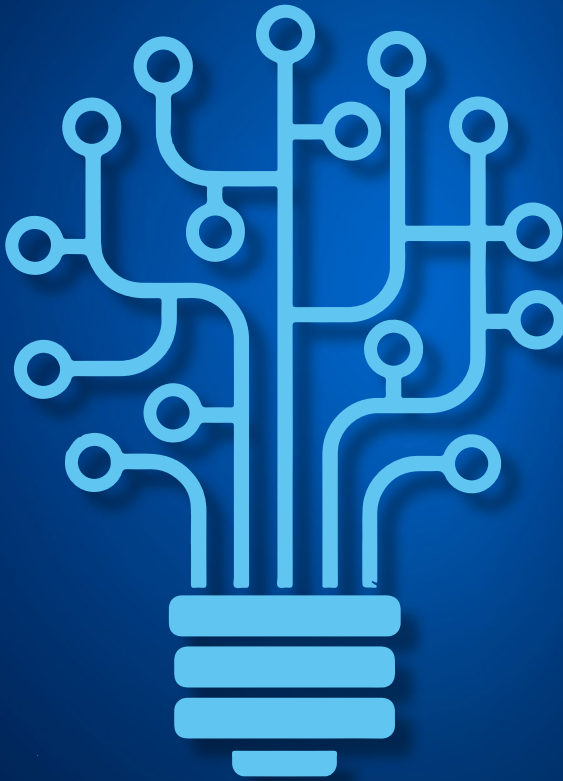


THE EVOLUTION OF ANTITRUST IN THE DIGITAL ERA: Essays on Competition Policy

Volume One

Editors

David S. Evans
Allan Fels AO
Catherine Tucker



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Editors' Note

The story of antitrust is the story of technology. The essays in this volume tell the latest chapter in this ongoing saga.

In the late 19th century, the disruptive technology of the day was the railroad. In the expanding U.S., local railroads were bought up and consolidated into broad systems by the “trusts” that gave the Sherman Antitrust Act of 1890, and the resulting worldwide body of law, its name. Moving on from transport, various technologies have formed the locus of economic growth, and therefore of antitrust scrutiny, throughout the past hundred years or so.

After the railroads came Standard Oil, and its control over the key input for 20th century economic growth. Again, this was a reflection of technology, both in other industries' need for vast sources of energy, and the improved refining technology that led to scale in the oil industry itself. Antitrust enforcement, famously, split the company up. Then, mid-century, came the telecommunications revolution. In the U.S., concerns crystallized around the role of the Bell System as an incumbent technology provider. Once more, antitrust enforcement split it up. In the 1970s and 80s, IBM's mainframe computing business became the target of enforcement. Following on from that, the banner cases of the 1990s in both the U.S. and Europe were against Microsoft's practices in the desktop computing space. In the latter two instances, however, the consequences were less radical, due, perhaps, to the intervening Chicago School critique of earlier antitrust remedies.

Despite these different outcomes, at each step along the way, antitrust thinking has been defined by the technologies that gave rise to its greatest enforcement challenges. Since the dawn of this century, attention has turned to the current generation of innovators, in what today is termed the “digital economy.” The quandaries facing today's legislators, enforcers, and public, are novel and multifaceted. Nonetheless, they bear comparison with the formative struggles that policymakers grappled with throughout the first century of antitrust.

The pieces in this volume draw on the lessons of the past to set out how competition rules might deal with this new set of concerns, in various jurisdictions around the world. Each one draws on general themes, yet nevertheless addresses specific aspects of the contemporary debate.

Much of today's antitrust discussion concerns the businesses run by large companies such as Amazon, Apple, Facebook, Google, and Microsoft. Each has significant share in a given industry, and derives its revenues from what are described as “platforms.” But

how are such platforms different from the incumbent businesses of the past? The answer to this is not clear. Yet queries surrounding the platforms' alleged dominance, and whether their conduct amounts to an infringement of competition rules, have been a source of controversy for over a decade. The pieces in this volume address this dilemma head-on.

At a fundamental level, there is the definitional threshold of what a “platform” even is, and what rules should apply to such a business. Then there is the question of whether “platforms” have a “special responsibility” towards downstream operators that rely on them to reach customers. In other words, can platform operators favor their own businesses in those related markets? Or do competition laws require them to treat all firms in the same way? What are the risks to competition if platforms are given free rein? In antitrust parlance, these questions are assessed under the rubric of “self-preferencing,” which has dominated recent headlines.

Pieces by **Thomas Kramler** and **Robert D. Atkinson & Joe Kennedy** report on this controversy from the trenches. The authors draw on their considerable experience in dealing with these issues to ask whether antitrust concerns in the digital economy can effectively be addressed within the confines of existing antitrust law and jurisprudence, or whether new rules are needed.

At the time of publication, this “platform regulation” debate is reaching its crescendo. In 2019, various jurisdictions, including the EU, Germany, Australia, and the Brexiting UK, commissioned detailed reports on whether competition rules need to be updated to deal with “platforms,” and “self-preferencing” specifically. The coming months and years will see legislatures take action on these reports. Much is at stake in how these reports' conclusions are interpreted. The pieces in this volume form a vital part of that discourse.

Aside from these (almost existential) concerns, there is the question of how “platforms” interact with other actors in the economy. While it is productive for there to be broad discourse on the role of competition and digital regulatory policy, it is also vital for those rules to stay in their own lane. Otherwise, reforms grounded in the logic of antitrust could unduly expand its role, and counteract other policies. This debate has reached an advanced stage in Australia, where policy efforts have honed in on the media and news industry. Pieces by **Simon Bishop & George Siolis**, and **Andrew Low & Luke Woodward**, describe these developments, and discuss the risks of focusing on a narrow set of sector-specific concerns to derive broad antitrust solutions.

Then, there are even more specific concerns. Algorithms, anonymously executed in server farms, dominate modern commerce. Aside from mundane operational decisions, algorithms are increasingly used to set pricing and other commercial strategies. This can be pro-competitive and efficient. But algorithms, like people, can also restrict competition and harm consumers. If firms use algorithms that “autonomously” tacitly collude through deep machine learning, can the firms that run them be held liable? The pieces by **Andreas Mundt** and **Gönoç Gürkaynak, Burcu Can**

& **Sinem Uğur** underline the need for further research on how such algorithms operate in real-life settings, before creating a new head of liability.

Technology allows consumers to access and interact with offers in the digital world with remarkable ease. But it has also created the potential for new forms of consumer exploitation, and facilitates highly individualised price discrimination. This creates opportunities for business models based on exploiting incumbents' superior bargaining position, particularly in the business-to-business space. Platforms can make “take-it-or-leave-it” offers that allow the platform to enjoy all the surplus of trade. This notion of an “abuse of a superior bargaining position” is foreign to competition rules in certain jurisdictions, but is known in Japanese competition law, as discussed by **Reiko Aoki & Tetsuya Kanda**.

Moore's Law famously predicts that the number of transistors on a microchip will double every two years, though their cost will be halved. These remarkable advances, coupled with parallel developments in mass data gathering and storage, allow today's computers to solve tasks of extraordinary complexity, including innovative, reliable, and lucrative predictive analytics. Yet this possibility raises profound privacy concerns, as reflected in laws such as the California Consumer Privacy Act and the EU's General Data Protection Regulation. Such rules, in turn, raise novel competition issues.

This dynamic has profound implications for competition law, and how it interacts with privacy rules. Although competition and privacy law are separate disciplines, they are in tension with each other. As **Maureen K. Ohlhausen & Peter Huston** discuss, this problem came to the forefront in recent U.S. litigation between hiQ and LinkedIn. The latter, invoking the privacy rights of its members, employed technical measures to block hiQ's automated bots from accessing data on LinkedIn's servers. HiQ, in turn, alleged that LinkedIn's actions were in reality an attempt to restrict competition.

As the authors discuss, this case represents the archetypal conflict between data privacy and competition, and will be repeated throughout the world in years to come. The policy dilemma between privacy rules and antitrust cannot be overstated. Protecting privacy by restricting data flows can hinder competition by denying new entrants access to the data they need to compete. On the other hand, ensuring that rivals have easy access to data can diminish privacy by distributing data in ways that consumers may not anticipate or want.

The foregoing should make clear that the story of antitrust in the “digital economy” is but one chapter in a saga that is still being written. Like all sagas, it draws from universal themes, and is self-referential within its canon. Yet it is all the more interesting as a result.

The editors would like to thank Elisa Ramundo, Sam Sadden, and Andrew Leyden for commissioning, compiling, and editing this volume.

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The Antitrust “Challenge” of Digital Platforms: How a Fixation on Size Threatens Productivity and Innovation¹

By Robert D. Atkinson & Joe Kennedy¹

Abstract

Over the last several years, much of the debate on antitrust policy has focused on the largest digital platforms, including, Amazon, Apple, Facebook, Google, and Microsoft. Each of these companies is large, has some significant market share in their narrowly defined industry, and most derive much of their revenues from running one or more multi-sided platforms. These factors have generated a backlash by anti-big firm activists and consternation among many European and U.S. competition policy officials. However, a careful review of both the individual markets and the general issues reveals that the challenges these companies pose, while slightly different from previous markets, are not entirely new. Moreover, in most cases legitimate competition policy issues, especially those related to structure, are limited and can be effectively addressed within the confines of existing anti-trust law and jurisprudence.

I. INTRODUCTION

Over the last several years, much of the debate on antitrust policy has focused on the largest digital platforms, including, Amazon, Apple, Facebook, Google, and Microsoft. Each of these companies is large, has some significant market share in their narrowly defined industry, and most derive much of their revenues from running one or more multi-sided platforms. These factors have generated a backlash by anti-big firm activists and consternation among many European and U.S. competition policy officials. However, a careful review of both the individual markets and the general issues reveals that the challenges these companies pose, while slightly different from previous markets, are not entirely new. Moreover, in most cases legitimate competition policy issues, especially those related to structure, are

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limited and can be effectively addressed within the confines of existing antitrust law and jurisprudence.

These companies, and others like them, add significant value to the economy. Although their size and market share have led to several concerns, regulators should pause before taking action. As with all antitrust cases, any decisions should follow from and be guided by a careful study of all sides of the specific markets involved and be focused on maximizing overall economic welfare. When this is done, regulators will find that many of the “problems” being debated, such as vertical expansion into other markets, accumulation of market power through mergers, and threats to innovation, do not justify a change in either the substance or the enforcement of antitrust law. Where real problems related to conduct, as opposed to presumed ones, do appear, existing tools give agencies sufficient power to deal with them.

