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Ecosystem Competition and the Antitrust Laws

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I. INTRODUCTION

Conventional antitrust norms analyze market power—as a stepping stone to anticompetitive effects and, hence, prohibited conduct—from the perspective of product substitutability. Two goods or services are said to compete with one another when they are reasonably interchangeable from the perspective of consumers, or to put it in more formal economic terms, when there is cross-elasticity of demand between them. Conversely, when two goods or services are not reasonably interchangeable, they are not horizontally related and are said not to compete with one another. Since a concern over horizontal agreements and horizontal effects dominate antitrust—courts even analyze vertical agreement or merger cases in terms of their horizontal effects—proof of effects among substitutable goods or services is a crucial touchstone of antitrust analysis.

This "substitutability" approach to understanding competition and market power fails to capture important economic phenomena when applied to platform markets or other complex and technologically evolving economic sectors featuring multiple potential value propositions for consumers. In such sectors, firms may compete aggressively

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against each other without offering substitutable products or services for sale. The rival firms may be "frenemies," sharing simultaneously co-dependent and complementary but rivalrous goals,[1] but they are not traditional competitors seeking to earn rents from the same sectoral node. Tech and media giants compete to commoditize. Players create products and services that commoditize the nodes of rivals. In turn, these firms isolate their own value propositions by simply neutralizing the unique offerings of others.

Lest this jargon overly muddle the thesis, let me offer the short version of three examples at the outset, one from the somewhat distant past, one from the fairly recent past, and one that is just beginning to emerge:

- In the late 1990s, Microsoft Corporation competed with Java programmers and other technology companies over the future of middleware and operating systems. Middleware and operating systems were not substitutable products—a consumer would not choose to run a computer without an operating system and only use middleware—but middleware did threaten to commoditize operating systems and shift most differentiated value from operating systems to programs.
- In the early 2000s, Apple Inc. and Amazon.com, Inc. competed aggressively in an ecosystem that included e-books, tablets, and e-readers, and a host of related audio and visual products and services. Apple and Amazon did have some substitutable offerings—for example, both sold devices for reading books—but competition in substitutable products only begins to explain the companies' commercial antagonism. Amazon's gambit was to perpetuate its control over online retail; the Kindle was essentially a device to lock customers into Amazon's retail world. Apple, by contrast, sought to commoditize the retail function and created differentiated value in the physical device—the iPad.
- In the emerging ecosystem of connected and automated vehicles, there is intensive competition among a variety of different players to establish or disestablish nodes as value propositions. Traditional car companies wish to preserve the differentiated automobile as a value proposition sought by consumers. Robotic vehicle technology companies like Waymo LLC and some traditional OEMs like Robert Bosch GmbH (Bosch) seek to commoditize the car itself and shift the value proposition to AV systems that are vehicle-brand-agnostic. Fleet operators like Uber Technologies, Inc. and Lyft, Inc. would prefer to commoditize the vehicle entirely and establish transportation services through

1. *See* ARIEL EZRACHI & MAURICE E. STUCKE, VIRTUAL COMPETITION: THE PROMISE AND PERILS OF THE ALGORITHM-DRIVEN ECONOMY 147 (2016).

> robotaxi fleets as a value proposition. Finally, telecom or communications technology companies like Qualcomm Incorporated and Intel Corporation are pushing for the primary value node to reside not in either vehicles nor ride sharing services, but rather in the communications networks connecting vehicles to other vehicles, roadside infrastructure, or "the cloud."

While these examples differ in important regards, they demonstrate ways in which a sectoral ecosystem may exhibit intensive competition among firms that do not necessarily offer substitutable products or services and hence fall outside of antitrust law's preoccupation with horizontal competition. The question is whether antitrust policy should adjust its ordinary analytical framework when assessing competitive effects in such markets. In this Article, I will first flesh out each of the three examples of ecosystem competition, then discuss the effects of ecosystem competition on consumer welfare, and finally turn to legal questions concerning the potential relevance of ecosystem competition to antitrust law.

