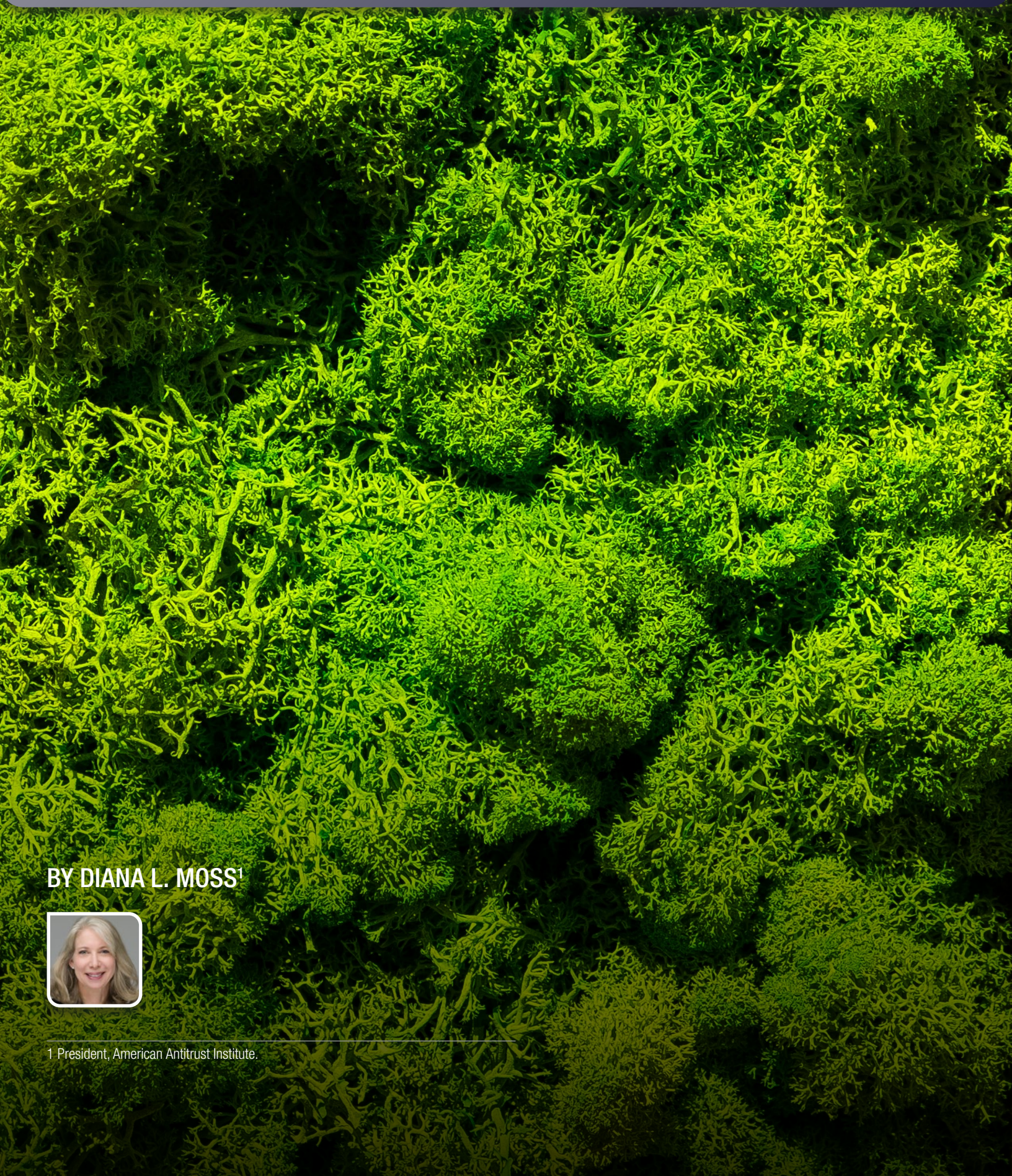
CONTROLLING MARKET POWER IN DIGITAL BUSINESS ECOSYSTEMS: INCORPORATING UNIQUE ECONOMIC AND BUSINESS CHARACTERISTICS IN COMPETITION ANALYSIS AND REMEDIES