It is critical that policymakers and antitrust practitioners get this right. Given the potential transformation of many industries by digital technologies and the importance of both network effects and economies of scale, digitally powered platforms in a range of industries may well become the dominant form of organization going forward, similar to the rise of the large industrial corporation at the turn of the 20th century and large diversified companies in the decades after WWII. In response to the great expansion of economic growth and innovation enabled by those then-new organizational forms, the U.S. federal government interpreted the Sherman and Clayton Acts to let individual companies acquire the size needed to maximize efficiency, but established guardrails against mergers and conduct that conferred clear market power and business practices that limited economic growth or hurt consumers.²

The main antitrust laws were passed around the turn of the 19th Century and were originally focused on limiting trusts – formal agreements of cooperation and collusion between separate companies. One key response to banning trusts was to encourage mergers and the emergence of large industrial corporations as a way for companies to take advantage of new technologies which enabled and even required economies of scale. Teddy Roosevelt’s Progressive Party platform reflected the common view of the time, “The corporation is an essential part of modern business. The concentration of modern business, in some degree, is both inevitable and necessary for national and international business efficiency.”³ Thirty years later, his cousin Franklin Delano Roosevelt stated, “Nor today should we abandon the principle of strong economic units called corporations, merely because their power is susceptible

2 An important influence behind this shift was Robert H. Bork, *The Antitrust Paradox: A Policy at War With Itself*, (New York: Basic Books, 1978).

3 Robert D. Atkinson & Michael Lind, “The Myth of the Roosevelt ‘Trustbusters,’” *New Republic*, May 4, 2018, <https://newrepublic.com/article/148239/myth-roosevelt-trustbusters>.

of easy abuse.”⁴ This acceptance of large corporations was central to the ability of the United States to become the dominant economic power through the late 1970s. In contrast, Europe continued to allow cartels which reduced the incentives to create large corporations, which meant that Europe developed many fewer large, globally competitive corporations, imposing a structural burden on the EU economy that persists to this day.⁵

If it is true that in the near future large intra-industry digital platforms in industries such as health care, banking, education, and logistics will emerge by combining data analytics, low transactions costs, and global reach with a platform-based business model, it is critical that competition policy evolve to enable, rather than stifle, these new, more productive forms of business organization. Just as antitrust doctrine in the early decades of the 20th century adapted to and indeed embraced the form of the large industrial corporation, antitrust policy needs to do the same today in embracing platform organizations. Applying more restrictive antitrust doctrines and practices to these new models threatens to squash European growth and do to the U.S. economy what Europe did to its economy through the mid-20th century. As such, the stakes of getting this right cannot be overestimated. The first place to start is to focus antitrust policy on what it is supposed to focus on: overall economic welfare.

II. THE BENEFITS DIGITAL PLATFORMS BRING

The dominant fact about digital platforms is that they deliver significant benefits to a wide range of users, including app developers, sellers of a wide variety of goods and services, advertisers, consumers, and tens of millions of people who use social media to stay in touch with family and friends.

The value of these benefits is hard to measure, in part because many services are offered for free. But even if they were not, the consumer surplus between their value to Internet users and the amount that users actually have to pay is very large. A recent study by MIT economists estimates the median Internet user would require compensation of \$17,530 to give up search engines for one year. The equivalent estimates for email and digital maps are \$8,414 and \$3,648, respectively.⁶

⁴ *Ibid.*

⁵ Jeffrey Fear, “Cartels and Competition: Neither Markets Nor Hierarchies,” (Working Paper, 2006), <http://www.hbs.edu/faculty/publication%20files/07-011.pdf>.

⁶ Erik Brynjolfsson, Avinash Collis & Felix Eggers, “Using Massive Online Choice Experiments to Measure Changes in Well-Being,” *Proceedings of the National Academy of Sciences*, vol. 116(15), April 9, 2019, <https://www.pnas.org/content/116/15/7250>, “How Much are Search Engines Worth to You?” MIT Management website, (accessed December 11, 2019), <https://mitsloan.mit.edu/ideas-made-to-matter/how-much-are-search-engines-worth-to-you>.

A filing by scholars from the Mercatus Center lists five ways Internet platforms create value:⁷

- By allowing people to rent out other people’s cars, homes, and other property, they increase the value of underutilized capital.
- By connecting large numbers of buyers and sellers, they make both supply and demand more competitive and allow greater specialization among producers, leading to more choice for consumers.
- By lowering the transaction costs of finding willing partners, negotiating over price, ensuring quality, and monitoring performance, they increase the number of beneficial trades.
- By making it easy for both buyers and sellers to check on the past performance of potential counterparties, they increase the amount of information in the marketplace and reduce the risk to parties.
- By offering an alternative to traditional markets, whose regulators are often captured by existing producers, they create opportunities for new suppliers to satisfy the unmet needs of consumers and force incumbents to become more efficient.

These benefits tend to have progressive effects. The savings from lower prices and free services often benefit low-income consumers the most, because the savings represent a higher proportion of their total income. Moreover, higher-income users are more valuable to platforms because they are more likely to buy advertised goods and services, yet both higher income and lower-income consumers receive the same services.

These companies are also among the most innovative in the world. Amazon and Alphabet led all companies in investment in research and development in 2018.

7 Christopher Koopman, Matthew D. Mitchell & Adam Theirer, “The Sharing Economy: Issues Facing Platforms, Participants, and Regulators,” (Mercatus Center, Public Interest Comment, May 26, 2005), <https://www.mercatus.org/publications/technology-and-innovation/sharing-economy-issues-facing-platforms-participants-and>.

Microsoft and Apple came in sixth and seventh, while Facebook was 14th.⁸ Each company is constantly innovating its core business in order to respond to competitive threats, including from each other, and attract new users. In addition to their core businesses, they are among the leaders in investing in the next generation of general-purpose technologies, including artificial intelligence, autonomous vehicles, blockchain, quantum computing, and robotics. Development of these technologies will deliver significant economic and social benefits.

III. THE ALLEGED THREAT TO ANTITRUST

Antitrust concerns about the largest digital giants are driven largely by the difficulty for antitrust thinking to effectively adapt to the network age. At the turn of the 19th century, some saw large firms with a significant share of the market as at best suspect; at worst a serious problem. Today, some see platform-based businesses in a similar light.⁹ But, in the digital economy, platforms may very well become the dominant form of business organization, for precisely the same reasons large industrial organizations became dominant in the 20th century: they are the most efficient organizational form for the current technology.

Today, antitrust concerns over platforms are driven by two common traits of multi-sided platforms. On the demand side, the push for bigness is caused by network externalities. The network's value to each user is increased by each additional user. One platform that contains everyone is more valuable than two platforms, each of which contains half the users. This is because with one platform every user can reach every other user. For example, Facebook has announced plans to make Facebook Messenger, WhatsApp, and Instagram interoperable, since these services are all owned by Facebook, so that users on one app can message users on the other apps using whichever service they prefer.¹⁰ Internet users would be worse off if the Federal Trade Commission obtained an injunction preventing Facebook from merging these services, or worse, split these companies apart, because then users would have to create and maintain separate accounts on each of these services to communicate with all of their con-

8 Statista, "Ranking of the 20 Companies With the Highest Spending on Research and Development in 2018," <https://www.statista.com/statistics/265645/ranking-of-the-20-companies-with-the-highest-spending-on-research-and-development/> (accessed November 22, 2019).

9 Tim Wu, *The Curse of Bigness: Antitrust in the New Gilded Age*, (Columbia Global Reports, 2018).

10 Mark Zuckerberg, "A Privacy-Focused Vision for Social Networking," Facebook, March 6, 2019, https://www.facebook.com/notes/mark-zuckerberg/a-privacy-focused-vision-for-social-networking/10156700570096634?mod=article_inline.

tacts.¹¹ Of course, not every network works this way, and mandating interoperability requirements for social networks could create security risks or create other problems for users, such as spam or harassment.¹² Even the classic example, the telephone, has lost its monopoly on intercommunication; people no longer need a phone to call each other. Internet-protocol standards allow voice packets to be generated and sent on a variety of different platforms. Users also have different interests, so often not everyone needs to communicate with everyone else, in which case the network advantage will fade out at a certain size. The net result is scale. As an Obama administration Council of Economic Advisers' report noted, "Some newer technology markets are also characterized by network effects, with large positive spillovers from having many consumers use the same product. Markets in which network effects are important, such as social media sites, may come to be dominated by one firm..."¹³

On the supply side, firms often grow bigger to benefit from economies of scale. By growing larger, firms can reduce their average total cost of production by spreading their fixed costs over more units. But traditional economic theory also assumes that most firms will eventually face increasing marginal costs because of inefficiencies that come from being too large. These increasing marginal costs limit how large firms can grow, making it difficult for any one firm to capture the entire market. However, digital platforms usually enjoy fixed marginal costs that do not increase with size. This means that their average total cost continues to decline as they add more users, and they do not face the same constraints on their size or market share. These efficiencies benefit society.

Digitally powered business models, including platforms, also have the advantage of being able to have strong offerings along a number of dimensions. Traditional firms normally focus on and gain advantage in one, or possibly two of three aspects: price, quality or customization, in large part because there are significant tradeoffs between each. Customization comes at the expense of low cost, for example. Indeed, much of the business strategy literature is premised on firms identifying which of these market areas they should specialize in. But for many Internet platforms, digital technologies enable them to make strong offerings in all three aspects: low prices, higher quality, and customization.¹⁴

11 John McKinnon & Emily Glazer, "FTC Weighs Seeking Injunction Against Facebook Over How Its Apps Interact," *Wall Street Journal*, December 12, 2019, <https://www.wsj.com/articles/ftc-weighs-seeking-injunction-against-facebook-over-how-its-apps-interact-11576178055>.

12 "Augmenting Compatibility and Competition by Enabling Service Switching Act of 2019," Congress.gov, <https://www.congress.gov/bill/116th-congress/senate-bill/2658/all-info>.

