents. A platform wants to have advantages over its competitors, not to be on an equal footing with them. All else equal, any given platform wants a transaction to occur through it rather than through a competing platform, wants to share less of the buyer's payment with the seller, and wants to raise sale prices to increase revenue from buyers.

In short, a platform and its users do not share all the same goals, and, therefore, when a platform annexes a multi-homing tool, it *creates* 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. After annexation the "multi-homing" tool is manipulated to maximize platform surplus at the expense of rivals. The conflict between platform and users is resolved in favor of the platform when buyers pay more and/or when sellers receive less. These results are exactly the opposite of the goals of the independent 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.

A. THE ANALYTICAL FRAMEWORK FOR PLATFORM ANNEXATION

Platform annexation involves a dominant firm obtaining control over users' ability to multi-home—perhaps through an acquisition, perhaps through "closure" of what was previously open—and a manipulation of interoperability to form an effective strategy for excluding rivals. As we have described, the platform's behavior towards the tools, and the tool's behavior towards the platform, can be used to reinforce one another. The resulting situation deters new entry that would otherwise be attracted by user demand. Potential tools are aware that a platform with this strategy will exclude any tool entrants; likewise, potential platforms are aware that a tool with this strategy will exclude new platforms. Elements of platform annexation can be related to various antitrust frameworks. The advantage of considering platform annexation as a distinct strategy is that, by incorporating the specific features of the phenomenon, it is possible to be more precise about whether the conditions that lead to inefficiency are satisfied. We consider several relevant frameworks in turn and show how platform annexation incorporates each while supporting an identifiable narrative of exclusion.

1. *Is This Horizontal or Vertical Conduct?*

Competition policy typically draws a distinction between horizontal and vertical conduct. When two competitors 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 contracting and vertical integration, such as when a manufacturing firm and one of its suppliers merge, are often considered to be efficient.²² The problem integration can solve is that a manufacturer can have 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. Economists refer to this inefficiency as the “double marginalization” problem, and a large literature is devoted to it. Empirically, however, any individual vertical merger may or may not exhibit these inefficient externalities, and the merger may or may not be able to internalize them.²³ 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.²⁴ Again, in these settings, vertical integration aligns the interests of the merging parties with consumers.

However, there is equally compelling scholarship explaining how vertical mergers can harm competition by misaligning the interests of the merging parties and consumers. One way this occurs is through the combined entity foreclosing a rival’s access to inputs or customers. In a 2003 article, Joseph Farrell and Philip Weiser analyzed judicial and regulatory decisions that promoted open architectures and interoperability in order to prevent firms that are powerful at one level from leveraging that power into adjacent segments.²⁵ Farrell and Weiser contrasted these decisions with the Chicago School view that vertical mergers are invariably efficient.²⁶ The Farrell and Weiser article argues that vertical mergers can be efficient when they internalize complementary efficiencies, but that vertical mergers do not accomplish this goal and

²² U.S. Dep’t of Justice & Fed. Trade Comm’n, *Vertical Merger Guidelines 2* (2020), 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”).

²³ See Jonathan B. Baker, Nancy L. Rose, Steven C. Salop & Fiona Scott Morton, *Five Principles for Vertical Merger Enforcement Policy*, *ANTITRUST*, Summer 2019, at 12, 15.

²⁴ Tim Baldenius, *Ownership, Incentives, and the Hold-Up Problem*, 37 *RAND J. ECON.* 276 (2006).

²⁵ Joseph Farrell & Philip J. Weiser, *Modularity, Vertical Integration, and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age*, 17 *HARV. J.L. & TECH.* 85 (2003).

