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The University of Chicago Booth School of Business**

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Market Structure and Antitrust Subcommittee

Report

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DISCLAIMER:

The purpose of these preliminary reports is to identify what are the new challenges digital platforms pose to the economic and political structure of our countries. These reports also try to identify the set of possible tools that might address these challenges. Yet, there is potential disagreement among the members of the committees on which of these problems is most troubling, which tools might work best, whether some tools will work at all or even whether the damage they might produce is larger than the problem they are trying to fix. Not all committee members agree with all the findings or proposals contained in this report. The purpose of these preliminary reports, thus, is not to unanimously provide a perfect list of policy fixes but to identify conceptual problems and solutions and start an academic discussion from which robust policy recommendations can eventually be drafted.

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I. Introduction

When the global, interactive, many-to-many communications network called the internet became available for broad public use in 1995, people were overjoyed with the new power at their fingertips. It is easy to forget that in the early years of the internet, that power was limited to visiting shops and getting news from the relatively small number of enterprises that had built websites on the World Wide Web. Over the past 25 years, that power has exploded with head-spinning velocity: Today, there is no area of human life that has not been affected by the technological innovations made possible by the internet. We now buy goods and services, do banking, pay bills, find information, and talk with multiple groups of friends and acquaintances on the web. The speed, scale, and scope of the internet, and of the ever-more powerful technologies it has spawned, have been of unprecedented value to human society.

History teaches us that social institutions must adapt after major technological advances. In just the past century, we saw this after the introduction of the automobile, the airplane, radio and television, and cell phones, to name but a few examples. New occupations—for example, bus drivers—arise to replace others—for example, buggy whip producers. At the same time, new behavioral norms and expectations replace those associated with past technologies—consider the social and economic changes wrought by the automobile, or the changes in both the rules and norms of the workplace in the age of mobile devices. As unintended and unforeseen social problems and harms arose, society responded with governance mechanisms aimed at addressing the problems or harms without impeding the clear benefits associated with the advances. These have ranged from the adoption of new social norms to the creation of new laws and regulations. Examples abound, encompassing everything from crosswalks and traffic lights to legal remedies addressing unfair competition in the marketplace. Ideally, the goal is to steer technological advances to ensure widespread benefit without attendant widespread harms—to protect and preserve innovation and advancement while minimizing harms so that all of society reaps net benefits. Such a goal often involves government intervention and always involves tradeoffs as society wrestles with the prevalence and cost of harms and how to balance them against the prevalence and size of benefits. While often messy, this is a healthy and desirable debate.

This working group came together to address specific problems arising from the digital platforms' reach, scale, scope, and use of data. We were asked to examine concerns stemming from the market structure contemporary platforms have created, and to investigate their competitive behavior, including the consequences of network effects that can create barriers to entry for new innovators and entrench incumbents. The global nature of many of today's platforms, a result of their scale, scope, and business models, creates novel complexities and considerations, particularly a concern that the digital platform may be a unique combination of economic forces that require both new analysis and new public policy. Regulatory authorities throughout the world are now turning their attention to these same questions. This report

contributes to this international analytical project by providing some of the necessary frameworks and inputs. We intend it to be a complement to other recent work, as experts across the world wrestle with how to ensure that markets remain open and healthy, allowing beneficial technological and social advancements to continue. Many of our conclusions and suggestions echo the findings of reports that have come out in the past year, and we hope they will be helpful to those reports not yet released. The list of antitrust experts and agencies working on this problem includes Australia, the United Kingdom, Germany, the European Commission, France, Israel, and Japan.¹

The issues are global in their scope, and these various jurisdictions are all engaged in analyzing how best to ensure that societies in general, and competition in particular, continue to thrive in the Digital Age. Our charge was restricted to market structure and competition, while other committees considered the equally important topics of the impact of digital platforms on politics, the media, and the nature of privacy. We note that monopolies can concentrate political power, reduce media plurality, and provide insufficient competition on dimensions such as privacy. In this way the findings of this report and the others are linked and quite consistent. Digital markets and platforms have already delivered great benefits to consumers, and the global concerns that have surfaced relating to actual or potential consumer harms may require action to ensure that the benefits are not undermined. Our report concludes that with deliberate government action to protect competition and consumers, the benefits from innovative firms could be even greater and more equitably spread, ensuring that the public is not short-changed in firms' pursuit of profit. Accordingly, this report is offered in the spirit of ensuring a future of continued technological and economic progress and social well-being as we move further forward into the Digital Age.