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Controlling Market Power in Digital Business Ecosystems: Incorporating Unique Economic and Business Characteristics in Competition Analysis and Remedies

By Diana L. Moss

Digital business ecosystems ("DBEs") reflect the culmination of progressive changes in business models over the last 40 years. Coupled with the unique economic characteristics of the DBEs, these features amplify concerns arounds their ubiquity and significant market power. This article argues that existing competition analysis and proposed remedial approaches miss important implications of the complex business model and unique economic characteristics of DBEs. These include pervasive market failures, economies of scale in cloud computing technology, and algorithmic preference-shaping, all of which have myriad implications for assessing and controlling market power. If unaccounted for, these features will likely lead to competition analysis and policy approaches that do not appropriately target the source of DBE market power and vast capacity for expansion and growth.

I. INTRODUCTION

Digital business ecosystems ("DBEs") reflect the culmination of progressive changes in business models and organizational structure over the last 40 years. DBEs feature collaborations of entities, primarily through digital architectures of information and communication technologies. Leading examples of large DBEs are Facebook (social networking), Google (search), and Amazon (e-commerce). Other powerful DBEs, however, are on the rise, including Zillow (real estate) and Optum (healthcare technology). The ubiquity and significant market power of large DBEs is troubling. But the DBE business model — which far surpasses other models in its scope, scale, and complexity — remains largely under-analyzed. This is a result of the speed with which the DBEs have developed, but also extant analysis that relies almost exclusively on a "law and economics" approach, without considering other important disciplinary perspectives.

This article encapsulates key results of a recent report by the American Antitrust Institute ("AAI"): Market Power and Digital Business Ecosystems: Assessing the Impact of Economic and Business Complexity on Competition Analysis and Remedies ("AAI Report").[2] The AAI Report argues that existing competition analysis and proposed remedial approaches miss important implications of the complex business model and unique economic characteristics of DBEs. These include a range of market failures such as positive network effects, information asymmetries around user data and privacy, and data externalities. As the engine of commerce and growth in DBEs, cloud computing technology, which displays significant economies of scale, adds further complexity. This is particularly true of data analytics, supported by artificial intelligence ("AI") and machine learning. All of these factors act to "supercharge" the DBE value proposition. That is, namely, to maximize user engagement across the interconnected set of markets in a DBE and monetize user data through advertising and infomediaries — all through the deployment of algorithmic recommendations.

These features have myriad implications for assessing and controlling market power. They increase the opacity of DBEs to consumers, competition enforcers, the courts, and lawmakers. If unaccounted for, the unique characteristics of DBEs will likely lead to policy approaches that do not appropriately target the source of their market power and vast capacity for growth. Enforcers and lawmakers are already behind in controlling the market power of large DBEs. U.S. merger enforcement in the sector is essentially nonexistent and monopolization cases are just getting off the ground. U.S. legislative proposals, while well-intended, miss the mark by tasking antitrust agencies with the job of "sector regulation," at the same time they target only the largest of the DBEs. This article explores major takeaways from the AAI Report in explaining the importance of new perspective for refocusing the lens on competition analysis and remedies for the digital technology sector.

II. GROWTH OF THE DIGITAL BUSINESS ECOSYSTEMS: THE ROLE OF CLOUD INFRASTRUCTURE IN FOSTERING EXPANSION

The DBE business model is particularly conducive to growth. Empirical evidence reveals that "growth through acquisition" is the major strategy for executing it. The five largest DBEs — Amazon, Apple, Facebook, Google, and Microsoft — have grown through the acquisition of almost 800 firms over the period 1987-2020, or an average annual rate of increase in acquisitions of almost 20 percent per year.[3] The average value of these acquisitions is much smaller than for similarly sized companies in non-digital sectors. The serial acquisitions made by the largest DBEs have reinforced the market position of the "platforms" that are often the hub of a DBE. Perhaps more important, acquisitions have expanded and diversified DBEs, with significant potential for further growth.