²⁶ *Id.*

are instead anticompetitive in a variety of settings, such as when vertical mergers are used to deter entry or nascent competitive threats.²⁷

Farrell and Weiser also argue that incomplete complementarity can undermine the efficiency of vertical mergers.²⁸ For example, in a setting where applications might serve consumers on more than one platform, a platform attempting to integrate into applications does not internalize harm to users that access the application through other platforms.²⁹ Farrell and Weiser also argue that the presence of scale economies in adjacent markets contributes to the potential for harm.³⁰ Our analysis is consistent with these arguments. 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. Those users cannot exert effective discipline on the foreclosing platform for the reasons described above: there are often externalities, switching costs, and asymmetric information that prevent users from acting in a timely fashion.

2. Existing Frameworks for Analysis of Platform Annexation: Raising Rivals' Costs

Steven Salop, who introduced the idea that raising rivals' costs (RRC) can be anticompetitive,³¹ recently summarized the implications of RRC and related theories for vertical merger policy, highlighting that upstream firms indirectly support competition between downstream firms, so that "vertical" behavior affects competition and welfare.³² When a downstream firm with market power is also a supplier to itself and to downstream competitors, it can use its market position to raise downstream competitors' costs or refuse to

²⁷ *Id.* at 109–12.

²⁸ *Id.* at 119.

²⁹ *Id.*

³⁰ *Id.* Einer Elhauge, Edward Iacobucci, and Francesco Ducci discuss the strong assumptions required for the "single monopoly profit" theory and further review the economics literature that shows that vertical integration 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. Einer Elhauge, *Tying, Bundled Discounts, and the Death of the Single Monopoly Profit Theory*, 123 HARV. L. REV. 397 (2009); Edward Iacobucci & Francesco Ducci, *The Google Search Case in Europe: Tying and the Single Monopoly Profit Theorem in Two-Sided Markets*, 47 EUR. J.L. & ECON. 15 (2019). Lina Khan 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 article suggests regulatory action, in particular structural separation, to prevent harms arising from platform annexation. Lina M. Khan, *The Separation of Platforms and Commerce*, 119 COLUM. L. REV. 973 (2019).

³¹ Steven C. Salop & David T. Scheffman, *Raising Rivals' Costs*, 73 AM. ECON. REV. 267 (1983).

³² Salop, *supra* note 8, at 4.

supply the input. This is true both in traditional, physical supply markets and in digital markets.³³

Platform annexation causes a harm to horizontal competition—between platforms—through a vertical foreclosure strategy, in particular by foreclosing rivals’ access to customers, one of the forms of RRC. When a platform purchases an independent tool provider, it uses the vertical relationship to steer volume to itself and raise rivals’ costs by making it more difficult for rivals to attract customers. If that scale creates liquidity or better matches for users, then RRC takes the form of lowering their quality. If a platform manipulates its multi-homing tool to disadvantage rival platforms, for example, by denying them information or interoperability, the platform will lower the quality of its rivals, and create or increase customer foreclosure. Or the platform may simply prevent usage of rivals through lack of interoperability, which may result in direct exclusion of those rivals, a more dramatic form of customer foreclosure. The vertical foreclosure that arises from platform annexation has a longer run impact also. If a rival platform foresees that it cannot obtain customers because of the foreclosure of the dominant platform, it will be less likely to enter. Similarly, a rival tool provider that foresees it cannot obtain equitable interoperability with the dominant platform will also be less likely to enter. These outcomes reduce competition in the fundamental services offered by the platform industry. Again, this fits into a classic RRC framework by foreclosing customers.

When a dominant platform degrades or ends interoperability with its multi-homing tools (perhaps an organized set of APIs), a rival platform also experiences higher costs. Its users (e.g., software developers) now no longer can develop software once for both platforms but must expend the resources to develop a second product for the rival’s platform. This type of RRC is known as “open early, closed late,” a concept related to refusal to deal. In this setting there is no merger, but rather the dominant firm unilaterally decides to change its conduct and cut off a rival. If the dominant firm is consistently attempting to maximize its long run profit, the change in strategy can be explained by a change in the external environment or the firm’s internal costs, opportunity costs, or benefits. The reason for the dominant firm to change its strategy from open to closed is likely related to the threat it faces from its rivals. Perhaps the rival lost key ground and could be forced out, or the cost to the dominant firm of closing its platform fell. An acquisition is an obvious reason for a change in strategy, as it provides the dominant firm with a new ability to engage in foreclosure.