13 White House, "Benefits of Competition and Indicators of Market Power," May 2, 2016, 3, https://obamawhitehouse.archives.gov/sites/default/files/page/files/20160502_competition_issue_brief_updated_cea.pdf.

14 David Moschella, *Seeing Digital: A Visual Guide to the Industries, Organizations, and Careers of the 2020s*, (DXC Technology 2018).

These advantages are not likely to be absolute, however. Economists Daniel Spulber & Christopher Yoo point out that market share due to network effects can be interrupted by periodic outbreaks of new competition for the market, raising the possibility that the dominant platform will be replaced.¹⁵ Two of the biggest drivers of this disruption are technology and demographics. Historically, technological innovation played a significant role in companies like IBM (mainframes), Digital Equipment Corporation (minicomputers), AT&T (telephony), Walmart (retail) and FedEx (delivery) losing dominant market shares. Indeed, important transitions such as the move from analog to digital, the rise of the Internet, and the advent of smart phones have been especially challenging for incumbents to spot and respond to.

As antitrust scholars Carl Shapiro & Hal Varian note, “[T]he information economy is populated by temporary, or fragile, monopolies. Hardware and software firms vie for dominance, knowing that today’s leading technology or architecture will, more likely than not, be toppled in short order by an upstart with superior technology.”¹⁶ And as IT industry expert David Moschella points out, “today’s giants are more vulnerable than previous industry leaders in at least one way: the customer switching costs are mostly ones of changing habits, not conversion effort and cost, and this relative ease of transition could be an important factor sometime down the road.”¹⁷ Today, rapid advances in technology continue to present platforms with new services and business models. Platforms that do not quickly adapt to these opportunities leave the door open for rivals.

In fact, Spulber & Yoo believe platforms are likely to face even more competition in the future, spurring more innovation.¹⁸ However, in order to enable this dynamic efficiency, regulators may have to allow static inefficiency for a limited period of time. Businesses with large upfront expenses and low marginal costs often need to earn higher rates of return to recoup their investments, and to fund the next big investments in innovation. But even then, their advantages may be temporary, particularly in a globally competitive economy. Similarly, the advantage of efficiencies of scale can be offset if competitors also enjoy zero marginal cost.

The constant entry of new consumers can also present Internet platforms with a challenge. Young consumers have little invested in existing networks, tend to be very comfortable with the latest technology, are more concerned about communi-

15 Daniel F. Spulber & Christopher S. Yoo, “Antitrust, the Internet, and the Economics of Networks,” in *Oxford Handbook of International Antitrust Economics*, Roger D. Blair & D. Daniel Sokol eds. (Oxford University Press, 2014).

16 Carl Shapiro & Hal R. Varian, *Information Rules: A Strategic Guide to the Network Economy*, 173, (Harvard Business Review Press 1998).

17 David Moschella, *Seeing Digital: A Visual Guide to the Industries, Organizations, and Careers of the 2020s*, 62.

18 Spulber & Yoo, “Antitrust, the Internet, and the Economics of Networks.”

cating with a narrow group of friends rather than the whole world, and are less than awed by their parents' technology. Younger users were the main drivers behind instant messaging, WhatsApp, Instagram, and most recently TikTok.

In both cases, antitrust regulators need to balance the benefits of competition for the market with the benefits of scale. However, this tradeoff only needs to be made if there is some harm to the consumer, such as a delay in innovation.

IV. LET ANTITRUST BE ANTITRUST

Nevertheless, the rapid growth of a few large companies that operate digital platforms has produced a lot of anxiety about their effects on society. Purported market dominance has been blamed for a host of ills including reduced privacy, poor data security, censorship, poor moderation of offensive and dangerous content, and excessive political power. These are all important issues, deserving their own policy response. But in most cases antitrust solutions would do nothing to solve them, and indeed may make them worse. Moreover, trying to incorporate them into antitrust policy would replace one widely supported policy goal, the consumer welfare standard, with a jumble of goals that often conflict with each other. Attempts to rank many policy goals on their own would not only give tremendous discretion to unelected regulators. It would threaten the discipline's ability to accomplish the goals it is suited to. Even the best regulators would struggle to find the right balance between these goals. The worst would use the tremendous discretion given to them to reward political supporters.

Moreover, the development of separate policies for privacy and other concerns can have antitrust implications. Rules such as Europe's General Data Protection Regulation impose large, somewhat fixed costs on firms that are subject to them, both in the cost of complying and the risk of punishment for inadvertent breaches. This gives larger firms an advantage because they can spread the fixed costs over a larger user base. Smaller firms therefore find it harder to compete. It can also drive firms from the market, further reducing the amount of competition. As economist Catherine Tucker notes, stringent privacy rules can strengthen advantages larger firms have when it comes to data.¹⁹

Nobel Laureate economist Jan Tinbergen developed the rule that achieving a desired number of policy targets requires regulators to have an equal number of policy instruments.²⁰ For this reason, social concerns should remain outside the boundaries of antitrust analysis and practice.

19 Catherine Tucker "Digital Data, Platforms and the Usual [Antitrust] Suspects: Network Effects, Switching Costs, Essential Facility," <https://ssrn.com/abstract=3326385>

20 Huiping Yuan & Stephen M. Miller, "Target Controllability, Time Consistency, and the Tinbergen Rule," October 1, 2013, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2334342.

V. HOW ANTITRUST HANDLES CONCERNS ABOUT DATA SCARCITY

As mentioned above, in most cases, a separate policy goal requires a separate policy instrument. Thus, most of the issues raised in the previous section do not involve antitrust issues and deserve non-antitrust solutions. However, data collection does have an antitrust component. Two points are important to keep in mind about data. First, the antitrust aspect is only a small part of this issue and should not get confused with other aspects. Second, current antitrust policy built around the Consumer Welfare Standard works well in dealing with the antitrust issues surrounding data. The confusion comes when proponents of stronger regulation try to use antitrust remedies to fix issues that do not involve antitrust goals.

Proponents of stronger antitrust enforcement for platforms frequently point to data as a strategic asset. It is often said that data is the new oil, implying strategic importance for those who have it and vulnerability for those who do not.²¹ But this is simply the wrong metaphor. Unlike oil, data is non-rivalrous (the same data can be used more than once) and is often non-excludable (others may gather the same data that I already own). Even more relevant to its role in antitrust policy, data often has zero marginal costs (the cost of collecting, processing, and storing additional data often approaches zero) but rapidly diminishing returns to scale.

Most important, however, is that much of the most collected personal data often tends to be worth little by itself. Rather, it is the business model and algorithms used to analyze the data that give companies value. Reporting by the *Financial Times* shows that individual pieces of data are often sold cheaply.²² General information, such as age, gender and location is worth only \$0.0005 per person. Information about someone shopping for a car is slightly more valuable at \$0.0021 per person. Knowing a woman is in her second trimester of pregnancy bumps it up to \$0.11 per person. The total for most individuals is less than a dollar.

Economists Anja Lambrecht and Catherine Tucker argue that data seldom provides a company with a competitive advantage, especially in the face of a superior product offering.²³ Although Amazon Marketplace, for example, benefits from knowing what products users searched for on their website, its large selection, low prices, and superior logistics are far more valuable. Although data makes its business model

21 “The World’s Most Valuable Resource is No Longer Oil, But Data,” *The Economist*, May 6, 2017, <https://www.economist.com/leaders/2017/05/06/the-worlds-most-valuable-resource-is-no-longer-oil-but-data>.

22 Emily Steel, “Financial Worth of Data Comes in at Under a Penny a Piece,” *The Financial Times*, June 12, 2013, <https://www.ft.com/content/3cb056c6-d343-11e2-b3ff-00144feab7de>.

23 Anja Lambrecht & Catherine E. Tucker, “Can Big Data Protect a Firm from Competition?” *Antitrust Chronicle*, No. 1(1), January 2017), <https://www.competitionpolicyinternational.com/can-big-data-protect-a-firm-from-competition/>.

better, it is a mistake to think data scarcity is the primary constraint to greater competition. Antitrust law should look at data the same as any other asset that occasionally has strategic value rather than as a unique resource conferring broad market power. In a more recent paper, Tucker cites previous studies to argue that neither network effects nor switching costs are likely to confer market power due to the mere possession of data.²⁴ One of these showed that the accuracy of Internet searches was not sensitive to the amount of historical data about past searches, implying that Google’s market share is due mainly to its present superiority rather than its past dominance.²⁵ Moreover, because most data is relatively worthless and ubiquitous, government requirements to share it will seldom be justified.

VI. SHOULD INTERNET COMPANIES BE BANNED FROM COMPETING WITH USERS ON THE PLATFORMS THEY RUN?

Another concern is that companies that run multi-sided platforms often compete with sellers on one or more sides of the market. For example, Amazon offers its own products on Amazon Marketplace, often in direct competition with those of its regular suppliers. Because Amazon can see what products are selling at what prices, critics claim it has an unfair advantage. Similarly, Apple was recently sued by Spotify, which alleged that Apple used unfair tactics in its App Store to suppress its competitors.²⁶ Senator Elizabeth Warren (D-MA) would prohibit this practice by designating the largest platforms “utilities” and prohibiting companies from both owning the platform and being a seller on the platform.²⁷

Of course, digital platforms are not the first, or even the biggest, marketplaces. Large retailers including CVS, Walmart, and Costco, offer shelf space to thousands of manufacturers. They also offer competing products under their own brand names, such as Costco’s Kirkland brand. These products usually sit on the same shelf, side-by-side with those of their suppliers, often undercutting them on price. And of course, the retail chains look at sales data when making decisions on what to sell.

The main point to remember when analyzing such cases is that this behavior is usually procompetitive. It may hurt the supplier of a competing good, but it benefits

24 Catherine Tucker “Digital Data, Platforms and the Usual [Antitrust] Suspects: Network Effects, Switching Costs, Essential Facility.”

25 Leslie Chiou & Catherine Tucker, “Search Engines and Data Retention: Implications for Privacy and Antitrust,” (NBER Working paper 23815, September 2017), <https://www.nber.org/papers/w23815>.

26 Adam Satariano & Jack Nicas, “Spotify Accuses Apple of Anticompetitive Practices in Europe,” *The New York Times*, March 13, 2019, <https://www.nytimes.com/2019/03/13/business/spotify-apple-complaint.html?searchResultPosition=3>.

