

Understanding the Economics of Platforms

BY ROSA ABRANTES-METZ, MICHAEL CRAGG, ALBERT METZ, AND MINJAE SONG

MOST ANTITRUST PRACTITIONERS have at least a rudimentary understanding of platforms, if not from a reading or two of the Supreme Court's decision in *Amex*,¹ then from the extensive and ongoing investigations, cases, and ad nauseam discussions and debates surrounding big tech platforms. But, for many, the economic issues that arise in the platform space quickly devolve into a thicket of specialized jargon, centering mostly around indirect network effects, interdependent demands, net prices, and so on. Many lawyers have to explain these concepts to judges (and sometimes juries), and that can be a challenge.

In this article, we attempt to take the mystery out of the economics of platforms, while at the same time providing insights into the complexities of this emerging subject area—in terms of both case law and economics. Notwithstanding over two decades of economic analyses of platforms, there is much to be done; our objective here is to make it a little easier to follow along.

Amex and its Limitations

Amex fundamentally changed the boundaries of market definition for transaction platforms. In assessing whether American Express's antisteering provisions violated the Sherman Act, the *Amex* Court relied heavily on economics literature about platforms to determine that transaction platforms like credit cards must be analyzed as two-sided platforms when examining market power. In addition, the *Amex* Court suggests that other platforms also might need to be analyzed as two-sided platforms if indirect network effects are strong.

A transaction requires a simultaneous exchange between a buyer and a seller. An intermediary may facilitate the transaction and thereby provide a service, but ultimately the two-sided market is distinguished by the product being a

transaction. *Amex* tells us that, to the extent this type of transaction has an identifiable characteristic (e.g., credit card, airline ticket, concert ticket, rideshare/taxi), a two-sided transaction market exists.

What then is a two-sided market? Two examples of markets that courts have determined to be two sided are credit cards, as in *Amex*, and airline global distribution systems (GDS), as in *Sabre*.² In each case, transaction providers bring together buyers and sellers through electronic intermediation; this structure has led to these markets being called "transaction networks." Transaction providers usually seek greater profits through more transactions; however, the defining consideration highlighted by *Amex* and the economics literature upon which it relies is that the value of a provider's network on a *per-user/transaction basis* can be affected by the size of the network, and in particular the size of the population on each side of the transaction platform. For instance, for consumers, a credit card is more valuable the more broadly it is accepted, and for travel agents, an airline GDS is more valuable the more airlines are available for travel bookings. This feedback *between* sides is often called an "indirect network effect." Because the two sides use the transaction platform simultaneously, substitutes on both sides must be considered in defining the relevant market for that platform.

Amex requires a different economic analysis for market definition in the context of transaction platforms only because the nature of substitutes on either side of non-transaction platforms can be substantially different. For instance, a computer operating system brings together various disparate stakeholders, including hardware producers, application developers, and computer users. Thus, an operating system has multiple sides, but the interaction among them lacks the simultaneity that marks a transaction platform. Hence, with non-transaction platforms, defining the relevant market and evaluating market power is not necessarily a two-sided analysis, although it likely entails two-sided considerations.

In many ways, *Amex* is a narrow decision because it focuses merely on market definition, finding that the plaintiffs failed to conduct a proper analysis because they considered only one side of a two-sided transaction market. Importantly, *Amex* made clear that transaction platforms, characterized by *simultaneous* transactions between different

Rosa Abrantes-Metz, Michael Cragg, and Minjae Song are Principals at The Brattle Group. Albert Metz is a Senior Consultant at the Brattle Group. The authors thank James Keyte and Ashley Laney and the editors for helpful suggestions. The authors have worked on some of the cases referenced in this article. The views expressed are those only of the authors and do not necessarily represent those of their affiliated organizations or their clients.

sides, require a two-sided analysis because the indirect network effects are “more pronounced.”³ *Amex* thus limits the Supreme Court’s decision in *Times-Picayune*, which held that, for certain arguably two-sided platforms like newspapers, indirect network effects may be weak enough to be properly considered through a one-sided analysis.⁴ However, this begs two questions that do not yet have settled answers in the economic literature: how strong must the indirect network effects be to require a two-sided analysis, and for that matter, what exactly is a two-sided analysis?