³³ *E.g.*, *Steves & Sons, Inc. v. Jeld-Wen, Inc.*, 988 F.3d 690 (4th Cir. 2021).

There are a number of factors that increase the effectiveness of platform annexation in the digital context. One is the ability the platform often has to hide information or create asymmetric information between itself and its constituents. The service provided by multi-homing tools may involve, for example, aggregating and comparing a large number of offers with many dimensions, so it may not be straightforward to audit the tool's performance. Thus, users may not be able to see that quality is being degraded, or see it quickly enough to respond. Some categories of users may have a default bias, or limited time and ability to analyze the platform's conduct and optimize. Unless users respond quickly to bias in multi-homing tools by switching tools, the quality of smaller platforms can drop quickly and cause the market to tip in favor of a dominant platform. If switching among multi-homing tools is costly and the costs are borne by the switchers, while all users gain from the smaller platform staying in the market, free riding may prevent competition in the multi-homing tool market from deterring the manipulation of multi-homing tools. Lastly, there is the critical role of feedback effects between the tool and the platform. These make platform annexation speedy and effective because the very same action that reduces sales on the smaller rival platform also reduces that platform's quality, and, in addition, the incentive for rival tools to enter and fix the problem. Users may not understand the mechanisms that lead to the outcomes they experience. They may simply note that one platform has better offers than the other, without recognizing that the lower quality of the smaller platform is a direct consequence of tools preferencing the leading platform and creating artificial differences in platform participation.

B. TYING, BUNDLING, AND THE SINGLE MONOPOLY PROFIT THEORY

A key component of platform annexation is the way in which the dominant platform interacts with multi-homing tools. If a platform fully interoperates only with its own multi-homing tool, or if a dominant firm's multi-homing tools interoperate better with the dominant platform, the behavior can be thought of as a form of tying or bundling. The literature on tying and bundling highlights that these practices may not create inefficiency in some benchmark scenarios but may lead to inefficiency in more realistic settings. The "single monopoly profit" thesis that a firm with market power in a core market cannot profit by tying or bundling its product with a product in an adjacent market holds only in very specific circumstances. In those circumstances, if a monopolist charges more for a product in an adjacent market, it would need to charge less in the core market. This argument, which requires market power in the core market and no market power in the adjacent market, is inapplicable in our setting because (among other reasons) it ignores the "tippyness" feature of platforms that creates feedback from quantity to quality to entry (without prevalent multi-homing).

In our setting, we can consider the platform as the core market and the tools market as an adjacent market. The conflict of interest created by platform annexation also demonstrates why the “single monopoly profit” critique³⁴ does not apply to cases of platform annexation. The existence and degree of market power in both the primary and adjacent markets are influenced by the conduct at issue; using a tool to reduce interoperability changes the long-run ability of the platform to extract surplus. Another way to look at it is that the dominant platform does not internalize the negative effects of reduced competition between it and other platforms in either the short or the long run (i.e., the benefits of such competition accrue to users, not the platform). The dominant platform’s subversion of its tool from an independent multi-homing device to a biased steering tool creates a negative externality, since users benefit in the short and long run when they can choose among competing platforms.³⁵

A number of other perspectives in the existing tying and bundling literature are consistent with our analysis. Michael Whinston showed 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.³⁶ Tools for multi-homing would be expected to have such scale economies. Dennis Carlton and Michael Waldman showed 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.³⁷ In literature that considers investments by a monopolist in complementary products, Jay Pil Choi and Christodoulos Stefanadis show that when there is uncertainty about returns to investment, a monopolist’s entry in a complementary market allows it to engage in a “price squeeze” that reduces investment and innovation by rivals.³⁸ All of these forces, or analogous forces, operate in platform annexation. Platforms and tools generally have entry costs and scale economies, while the ease of multi-homing is a key force determining the barriers to entry in platform markets.³⁹

³⁴ Steven C. Salop, *Invigorating Vertical Merger Enforcement*, 127 YALE L.J. 1962, 1968–70 (2018); Thomas G. Krattenmaker & Steven C. Salop, *Competition and Cooperation in the Market for Exclusionary Rights*, 76 AM. ECON. REV. 109, 111–12 (1986).