27 Team Warren, “Here’s How We Can Break Up Big Tech,” *Medium*, March 8, 2019, <https://medium.com/@teamwarren/heres-how-we-can-break-up-big-tech-9ad9e0da324c>.

consumers by offering more choice at lower prices. As long as the supplier's intellectual property is not violated and consumers are not confused, government should not dissuade this type of competition. Antitrust policy should protect consumers, not sellers hurt by legitimate competition. While there may be room for general fair-dealing requirements that require platforms to post their policies and enforce them evenly, platforms usually have a strong incentive to engage in fair-dealing: platforms that abuse their suppliers will lose them. This in turn will attract fewer buyers, leading to a downward spiral.

The widespread assumption that platforms' dominant position in a particular market frees them from competition is based on a faulty definition of the relevant market. For platforms providing free services, including Facebook and Google, the relevant market is the total ad market. They derive a significant portion of their revenue from advertisements shown to their users. In many cases, the buyers of these ads are also large sophisticated companies that use analysis by Visual IQ and C3 Metrics to evaluate the return on investment across platforms, including television and radio. The competition for ads leads to a competition for eyeballs as platforms compete for users' limited time and attention. Although YouTube does not offer the same functions as Facebook, users can only pay attention to one or the other at a time.

Platforms that make money from consumers must also compete with off-line firms which still represent the largest part of the economy. Amazon competes with other sellers on its Marketplace, the Internet sites of other retailers and, most significantly, brick and mortar stores. Its cloud-based services compete with those of established companies including Google, Microsoft and Oracle. Apple computers compete with Windows-based systems and its iOS devices, such as the iPhone and iPad, compete with Android-based tablets and smart phones.

Finally, possessing a dominant position in the market does not guarantee a profit. Amazon experienced net cash outlays for many years as it reinvested profits to expand its business. More tellingly, Uber continues to suffer losses with no end in sight. Heavy competition from rival services, including taxis, may prevent it from ever rising out of what is essentially a commodity business.

VII. FOUR ILLUSTRATIVE CASES OF COMPETITION INVOLVING PLATFORMS

A closer look at some of the more commonly cited instances of market abuse shows that the issues are far more complicated than many observers describe. Although the four instances described below may not be typical, the fact that they are commonly cited as showing the failures of market forces justifies going into more detail.

Amazon's purchase of Quidsi: As mentioned above, the potential for companies to offer competing products on the markets they run is often cited as a threat

to competition. The concern, however, seems directed at protecting competing sellers rather than consumer welfare. A frequently mentioned example is Amazon’s competition with and eventual purchase of Quidsi. Attorney Lina Khan gives a detailed description of some of the facts in her widely cited article “Amazon’s Antitrust Paradox.”²⁸ Quidsi sold a number of household products, including diapers, over Amazon’s Marketplace. Khan alleges that, in order to drive Quidsi out of business, Amazon sold diapers at a 30 percent discount from its normal prices. While this tactic may have hurt Quidsi, it clearly helped consumers, at least in the short run. On the surface this tactic was successful because Amazon eventually purchased Quidsi in 2011, eliminating it as a source of competition.

But why was Amazon selling at a loss? For the same reason that Quidsi was. Quidsi’s owners saw that Walmart and Target used diapers as loss leaders in order to establish a relationship with new mothers who might then purchase a lot more from the store, generating sufficient profits to make up for the loss on diapers. In the words of their founders:

[W]e started with selling the loss leader product to basically build a relationship with mom. And once they had the passion for the brand and they were shopping with us on a weekly or a monthly basis that they’d start to fall in love with that brand. We were losing money on every box of diapers that we sold.²⁹

After the purchase, Amazon continued to face strong competition in the diaper market. This prevented it from raising prices to recoup the cost of buying Quidsi. In the supply market it had to purchase its product from national brands such as Pampers and Huggies, which were not dependent on Amazon for customers and could therefore negotiate for higher wholesale prices, while in the retail market it faced major chains including Walmart and Target. By 2016 Amazon had acquired 43 percent of the online baby supply market, while Walmart and Target had 23 percent and 18 percent respectively. However, 80 percent of sales occurred off-line.³⁰ But these sales apparently did not generate much profit. Amazon shut down Quidsi, including *diapers.com*, in April 2017. Meanwhile the founders of Quidsi used the proceeds from its sale to start a new online retail company, *Jet.com*, which was eventually purchased

28 Lina Khan, “Amazon’s Antitrust Paradox,” *Yale Law Journal*, vol. 126(3), 2016.

29 Quoted in Kristian Stout and Alec Stapp, “Is Amazon Guilty of Predatory Pricing?” International Center for Law & Economics Blog, May 7, 2019, <https://laweconcenter.org/resource/is-amazon-guilty-of-predatory-pricing>.

30 Business Insider, “Target, Walmart, Amazon Dominate the Online Baby Goods Market,” April 22, 2016, <https://www.businessinsider.com/target-walmart-amazon-dominate-the-online-baby-goods-market-2016-4>.

by Walmart for \$3.3 billion.³¹ In perhaps the clearest case of competitive underselling, it is hard to see how Amazon benefited or how consumers were harmed.

Allbirds: Of course, not every case is the same. A more recent example raises some of the same issues in a different context. Allbirds makes environmentally friendly shoes. Rather than sell its product over Amazon's Marketplace and other sites, Allbirds sells direct to the customer. Hence the competition occurs between two websites rather than within Amazon's Marketplace. Once again, Amazon offered a competing product, this time selling similar-looking shoes for less than half the price that Allbirds charges. Its decision to do so is informed by its knowledge of how many customers mistakenly search for Allbirds on its site. However, from here the tale gets more complicated. First, Allbirds is active in the supply market, selling its organic materials to over 100 other brands, some of which may use them to manufacture shoes.³² Amazon is also not the only company producing a close substitute.³³ But perhaps the most interesting fact is that Allbirds' main objection to Amazon's product is that Amazon achieves its cost advantage by not adhering to Allbirds' stringent environmental and social practices, primarily its use of natural and recycled materials.³⁴ If consumers are being misled into mistakenly purchasing look-alike shoes when they think they are getting Allbirds, that would present a clear case of consumer harm and probably trademark infringement. But assuming consumers know what they are getting, the entry of close substitutes benefits them.

Google price comparison: The third case looks at Google's price comparison feature on its search engine. In June 2017 the European Commission determined that Google had violated antitrust rules by favoring its own results in searches. The Commission fined Google €2.42 billion (\$2.7 billion). Carl Shapiro, who advised Google during the case, recently analyzed its merits.³⁵ When a person enters a search of "Nikon cameras" into Google's search engine the first several sites that appear on the results screen are sponsored search results accompanied by a photo of one or more

31 Jeffrey Eisenach, "Who Should Antitrust Protect? The Case of Diapers.com," American Enterprise Institute Blog, November 5, 2018, <https://www.aei.org/technology-and-innovation/who-should-antitrust-protect-the-case-of-diapers-com>.

32 Aaron Holmes, "Allbirds' Cofounder Just Slammed Amazon for Selling a Lookalike Shoe: 'Please Steal Our Approach to Sustainability'" *Business Insider*, November 25, 2019, <https://www.businessinsider.com/allbirds-slams-amazon-knockoff-shoes-sustainability-approach-2019-11>.

33 Kait Hanson, "The Best Allbirds Wool Runner Dupes," *Communikate* blog, January 29, 2019, <https://kommunikait.com/2019/01/the-best-allbirds-wool-runner-dupes/>.

34 Washington Journal of Law, Technology & Arts, "Please Steal Our Business Practices: Allbirds' Novel Approach to Intellectual Property Theft," November 21, 2019, <https://wjla.com/2019/11/21/please-steal-our-business-practices-allbirds-novel-approach-to-intellectual-property-theft/>.

35 Carl Shapiro, "Protecting Competition in the American Economy: Merger Control, Tech Titans, Labor Markets," *Journal of Economic Perspectives*, Vol. 33(3), Summer 2019.

cameras that allow users to quickly compare offerings from several sites. These are advertisements paid by online merchants to Google and are clearly marked as sponsored. Next follow sponsored text ads, followed by generic search results generated by the search algorithm. Google does not charge for listing generic results.

The Commission ruled that Google had abused its dominance as a search engine to promote its position in what the Commission determined was a separate market, comparison shopping, by placing its own comparison shopping service above that of rival comparison sites and demoting some of these rival sites in its search results. Although in the fact sheet accompanying its opinion the Commission stated that it “does not object to the design of Google’s generic search algorithms, or to demotions as such, nor to the way that Google displays or organizes its search results pages,”³⁶ the Commission ruled that Google’s comparison shopping service gained significant market share at the expense of rivals. The Commission objected “to the fact that Google has leveraged its market dominance in general internet search into a separate market, comparison shopping. Google abused its market dominance as a search engine to promote its own comparison shopping service in search results, whilst demoting those of rivals.”³⁷ The Commission felt that this extension of market power into a new market “deprived European consumers of the benefits of competition on the merits, namely genuine choice and innovation.”³⁸

The charge that Google actively manipulated the results of the generic search to demote rival comparison sites clearly raises antitrust concerns. The problem with the Commission’s analysis is that it also implies Google violated antitrust rules merely by selling new ads with pictures and placing them on top where all of its other ads go. If this is what the Commission believes, it should indicate exactly how consumers, as opposed to rival comparison sites, are hurt merely by placing Google’s comparison results on the top. Instead, it only made a broad complaint that there was less competition because Google integrated this new service with its traditional search results, where it is the market leader. While the Commission apparently did not object to Google’s *generic* search results, it did apparently object to its overall search results which, according to its definition, includes the paid ads. It apparently thinks that, having shown users a prominent comparison of different ads, Google was required to show similar comparisons by other companies.

The Commission’s objection to this type of integration is misguided. Using its strength in regular search results to offer comparison ads that are similar to its tradi-

36 European Commission, “Antitrust: Commission Fines Google €2.42 Billion for Abusing Dominance as Search Engine by Giving Illegal Advantage to Own Comparison Shopping Service—Factsheet,” European Commission Factsheet, June 27, 2017, https://ec.europa.eu/commission/presscorner/detail/en/MEMO_17_1785.