Other Types of Platforms and Related Network Effects

A variety of industries in the modern economy are built upon platforms, including media platforms, operating system-based networks, and search and matching networks. These networks each has the characteristic that two or more groups of users are provided platform services that can have direct and indirect network effects, and one or more sides of the platform must achieve critical mass for the network to be viable. Whether these platforms fall within *Amex*’s scope depends on whether the indirect network effects are strong enough to require balancing users’ needs on each side of the platform, among other case-specific considerations.

Media Platforms. Much empirical analysis in the academic literature has been on advertiser-supported media platforms, including traditional platforms such as radio, newspapers, magazines, and yellow pages.⁵ In each of these cases, there are significant costs related to content creation and distribution. Content attracts subscribers, and in the traditional model there are limited, if any, direct network effects for subscribers. There is also evidence for a pattern of *negative* indirect network effects from advertisers to subscribers, because generally content consumers do not appreciate the interruption of advertisements, while there is a *positive* direct network effect from subscribers to advertisers, because more eyeballs seeing an advertisement increases the value of each ad. There may even be negative direct network effects for advertisers who do not appreciate the competition or congestion from other advertisers.

In the new economy, media platforms are rapidly transforming. Unlike traditional media platforms, social media platforms such as Facebook and LinkedIn have strong direct network effects on the subscriber side, because content is created and consumed primarily by subscribers. The ability to target and tailor advertising potentially reduces the negative indirect network effect from advertising to subscribers. And with the Internet, distribution costs are very different.

These changes in the network effects and cost structures of media platforms will change which cases can be used as precedent for antitrust analysis. *Amex* provides some guidance on the limitations of applying *Times-Picayune* to determine whether a two-sided analysis is needed to define the relevant market, but other questions—such as how to evaluate the extent of market power arising from network

effects in media platforms and how to evaluate the effects of the alleged conduct—are far from decided. For instance, consistent with *Times-Picayune*, the German competition authority conducted a one-sided analysis and found that Facebook operated in at least two separate relevant markets, one being “the national market for social networks” and the other being no wider than “the national market for non-search online advertising.”⁶ However, the German competition authority nonetheless determined that Facebook has significant market power based on the strong direct network effects in social networking.⁷

Operating System-Based Networks. A point of similarity between gaming consoles, smart phones, and personal computers is that they all rely on an operating system (OS) to intermediate between system users, peripherals, and applications built for the platform. In some cases, the OS is provided by the hardware producer, as in the case of Apple; in other cases, original equipment manufacturers (OEMs) sell their devices with a third-party operating system, as in the case of personal computers and Microsoft Windows.

Two distinguishing features of these types of platforms versus transaction platforms is that they are often multi-sided and engagement is ongoing in ways that fundamentally change switching costs. To illustrate the multisided distinction, consider a cell phone that can be used to make a call, get directions, play a game, engage in social media, attach to devices, and distribute digital content. Each of these uses in turn might be a platform in its own right—for example, Facebook is both an application and a platform. With respect to the role of switching costs, each device or application that connects to the hardware is intermediated by a set of application programming interfaces (APIs). An OS may have thousands of APIs, each acting as a sophisticated plug that allows an application to control certain hardware or software features. Each application is therefore specific to an OS, unless it is ported to another OS. Thus, where the transaction platforms referenced in *Amex* provide an exchange service bringing buyers and sellers together, OS-intermediated platforms engage in a range of far more complicated intermediations that may form their own product or service markets, some of which may be transaction markets.

From both a legal and an economic perspective, much remains to be sorted regarding how *Amex* and the DC Circuit Court opinion in *United States v. Microsoft*⁸ will apply to OS-based platforms. *Microsoft* provides important lessons for the role of middleware, nascent entry, exclusionary conduct, and market definition in a platform context. We expect this decision will play an increasingly important role in the examination of platforms, because it considers the effects of conduct by a large platform—Microsoft—on a market including small innovators, such as Java and Netscape, which have the potential to disrupt market power. It is yet to be seen whether and how the analyses in *Microsoft* will

be applied to modern-day platforms now that we are fully in the Internet era.

Search and Matching Networks. *Amex* applies to a relatively simple transaction service—the replacement of cash and other means of exchange for goods and services, conditional on the buyer and seller already having been matched. But the internet has also transformed the search for goods and services themselves. Sites exist to match pets with owners, single people with lovers, vacationers with rental properties, drivers with passengers, and the list goes on. Some of these are little more than a very efficient catalogue, virtual mall or taxi dispatch service where the efficiency gain arises from the reduction in search and transaction costs and the control of congestion through pricing and other means (e.g., ride-sharing apps). Other sites combine extensive social interaction (e.g., dating sites), while still other sites allow consumer choice within the context of stories or reviews (e.g., online magazines). Market definition and power in the context of platforms providing multiple services to two or more sides has yet to be fully tested.