¹ See JACQUES CREMER, YVES-ALEXANDRE DE MONTJOYE, & HEIKE SCHWEITZER, EURO. COMM'N, DIRECTORATE-GENERAL FOR COMPETITION, COMPETITION POLICY FOR THE DIGITAL ERA (Apr. 4, 2019), <http://ec.europa.eu/competition/publications/reports/kd0419345enn.pdf> [hereinafter EC COMPETITION REPORT]; JASON FURMAN ET AL., H.M. TREASURY (U.K.), UNLOCKING DIGITAL COMPETITION: REPORT OF THE DIGITAL COMPETITION EXPERT PANEL (March 13, 2019), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785547/unlocking_digital_competition_furman_review_web.pdf [hereinafter U.K. COMPETITION REPORT]; AUSTL. COMPETITION & CONSUMER COMM'N, DIGITAL PLATFORMS INQUIRY: PRELIMINARY REPORT (Dec. 2018), <https://www.accc.gov.au/system/files/ACCC%20Digital%20Platforms%20Inquiry%20-%20Preliminary%20Report.pdf> [hereinafter AUSTRALIA COMPETITION REPORT]; Japanese Ministry of Economy, Trade, & Industry, Fundamental Principles for Rule Making to Address the Rise of Platform Businesses Formulated, (Dec. 18, 2018), https://www.meti.go.jp/english/press/2018/1218_002.html; HEIKE SCHWEITZER ET AL., GERMAN BUNDESMINISTERIUM WIRTSCHAFT UND ENERGIE, MODERNISING THE LAW ON ABUSE OF MARKET POWER: REPORT FOR THE FEDERAL MINISTRY FOR ECONOMIC AFFAIRS AND ENERGY (Apr. 9, 2018), <https://www.bmwi.de/Redaktion/DE/Downloads/Studien/modernisierung-der-missbrauchsaufsicht-fuer-marktmaechtige-unternehmen-zusammenfassung-englisch.pdf> [hereinafter GERMAN COMPETITION REPORT SUMMARY]; L'AUTORITÉ DE LA CONCURRENCE [FRENCH COMPETITION AUTHORITY], PORTANT SUR L'EXPLOITATION DES DONNÉES DANS LE SECTEUR DE LA PUBLICITÉ SUR INTERNET [ON THE EXPLOITATION OF DATA IN THE INTERNET ADVERTISING SECTOR] (Mar. 6, 2018), <http://www.autoritedelaconcurrence.fr/pdf/avis/18a03.pdf> [hereinafter FRENCH COMPETITION REPORT]; Press Release, The Israel Antitrust Authority invites interested members of the public to submit their comments, towards an inquiry into competition issues in the digital economy, Reishut HaTachrut [Israel Antitrust Authority] (Apr. 9, 2018), <http://www.antitrust.gov.il/eng/subject/177/item/35246.aspx>.

Executive Summary

a. Attributes

The market structure and antitrust report begins by discussing the characteristics of digital markets. These markets often have extremely strong economies of scale and scope due to low marginal costs and the returns to data. Moreover, they often are two-sided and have strong network externalities and are therefore prone to tipping. If so, the competitive process shifts from competition *in* the market to competition *for* the market. This combination of features means many digital markets feature large barriers to entry. The winner in these settings often has a large cost advantage from its scale of operations and a large benefit advantage from the scale of its data. An entrant cannot generally overcome these without either a similar installed base (network effects) or a similar scale (scale economies), both of which are difficult to obtain quickly and cost-effectively.

Additional barriers to entry are, ironically, generated by the very consumers who are harmed by them. Consumers do not scroll down to see more search results, they agree to settings chosen by the service, they single-home on one platform, and they generally take actions that favor the status quo and make it difficult for an entrant to attract consumers. In general, the findings from the behavioral economics literature demonstrate an under-recognized market power held by incumbent digital platforms.

The theme that runs throughout the report is the difficulty of entry into digital platform businesses once an incumbent is established. Whether the entrant is vertical or horizontal, has succeeded to some degree, is nascent, is a potential entrant, or is a large platform in an adjacent space, its existence improves consumer welfare. Either the entrant provides more choice, different features, and a chance of higher quality, or the threat of those outcomes spurs the incumbent to provide lower prices, higher quality and innovation, and to do so more quickly.

The role of data in digital sectors is critical. Personal data of all types allows for targeted advertising to consumers, a common revenue model for platforms. The report shows that the returns to more dimensions and types of data may be increasing, which again advantages incumbents. Consumer data in the United States is not regulated in any way that gives useful control or privacy to consumers; and additionally, most consumers have little idea what is being collected about them and re-sold. One way in which digital platforms often exploit their market power – and increase their profits – is by requiring consumers to agree to terms and conditions that are unclear, difficult to understand, and constantly changing, but which give the platform freedom to monetize consumers' personal data.