II. THREE EXAMPLES OF ECOSYSTEM COMPETITION

A. Middleware and Operating Systems

My opening example concerns a puzzle at the center of *United States v. Microsoft Corp.*: how Microsoft could have violated Section 2 of the Sherman Act by deceiving Java developers into creating Windows-dependent applications, when Java and other forms of "middleware"—such as Netscape Navigator—were held not to reside in the relevant product market.[2] Microsoft argued that its view that independent (i.e., platform-agnostic) middleware was a competitive threat implied that middleware was in the same relevant market as the Windows operating system. Hence, Microsoft did not possess monopoly power in the relevant market.[3] The D.C. Circuit rejected this argument, finding that, although Microsoft neutered middleware as a competitive threat to the Window's monopoly, the relevant market should exclude middleware because consumers could not substitute middleware for an operating system.[4]

The conventional reading of *Microsoft* is that the court excluded middleware from the market because it was not yet substitutable for an operating system from the perspective of customers even though

2. United States v. Microsoft Corp., 253 F.3d 34 (D.C. Cir. 2001) (en banc) (per curiam).
3. *Id.* at 53 ("Microsoft argues that, because middleware could usurp the operating system's platform function and might eventually take over other operating system functions (for instance, by controlling peripherals), the District Court erred in excluding Navigator and Java from the relevant market.").
4. *Id.* at 53–54.

Microsoft's anticompetitive conduct allowed for this eventual possibility. But a somewhat different explanation is also possible: the development of independent middleware could eventually commoditize the operating system by making software developers indifferent as to the operating system on which their programs would run, since all operating systems would equally function to expose the Application Programming Interfaces (APIs) chosen by the developers. In this story, middleware did not evolve to take the place of operating systems, it evolved toward commoditizing operating systems and transferring the differentiated value in computer programs to the programs (and programmers) themselves. Microsoft directed its allegedly anticompetitive scheme toward stifling a competitive threat that was not—and would not likely become—a substitute for what Microsoft produced, but nonetheless threatened to eliminate Microsoft's monopoly power by shifting consumer value from operating systems to programs. The relevant competition occurred among ecosystem rivals who were vying for consumer dollars, but not necessarily vying to sell consumers the same things.

B. E-Books and Tablets

Our second example of ecosystem competition concerns the rivalry between Apple and Amazon that resulted in an unfavorable antitrust judgment against Apple shortly after Apple CEO Steve Jobs's untimely passing. Apple and Amazon co-existed for years with relatively little commercial antagonism, but landed in a well-publicized skirmish over e-books in the second decade of the twenty-first century[5]—the result of the two companies' core business models coming into conflict over whether distribution or device would be commoditized in the new digital world.

Although it has sprouted in many directions since its founding in 1994, Amazon's core business has always been retail distribution. When the company moved into the sale of hardware with the introduction of the Kindle e-reader in 2007, it did so not to diversify its business, but rather to stimulate demand for retail sales of e-books. Amazon sold Kindles to entrench its core historic business—the online bookstore. Amazon reportedly loses money on every unit of hardware it sells.[6] CEO Jeff Bezos admits: "We sell the hardware at our cost, so

5. The skirmish culminated in *United States v. Apple, Inc.*, 791 F.3d 290 (2d Cir. 2015).

6. *See* Kelly Clay, *Amazon Confirms It Makes No Profit on Kindles*, FORBES (Oct. 12, 2012, 01:10 AM), https://www.forbes.com/sites/kellyclay/2012/10/12/amazon-confirms-it-makes-no-profit-on-kindles/#289953996b43 [https://perma.unl.edu/YJ2M-GN8W]; Jay Yarow, *Chart of the Day: How Much Money Amazon is Making from the Kindle*, BUS. INSIDER (Feb. 13, 2013, 4:20 PM), https://www.businessinsi

it is break-even on the hardware."[7] The retail giant views the Kindle as a commodity delivery device for high-margin online content such as books and video content.