The major area of growth in the formative stages of development of the large DBEs was in core competencies. As part of the most recent cycle of acquisition beginning in 2010, most DBEs shifted their focus to the development of cloud infrastructure. Cloud infrastructure comprises the suite of technologies necessary to collect, aggregate, and enrich vast quantities of user data. The ability to use data has grown significantly through traditional statistical approaches, but also through the emergence of AI and machine learning. Economies of scale in cloud infrastructure allow for cost-effective gathering and processing of data that is essential to creating value by opening new routes to markets and supporting further DBE expansion.

2 Diana L. Moss, Gregory T. Gundlach & Riley Krotz, Market Power and Digital Business Ecosystems: Assessing the Impact of Economic and Business Complexity on Competition Analysis and Remedies, Am. Antitrust Inst. (June 1, 2021).

3 See Diana L. Moss, The Record of Weak U.S. Merger Enforcement in Big Tech, Am. Antitrust Inst., Jul. 8, 2019 (Moss (2019)); and Diana L. Moss; and Update on Digital Technology: The Failure of Merger Enforcement and Need for Reform, American Antitrust Inst., Mar. 3, 2021 (Moss (2021)).

The largest DBEs embarked on a build-out of cloud infrastructure that began in earnest in about 2013 and remains in an extended cycle. 2019 was a banner year, with an all-time high of 24 major cloud acquisitions. The average annual rate of growth in cloud acquisitions between 2013-2020 is about 26 percent, whereas the same rate for all acquisitions over the same period is -1.5 percent. This pattern reveals an intense focus on developing the cloud infrastructure that is central to fulfilling the DBE value proposition. The roughly 150 cloud acquisitions made by the five largest DBEs since 1998 have proceeded without opposition from antitrust enforcers. Four players now account for almost 65 percent of the cloud market: Amazon Web Services (31 percent in 2021), Microsoft Azure (percent), Google Cloud Platform (7 percent), and Alibaba Cloud (6 percent).[4] Two of those companies, Amazon and Microsoft, account for over 50 percent of the market. With ongoing investment in cloud infrastructure, DBEs are primed to enter further cycles of expansion, potentially creating even larger and more powerful entities.

III. UNIQUE FEATURES OF DIGITAL BUSINESS ECOSYSTEMS: SUPERCHARGING THE VALUE PROPOSITION AND ENHANCING MARKET POWER

The starting point for understanding market power in DBEs is the value proposition. The DBE business model is conducive to co-creating value. For example, most DBEs features a "platform," which serves as the hub of a star-like network. The platform is the digital infrastructure that provides the core functionality with which third-parties interoperate to provide complementary products and services. Platforms can serve as aggregators, marketplaces, or clearinghouses. Clusters of proprietary or rival businesses surround a platform, in horizontal, vertical, and "ecosystem" relationship to the platform, or each other. The operation and expansion of DBEs depends on this integration. For example, Facebook's acquisition of Instagram and Google's 2010 acquisition of ITA Software, Inc. reflect horizontal and vertical integration, respectively. Ecosystem integration does not involve assets that are in direct horizontal or vertical relationships. Rather, they capitalize on the DBE business model to co-create value by increasing connectivity across a series of markets. For example, Microsoft's 2016 acquisition of professional online networking service LinkedIn (2016) was designed to "recreate the connective tissue" for Microsoft's enterprises suite of functionality.[5]

Another key feature is the role of user data, where the unprecedented collection and commercial use of such data has resulted in the explosive growth of DBEs.[6] Data come from multiple sources, including given voluntarily in exchange for free services such as internet search and social networking; and collected from various user interactions through cookies, tracking, web surfing, and sensor data.[7] As DBEs enter further cycles of expansion, their expanding base of users will generate significantly more user data. And the larger the DBE, the more valuable is the value proposition. But it is well-known that raw user data do not offer much value. Data must be transformed to realize their full value by "mapp[ing] a given consumer's data into estimates of his values for products," to produce search results, personalized product recommendations, product ratings, and targeted advertisements.[8]