In some cases, both parties acknowledge they are dealing with characteristics of two-sided markets (see, e.g., *Epic v. Apple*⁹) but in others, this is a potential point of dispute (see, e.g., the *Blue Cross Blue Shield MDL*¹⁰). We will have to wait to see whether the U.S. courts will follow the European Commission’s *Google Search (AdSense)* decision, in which the Commission found a market for online search advertising intermediation because this type of service has a limited substitutability with both direct online sales and intermediation services for online non-search, and providing this type of service requires a sufficiently large portfolio of publishers and advertisers.¹¹ The Commission also found that Google was dominant in the markets for general internet search services, licensable smart mobile operating systems, and app stores for the Android mobile operating system.¹² In *Google Android*, the Commission rejected Google’s contention that it was required to analyze indirect network effects because of its decisions in *Microsoft*, even though the Commission noted the importance of scale and indirect network effects for Google’s success in both search and licensable smart mobile operating systems.¹³

Conduct Evaluation in a Platform Setting

Platform economics becomes particularly challenging and interesting when we begin to examine traditional antitrust theories and potential misconduct in a platform environment. This includes, first, understanding what metrics are used to measure effects and, where useful, asserted justifications; second, whether and to what extent standard horizontal behaviors may be assessed differently in a platform setting; and, finally, how common unilateral behaviors or vertical agreements are analyzed in the platform context, including the assessment of effects and proffered justifications. The legal framework for assessing this myriad conduct is itself complex, and quite limiting in particular cases.

We provide below a discussion of basic principles from an economics perspective, as well as the state of the economic literature on particular conducts, as applied to platform environments.

The Metrics (For the Most Part) Remain the Same

In both the economic literature and the case law dealing with platforms, the usual metrics of the consumer-welfare standard remain the foundation. Indeed, though this principle remains somewhat controversial, the *Amex* court made clear that, at least in cases involving transaction platforms and alleged non-price vertical restraints directly related to those transactions, the appropriate metric to assess alleged harm remains whether an increase in prices or a reduction in output or innovation occurred. Likewise, even for matters involving the more subtle effects that flow from harm or impediments to rivals, the relevant metrics appear to remain price, quantity, and innovation in the actual world compared to those metrics in a but-for world without the alleged misconduct. However, there will continue to be vigorous debates—especially outside of the strict application of *Amex*—about whether and to what extent the appropriate metric should be applied to each “side” of a platform separately, or whether a “net” metric measuring the effect on all sides combined should be applied. The debate following from *Amex* will involve defining when indirect network effects are strong enough to warrant defining a two-sided market (with the exception being a transaction platform that is two-sided regardless of whether indirect network effects are weak). It will also require determining whether indirect network effects have different strengths on each side of the two-sided market, so that each side’s market power is different.¹⁴

When evaluating the potential effect of the alleged conduct, the platform context brings at least two additional complicating factors to this analysis. First, as it relates to pricing in the actual and but-for worlds for each side of the two-sided market, one should account for indirect network effects and the extent to which perceived elevated prices on one side of a platform are interrelated with demand on the other side. Second, in the context of platforms and often extensive network effects, the market evolution for both effects and justifications may be more dynamic than in typical antitrust cases, and thus, the assessments of such effects and justifications require a dynamic inquiry. For instance, the early stage of platform development often requires hitting a critical mass at which there are enough users on both sides of the market to realize network effects that, once achieved, can create natural market power and possibly even monopoly power. In addition, cross-side feedback effects can shift rapidly in the face of competition, when one platform achieves critical mass and the market tips toward it.

To illustrate how the typical measures change in a platform setting, consider the question of price. The economics literature provides that both sides of a platform market

are expected to pay a positive, “unsubsidized price” in the absence of network effects. However, when the indirect network effect from side B to side A is sufficiently large, cases can arise where side A pays side B a “subsidy” for the benefit of the externality it creates such that side B pays a price below its marginal cost; in extreme cases, it might even be paid to use the platform. An important economic principle is that prices are set with respect to the marginal consumer. This means that platform pricing is set not only by the size of the direct elasticities of demand and marginal costs but also by the strength of the network effects. Network effects may change with the size and stage of development of the platform. While it may be tempting to use the phrase “maturity” to describe whether network effects are large or small given the stage of a platform’s development, the law requires a more careful analysis beyond age alone.