By contrast, since its founding in 1977, Apple has primarily been a hardware company, and entered retail markets largely to strengthen its position in personal device markets. When Apple launched the iTunes store in 2003, its primary goal was to sell iPods, not songs. Unlike Amazon's entry into hardware, Apple's entry into music retail was somewhat profitable.[8] Nevertheless, the venture's most important business function was to entrench Apple's position in the digital player market even before the emergence of the smartphone and tablet. Similarly, when Apple launched the iBooks online bookstore in 2010 (subsequently renamed Apple Books), the company sought less to compete with Amazon as a book retailer than to strengthen its position in the tablet market. Notably, Apple designed tablets to displace the e-reader by offering a product that could perform many other functions in addition to displaying e-books. Apple does not disclose profitability by product line; however, book retailing is not likely a significant profit center for the company, particularly given its shrinking e-book market share and the company's decision to overhaul its online bookstore in 2018.[9]

The clash that ultimately resulted in a finding of antitrust liability against Apple showcases the intense competition to define value propositions in the e-books ecosystem. With the emergence of e-books in 2007, Amazon sought to keep customers locked into its platform. It was willing to lose money on sales of e-books and Kindles to manage the transition from physical books to e-books in a way that kept customers buying books from Amazon. To do that, Amazon had to maintain an overwhelming share of the e-books market—over ninety percent—to keep customers accustomed to the Kindle system. Working from a wholesale distribution model, Amazon licensed e-book distribution rights from the seven largest publishing houses and then sold them to customers often below its wholesale price—thus losing

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der.com/chart-of-the-day-how-much-money-amazon-is-making-from-the-kindle-2013-2 [https://perma.unl.edu/M2AB-2PXQ].

7. Clay, *supra* note 6.

8. *See* Philip Elmer-DeWitt, *How Much Revenue Did iTunes Generate for Apple Last Quarter?*, FORTUNE (July 21, 2013), http://fortune.com/2013/07/21/how-much-revenue-did-itunes-generate-for-apple-last-quarter/ [https://perma.unl.edu/JTC5-CKDT].

9. *See* Mark Gurman, *Apple's Getting Back into the E-books Fight Against Amazon*, BLOOMBERG (Jan. 25, 2018, 5:00 AM), https://www.bloomberg.com/news/articles/2018-01-25/apple-is-said-to-ready-revamped-e-books-push-against-amazon [https://perma.unl.edu/9ASP-FF4V] (reporting that Apple's e-book market share fell from 11% in October 2015 to 9% in February 2017).

money on many transactions, but keeping customers loyal to the Kindle ecosystem.[10]

In launching the iPad in 2010, Apple sought to break Amazon's grip over the e-books ecosystem and to introduce a new technology—the personal tablet—as its value proposition. Hardware was not essential to Amazon's strategy—it never required customers to use a Kindle. Amazon had shown a willingness to develop applications that allowed customers to read books encoded in the proprietary Kindle formats (.azw, .kf8, and .kfz) on other devices, such as PCs and Macs, and eventually other tablets and smartphones. Amazon's primary goal was to ensure that customers transacted the retail function through Amazon (i.e., bought from Amazon as a retailer in the Kindle format). Apple, by contrast, intended to commoditize this same retail distribution function and accentuate the tablet. To do so, Apple had to create competition in e-book distribution. So, it launched the Apple iBooks store. In contrast to Amazon's insistence on proprietary e-book formats, Apple made its books available in an open format.[11] E-books would be a commodity—the device on which customers read them would matter far more.

In its attempt to unseat Amazon's e-books dominance, Apple found a willing alliance in book publishers that were concerned that Amazon was permanently devaluing book content by selling e-books at below-cost prices. By leveraging the joint power of the book publishers, Steve Jobs disposed of the wholesale model for e-book distribution and flipped instead to an agency model in which the book publishers, rather than Amazon, would set the retail price (and Amazon and Apple would collect a thirty percent distribution services fee). The U.S. Court of Appeals for the Second Circuit ultimately found this to be a form of horizontal price-fixing over a strong dissent by Judge Jacobs, who believed that Apple had acted pro-competitively by organizing the book publishers to challenge Amazon's retail hegemony over e-books.