DBEs deploy sophisticated tools to harness the value of user data. Algorithms, generated by cloud-based data analytics and supported by AI and machine learning, "shape" consumer preferences by curating options based on past expressed preferences. This process occurs within a "fabricated informational sphere, built in a constant feedback loop," created and managed by the DBE.[9] This conduct generates a number of concerns such as algorithm overdependence, or when consumers "surrender to algorithm-generated recommendations even when the recommendations are inferior."[10]

4 Katy Stalcup, AWS vs Azure vs Google Cloud Market Share 2021: What the Latest Data Shows, ParkMyCloud.com, Feb. 10, 2021. Based on cloud infrastructure spending in 2020.

5 Microsoft to Acquire LinkedIn, Microsoft.com, Jun. 13, 2016. See also Grant Feller, This Is the Real Reason Microsoft Bought LinkedIn, Forbes.com, Jun. 14, 2016.

6 Dirk Bergemann, Alessandro Bonatti, & Gan Tan, The Economics of Social Data, Cowles Foundation Discussion Papers (2019), at 2.

7 Wolfgang Kerber, Digital Markets, Data, and Privacy: Competition Law, Consumer Law, and Data Protection, Gewerblicher Rechtsschutz und Urheberrecht. Internationaler Teil (2016), at 2.

8 Shota Ichihashi, *Online Privacy and Information Disclosure by Consumers, 110* Am. Econ. Rev. 569 (2020), at 2.

9 *Id.*

10 Sachin Banker & Salil Khetani, *Algorithm Overdependence: How the Use of Algorithmic Recommendation Systems Can Increase Risks to Consumer Well-Being*, 38 J. of Pub. Pol. & Mkting. 500 (2019), at 500.

Algorithmic preference-shaping, which operationalizes the DBE value proposition, creates strong incentives to exploit pervasive market failures and other economic anomalies. For example, social media and search platforms display positive network effects, a demand-side externality that make a network more valuable to all users when more users join it. This encourages users to divulge information they may not otherwise provide, promoting "tipping" to a dominant provider. Also consider information asymmetries around user data and privacy. Users provide their data and information in exchange for engagement and services. But while the firm has complete information about user data, the user has little to no information about how much data is collected, how it is used, and even DBE policies regarding its use.[11] One perverse outcome of this information asymmetry is that even when consumers state certain preferences for privacy, when they are presented with scenarios where their data is shared, they behave counterintuitively, or rarely change their behavior.[12]

DBEs are also home to another market failure, powerful data externalities, which are revealed in the value of a small number of users' data in predicting the behavior of even larger groups of users. This includes how the privacy choices of a smaller number of users affect what sellers can learn about the privacy preferences of others. The power of data externalities, in conjunction with algorithmic preference-shaping, can induce DBEs to require users to provide even more detailed, personal information. DBEs can coerce this provision through lock-in or dependence on a particular platform or service,"[13] resulting in the collection of an excessive amounts of private data.[14] Taken together, the market failures that pervade DBEs foster not only anomalous user behavior but strong incentives for DBEs to acquire and exercise market power.

IV. WIDENING THE LENS ON COMPETITION ANALYSIS: HOW COMPLEXITY EXPANDS THE UNIVERSE OF POTENTIAL STRATEGIC CONDUCT

The unique economic and business features of DBEs directly affect how enforcers and policymakers frame competition problems in the digital technology sector. This includes how markets are conceptualized and defined, and the types of anticompetitive conduct for which redress is sought. For example, the market failure around user data and privacy, coupled with the algorithmic shaping of user preferences in DBEs, call into question whether consumers behave "rationally" — a critical assumption in competition analysis. This, in turn, creates a lack of clarity around how consumers will respond to the exercise of market power by switching (or not) to competing providers. These problems may mean the difference between a very narrowly defined market within a DBE in which there is suspected competitive harm and a larger "cluster" market, which could encompass a broader set of interconnected markets within a DBE.[15] Demand is the ultimate arbiter of market power, so any difficulty in evaluating it as the result of the unique features of DBEs will have a material impact on the ability of enforcers and policymakers to tackle competition problems.