In determining the competitive or but-for price, the age-old issue of increasing returns to scale that can lead to large deviations between average and marginal costs will often be central. In particular, the concept behind the *Cellophane* fallacy—that market definition and substitution effects can be radically different in the actual and but-for worlds—will be critical. In today’s enforcement environment, these conceptual boundaries are likely to be pushed, with the help of economists where appropriate.

Horizontal Issues—A Continuum of Conduct for Platforms

Naked Restraints. As several economics writings in this area have observed, the fact that platforms have many complexities that can influence the appropriate analytical framework does not mean that platforms can engage in traditional per se misconduct with impunity.¹⁵ Platforms must be cautious and ensure that any horizontal agreements or interactions with other platforms—on price or other competitive dimensions—are defensible on integration and efficiency grounds, e.g., whether prohibiting the conduct would interfere with any of the intra-platform operations or efficiencies that make platforms unique in the first place.

Collaborations/Interchange. More common are interactions among platforms that either expressly or in practice constitute agreed-upon collaborations, ranging from standards setting to overt agreements on price. The most obvious of these agreements revolve around interchange fees, which have a long and intense history of litigation.

From an economic perspective, there is rich literature both supporting and condemning agreements on interchange fees. Economists have identified conditions under which issuers set an interchange fee that leads to *efficient* card usage.¹⁶ Such conditions require, among other things, issuers to be perfectly competitive; the optimal interchange fee (i.e., the one that results in efficient card usage) involves issuers charging cardholders a usage fee. Economists have also identified conditions under which the interchange fee structure leads cardholders to “overuse” credit cards and

merchants to pay “high” merchant fees. For example, if merchants accept credit cards as a way to steal customers from each other, card networks may set higher merchant fees than when merchants’ card acceptance decision is solely based on the technological benefits, such as convenience, theft, and fraud control.¹⁷

Interestingly, platform (network) competition has been identified as another source of bias favoring cardholders. If merchants multi-home (i.e., accept multiple types of credit cards), networks may offer favorable terms to cardholders to attract them while charging merchants high fees in exchange for giving them access to their cardholder base.¹⁸

More recently, the literature focuses on credit card policies that restrict merchant choice, which can arise from the fact that consumers make membership and usage choices, while merchants make only acceptance decisions. No-steering policies can lead to skewed card prices that oversubsidize card usage at the expense of charging inefficiently high fees to merchants.¹⁹ A “price coherence” policy—meaning a rule that prohibits merchants’ surcharging on credit card transactions—can also result in overuse of credit cards and inflated retail prices.²⁰ Platform competition may not fix these distortions under the price coherence policy and may exacerbate the overuse of credit cards.

Mergers. Apart from so-called nascent acquisitions, there has been less focus on the economic analysis of the likely effects of mergers involving platforms. This, in part, is due to the inherently predictive nature of merger analysis—unlike Section 1 and most Section 2 cases, there is no historical data on actual effects. As several economists have observed, traditional margin and SSNIP analyses, in particular, may be misleading in the platform context.²¹

But economists have only more recently turned to structural modeling of these complexities in the merger context. For instance, in the case of a structural model of a hypothetical merger in the Dutch daily newspaper market, economists found the merger increased subscription prices but reduced advertising demand and advertising profits significantly, making the merger profitable.²² It is not clear how general this result is, however, as the authors note that it is mainly driven by a particular functional form of their advertising demand model.

Another example involves a structural model of two-sided markets to quantify the welfare effects of the 1996–2006 merger wave in the U.S. radio industry.²³ This analysis finds that listeners benefited from the merger wave, as it increased product variety and decreased advertising, while advertisers became worse off because of higher ad prices.

Finally, a published study has modeled mergers among German TV magazines using a modeling approach that accounts for readers’ preference for content and advertising and advertisers’ preference for the size of readership.²⁴ This study shows that mergers that would appear harmful in a single-sided market model can be much less harmful once interdependent demand and indirect network effects are

taken into account, while a merger between platforms with relatively high market shares can result in larger price effects than the single-sided market model predicts. For instance, ad prices would generally increase post merger, but advertisers would not necessarily be worse off since the size of readership may increase post merger thanks to lower per-copy prices.