³⁵ See Jonathan Baker, Note on ‘Single Monopoly Profit’ Theory 4–5 (2014) (unpublished manuscript) papers.ssrn.com/sol3/papers.cfm?abstract_id=2496932.

³⁶ Michael D. Whinston, *Tying, Foreclosure, and Exclusion*, 80 AM. ECON. REV. 837, 837–41 (1990).

³⁷ Carlton & Waldman, *supra* note 12, at 164–97.

³⁸ Jay Pil Choi & Christodoulos Stefanadis, *Tying, Investment, and the Dynamic Leverage Theory*, 32 RAND J. ECON. 52 (2001).

³⁹ See OECD, RETHINKING ANTITRUST TOOLS FOR MULTI-SIDED PLATFORMS 77–78, 103–04 (Apr. 6, 2018), www.oecd.org/daf/competition/Rethinking-antitrust-tools-for-multi-sided-platforms-2018.pdf; David S. Evans & Richard Schmalensee, *The Antitrust Analysis of Multisided*

1. *Platform Envelopment and Competition with Complementors*

Thomas Eisenman et al. develop a model of “Platform Envelopment” in the literature that addresses platform economics more specifically.⁴⁰ They describe how when two platforms are serving the same set of users (or have substantial overlap), one can attempt to foreclose the other’s access to users.⁴¹ The winning platform harnesses the network effects that formerly belonged to the now foreclosed rival.⁴² The paper articulates a set of tactics that have been observed in practice that facilitate this foreclosure.⁴³ Our discussion of platform annexation highlights a subset of these strategies; the way the foreclosure is effectuated is through the acquisition of a complement, in this case, the adjacent market for tools.⁴⁴

To be sure, a platform may help consumers by entering the complementary 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. Observers have argued that 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.⁴⁵ 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. Steven Davis et al. use the case study of Microsoft to illustrate the idea that platforms can benefit by creating APIs to reduce the cost of complementary investments by applications developers; they also show that in addition to cost reduction, the release

Platform Businesses, in 1 OXFORD HANDBOOK OF INTERNATIONAL ANTITRUST ECON. 404 (Roger D. Blair & D. Daniel Sokol eds., 2014).

⁴⁰ Thomas Eisenmann et al., *Platform Envelopment*, 32 STRATEGIC MGMT. J. 1270 (2011).

⁴¹ *Id.* at 1275–76.

⁴² See also Michael A. Cusumano & Annabelle Gawer, *The Elements of Platform Leadership*, MIT SLOAN MGMT. REV., Spring 2002, sloanreview.mit.edu/article/the-elements-of-platform-leadership/ (examining scenarios where a monopolist wishes to commit not to enter into complementors’ markets in order to induce complementary firms to make platform-specific investments). Cusumano and Gawer also observe that a firm might enter an adjacent, complementary market if existing complementors are poor quality.

⁴³ Eisenmann et al., *supra* note 40.

⁴⁴ The model of Eisenman et al. considers two adjacent platforms and allows the two platforms to be unrelated, substitutes, or complements. See *id.* at 1274. Our analysis, in contrast, focuses on the case of complements, although multi-homing tools may not be formally considered platforms, in that they provide a service to only one side of the market, typically connecting to platforms through APIs.