The complexity and special characteristics of DBEs also give rise to a diverse set of potential anticompetitive strategies. Some outcomes are directly the result of key economic features, such as network effects and tipping, which can create barriers to entry for smaller DBEs and that might seek to challenge the position of an incumbent DBE. Other anticompetitive incentives result from ownership of a dominant platform, on which the DBE competes with third-party providers. For example, the 2020 state complaint against Facebook alleges the firm "selectively enforce[d] its policies to cut off API access to companies Facebook worried might one day threaten its monopoly."[16] Likewise, in 2012, the FTC investigated whether "Google unfairly promoted its own vertical properties through….the introduction of the 'Universal Search' box."[17] And in 2020, the EC investigated whether Amazon favored its proprietary products or preferred sellers that used Amazon's logistics and delivery services in calibrating which sellers are eligible to participate in its Prime loyalty program and appear in the "Buy Box."[18]

11 Kerber, *supra* note 7, at 7.

12 *Id.,* at *2* [noting "In the aftermath of Facebook's Cambridge Analytica scandal the social media company should have seen a higher number of consumers switching services or closing their accounts, but the outcome was the opposite."] See also, Thomas C. Redman & Robert M. Waitman, *Do You Care About Privacy as Much as Your Customers Do?* Har. Bus. Rev. (Jan. 28, 2020).

13 Nicholas Economides & Ioannis Lianos, Antitrust and Restrictions on Privacy in the Digital Economy, *2* Concurrences Review 22 (May 2020), at 23.

14 Kerber, *supra* note 7, at 7.

15 See e.g. Herbert Hovencamp, Digital Cluster Markets, Col. Bus. L. Rev. (2021) (forthcoming), at 6.

16 Complaint, *FTC v. Facebook,* No. 1:20-cv-03590 (D.D.C. filed Dec. 9, 2020).

17 See Statement of the Federal Trade Commission Regarding Google's Search Practices 3, n.2, In the Matter of Google Inc., FTC File No. 111-0163, Jan. 3, 2013.

18 Commission Sends Statement of Objections to Amazon for the Use of Non-Public Independent Seller Data and Opens Second Investigation into Its E-commerce Business Practices, European Commission, Nov. 10, 2020.

Analysis in the AAI Report reveals additional competitive concerns. One is the rapid expansion of the DBEs through ecosystem acquisitions. For example, the EC's concern in Google's acquisition of fitness wearables maker, Fitbit, was the potential extension of Google's enhanced market power in the market for health and fitness data to the broader ad-tech market.[19] Such acquisitions, which may be dismissed by enforcers as harmless "conglomerate" deals, pose significant competitive issues around leveraging of market power within a DBE. Novel analysis in the AAI Report also identifies additional forms of exclusionary conduct, particularly around cloud technology. For example, economies of scale in cloud infrastructure and high concentration in cloud markets raise barriers to entry to smaller firms seeking to gain a foothold within a DBE market(s).[20]

A DBE can also engage in a variety of anticompetitive conduct involving cloud technology, such as denying rivals' access, granting access on discriminatory terms and conditions, or manipulating firewalls that cordon off rivals' cloud data. Even more troubling are scenarios where a DBE could deploy cloud technology to steer users to proprietary services (and away from rivals) using algorithmic recommendations. These strategies lock users into proprietary systems, limiting their ability to switch to a DBE that offers a similar cluster of services. But given the opacity of algorithmic recommendation systems, such conduct is likely to be difficult for rivals to detect. And switching also depends critically on competition, which may not be present in markets dominated by large DBEs.