When indirect network effects are very strong, combining smaller platforms together can be welfare-enhancing. One way to achieve this effect is through mergers, but it may not be the only way or the best way. Interchange fees, as discussed above, can have the effect of “merging” different networks, by giving users the benefit of the aggregate network—the same network that would result if the different platforms merged. This describes our current e-mail system, in which there are different providers, yet to a user there appears to be a single, global network. Whether the consumer would be better off paying the occasional interchange fee to use a variety of different networks or paying a single platform operator to use a single global network may depend on the facts of the case.

Unilateral and Vertical Conduct

Most of the legal and economic action in this arena lies in the area of unilateral behavior and vertical restraints. As with traditional unilateral conduct, cases like *Verizon Communications, Inc. v. Law Offices of Curtis V. Trinko*²⁵ make it quite difficult for plaintiffs to rely on refusals to deal or leveraging-type theories of misconduct in the platform context. Likewise, because vertical restraints are most troubling in the context of firms with substantial market power, these cases often raise complex issues of defining markets in the context of large installed bases—e.g., the “aftermath” debate.

Below we highlight the primary analytical challenges for assessing unilateral and vertical conduct involving platforms as well as the state of economic literature in these areas.

Refusals to Deal. Refusals to deal in the platform space—at least from a legal perspective—necessarily follow the *Trinko/Aspen Skiing*²⁶ parameters for potential liability. This framework, of course, can be quite restrictive, which may account for the relative lack of distinct economic literature and modeling specific to the refusal-to-deal context. Instead, economists tend to see refusal to deal as a form of foreclosure, assuming that the refusal to deal involves the type of access that may be viewed as essential for platform entry or expansion.

Predatory Pricing. Much more economics in the platform setting has been written about predatory pricing—a relatively rare legal case as it requires both below-cost pricing and a market structure that enables recoupment. From a platform perspective, the economics of predatory pricing is relatively mature; some of the earliest economic observations involve explaining why free or even negative prices in the platform space do not involve traditional notions of predation (or, necessarily, any inherent likelihood of recoupment).²⁷ The literature here has not changed much, and it would take

a unique fact pattern to sustain a predatory pricing theory in the context of legitimate indirect network effects.

In the context of a two-sided analysis, predatory pricing would presumably be understood in the sense of the net price captured by the platform. A central lesson of *Amex* is that one cannot look at a high price on one side of a platform in isolation. Applying the same rationale, one cannot look at a low price on the other side in isolation. Instead, the net price—the effective price charged by the platform—would be at issue. An accusation of predatory pricing would presumably suggest that the platform’s net price was below cost with the intention or effect of foreclosing competition.

Yet again, the dynamic nature of the platform complicates this analysis. To achieve critical mass, a nascent platform may need to operate below cost, subsidizing both sides in an effort to grow. This is a typical strategy adopted by start-up companies to build demand for a new product or even a new market, with early-stage, pre-IPO financing typically fueling commercialization during a period of losses until sales catch up with costs. Thus, whether an observed low net price is an effort to foreclose entry and competition or a natural effort of a small platform to achieve critical mass and hence create entry and competition will depend on the facts of the case.

Exclusive Contracts. By contrast, exclusive contracting by platforms is a ripe area for both litigation and economic analyses. We know that, from a traditional legal and economic perspective, exclusive contracting has many potentially procompetitive features, including assuring supply, promoting investment, avoiding free-riding, and even facilitating entry. On the other hand, exclusive contracts have the potential to make it difficult for new platforms to achieve scale or sustain viable or efficient network effects.

These competing—but not mutually exclusive—marketplace realities are reflected in the economic literature as well. Consider the role of exclusive contracts in a setting of two competing platforms where buyers (consumers) join either of the platforms while sellers (firms) join both platforms, i.e., multi-homing.²⁸ In such settings, an exclusive contract can be used to persuade sellers to stop subscribing to the rival platform. This is not different from what exclusive contracts can achieve in one-sided market settings, but when indirect network effects are strong, this behavior can lead to an outcome in which all sellers and buyers sign up exclusively to a single platform even though this platform sets high prices on both sides.

The role of exclusive contracts in deterring the entry of more efficient rivals does not change in two-sided market settings except that entry deterrence does not require the presence of economies of scale.²⁹ Economists have shown that in a buyer-seller two-sided market setting, exclusive deals can result in complete foreclosure with all sellers signing exclusive deals with an incumbent platform so that no buyer wants to multi-home. In such an equilibrium, the incumbent and sellers are better off thanks to exclusive deals, while buyers and the potential entrant are worse off.