Amazon and Apple, with the aid of their respective allies, locked in an intense battle to define value propositions in the e-books ecosystem. The competitors were less interested in selling substitutable products (which they did to some extent), and instead sought to define the customer experience in how and what customers read. Amazon and Apple battled over whether a customer's critical purchasing decision was either where they bought an e-book or on what device they chose to read. This was an intense, largely non-horizontal technological and commercial competition between ecosystem rivals with important implications for consumer welfare.

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10. *Apple, Inc.*, 791 F.3d at 342 (Jacobs, J., dissenting).
11. Chris Taylor, *Hey Apple, Here's How to Show the World You Love Books with iOS 12*, MASHABLE (July 3, 2019), https://mashable.com/article/apple-books-preview-ios12/#L461HsOs8kqZ [https://perma.unl.edu/39JD-GJD5].

C. Connected and Automated Vehicles

From the introduction of Ford's Model T until recently, the automobile ecosystem functioned under a stable model: manufacturers competed vigorously (at least since the emergence of European and Japanese competition in the 1980s) to roll out new models of automobiles—highly differentiated products whose features were at least tweaked in each model year and completely overhauled even within a model line every three or four years, needed or not. Manufacturers advertised intensely to consumers but distributed in most states only through independent franchised dealers because of state dealer protection laws.[12] Putting aside rental fleets—which are mostly used by travelers on a short-term basis—cars are individually owned, maintained, and operated.

The automotive industry is leaving this model of individual ownership and operation of highly differentiated vehicles by the roadside and ushering in the first true revolution since the advent of the internal combustion engine. Electric motors and automated driving are beginning to displace internal combustion and the human behind the wheel. Connectivity among vehicles on the road (V2V), vehicles and roadside infrastructure (V2I), and vehicles and "everything" (V2X) through dedicated short range communications (DSRC) in the 5.9 GHz frequency or 5G telecommunications will make driving an activity centrally coordinated in real time, eliminating the individualistic model of driver-dominated decision-making. Companies expect customers to abandon individual vehicle ownership in favor of automated ridesharing.

In anticipation of these coming revolutionary trends, traditional car companies are attempting to shift their business models away from the traditional manufacturing and sales model and into a "transportation-as-a-service" model. Ford Motor Company, Daimler AG, and General Motors Company have all announced plans to launch ridesharing services in competition not only with Uber and Lyft, but also with technology companies like Alphabet Inc.'s (Google's) Waymo unit. The entire competitive ecosystem is rapidly shifting:

> [C]ompeting in the on-demand mobility market will pit legacy automakers against ride-hailing services from startups and tech giants that have far greater experience in acquiring and engaging consumers through digital channels. To succeed in what will likely be a hyper-competitive market for urban ride-hailing, automakers will have to foster new skill sets in their organizations, and transform from companies that primarily produce vehicles to ones that also manage vehicle fleets and customer relationships. That will entail competing with startups and tech giants for software development and data science talent, as well as reforming innovation processes to keep pace with

12. *See* Daniel A. Crane, *Tesla, Dealer Franchise Laws, and the Politics of Crony Capitalism*, 101 IOWA L. REV. 573 (2016).

> digital trendsetters. Automakers will also need to create unique mobile app and in-car experiences to lure customers.[13]

Who are the competitors in this evolving ecosystem? Conventional models of substitutability do not begin to describe the competitive relationships that characterize this ecosystem. It is not just that car companies are being forced to become ride-sharing service providers and mobile app purveyors. Nor is it just that ride-sharing companies are heavily investing in automated technologies and product development and hence becoming more like car companies; that software firms like Google and Apple are making technological moves that make them increasingly look like Tier 1 Original Equipment Manufacturers (OEMs); and that telecommunications companies are thinking about becoming transportation service providers. That perspective still imagines that competition occurs only when previously non-competitive companies transition into each other's spaces to vie for customers' attention. Many of the most significant competitive dynamics in the connected and automated vehicle ecosystem occur among firms that are unlikely to sell substitutes or unlikely to define themselves in the same relevant market through evidence of demand cross-elasticity. Uber and Lyft will unlikely become automobile manufacturers. Qualcomm may never administer a ride-sharing service. General Motors may never become a major app developer. And yet, all of these companies, and many others, are competing hard to define the value propositions in the connected and automated vehicle ecosystem.