37 *Ibid.*

38 *Ibid.* The Commission made clear that Google’s actions would have been abusive even if comparison shopping sites and merchant platforms were considered to be part of one market.

tional ads does not hurt consumers. While antitrust policy was originally suspicious of efforts to use dominance in one market to enter others, in recent decades courts have become more accepting of such practices, provided there is no harm to consumers. In many cases tying two products together promotes consumer welfare. For example, consumers who purchase a new car usually buy separate items, such as a music console, car loan, and service plan at the same time. Even if they could purchase each of these items separately, they usually prefer to buy them as a package, looking at the total price of the vehicle. In the case of comparison shopping, consumers are better off seeing these results in one search, rather than having to go to multiple ones. Google helped consumers by placing comparisons on top. While it should treat all generic ads equally, it should not be required to give equal prominence to non-paying comparison sites that placed low in its generic results.

Spotify v. Apple: More recently, Spotify filed an antitrust complaint against Apple in the European Union. Although Apple's App Store does not charge for most of the apps downloaded by its users, it does take a percentage of any subscription fees (but not ad revenue or product sales) that apps collect from their users. This percentage is 30 percent in the first year and 15 percent in subsequent years. Spotify alleges Apple has unilaterally changed the rules and interpretations in ways that disadvantage the makers of rival apps in order to favor Apple Music.³⁹ Specifically, Spotify does not want to pay the subscription fee commission for users who pay for its Premium service through Apple's in-app payment system. (Apple earns no revenue from Spotify users who subscribe through the Spotify website, and existing Spotify users who subscribe through Apple's in-app payment system can cancel their subscription through Apple and re-subscribe through Spotify's website.)

Based on Apple's response, the parties seem to disagree on a lot of the facts.⁴⁰ But let's look at the larger picture. Having built an iconic device that can run apps, Apple then decided to allow third parties to write apps for its device. However, it required app developers to sell their apps through its App Store. This gave Apple great control over the apps its users could download but it also allowed the company to ensure that these apps complied with certain standards such as data security and use, the absence of malware, and compatibility with Apple products. For most apps, Apple does not charge a fee, but it does for the type of subscription offered by Spotify's premium service. Which of these business decisions constitute unfair competition?

Spotify is apparently claiming that, having built the device and the store, Apple should be required to make the store available to everyone for free. Users can

39 Spotify, "A Timeline: How We Got Here," <https://timetoplayfair.com/timeline/>.

40 Apple, "Addressing Spotify's Claims," Apple Statement, March 14, 2019, <https://www.apple.com/newsroom/2019/03/addressing-spotifys-claims/>.

currently download Spotify for free from the App Store. Apple does this because they want their App Store to be appealing to consumers so they will buy Apple devices (e.g. iPhones) What users cannot do is use Apple's in-app payment system to subscribe to Spotify's premium service unless Spotify pays the commission fee. As Apple points out, many Spotify users sign up for its services through mobile carriers, avoiding the App Store completely. It might seem like Apple has an incentive to handicap Spotify so that listeners will use Apple Music instead, or that Apple Music has a natural advantage since it does not have to pay the commission fee to itself for Apple Music. However, every time Apple succeeds in converting a Spotify customer from its site, its gain is offset by the fee Spotify would otherwise have paid it. This reduces the gain from competition. Apple must also compete with Android, which has most of the U.S. and world market. One of the primary methods of competition is the availability of apps for each device. If popular apps such as Spotify are easily available for Android but not on the App Store, Apple could lose phone sales. But perhaps the biggest point is that Apple users can use their phones to sign up for premium service by going to Spotify's mobile website, avoiding the App Store and its commission altogether.

VIII. REMEDIES

The point of the above discussion is not that potential actions will never give platforms unfair market power and therefore should never be stopped. Nor is it to argue that platforms will never engage in anticompetitive behavior. Both are clearly possible. Therefore, we need to continue enforcing antitrust law but focus on maximizing consumer welfare, not protecting competitors. Some supporters of the consumer welfare standard have argued that past enforcement has been too lax and that, going forward, regulators and courts need to err more on the side of ensuring that markets are competitive and less on the side that innovation will be curtailed by excessive government interference.⁴¹

Whether or not the level of enforcement needs to be adjusted, platforms pose a special challenge for regulators. Because they involve more than one side of a given market, regulators need to conduct a careful empirical study of the effect that a merger or corporate action would have. In particular, they need to examine the effect on all sides of the market before concluding that competition has been harmed. Some practices that normally indicate a threat to competition in most markets can actually increase competition and consumer welfare in platforms. These include pricing below marginal costs, tying, high margins, and exclusive arrangements.⁴² For example, revenues from ad markets

41 Carl Shapiro, "Protecting Competition in the American Economy: Merger Control, Tech Titans, Labor Markets."

42 Jonathan L. Rubin, "The Systems Approach to Antitrust Analysis," *The Antitrust Bulletin*, vol. 56(1), Spring 2011; Marc Rysman, "The Economics of Two-Sided Markets," *Journal of Economic Perspectives*, vol. 23(3), Summer 2009.

may be used to subsidize ad viewers in order to attract a sufficient number to support the ad market. As the above examples show, the details of the market often matter a lot.

Still, some advocate for breaking large platforms up and regulating part of the platform as a utility. Several main problems stand out. The first is that breakups are hard to accomplish. They take several years, regulators are likely to have difficulty separating the various technologies, and regulated industries do not have a history of steady innovation. Second, and partly for these reasons, courts have become much more demanding about proving consumer harm before they will approve an antitrust suit.⁴³

Third, past breakups have not led to notable success in the form of increasing competition, raising industry output, or reducing prices.⁴⁴ Breaking up the Internet platforms involves separating both integrated working teams and the underlying technology, something regulators are not experienced with. For example, FTC Commissioner Joseph Simons, in speaking about a potential investigation that could force Facebook to divest certain mergers, mentioned that the company's efforts to integrate its three major brands would complicate any effort to break them up.⁴⁵ The *Economist* magazine points out that decisions over which part of the business gets access to data, defining the lines between different markets, and anticipating both unintended consequences and the effect of future technology do not have any obvious answers.⁴⁶

Fourth, breakups would require continued regulation to separate the various components from other markets, otherwise the various parts could reestablish their dominance through future mergers or internal growth into related markets. Finally, it is not clear that government-set prices would be better for consumers.

Luckily, existing case law is adequate to deal with the most likely antitrust problems, including mergers, price fixing, and unfair trade practices. But it requires a careful study of the existing markets, a realization of the limits of regulatory action, and a balance between government intervention to preserve market competition and a continued reliance on market forces to drive technology and innovation.

As discussed above, it is possible that the age of digital platforms is just beginning. Many companies, including today's digital leaders, are experimenting with tech-

43 Carl Shapiro, "Protecting Competition in the American Economy: Merger Control, Tech Titans, Labor Markets."

44 Robert W. Crandall, "The Failure of Structural Remedies in Sherman Act Monopolization Cases," (AEI-Brookings Joint Center for Regulatory Studies, Working Paper 01-05, March 2001), <https://www.brookings.edu/research/the-failure-of-structural-remedies-in-sherman-act-monopolization-cases/>.

45 Kadhim Shubber, "Facebook Break-Up Would Be Hard, Says FTC Chief," *Financial Times*, August 19, 2019, <https://www.ft.com/content/64e887f6-c2b8-11e9-a8e9-296ca66511c9>.

46 "Dismembering Big Tech," *The Economist*, October 24, 2019, <https://www.economist.com/business/2019/10/24/dismembering-big-tech>.

nology to develop new approaches to some of society’s biggest problems. Federal and state policies should encourage this innovation by allowing new arrivals to challenge traditional incumbent firms, even if the result is less direct competition. The reason is that a shift to fewer firms with the winners operating on platforms will likely deliver more benefits to the economy through higher productivity and more benefits to consumers through lower prices. As pointed out above, the combination of massive data, Internet technology, and the right business model could create great value in health care, education, construction, and other industries, many of which have not seen strong productivity growth for several decades. Policies that limit market consolidation or restrict companies from moving into related markets are likely to discourage these efforts.

IX. CONCLUSION

It is true that the largest digital platform companies are different from the traditional corporations that preceded them. Their low marginal costs, global scope, and rapid pace of innovation may make digital platforms a primary source of value creation in the future. But that does not mean that a new platform era requires a major overhaul of existing competition law.⁴⁷ A big advantage of current antitrust law is that it is general enough to be applied to new conditions. Thanks to the flexibility of laws enacted over 100 years ago, the Department of Justice and the Federal Trade Administration have the powers they need to address mergers that might result in consumer harm and corporate actions that unfairly disadvantage competitors. If they can identify specific practices regarding the operation of platforms that harm consumers, current laws give them the power to prohibit them. What matters is that the focus of their efforts be firmly fixed on the task of developing clear evidence that the activity would harm economic and consumer welfare.

In the last few years a distinct group of commentators has argued the largest platforms suddenly represent unique threats to competition and innovation.⁴⁸ What the critiques do not contain is a careful description of how platforms’ behavior harms society as opposed to competitors, and why we should expect a revamped antitrust policy to produce a better result. Much of the analysis is built on speculation about what might happen, coupled with a “neo-Brandeisian” suspicion of bigness.⁴⁹ However, the vast number of users and continued innovation demonstrates that a broad section of the population derives great value from existing digital platforms. There is little likelihood that this will change soon.

47 Joe Kennedy, “Why Internet Platforms Don’t Need Special Regulation, (Information Technology and Innovation Foundation, October 2015), <https://itif.org/publications/2015/10/19/why-internet-platforms-dont-need-special-regulation>.

48 Lina Khan, “The Separation of Commerce and Platforms,” *Columbia Law Review*, Vol. 119, 2019.

49 Robert D. Atkinson & Michael Lind, *Big is Beautiful: Debunking the Myth of Small Business* (MIT Press, 2018).

Editors' bios



David S. Evans' academic work has focused on industrial organization, including antitrust economics, with a particular expertise in multisided platforms, digital economy, information technology, and payment systems. He has authored eight books, including two award winners, and more than one hundred articles in these areas. He has developed and taught courses related to antitrust economics, primarily for graduate students, judges and officials, and practitioners, and have authored handbook chapters on various antitrust subjects.

David's expert work has focused on competition policy and regulation. He has served as a testifying or consulting expert on many significant antitrust matters in the United States, European Union, and China. He has also made submissions to, and appearances before, competition and regulatory authorities with respect to mergers and investigations in those and other jurisdictions. David has worked on litigation matters for defendants and plaintiffs, on mergers for merging parties and intervenors, and for and in opposition to competition authorities.