⁴⁵ See Adam Levine-Weinberg, *Amazon’s Kindle Strategy Is Finally Working*, MOTLEY FOOL (Feb. 9, 2014), www.fool.com/investing/general/2014/02/09/amazons-kindle-strategy-is-finally-working.aspx.

of APIs facilitates complementary innovation.⁴⁶ Annabelle Gawer and Rebecca Henderson 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.⁴⁷ 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.⁴⁸ Feng Zhu surveys the studies that have considered how a platform responds to the possibility of supplying its own complement.⁴⁹ Many platforms chose not to do that, often for the reasons identified above, but Zhu identifies several case studies where the platform offers the complement, then bundles it together with other platform services and is able to exclude rival complements.⁵⁰

2. *Exclusive Contracts*

The manipulation of multi-homing tools has economic consequences similar to those of exclusive contracts between platforms and platform users, since exclusive contracts also result in a reduction of multi-homing. Platform annexation is an indirect way to achieve an exclusive relationship with users. 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. Robin Lee empirically studies these effects in the gaming market.⁵¹

V. COMPETITION POLICY AND PLATFORM ANNEXATION

Annexation of services and tools allows the dominant platform to acquire, maintain, or exercise market power. The asset acquisitions that can be characterized as platform annexation thus often feature tactics that prevent multi-homing with competing products or that help the acquirer block or impede

⁴⁶ Steven J. Davis, Kevin M. Murphy & Jack MacCrissen, *Economic Perspectives on Software Design: PC Operating Systems and Platforms*, in MICROSOFT, ANTITRUST AND THE NEW ECONOMY 361 (David S. Evans ed., 2002). Previous version available at www.nber.org/system/files/working_papers/w8411/w8411.pdf.

⁴⁷ Annabelle Gawer & Rebecca Henderson, *Platform Owner Entry and Innovation in Complementary Markets: Evidence from Intel*, 16 J. ECON. & MGMT. STRATEGY 1, 2–4 (2007).

⁴⁸ *Id.*

⁴⁹ See generally Feng Zhu, *Friends or Foes? Examining Platform Owners' Entry into Complementors' Spaces*, 28 J. ECON. & MGMT. STRATEGY 23, 26 (2019).

⁵⁰ *Id.* at 4.

⁵¹ Robin S. Lee, *Vertical Integration and Exclusivity in Platform and Two-Sided Markets*, 103 AM. ECON. REV. 2960 (2013).

entry. It is the combination of these tactics in an appropriate setting that delivers stronger exclusionary conduct than a simple refusal to deal.

A. CONSIDERATIONS

In evaluating whether a platform annexation is anticompetitive, the following considerations are important. First, the value of multi-homing and its ability to create competition between platforms is an important condition. Taking control of a multi-homing tool is a critical element of the conduct. This can occur through an acquisition or through a platform encouraging multi-homing with an “open” strategy that later expropriates users by becoming closed in a way that prevents or raises the costs of multi-homing. When the dominant platform has taken control of the multi-homing tool, a competition authority or court should ask whether that integration creates a conflict of interest rather than resolving one.

Second, the conduct will be particularly dangerous for competition when the rival experiences economies of scale and when its quality rises with its output (*ceteris paribus*). Other factors 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, and whether competition will discipline the platform to provide constituent-friendly tools that promote multi-homing and interoperability.

It is important for courts and competition authorities not to fall into the trap of thinking that platform annexation is best thought of as “vertical,” with all the connotations that brings. Combinations between a platform and its tools are related market acquisitions that harm horizontal competition and therefore are more easily understood in a horizontal framework. The central platform expands 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.

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. Agencies and courts may find it a useful guide to observe which firms and tactics try to harm multi-homing to learn where the anticompetitive conduct may lie.

The logic of competition policy towards horizontal competitors can also be used to identify cases where antitrust enforcement is *not* necessarily appropri-

ate. 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 procompetitive 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—and those tools will tend to be neutral since users want access to the large platform as well as the small one.

Some economists have advised caution in applying antitrust regulation to multi-sided platform markets 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.⁵² However, in the case of platform annexation, the platform reduces the quality of the tools on one side of the market (e.g., sellers), *without* passing on the surplus to the other side of the market (e.g., buyers). For example, a rival platform's buyers are harmed in the long run as it attracts fewer sellers and loses its utility to buyers, and the rival platform's sellers are similarly harmed by its long-term loss of 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.