There are many vectors of competition over which industry participants are vying. Will the automobile become a commodity—a fungible transportation pod whose brand the average consumer notices no more than the brand of the city bus or subway car—or will even the shared automated vehicle remain a differentiated status symbol and marker of personal identity? Will automated vehicle features and protocols become standardized through regulation or industry standard-setting, or will AV technology suppliers continue to compete to offer differentiated products? Will communication among vehicles and roadside infrastructure become centrally defined and managed, with telecommunications services largely commoditized, or will competition among distinctive telecommunications networks play an important role in shaping the connected vehicle ecosystem?

It is too early to tell how these, and many related questions, will be answered, and not clear which firms have the interests to push for commoditization or differentiation of the ecosystem's nodes. What is certain, however, is that, as the ecosystem develops, there will be an

13. *By the End of 2019, Waymo, Uber, and GM All Plan to Have Fleets of Autonomous Cars Providing On-Demand Rides—Here's How Automakers Can Compete*, BUS. INSIDER (Mar. 19, 2018, 10:02 AM), https://www.businessinsider.com/the-autonomous-mobility-ecosystem-report-2018-3 [https://perma.unl.edu/UY9L-LW3C].

intense rivalry to shape the ecosystem to their own commercial advantage, including among firms that are not conventional horizontal competitors.

III. HOW ECOSYSTEM COMPETITION ENHANCES CONSUMER WELFARE

It is easy to observe that firms that are not horizontally related sometimes compete against each other, although this statement requires some qualifications. Two firms selling completely different products in completely different markets might compete over buyers of inputs (for example, to lease the same office building) and still be horizontal buyers (rather than sellers) under antitrust laws.[14] But rivalries exist among firms that are related neither as buyers, nor as sellers. For example, unrelated businesses might compete aggressively to shape public infrastructure development to benefit their particular line of business or vie to influence political processes in directions favorable to their own commercial interests.

I raise these examples to make the point that just because two or more firms are "competing" over something does not necessarily make their competition relevant to the set of issues of concern to antitrust lawyers and economists—i.e., rivalrous market behavior affecting the welfare of consumers (broadly conceived). So arises the question of whether the ecosystem competition described in this Article is the sort of competition that shapes the efficiency of markets (producing lower prices, enhanced output, higher quality, and innovation) and hence enhances consumer welfare. Should antitrust law be interested in the subversion of ecosystem competition, on the view that such subversion harms consumer welfare by suppressing a relevant dimension of competition?

Ecosystem competition among firms that are not horizontally related (or are related horizontally only minimally) do have important consequences for consumer welfare, and hence should be a proper subject of antitrust scrutiny (more on this in the final section). These consequences—again, defined as competition to commoditize or differentiate nodes in an ecosystem of complementary products and services—can be seen as to both static and dynamic efficiency.

On the static or price effects side, ecosystem competition occurs as sellers of complementary products or services seek to simultaneously commoditize the nodes controlled by other firms while trying to preserve differentiation in the nodes they dominate. Apple sought to commoditize the retail distribution function for e-books, making customers indifferent about the platform from which they purchased a

14. *See* Mandeville Island Farms, Inc. v. Am. Crystal Sugar Co., 334 U.S. 219 (1948); Todd v. Exxon Corp., 275 F.3d 191 (2d Cir. 2001).

book, while shifting the value proposition into the e-reading device (i.e., the tablet). Amazon tried to accomplish the reverse. The motives behind this reciprocal commoditization strategy are clear from the economics of complementary products. The sales and profitability of each product depends on the price of complementary products—roughly speaking, Apple loses sales of iPads (or must reduce their price) if Amazon charges a high retail price for content, while Amazon loses sales of content (or must reduce their price) if Apple controls the tablet market and charges a high price. Each firm makes more money if the node controlled by the other firm is commoditized, in the sense that customers become indifferent on the seller from which they procure the relevant product or service, and hence pay a lower price than they would in a more differentiated or heterogeneous market.