Allan Fels AO graduated in economics (first class honors) and law from the University of Western Australia in 1965. He has a PhD in Economics from Duke University and was a research fellow in the Department of Applied Economics at the University of Cambridge from 1986-1972, where he wrote *The British Prices and Incomes Board* (Cambridge University Press, 1972).

On his return to Australia Professor Fels joined the Economics Department of Monash University as a Senior Lecturer, before becoming Professor of Administration and Director of the Graduate School of Management from 1984 until 1991.

The career of Professor Fels in Australia falls into two parts. He was generally regarded as the nation's leading regulator, serving as inaugural Chair of the Australian

Competition and Consumer Commission (and its predecessor bodies) from 1989 until 2003. The Australian Competition and Consumer Commission is the country's regulator of competition law and consumer law; it also regulates public utilities in the telecommunications and energy industries (in a similar manner to industry-specific bodies such as Ofcom in the UK and FCC in the US). He has had numerous other regulatory roles (for example, in insurance, agriculture, telecommunications, and aviation).

Professor Fels remains a leading figure globally in competition policy. He co-chaired the OECD Trade and Competition Committee from 1996 to 2003 and continues regularly to be a keynote speaker at major global competition events including the world's two peak events, the International Competition Network Annual Conference and the OECD Global Competition Forum.

He was a participant in the 15-year process of drafting the Chinese Antimonopoly Law 2008 and currently advises the Chinese government on the law's implementation. Academically, he is co-director of the Competition Research Centre at the Chinese Academy of Science, a prestigious position, and an international adviser to the Chinese Academy of Social Science.

The second part of Professor Fels' career has been academic. He was appointed Foundation Dean of the Australia and New Zealand School of Government and served in that position from 2003 until 2012. The predominant activity of the School has been the provision of management development programs to senior public servants in the two countries. There is also a substantial research program and other professional and outreach activities.



Catherine Tucker is the Sloan Distinguished Professor of Management and a Professor of Marketing at MIT Sloan. She is also Chair of the MIT Sloan PhD Program.

Her research interests lie in how technology allows firms to use digital data and machine learning to improve performance, and in the challenges this poses for regulation. Tucker has particular expertise in online advertising, digital health, social media, and electronic privacy. Her research studies the interface between marketing, the economics of technology, and law.

She has received an NSF CAREER Award for her work on digital privacy, the Erin Anderson Award for an Emerging Female Marketing Scholar and Mentor, the Garfield Economic Impact Award for her work on electronic medical records, the Paul E. Green Award for contributions to the practice of Marketing Research, the William F. O'Dell

Award for most significant, long-term contribution to Marketing, and the INFORMS Society for Marketing Science Long Term Impact Award for long-run impact on marketing.

She is a cofounder of the MIT Cryptoeconomics Lab which studies the applications of blockchain and also a co-organizer of the Economics of Artificial Intelligence initiative sponsored by the Alfred P. Sloan Foundation. She has been a Visiting Fellow at All Souls College, Oxford. She has testified to Congress regarding her work on digital privacy and algorithms, and presented her research to the OECD and the ECJ.

Catherine Tucker is coeditor at Quantitative Marketing and Economics, associate editor at Management Science, Marketing Science, and the Journal of Marketing Research and a research associate at the National Bureau of Economic Research. She teaches MIT Sloan's course on Pricing and the EMBA course "Marketing Management for the Senior Executive." She has received the Jamieson Prize for Excellence in Teaching as well as being voted "Teacher of the Year" at MIT Sloan.

She holds a PhD in economics from Stanford University and a BA from the University of Oxford.

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Reiko Aoki has been Commissioner of the Japan Fair Trade Commission since 2016. She has conducted research and published on the economics of patents, patent pools, standards, innovation and intergenerational political economy in academic positions at the Ohio State University, SUNY Stony Brook, University of Auckland and Hitotsubashi University. She is Professor Emeritus of Hitotsubashi University. She has served as Executive Member of the Council for Science and Technology Policy, Japanese Cabinet Office 2009-2014, Member of the Information and Communication Council 2014-2016 and Member of Science Council of Japan 2014-2016. Prior to joining the JFTC, she was Executive Vice-President (International, Gender Equality, and Intellectual Property) at Kyushu University. She received her B.S. in mathematics from University of Tokyo, M.A. in economics from University of Tsukuba, and PhD in economics and MS in statistics from Stanford University. She is currently President of the Japanese Law and Economic Association, and Executive Board Member of the Japanese Economic Association.

Robert D. Atkinson is founder and president of the Information Technology and Innovation Foundation (“ITIF”), the world’s leading think tank for science and technology policy. He is an internationally recognized scholar, a widely published author, and a trusted adviser to policymakers around the world, with expertise in the broad economics of innovation and specific policy and regulatory questions around new and emerging technologies. Rob’s most recent book, co-authored with Michael Lind, is *Big Is Beautiful: Debunking the Myth of Small Business*.

Before founding ITIF, Atkinson was Vice President of the Progressive Policy Institute and Director of PPI’s Technology & New Economy Project. He received his Masters in Urban and Regional Planning from the University of Oregon and was named a distinguished alumnus in 2014. He received his Ph.D. in City and Regional Planning from the University of North Carolina at Chapel Hill in 1989.

Simon Bishop is co-founder and Partner at RBB Economics. He has over 20 years’ experience of providing expert economic advice in competition law matters and has advised on several hundred cases before competition authorities and courts around the world. Clients for whom Simon has acted as lead economist on several occasions include GE, British Airways, FA Premier League, Bertelsmann, Sony, and BHP Billiton.

Simon has published widely including reports and articles on market definition, non-horizontal mergers, bidding markets, loyalty rebates and vertical restraints. He is the co-author of *The Economics of EC Competition Law* (3rd edition, Sweet & Maxwell, 2009), a leading textbook on the application of economics to European competition law, and is co-editor of the *European Competition Journal*.

Aleksandra Boutin is a Founding Partner of Positive Competition. She is featured in the *Who's Who Legal: Thought Leaders - Competition*, a ranking listing the world's leading competition professionals. She has more than fifteen years of experience in competition policy as an enforcer, consultant and academic. She is a member of the Scientific Council of the GCLC and a Non-Governmental Advisor for Poland in the ICN.

Aleksandra advises clients on a wide range of competition issues in the context of competition proceedings in front of the European Commission, National Competition Authorities and Courts. Her recent experiences involve cartel overcharge analysis, vertical and horizontal mergers, exclusionary and exploitative abuses, state aid and information exchanges. She has also advised clients in antitrust cases involving digital platforms in e-commerce and in the software industry.

On the policy front, she was the lead author of the European Commission's Guidelines on Horizontal Cooperation Agreements and Block Exemption Regulations, she participated in preparing the communication of the Commission on quantifying harm in antitrust damage actions and in the Commission's IP Guidelines.

Aleksandra holds a Master in Theoretical Economics and Econometrics from Toulouse School of Economics, and a Master in European Law and Economic Analysis from the College of Europe. She completed her PhD studies at the Université Libre de Bruxelles.

Xavier Boutin is a founding partner at Positive Competition and an adjunct professor of economics at the Université libre de Bruxelles. He holds a PhD in Economics from EHESS (Paris School of Economics). He is featured in the *Who's Who Legal Thought Leader: Competition*, a ranking listing the world's leading competition professionals. Xavier is also a founding and board member of l'Entente, the association of French speaking antitrust practitioners in Brussels.

Xavier leads a team of consultants advising clients in the context of merger, State Aid and antitrust proceedings in front of the European Commission and national competition authorities. Prior to founding Positive Competition, Xavier was an expert in an international consultancy. Before joining the private sector, he spent

almost eight years in the Chief Economist Team of the European Commission's DG Competition.

Xavier made a major contribution to the EU Commission's Article 102 guidance paper, its Article 101 horizontal guidelines and the accompanying Block Exemption Regulation ("BER"). He also contributed to the State Aid Modernization, in particular, in the areas of R&D&I and Regional Aid.

Xavier's most recent work includes the assessment of vertical and horizontal mergers. In addition, Xavier has led many investigations involving exclusionary and exploitative abuses in the digital platform sector. These include the assessment of vertical restraints and self-preferencing in e-commerce, as well as Article 102 cases in the software industry.

Burcu Can graduated from Ankara University, Faculty of Law in 2008. Over five years of her close to 10 years of career in competition law was devoted to the Turkish Competition Authority as a competition expert case handler. Burcu has obtained her LL.M. degree from Harvard Law School and worked for many years at the Brussels office of one of the top international law firms as a competition lawyer. During her years at the Turkish Competition Authority, Burcu took part in leading antitrust and merger cases concerning banking, finance, motor vehicle and transportation sectors, contributed to the preparation of secondary legislation for competition law and several International Competition Network projects. In addition to her LL.M. degree from Harvard Law School, Burcu also has a master's degree in commercial law from Gazi University in Turkey. Burcu is a member of the New York Bar and the Istanbul Bar.

Sayanti Chakrabarti is the Joint Director in the Economics Division of the Competition Commission of India, where she is responsible for carrying out economic analysis of antitrust and merger cases. She has also contributed to several research outputs of the Division on competition law and policy. Prior to joining the CCI in 2010, Sayanti worked with the Economic Affairs Team of the Federation of Indian Chambers of Commerce and Industry, where she contributed to a number of surveys and studies on issues of importance to the Indian business and economy. She holds an MSc in Economics from Calcutta University.

Naval Satarawala Chopra is a partner at Shardul Amarchand Mangaldas and has been practicing competition law since its inception in India. He is the first Indian lawyer in GCR's top "40 under 40" competition lawyers in the world (2015);

listed as a global “thought leader” (Who’sWhoLegal); and recognized regularly as a leading advisor in Chambers & Partners.

Naval has been involved in some of the most prominent abuse of dominance cases in India. He is particularly skilled in advising on antitrust aspects of technology related matters, having successfully defended WhatsApp in relation to its privacy policy and separately digital payments services, Microsoft Corporation in relation to software licensing terms and Uber in relation alleged predatory pricing, before the Competition Commission of India (“CCI”).