B. REMEDY

One obvious remedy for platform annexation is mandatory interoperability, and, in the settings we have described in this article, mandatory interoperability is very likely to be feasible because it was the status quo immediately before the conduct at issue. Therefore, the platform cannot credibly claim that such interoperability is not technically possible or too costly. Typically, whatever APIs are shared between the platform and its own multi-homing 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. Moreover, if the market was interoperable prior to the anticompetitive conduct, it should not be too risky for consumers to make it interoperable again and other market institutions should support and complement interoperability. When interoperability was withheld from rivals in order to foreclose them and create market power, the rivals are likely to benefit when interoperability is restored. They will then be on equal footing (again) with the dominant firm.

⁵² E.g., David S. Evans, *The Antitrust Economics of Multi-Sided Platform Markets*, 20 YALE J. ON REG. 325, 380 (2003).

The oversight of mandatory interoperability can be carried out by a competition authority or court, or by a monitoring trustee or technical committee if the competition authority or court does not have the resources or capability. A regulator will be better situated to oversee a setting where the interface frequently changes and those changes can be exploited by the dominant firm to create or maintain a monopoly. A discussion of how such a competition remedy might work in the United States is covered in Michael Kades and Fiona Scott Morton (2021).⁵³

To promote robust competition, it is critical not only to prevent a dominant platform from preserving its monopoly through inadequate interoperability of its multi-homing tool with platform rivals, but also to prevent it from favoring some rivals over others. The interoperability must be *equitable* in the sense that all platform rivals have the same access and functionality.⁵⁴ Otherwise the dominant firm will be able to distort competition to its own advantage.

Of course, other remedies may also be appropriate, such as divestiture. The multi-homing tool would then become independent again, with all the beneficial incentives that situation brings. If the conduct of the dominant firm has created irreparable harm to the point where no independent buyer can be found, then mandatory interoperability would be the obvious remedy.

VI. CONCLUSION

When a platform competes against other platforms, it is incentivized to keep all sides of its own platform happy by ensuring it serves their needs and by improving quality and price. Some mergers involving platforms will be designed to this end and will therefore be procompetitive. In 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. This conduct is harmful because it alters short run choices users would otherwise make in order to harm them further in the long run.

In a scenario where multi-homing tools are independently owned and facilitate multi-homing on multiple sides of a platform market, the platform market can be very competitive, characterized by low take rates and robust competition in quality and innovation in the goods and services being provided by or through the platforms. 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

⁵³ Michael Kades & Fiona Scott Morton, Interoperability as an Antitrust Remedy (Mar. 2021) (unpublished manuscript), papers.ssrn.com/sol3/papers.cfm?abstract_id=3808372.

⁵⁴ See Fiona M. Scott Morton et al., *Equitable Interoperability: The "Supertool" of Digital Platform Governance* (Tobin Ctr. Pol'y Paper 4, Yale Univ., Oct. 27, 2021), papers.ssrn.com/sol3/papers.cfm?abstract_id=3923602.

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.⁵⁵ However, if multi-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.

In this article, we introduced the concept of platform annexation, whereby a platform annexes multi-homing tools and manipulates them to reduce multi-homing and competition. 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 incentive to reduce multi-homing.

When evaluating whether a platform annexation is anticompetitive, regulators and courts should consider several factors, including whether the integration of the multi-homing tool creates a conflict of interest, whether rivals experience economies of scale, whether the annexing platform has significant market share, and whether competition will discipline the platform to promote multi-homing and interoperability. We advocate that platform annexation undertaken by a dominant firm be presumed anticompetitive. If a given instance of platform annexation is found to be anticompetitive, effective remedies could include mandatory equitable interoperability or divestiture.

⁵⁵ 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 (e.g., due to some sellers single-homing or due to different matching algorithms, 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.