There has also been empirical research on the impact of exclusive contracts. In the sixth generation of the U.S. video game marketplace (2000–2005), in which over 60 percent of all software titles were exclusive to one of three hardware platforms, economists found that entrant platforms benefited from exclusivity more than incumbent platforms did; without exclusive arrangements, the entrants were not able to differentiate themselves from the incumbents.³⁰

There is a connection between the economics of predatory pricing and exclusive contracts. When the market is characterized by single-homing—as would be the case when exclusive contracts are in place—a prospective entrant must convince the incumbent’s subscribers to leave its larger network and join the entrant’s smaller network. This shift might be sensible if the entrant’s prices are sufficiently lower than the incumbent’s, meaning the incumbent can react by lowering its own prices to obviate the entrant’s value proposition. However, when the market is characterized by multi-homing, the entrant only needs to persuade the subscribers to *also* join its network. The incumbent’s price does not affect this calculation, meaning a strategy of predatory pricing is less effective in a multi-homing market, other things equal.³¹

Tying/Bundling. Compared to exclusive contracting, tying and bundling have a more sordid history in the case law and economics, especially for firms with substantial market power. The notion is that such firms can coercively extend their power to related markets, potentially harming both rivals and competition in those markets or, as alleged in *Microsoft*, protecting the related tiedmarket from new entry or expansion. On the flip side, many economists support the notion of “one monopoly rent,” and it has long been recognized that tying can facilitate new entry and expansion.

These often case-specific views of tying in the platform context are reflected in the current economic literature. Economists studying the role of tying in the payment card industry have shown that the tying of a credit card and a debit card (“honor-all-cards”) can increase social welfare by allowing a card network to lower the interchange fee on credit and raise the interchange fee on debit, highlighting the rebalancing function of tying.³² Admittedly, this analysis was conducted under some simplifying assumptions, including that a card network was a not-for-profit association with no market power to raise the overall price level, thus precluding anticompetitive effects by design.

Other effects of tying in two-sided markets have also been studied.³³ Focusing on the role of multi-homing in determining the welfare effects of tying, economists have shown that tying can be welfare-enhancing if multi-homing is allowed because “tying induces more consumers to multi-home and makes platform-specific exclusive content available to more consumers, which is also beneficial to content providers.”³⁴

More recent literature challenges the one-monopoly rent notion in a two-sided market setting in which platforms cannot charge negative prices (e.g., no rewards).³⁵ This research shows that the monopolist has incentives to engage in tying

to extend its monopoly power to another market if a tied product is distributed for free due to the nonnegative price constraint in a two-sided market. When platforms *cannot* charge consumers negative prices in the tied-good market, tying limits competition in that market, because price cannot go below zero, and limits a rival firm’s response, which creates incentives for the monopolist to tie.

Challenges in Constructing But-for Worlds

Finally, as with nearly all antitrust cases, constructing the but-for world in a platform setting can be particularly complex and challenging. In the first instance, there can be some ambiguity in determining the scope of the misconduct that must be removed—it is often debated in the platform context whether any part of the alleged misconduct is procompetitive and thus should be allowed to remain. It also can be quite challenging in the platform context to discern and define appropriate “before and after” time periods or to identify reasonable and comparable benchmarks for comparative analyses.

Based on case-specific fact findings, economists construct counterfactual but-for worlds with either reduced form or structural economic models. While the general methods of constructing but-for worlds have been around for a long time and are now fairly standard in antitrust litigation, platform settings can present particular challenges relating to the availability and scope of relevant data as well as constructing reasonable but-for relationships among market participants. As this area is ripe for future econometric work, practitioners should be aware of developments like those noted above, both in the economic literature and in the case law.