Naval has recently advised Facebook in its acquisition of minority shareholding in India’s fastest growing telecom company. He has also advised in Avago’s acquisition of Broadcom, Ctrip’s investment in MakeMyTrip, the failed merger of Publicis and Omnicom as well as the conditional approval for Bayer AG’s acquisition of Monsanto Company.

Naval also advises a number of clients in cartel cases and is involved in challenges on account of due process and natural justice issues before the Supreme Court of India.

David S. Evans’ academic work has focused on industrial organization, including antitrust economics, with a particular expertise in multisided platforms, digital economy, information technology, and payment systems. He has authored eight books, including two award winners, and more than one hundred articles in these areas. He has developed and taught courses related to antitrust economics, primarily for graduate students, judges and officials, and practitioners, and have authored handbook chapters on various antitrust subjects.

David’s expert work has focused on competition policy and regulation. He has served as a testifying or consulting expert on many significant antitrust matters in the United States, European Union, and China. He has also made submissions to, and appearances before, competition and regulatory authorities with respect to mergers and investigations in those and other jurisdictions. David has worked on litigation matters for defendants and plaintiffs, on mergers for merging parties and intervenors, and for and in opposition to competition authorities.

Máté Fodor is an Economist at Positive Competition. Prior to joining the company, he was an assistant professor of Econometrics and Game Theory at the International School of Economics, a University of London affiliate institution. Máté holds a MSc. in Economics from Trinity College Dublin, where he was the recipient of the Terrence Gorman Prize for valedictorian. After consulting missions for the

public sector authorities, he joined ECARES at the Université libre de Bruxelles to obtain his PhD in Economics. He has secured research funding from several prestigious grants, such as the Marie Curie Framework and FNRS. His research profile is diverse with peer-reviewed publications in political economy, labor, energy, development, and media economics.

Since joining Positive Competition, Máté has worked on abuse of dominance cases involving digital platforms in the e-commerce and software industries. Máté has also been involved in overcharge and damages estimations in the construction and primary resources industries. He has also contributed to the economic assessment of mergers.

Gönenç Gürkaynak is a founding partner of ELIG Gürkaynak Attorneys-at-Law, a leading law firm of 90 lawyers based in Istanbul, Turkey. Mr. Gürkaynak graduated from Ankara University, Faculty of Law in 1997, and was called to the Istanbul Bar in 1998. Mr. Gürkaynak received his LL.M. degree from Harvard Law School in 2001, and is qualified to practice in Istanbul, New York, Brussels, and England and Wales. Before founding ELIG Gürkaynak Attorneys-at-Law in 2005, Mr. Gürkaynak worked as an attorney at the Istanbul, New York, and Brussels offices of a global law firm for more than eight years of his total of 23 years of career in private practice so far. Mr. Gürkaynak heads the competition law and regulatory department of ELIG Gürkaynak Attorneys-at-Law, which currently consists of 45 lawyers. He has unparalleled experience in Turkish competition law counselling issues with more than 23 years of competition law experience, starting with the establishment of the Turkish Competition Authority. Mr. Gürkaynak frequently speaks at local and international conferences and symposia on competition law matters. He has published more than 200 articles in English and Turkish by various international and local publishers, and he has published three books. Mr. Gürkaynak also holds teaching positions at undergraduate and graduate levels at two universities, and gives lectures in other universities.

Peter K. Huston is a partner in the San Francisco office of Baker Botts. He has 30 years of experience in high-stakes civil and criminal antitrust litigation, trials, government investigations, class actions and merger clearance work, both in and out of government. In 2020 he was recognized in the 27th Edition of Best Lawyers in America. Prior to joining Baker Botts, Peter served as Assistant Chief in the San Francisco Office of the Antitrust Division of the United States Department of Justice where he led and supervised both criminal price-fixing matters and civil merger matters. For his government service, Peter was awarded the Attorney General's Distinguished Service Award and was twice awarded the Antitrust Division's Award of Distinction. He also received the California Lawyer Attorney of the Year Award in 2013

and was named to the Daily Journal Top 100 Lawyers in 2012. Peter currently serves on the Executive Committee of the California Lawyers Association Antitrust, Unfair Competition and Privacy Law Section and the ABA International Cartel Task Force.

Tetsuya Kanda has been a Senior Planning Officer in Legal System Planning Division, Consumer Affairs Agency (“CAA”) of Japan, since July 2019. In the current capacity, he is in charge of an initiative to reinforce the Whistleblower Protection Act.

Prior to the current position, he held various positions in the Japan Fair Trade Commission (“JFTC”), in both fields of investigation and policymaking. Mostly recently, he was a Senior Planning Officer for Investigation from 2017 to 2019, where he dealt with procedural and substantive issues of investigations against major technology firms. His past responsibility in the JFTC includes drafting of law amendments strengthening public enforcement of the Japanese Antimonopoly Act and its “monopoly” guidelines.

He was seconded to the Directorate-General for Competition of the European Commission from 2012 to 2013.

He holds a Master of Public Policy from the University of Michigan and a Bachelor of Laws from the University of Tokyo. He also teaches the Japanese competition law at the Graduate School of Law, Meiji University in Tokyo.

Joe Kennedy is a senior fellow at ITIF. For almost 30 years he has worked as an attorney and economist on a wide variety of public policy issues. His previous positions include chief economist with the U.S. Department of Commerce and general counsel for the U.S. Senate Permanent Subcommittee on Investigations. He is president of Kennedy Research, LLC, and the author of *Ending Poverty: Changing Behavior, Guaranteeing Income, and Transforming Government* (Rowman & Littlefield, 2008). Kennedy has a law degree and a master’s degree in agricultural and applied economics from the University of Minnesota and a Ph.D. in economics from George Washington University.

Maria Khan is a Research Associate in the Economics Division of the Competition Commission of India. She has over five years of work experience in the field of Competition Law and Policy. She is responsible for carrying out economic assessment of antitrust conduct cases and mergers and acquisitions, competition advocacy and research related to competition law and policy. Maria is an Economist

by qualification and holds an M.Phil. in Economics degree from Jawaharlal Nehru University, New Delhi and a Post Graduate degree in Economics from Jamia Millia Islamia, New Delhi.

Thomas Kramler is head of the unit dealing with e-Commerce and the data economy in the European Commission's Directorate General for Competition. Before that, he was Head of the Digital Single Market Task Force responsible for the e-commerce sector inquiry. Mr. Kramler holds a law degree and a PhD from the University of Vienna, Austria. He has graduated with a Master's degree in European Community Law from the College of Europe (Bruges).

Previously Mr. Kramler was deputy head of the unit responsible for antitrust cases in the information industries, internet and consumer electronics sectors. Before joining the European Commission, Mr. Kramler worked as agent representing the Austrian government before the European Courts in Luxemburg.

Andrew Low is a senior lawyer in Gilbert + Tobin's competition and regulation group. Andrew's practice is directed to providing complex advice and advocacy for clients in complex and high-profile matters across each core area of the Competition and Consumer Act (including complex merger clearance, enforcement investigations, industry inquiries, and dispute resolution).

Andrew has a particular expertise and interest in, and has contributed significant thought leadership to, digital issues for competition policy and regulation. This includes chairing sessions including with the ACCC Chairman and international experts Maurice Stucke and Ariel Ezrachi on reflections on the Digital Platforms Inquiry and whether Robots Can Collude?_ He has authored a number of papers including Decoding the Data Lifecycle, ACCC signals a changing approach to digital M&A, Digital Reform unfolds, and Impact of competition policy on data access and management, and the soon to be published Digital Competition Australia 2021 (Lexology/GTDT). He has spoken at the Law Council of Australia's Rising Stars 2019 Conference on digital competition policy.

Such thought leadership is supported by in-depth commercial experience advising large tech companies. He is widely recognised by key clients as a rising star competition lawyer and is sought after by clients for his digital economy expertise.

Payal Malik is Adviser, Economics and Head of the Economics Division at the Competition Commission of India. She is on secondment from PGDAV College,

University of Delhi, where she is an Associate Professor of Economics. Her areas of expertise are competition law, policy and regulation. She has several years of research and economic consulting experience in network Industries such as power and telecommunication, ICTs, Innovation systems, and Infrastructure.

Her research and professional collaborations have been with NCAER, Delhi, OECD, Orbicom, IDEI, University of Toulouse, University Of Québec at Montreal, CEPR, JRC, European Commission, IPTS Seville, ICEGEC, Hungary, Department of Information Technology, TRAI, Ministry of Power, Ministry of Information and Broadcasting, Planning Commission of India, CSO, India, WSP-SA, World Bank and AFD, Paris. She was on the team that drafted the Electricity Act of India ushering competition into the sector.

She has a BA (Hons.) in Economics from Lady Shri Ram College, University of Delhi and an MA and MPhil in Economics from the Delhi School of Economics. She also has an MBA in finance from University of Cincinnati, Ohio.

Vinicius Marques de Carvalho is Partner at VMCA Advogados and Professor of Commercial Law at the University of São Paulo. He holds a PhD in Commercial Law from the University of São Paulo and a PhD from the University Paris I (Pantheon-Sorbonne) in Public Comparative Law. He was a Yale Greenberg World Fellow (2016), President of the Administrative Council for Economic Defense (“CADE”) (2012-2016), Vice-President of the International Competition Network (2013-2016), Secretary of Economic Law (2011-2012) and Commissioner at CADE (2008-2011).

Marcela Mattiuzzo is Partner at VMCA Advogados and PhD Candidate in Commercial Law at the University of São Paulo. She holds a Masters in Constitutional Law from the same institution and was Visiting Researcher at Yale Law School. She was Advisor and Chief of Staff at the Office of the President at the Administrative Council for Economic Defense (“CADE”), Commissioner at the Federal Fund for the Defense of Collective Rights and CADE’s representative before the National Strategy for the Fight Against Corruption and Money Laundering.

Andreas Mundt has been President of the Bundeskartellamt since 2009, member of the Bureau of the OECD Competition Committee since 2010 and the Steering Group Chair of the International Competition Network since 2013.

After qualifying as a lawyer, Andreas Mundt entered the Federal Ministry of Economics in 1991. In 1993 he joined the staff of the Free Democratic Party in the

German Parliament. In 2000 he joined the Bundeskartellamt as rapporteur and later acted as Head of the International Unit and Director of General Policy.