Alternatively, imagine that Apple and Amazon enter into a non-aggression pact, in which Apple agrees to take no action that reduces Amazon's dominance in online retailing and Amazon will do nothing to diminish Apple's brand power in iPads. Further, assume that Apple never intended seriously to invest in an e-bookstore to put competitive pressure on Amazon (not entirely counterfactual, at least until recently) and that Amazon never meant to seriously compete with Apple in the wider tablets market (the Kindle being essentially limited to an e-reader). Instead, suppose each firm had the ability through its strategic alliances and actions to affect the differentiation or commoditization of the other's primary node. The non-aggression agreement would essentially function as a market-division agreement among firms that are not, and did not intend to be, horizontal competitors, with the effect of higher prices and reduced output in both nodes. The effect might mimic the disintegration of a previously vertically integrated firm, where post-disintegration prices increased and output decreased due to double marginalization.

Ecosystem competition can also have important effects on dynamic efficiency. On the one hand, not all ecosystem competition directly entails product innovation. Firms sometimes compete to shape sectoral nodes into differentiated or commoditized markets through marketing or commercial strategies that do not involve new product development. For example, a development effort to replicate an existing online bookstore without introducing new features or functions, or a marketing campaign designed to educate customers about their ability freely to port their content between different platforms—thus commoditizing the platforms—serves to commoditize a rival node without directly changing the products or services offered to consumers. On the other hand, ecosystem competition does have significant dynamic efficiency effects. Returning to the Apple and Amazon example, Apple's effort to commoditize the e-book retailing market by launching an e-bookstore was part of its broader strategy to create a new product

market—the personal tablet—that could move far past Amazon's e-reader in uses and functionality. Apple saw the commoditization of retail distribution of tablet-accessible content as critical to the success of its new hardware product line.

As with antitrust analysis generally, one should not overclaim by assuming that all ecosystem competition is important to either static or dynamic efficiency. The Supreme Court has been quite right in recent decades to note that sometimes intense horizontal rivalry has no general effects on market competitiveness or consumer welfare[15] The point is not that ecosystem competition invariably affects consumer welfare or should always be of interest to antitrust law, but rather that it can sometimes have important efficiency effects of the kinds that concern antitrust analysis.

IV. IMPLICATIONS FOR ANTITRUST LAW AND POLICY

The concept of non-horizontal competition is not new to antitrust law—antitrust agencies sometimes analyze mergers through a "perceived potential competition" or "actual potential competition" lens that assumes that a firm may act as a competitive constraint without yet acting as a horizontal competitor.[16] Such cases, however, still consider the relevant competition to involve a horizontal relationship—albeit one that does not yet exist or one that businesses perceive as a threat that constrains business behavior. The ecosystem competition described in this Article may occur among complimentary firms that do not perceive one another as ever likely to offer substitutable products or services. Similarly, there has been some discussion in antitrust scholarship about "vertical competition" among vertically related firms in the production-to-distribution chain.[17] Vertical competition—and efforts to commoditize nodes upstream or downstream in a traditional vertical chain—may describe some of the relationship characteristic of ecosystem competition. However, the phenomenon with which this Article is concerned is broader, since firms whose products are complementary, rather than vertically related, also compete for primacy in broad ecosystems that do not resemble the conventional vertical model.

Although, as noted at the outset, current legal conventions for defining relevant markets and market power rely heavily on the as-

15. NYNEX Corp. v. Discon, Inc., 525 U.S. 128 (1998) (quoting Brooke Grp. Ltd. v. Brown & Williamson Tobacco Corp., 509 U.S. 209 (1993)) ("Even an act of pure malice by one business competitor against another does not, without more, state a claim under the federal antitrust laws.").

16. *See, e.g.*, Darren S. Tucker, *Potential Competition Analysis Under the 2010 Merger Guidelines*, 12 SEDONA CONF. J. 273 (2011).