Conclusion

Economists have been intrigued by the role that indirect network effects play in defining markets, identifying market power, and analyzing when a platform company’s actions might be anticompetitive. While the European Commission was arguably the first antitrust agency to identify the importance of indirect network effects in *Google Android*, the U.S. Supreme Court was the first court to define transaction markets as two-sided and to require analysis of both sides of the market, in *Amex*. The Court’s two-sided analysis focused on the potentially strong indirect network effects resulting from the simultaneity of action between a buyer and seller in a transaction platform, which indicates that, if indirect network effects are sufficiently strong, even non-transaction platforms may need to be analyzed as two-sided. This analysis contrasts with the European Commission’s approach, which placed less emphasis on indirect network effects and greater emphasis on size in creating a barrier to entry for platforms. Regardless of the jurisdiction, the relationship between market power and network size or the strength of network effects remains undefined, and there is much to be explored in the application of economic analyses in the antitrust enforcement of platforms. ■

- ¹ Ohio v. Am. Express Co., 138 S. Ct. 2274 (2018).
- ² US Airways v. Sabre Holdings, No. 17-960 (2d Cir. 2019).
- ³ Amex, 138 S. Ct. at 2286.
- ⁴ Times-Picayune Pub. Co. v. United States, 345 U.S. 594, 612–13 (1953).
- ⁵ See, e.g., Przemyslaw Jeziorski, *Effects of Mergers in Two-Sided Markets: The U.S. Radio Industry*, AM. ECON. J.: MICROECON., Nov. 2014, at 35; Lapo Filistrucchi et al., *Assessing Unilateral Merger Effects in a Two-Sided Market: An Application to the Dutch Daily Newspaper Market*, 8 J. COMPETITION L. & ECON. 297 (2012); Minjae Song, *Estimating Platform Market Power in Two-Sided Markets with an Application to Magazine Advertising*, AM. ECON. J.: MICROECON. May 2021, at 35; Marc Rysman, *Competition Between Networks: A Study of the Market for Yellow Pages*, 71 REV. ECON. STUD. 483 (2004).
- ⁶ Bundeskartellamt [BGH] [Federal Court of Justice] Feb. 6, 2019, B6-22/16, ¶¶ 212, 352, at 59, 100, https://www.bundeskartellamt.de/SharedDocs/Entscheidung/EN/Entscheidungen/Missbrauchsaufsicht/2019/B6-22-16.pdf?__blob=publicationFile&v=5.
- ⁷ Press Release, Bundesgerichtshof [BGH] [Federal Court of Justice], Bundesgerichtshof bestätigt vorläufig den Vorwurf der missbräuchlichen Ausnutzung einer marktbeherrschenden Stellung durch Facebook [The Federal Court of Justice Provisionally Confirms the Allegation of Abuse of a Dominant Market Position by Facebook] (June 23, 2020), <https://www.bundesgerichtshof.de/SharedDocs/Pressemitteilungen/DE/2020/2020080.html>.
- ⁸ 253 F.3d 34 (D.C. Cir. 2001).
- ⁹ Epic Games, Inc., v. Apple Inc., ___ F. Supp. 3d ___, 2021 WL 4128925, at *83 (N.D. Cal. Sept. 10, 2021).
- ¹⁰ In re: Blue Cross Blue Shield Antitrust Litigation, 308 F. Supp. 3d 1241, 1276 n.20 (N.D. Ala. 2018).
- ¹¹ Case AT.40411–Google Search (AdSense), Comm’n Decision, ¶¶ 135–55, 184–200, (Mar. 20, 2019) (Summary: 2020 O.J. (C369) 6), https://ec.europa.eu/competition/antitrust/cases/dec_docs/40411/40411_1619_11.pdf.
- ¹² Case AT.40099–Google Android, Comm’n Decision, ¶¶ 439–40 (July 18, 2018) (Summary: 2019 O.J. (C402) 19), https://ec.europa.eu/competition/antitrust/cases/dec_docs/40099/40099_9993_3.pdf.
- ¹³ *Id.* ¶¶ 964–68 (presenting the Commission’s discussion of how to properly consider indirect network effects following the Microsoft decisions); Case COMP/C-3/37.792–Microsoft, Comm’n Decision, 2007 O.J. (2007/53/EC) 23 https://ec.europa.eu/competition/antitrust/cases/dec_docs/37792/37792_4177_1.pdf; Case T-201/04, Microsoft Corp. v. Comm’n, 2007 E.C.R. II-3619, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:62004TJ0201&from=EN>; Case COMP/39.530–Microsoft (Tying), Comm’n Decision (June 3, 2013) (Summary: 2103 O.J. (C120) 15), https://ec.europa.eu/competition/antitrust/cases/dec_docs/39530/39530_3162_3.pdf.