Maureen K. Ohlhausen chairs the antitrust group at Baker Botts LLP, where she focuses on competition, privacy and regulatory issues and frequently represents clients in the tech, life sciences, energy, and retail industries. She served as Acting FTC Chairman from January 2017 to May 2018 and as a Commissioner starting in 2012. She directed all FTC competition and consumer protection work, with a particular emphasis on privacy and technology issues. Ms. Ohlhausen has published dozens of articles on antitrust, privacy, regulation, FTC litigation, and telecommunications law issues and has testified over a dozen times before Congress. She has received numerous awards, including the FTC’s Robert Pitofsky Lifetime Achievement Award. Prior to serving as a Commissioner, Ms. Ohlhausen led the FTC’s Internet Access Task Force and headed the FTC practice group at a leading communications law firm. Ms. Ohlhausen clerked at the U.S. Court of Appeals for the D.C. Circuit and received her J.D. with distinction from the George Mason University School of Law and her B.A. with honors from the University of Virginia.

Dr. Burton Ong, LLB (NUS); LLM (Harv); BCL/DPhil (Oxon) is an Associate Professor at the Faculty of Law, National University of Singapore (“NUS”), where he teaches and researches in the fields of competition law, intellectual property and contract law. He is an Advocate and Solicitor of the Supreme Court of Singapore, as well as an Attorney and Counsellor-at-Law in New York State. He is a member of the Ministry of Trade and Industry’s Competition Appeal Board, an IP Adjudicator with the Intellectual Property Office of Singapore and sits on the dispute resolution panel of the Casino Regulatory Authority. He is a Director (Competition Law) at the EW Barker Centre for Law and Business at the National University of Singapore. He is the editor of “The Regionalisation of Competition Law and Policy Within the ASEAN Economic Community” (2018), published by Cambridge University Press.

Alejandra Palacios, Chair of Mexico’s Federal Economic Competition Commission (Comisión Federal de Competencia Económica; “COFECE”) is the first woman to head the Mexican antitrust authority. Following a major constitutional reform that set forth a new framework for competition in Mexico, Alejandra was appointed by Congress in 2013 to head the COFECE. She was reelected in 2017 for a second four-year tenure that will end in September 2021.

Before her current role at COFECE, Alejandra worked as Project Director at the Mexican Institute of Competitiveness (the Instituto Mexicano para la Competitividad; “IMCO”) for research projects focused on economic regulation, telecom, public procurement and other issues related to competition.

Since June 2016, she is Vice-President for the International Competition Network (“ICN”), the most prominent international network on competition, composed of 138 competition authorities around the world, and as of 2017, Member of the Bureau of the Competition Committee of the Organisation for Economic Cooperation and Development (“OECD”). Alejandra is also a member of the International Women’s Forum, Mexico chapter. In 2019 the Women@Competition organization included her in its list of “40 in their 40s” as one of the 40 most notable women in competition in the Americas, Asia and Europe.

Alejandra holds a bachelor’s degree in Economics, as well as an MBA from the Instituto Tecnológico Autónomo de México (“ITAM”). She completed a second master’s degree in public policy at the Centro de Investigación y Docencia Económicas (“CIDE”).

Her academic work includes teaching as well as serving as the Academic Coordinator for the ITAM Economics faculty.

Aman Singh Sethi is a Principal Associate at Shardul Amarchand Mangaldas. He has a diverse work experience, and has been closely involved on matters pertaining to anti-competitive agreements and abuse of dominance before the CCI, the National Company Law Appellate Tribunal as well as the Supreme Court of India. He has also been involved in a number of challenges seeking due process and the preservation of natural justice rights for clients against the CCI before the High Court of Delhi.

Aman has worked for several clients in the high-tech/disruptive industry, agrochemicals and agricultural traits, cement, petrochemicals, and telecommunication sectors in contentious cases. He also writes, and advises clients, on issues related to the interplay of competition law and intellectual property.

Along with co-authors Naval Satarawala Chopra and Yaman Verma, he successfully represented Matrimony.com in an abuse of dominance case against Google. Aman has also represented Uber and Indian hospitality disruptor OYO in wins against abuse of dominance claims before the CCI.

George Siolis joined the Melbourne office as a Partner when RBB Economics was established in Australia in 2009, and since then he has advised clients on

a number of contentious mergers before the ACCC as well as a variety of behavioral matters involving the alleged misuse of market power. He is a member of the Consumer and Competition Committee of the Business Law Section of the Australian Law Council and is listed in *Who's Who Legal of Competition Lawyers and Economists*. George has worked as a micro-economist for 20 years. Prior to joining RBB Economics George worked with Telstra and was an economic consultant based in the UK for eight years where he developed and led the communications practice at Europe Economics.

Celestine Song is an Assistant Director at the Competition and Consumer Commission of Singapore, where she leads teams working across a wide range of competition enforcement, policy formulation, outreach and advocacy work, including providing competition advice to government agencies. Prior to joining CCCS in 2014, Celestine worked on manpower and productivity policy formulation matters in the Ministry of Manpower. Celestine holds a bachelor's degree in Economics from the Nanyang Technological University of Singapore and a masters' degree in Public Policy from Peking University.

Hi-Lin Tan is the director of the policy and markets division and a member of the senior management at the Competition and Consumer Commission of Singapore, where he is involved in engaging and advising other government agencies on competition matters, and conducting market studies, investigations, and other competition law enforcement activities. Among the cases he has supervised include a market study on online travel booking, and abuse of dominance investigations into online food delivery and payment terminals.

Prior to joining CCCS in 2007, he was a teaching fellow at Boston College, a trading member of the Singapore Exchange, and an economist at the Monetary Authority of Singapore. He holds a PhD in economics from Boston College and master's and bachelor's degrees from the London School of Economics.

Sinem Ugur is a senior associate at ELIG Gürkaynak Attorneys-at-Law. She graduated from Istanbul Commerce University, Faculty of Law in 2011. She is admitted to the Istanbul Bar and has experience close to 10 years in competition law in a variety of industries. She provides legal consultancy to global and domestic clients in all areas of competition law including vertical agreements, abuse of dominance, cartel cases, concentrations, joint ventures, and compliance programs. Sinem Ugur has co-authored numerous articles relating to competition law and international trade matters in English and Turkish. She is also fluent in German.

Yaman Verma is a Partner at Shardul Amarchand Mangaldas with over 10 years' experience practicing competition law. He is recognized as a "future leader" (Who'sWhoLegal, 2017-20); a "rising star" (Competition/Antitrust, Expert Guides, 2018-20) and included in the list of "next generation lawyers" for India (Legal 500, 2017-20).

Yaman has successfully defended WhatsApp against abuse of dominance allegations in relation to its privacy policy, Microsoft Corporation against allegations of unfair and discriminatory software licensing terms, and e-tailer Flipkart against allegations of preferential treatment and discrimination.

Yaman has recently advised on Facebook's acquisition of minority shareholding in India's fastest growing telecom company. Previously, he helped obtain unconditional approvals for Vodafone India's merger with Idea Cellular Limited, the capital alliance between Suzuki Motor Corporation and Toyota Motor Corporation, the Fiat/Peugeot merger, Walmart's acquisition of Flipkart (and successfully defended the approval in follow on litigation), and Microsoft's acquisition of Nokia's mobile telephony business. He has also advised on obtaining conditional approvals for several major global transactions, including Dow/DuPont, Agrium/PotashCorp, and Linde/Praxair.

Yaman has represented Globecast Asia in their leniency application before the Commission, and was successful in obtaining a 100 percent reduction in penalty for Globecast and its officials. He advises several trade associations in relation to compliance with competition laws.

Beth Webster is Director of the Centre for Transformative Innovation at Swinburne University of Technology. She is also Pro Vice-Chancellor for Research Impact and Policy. Her expertise centers on the economics of the way knowledge is created and diffused through the economy. She has a PhD in economics from the University of Cambridge and an M.Ec and B.Ec (hons) from Monash University. She is a fellow of the Academy of Social Sciences Australia.

Professor Webster is responsible for providing advice and leadership on policies relating to the economic and social impact of research, public industry and innovation policies. She is also responsible for measuring university research engagement and impact.

Professor Webster has authored over 100 articles on the economics of innovation and firm performance and has been published in RAND Journal of Economics, Review of Economics and Statistics, Oxford Economic Papers, Journal of Law & Economics, the Journal of International Economics and Research Policy. She has been appointed to a number of committees including the Bracks' review of the automotive

industry, Lomax-Smith Base funding Review, CEDA Advisory Council, and the Advisory Council for Intellectual Property. She is a past President of the European Policy for Intellectual Property Association and is the current General Secretary of the Asia Pacific Innovation Network.

Luke Woodward heads Gilbert + Tobin’s Competition and Regulation group, advising and representing clients on competition and consumer law investigations and prosecutions, ACCC acquisition and merger clearances and infrastructure regulation, including in the digital, telecommunications, gas, electricity, water, airports, sea ports and rail industries in Australia.

He has over 30 years competition and consumer law enforcement experience, both on the enforcement side with the former Trade Practices Commission (“TPC”) and Australian Competition and Consumer Commission (“ACCC”), and in private practice. Prior to joining the firm in 2000, Luke held senior positions at the ACCC as General Counsel, Executive General Manager, Compliance Division (responsible for enforcement) and Senior Assistant Commissioner, responsible for mergers and asset sales.

Luke was awarded “Competition Lawyer of the Year” in Best Lawyers 2021 and is recognized as “the ultimate strategist” by a client who notes: “He knows the law, knows the ACCC inside and out and knows the best way to approach a matter from a strategic perspective; it’s a real value-add.” (Chambers Asia-Pacific 2020).

THE EVOLUTION OF ANTITRUST IN THE DIGITAL ERA: Essays on Competition Policy

Volume One

Editors

David S. Evans
Allan Fels AO
Catherine Tucker

This collection of essays represents the first in a series of two volumes that set out to reflect the state of the art of antitrust thinking in digital markets in jurisdictions around the world. The issues it tackles are many: the role of innovation, the conundrum of big data, the evolution of media markets, and the question of whether existing antitrust tools are sufficient to deal with the challenges of digital markets. Each author tackles the overarching themes from their unique national perspective. The resulting tapestry reflects the challenges and opportunities presented by the modern digital era, viewed through the lens of competition enforcement.