17. *See* Robert L. Steiner, *A Dual-Stage View of the Consumer Goods Economy*, 35 J. ECON. ISSUES 27, 27 (2001).

sumption that competition means horizontal rivalry over substitutes, nothing in the statutory structure of antitrust law precludes conceiving of competition to include ecosystem competition. As Justice Holmes famously protested, the Sherman Act "says nothing about competition."[18] The casting of Section 1 and Section 2 analyses in terms of horizontal competition is a product of malleable common law development. We still have a law of vertical restraints and vertical mergers. The Clayton Act does reference "competition," but the 1950 Celler-Kefauver amendments eliminated language that could be interpreted to limit the statute's reach to horizontal competition.

The important question is not whether the existing antitrust statutes could be made applicable to ecosystem competition (they could), but whether it would be advisable to do so, and if so, what kind of cases might be brought under an ecosystem competition theory. On this question, an important framing observation: the burden of this Article is to broaden the understanding of what constitutes competition relevant to the antitrust laws. One might assume that this would lead to broadening the domain of antitrust liability to comprehend and condemn conduct otherwise falling outside the scope of the antitrust laws. That result might well occur, and I shall offer an example momentarily. But in antirust analysis, broadening lenses does not invariably result in more liability. Sometimes, broadening lenses decreases concerns that conduct in question is harmful. For example, in a merger case, behind the veil of ignorance one cannot know whether the merging parties would prefer a broader or narrower relevant geographic market. Broadening a market could dilute the parties' respective shares in the market and its concentration, to their advantage in antitrust proceedings. However, two parties arguing that their merger is not horizontal because they are not competitors in the same relevant market would want to draw narrow rather than broad markets, since broadening the relevant market definition could make them competitors for purposes of the relevant antitrust analysis. In the same way, recognizing ecosystem competition as a species relevant to antitrust law would not necessarily result in expanded antitrust liability—whether it would expand or contract liability would depend on the facts of each case.

As an example of how recognizing ecosystem competition might expand antitrust liability, consider the potential acquisition by an e-commerce platform of a software input supplier. At present, such an acquisition would be analyzed under a relatively permissive vertical merger standard that asks whether the vertical integration would foreclose opportunities to competitors in either relevant sector—e-

18. N. Sec. Co. v. United States, 193 U.S. 197, 403 (1904) (Holmes, J., dissenting).

commerce or software design.[19] In other words, the vertical merger analysis asks how the merger would affect competition between each of the merging parties and their horizontal competitors. It does not inquire as to how the cessation of competition between the merging firms might affect the competitive ecosystem in which they both participate. If there is evidence that the merging firms previously were involved in an intensive rivalry directed against each other to shape their respective nodes as commodities or sites of differentiated value, then the merger might reduce consumer welfare, even if it had no foreclosure effect on either firm's horizontal rivalry.

Conversely, recognizing ecosystem competition as a genuine competitive phenomenon could be advantageous to firms resisting antitrust liability. Consider a horizontal merger between two firms in a somewhat concentrated market that raises unilateral effects concerns under the Horizontal Merger Guidelines—i.e., concerns that the firms are sufficiently close substitutes in a differentiated market that, post-merger, they might become so profitable as to be able to raise price, reduce output, or limit innovation even without coordinating with other firms in the market. Evidence that the merging firms are competing aggressively over differentiation and commoditization against non-horizontally related firms in the same ecosystem could reduce the antitrust agencies' concerns over the unilateral exercise of monopoly power post-merger.

Ecosystem competition is undoubtedly a genuine phenomenon, and nothing in the structure of the antitrust statutes prevents its inclusion in antitrust analysis. However, that does not necessarily mean that it would be desirable to expand the notion of "competition" within the antitrust laws to include ecosystem competition. Identifying the incidence, mechanisms, and effects of ecosystem would be complex, and adding complexity in pursuit of precision does not invariably improve outcomes.[20] This Article has sought to identify and name a competitive phenomenon (largely) excluded from antitrust analysis in the hopes of spurring a conversation about whether formal antitrust analysis warrants its explicit inclusion.

19. *See* United States v. AT&T, Inc., No. 18-5214, slip op. at 18–34 (D.C. Cir. Feb. 26, 2019).

20. *See* RICHARD A. EPSTEIN, SIMPLE RULES FOR A COMPLEX WORLD (1995).