- ¹⁴ See, e.g., Rosa M. Abrantes-Metz & Albert D. Metz, *The Dynamics of Single- and Multi-Sided Platform Monopolies* (Working Paper, Sept. 14, 2020), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3692861.
- ¹⁵ See, e.g., David Evans & Richard Schmalensee, *The Industrial Organization of Markets with Two-Sided Platforms*, COMPETITION POL’Y INT’L, Spring 2007 at 151, 175–76 (observing that a successful cartel in the platform context may need to coordinate on both sides to make sure it does not compete away supracompetitive profits on the other side of the platform); David Evans, *The Antitrust Economics of Multi-Sided Platform Markets*, 20 YALE J. ON REG. 325, 373–75, 380 (2003) (observing that cooperation among platforms may be essential to get all sides on board; noting also that these businesses, too, may engage in strategies that reduce consumer welfare); Michael Katz & Jonathan Sallet, *Multi-Sided Platforms and Antitrust Enforcement*, 127 YALE L. J. 2142, 2169–70 (2018) (observing that the antitrust treatment should not change based on the firm’s being labeled a platform).
- ¹⁶ See generally William Baxter, *Bank Interchange of Transactional Paper: Legal and Economic Perspectives*, 26 J. L. & ECON. 541 (1983).
- ¹⁷ Jean-Charles Rochet & Jean Tirole, *Cooperation Among Competitors: Some Economics of Payment Card Associations*, 33 RAND J. ECON. 549, 565 (2002).
- ¹⁸ See, e.g., Jean-Charles Rochet & Jean Tirole, *Platform Competition in Two-Sided Markets*, 1 J. EUR. ECON. ASS’N 990, 1008 (2003); Graeme Guthrie & Julian Wright, *Competing Payment Schemes*, 55 J. INDUS. ECON. 37, 38–39 (2007); Mark Armstrong, *Competition in Two-Sided Markets*, 37 RAND J. ECON. 668, 670 (2006).
- ¹⁹ See Özlem Bedre-Defolie & Emilio Calvano, *Pricing Payment Cards*, AM. ECON. J.: MICROECON., Aug. 2013, at 206, 225 (2013).
- ²⁰ Benjamin Edelman & Julian Wright, *Price Coherence and Excessive Intermediation*, 130 Q. J. ECON. 1283, 1284 (2015).
- ²¹ See, e.g., Eric Emch & T. Scott Thompson, *Market Definition and Market Power in Payment Card Networks*, 5 REV. NETWORK ECON. 45 (2006); David Evans & Michael Noel, *The Analysis of Mergers that Involve Multisided Platform Businesses*, 4 J. COMPETITION L. & ECON. 663 (2008); Lapo Filistrucchi et al., *Market Definition in Two-Sided Markets: Theory and Practice*, 10 J. COMPETITION L. & ECON. 293 (2014).
- ²² Filistrucchi et al., *supra* note 5.
- ²³ Jeziorski, *supra* note 5.
- ²⁴ Song, *supra* note 5.
- ²⁵ 540 U.S. 398 (2004).
- ²⁶ Aspen Skiing Co. v. Aspen Highlands Skiing Corp., 472 U.S. 585 (1985).
- ²⁷ See, e.g., Rochet & Tirole, *supra* note 17.
- ²⁸ Mark Armstrong & Julian Wright, *Two-Sided Markets, Competitive Bottlenecks, and Exclusive Contracts*, 32 ECON. THEORY 353, 354 (2007).
- ²⁹ See Toker Doganoglu & Julian Wright, *Exclusive Dealing with Network Effects*, 28 INT’L J. INDUS. ORG. 145 (2010); Ilya Segal & Michael Whinston, *Exclusive Contracts and Protection of Investments*, 31 RAND J. ECON. 603 (2000).
- ³⁰ Robin Lee, *Vertical Integration and Exclusivity in Platform and Two-Sided Markets*, 103 AM. ECON. REV. 2960, 2961–62 (2013).
- ³¹ Abrantes-Metz & Metz, *supra* note 14.
- ³² See Jean-Charles Rochet & Jean Tirole, *Tying in Two-Sided Markets and the Honor All Cards Rule*, 26 INT’L J. INDUS. ORG. 1333 (2008).
- ³³ See, e.g., Jay Pil Choi, *Tying in Two-Sided Markets with Multi-Homing*, 58 J. INDUS. ECON. 607 (2010).
- ³⁴ *Id.* at 608.
- ³⁵ Jay Pil Choi & Doh-Shin Jeon, *A Leverage Theory of Tying in Two-Sided Markets with Nonnegative Price Constraints*, AM. ECON. J.: MICROECON., Feb. 2021, at 283.