V. REINING IN THE MARKET POWER OF THE DIGITAL BUSINESS ECOSYSTEMS: WHAT NEW ANALYSIS TELLS US ABOUT EFFECTIVE REMEDIES

Analysis of the DBE business model provides important insight into the effectiveness of various remedial approaches, a perspective that should inform current debate and legislative proposals to rein in the market power of the large DBEs. To date, proposals focus almost exclusively on two components of a regime that promotes access by both rivals and users. One is interoperability standards that ensure rivals' nondiscriminatory access to a platform and a second is data portability requirements that promote users' ability to switch between competing DBE services. These remedies, while important and necessary, do not address the unique economic and business features of DBEs that create strong incentives to exploit users and impede access by rivals. The following takeaways highlight a number of these, and related, issues.

Use of the antitrust laws to "quasi-regulate" the largest DBEs is not the most effective approach to addressing competitive concerns that arise more broadly in the digital technology sector. Tackling the market power problems raised by DBEs will require the coordination of multiple policy tools. Current proposals in the U.S., however, would require antitrust agencies to bear the vast burden of policing competition. This includes a new form of quasi-regulatory oversight involving structural separation of the largest firms, which would be added to traditional merger and monopolization enforcement performed by the DOJ and FTC. Aside from diverting scarce resources from the vital antitrust enforcement mission, burdening the agencies with quasi-regulation that is administered through the antitrust process would likely prove too slow, against the backdrop of a dynamic sector. The market power issues that are amplified by the market failures and complex business model that characterize the DBEs and would be better addressed through broader sector regulation. Sector regulation would work more efficiently and quickly to promote a system of universal nondiscriminatory access. This would also carry less risk of serious market distortions and a higher probability of success in preventing firms from growing to dominance. In sum, tasking the antitrust agencies with responsibilities for which law enforcement is not designed could impair the vital antitrust mission at a time when we need it the most, in digital technology and in other sectors.

Antitrust conduct remedies would be even less effective in the DBE context than they are in more traditional, non-digital sectors. Experience teaches that antitrust remedies designed to prescribe and proscribe certain activities of a defendant are the least effective at restoring competition. Antitrust conduct remedies do not reduce incentives to exercise market power and require oversight and monitoring, a task for which the courts are ill-suited. As applied in the DBE context, antitrust conduct remedies would be particularly ineffective. Complexity, market failures, and the opacity of complex technology systems make antitrust conduct remedies poor candidates for addressing the root problems that create anticompetitive incentives. A more comprehensive remedial framework is needed for DBEs, in the form of sector regulation.

19 Mergers: Commission clears acquisition of Fitbit by Google, subject to conditions, European Commission, Dec. 17, 2020.

20 Emilio Calvano & Michele Polo, Market Power, Competition and Innovation in Digital Markets: A Survey, Info. Econ. & Pol., forthcoming, Dec. 1, 2019, at 27. See also Marc Bourreau, Some Economics of Digital Ecosystems, Hearing on Competition Economics of Digital Ecosystems, Directorate for Financial and Enterprise Affairs Competition Committee, OECD, Nov. 13, 2020, at 4.

Antitrust or legislated structural separations alone are unlikely to address the unique features of DBEs that give rise to market power. Structural remedies have been proposed to address a number of problems that arise in DBEs. Take privacy, where dominant DBEs have incentives to provide insufficient options to users.[21] Breakups will do little to eliminate incentives to exploit network effects and data externalities that compromise user data and privacy. And more competition could even promote more intense efforts to obtain personal data.[22] On another front, separation of affiliated businesses from a DBE platform could significantly weaken incentives to exclude rivals. A standalone platform would provide an essential network service where rivals operate out of the shadow of a DBE's affiliated businesses, and no longer be the target of discriminatory conduct. However, structural separations are only as effective as the ability of buyers of divested assets to fully restore competition. The growing record of failed antitrust divestitures in other sectors suggests that caution is needed in selecting viable buyers with a demonstrated ability to maintain divested DBE assets.

History teaches that reduced incentives to maintain a standalone platform will be a challenging issue in crafting remedial approaches. A DBE's incentive to maintain and invest in a platform is driven both by competition with third-party rivals on the platform *and* the risk of losing users to competing DBEs. Separating a platform from affiliated DBE businesses will weaken such incentives. This could lead to an overall decay in the quality of the platform, especially cloud infrastructure, access to which is essential for rivals to compete. These effects are illustrated by the spinoff of the British railway system to an independent operator in the 1990s, which was followed by safety problems and modifications to the original ownership and operation scheme.[23] Concerns over the sufficiency of investment in a network also arose in the U.S. electricity sector in the 1990s, where vertically integrated utilities were required to cede control of their transmission systems to regional organizations. Solutions to these concerns are largely absent from current policy approaches to controlling the market power of DBEs.

The stronger restrictions necessary to address the features of DBEs that foster the exercise of market power pose serious challenges for enforcers, courts, and regulators. Remedies that address the unique characteristics of DBEs that foster exploitative and anticompetitive conduct would focus on market failures, economies of scale, and algorithmic recommendation systems.[24] Such requirements pose serious challenges. For example, DBEs will invoke First Amendment protection to prevent outside access to algorithms[25] and it is not clear how enforcers or courts would ensure (and monitor for) unbiased results. Maintaining separate or firewalled datasets and cloud computing assets would eviscerate any benefits from data externalities and scale economies, and thus be strongly opposed by DBEs. Mandatory data-sharing raises questions about what and how much data should be shared between the DBE and rivals to reduce anticompetitive incentives. Moreover, it is not clear, as of yet, what changes to opt-out provisions would empower users to better align their preferences for privacy with their actual behavior. These questions require more thought and analysis, as part of a potential regulatory regime.

An effective regime for reining in the market power of the DBEs will require a comprehensive, hybrid approach. Analysis of the DBEs reveals the necessity of a hybrid approach that deploys a set of appropriate and complementary policy tools. Vigorous antitrust enforcement is a critical prong of a broader public policy approach to reining in the market power of the DBEs. Merger and monopolization law will remain critical in controlling the market power of DBEs, but constructive reforms are needed to clarify and strengthen their effectiveness across all sectors of the economy, including the digital technology sector. Structural remedies should be the approach "of choice" in antitrust consent decrees that emerge from successful enforcement actions. A complementary regulatory regime that governs potentially harmful conduct in the digital technology sector more broadly is essential. A regulatory framework should minimize the risk of gaming and ongoing legal challenges, at the same time it recognizes the characteristics of DBEs that create strong anticompetitive incentives. The complementarity between antitrust and regulation should be ensured through savings clauses in any legislative proposals, and full rein for antitrust authorities to pursue violations in the sector.

21 Daniel P. O'Brien & Doug Smith, Privacy in Online Markets: A Welfare Analysis of Demand Rotations, Federal Trade Commission, Bureau of Economics, Working Paper No. 323, Jul. 2014, at 26.

22 Eugene Kimmelman, Harold Feld, & Agustín Rossi, *The Limits of Antitrust in Privacy Protection*, 8 Int'l. Data Privacy L. 270 (2018).

23 Russell Pittman, Structural Separation and Access Pricing in the Railways Sector: Sauce for the Goose Only? Oct. 15, 2004.

24 Diane Coyle, *Practical Competition Policy Implications of Digital Platforms*, 82 Antitrust Law J. 835 (2019), at 7. See also, In the matter of *Google/Double Click*, Dissenting Statement of Commissioner Pamela Jones Harbour (F.T.C. File No. 071-0170, Dec. 20, 2007). See also, Inge Graef, Blurring Boundaries of Consumer Welfare: How to Create Synergies between Competition, Consumer and Data Protection Law in Digital Markets, Dec. 7, 2016.

25 Randy M. Stutz, An Examination of the Antitrust Issues Posed by Google's Acquisition of ITA, Am. Antitrust Inst. (Feb. 18, 2011), at 22.

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