Digital platforms are characterized by free services. “Free” is not a special zone where economics or antitrust do not apply. Rather, a free good is one where the seller has chosen to set

a monetary price of zero and may set other, non-monetary, conditions or duties. It is possible that a digital market has an equilibrium price that is negative; in other words, because of the value of target advertising, the consumer's data is so valuable that the platform would pay for it. But the difficulty of making micropayments might lead a platform to mark up this negative competitive price to zero. As a result, barter is a common way in which consumers pay for digital services. They barter their privacy and information about what restaurants they would like to eat in and what goods they would like to buy in exchange for digital services. However, in principle, that information has a market price that can be analyzed.

b. Harms

Market power, consumer biases and an ad-supported platform model can generate significant consumer harms. First, market power in advertising markets will result in markups paid by advertisers. Secondly, while behavioral economists have studied consumer biases and firm responses in offline markets, these are swamped by what digital businesses can learn by using high-dimensional, large datasets to explore every nook and cranny of consumers' many behavioral shortcomings and biases in real time. Framing, nudges, and defaults can direct a consumer to the choice that is most profitable for the platform. A platform can analyze a user's data in real time to determine when she is in an emotional "hot state" and then offer targeted sales. These tactics reduce the quality of the zero-price content the user experiences on the platform.

In addition to *de novo* entry, platforms fear disintermediation by a partner or complement. If a platform's partner is able to directly access and serve the platform's customers, it might take them off the platform entirely, reducing the platform's profit. A platform that has total control of demand due to control over framing of consumer choices, policies for complements, and technical standards can steer customers to content and complements of most benefit to it. The most privately beneficial content might be owned by the platform itself rather than provided by independent firms that could extract rent or even challenge the platform's market power in the future. To the extent that consumers single-home, they may not be aware of such steering, or may not have competitive alternatives to which they can turn if they are aware.

Today's platforms understand that in some settings they can obtain higher margins if they either, make all of the necessary complements themselves, or, position themselves as a mandatory bottleneck between partners and customers. In particular, digital platforms are often very careful to maintain complete control over the user relationship so that they do not face any threat of disintermediation from a complement. These technological and policy choices can be used to reduce the possibility of successful entry by direct competitor. Other strategies such as exclusive contracts, bundling, or technical incompatibilities can also be used by platforms to restrict entry of competitors. Some of these strategies could be violations of existing antitrust law, as discussed below.

Insufficient competition and entry result in harms to investment and innovation. There is significant theoretical and empirical research that concludes that anticompetitive creation or maintenance of market power will cause a reduction in the pace of innovation. The lessening or blocking of innovative entry is of particular concern given its value to consumers. A VC will usually be wary of outright investing in an innovative startup that will implicitly or explicitly compete head-on with a tech giant. In that case, the best hope might be to be the preferred innovator of a complement and sell its business to the platform at an early stage. However, if entry barriers were reduced, the entrepreneur would not have to settle for a small fraction of the platform's profits, but could compete for all of them and try to replace the platform. This possibility would generate a much larger incentive to innovate.

c. Solutions

While some markets may self-correct, the findings of this report suggest that rapid self-correction in markets dominated by large digital platforms is unlikely.

While US antitrust law has long been flexible in combatting anticompetitive conduct, there is increasing concern that it has been underenforced in recent years. Antitrust law and its application by the courts over the past several decades have reflected the now outdated learning of an earlier era of economic thought, and they appear in some respects inhospitable to new learning. Antitrust enforcement better suited to the challenges of the Digital Age may therefore require new legislation.

Technology platforms present particular challenges for antitrust enforcement. Markets tip and the resulting market power is durable, so even effective antitrust enforcement is unlikely to generate fragmented markets. Nonetheless, enforcement that protects competition on the merits in the first stage and prevents exclusionary conduct in the second stage will help ensure that market-participants make unfettered choices among competing platforms and that entry and innovation are not inhibited by private rent-seeking.

Economists and lawyers will have to develop tools to explain to courts the role of behavioral biases in the creation of market power and in their effect on the quality of content. The existence of zero money prices means that measurement of quality will be critical. The law needs better analytical tools to take into account the impact of potential and nascent competitors and competition. Market definition will vary according to what consumers are substituting between, whether there is competition on the platform between complements, or competition between platforms, or competition between a platform and potential or nascent competitors regarding possible future markets. The need to identify the specific anticompetitive exclusionary conduct and analyze it may raise enforcement costs given all the possible variants of exclusionary conduct possible in digital markets.

This report details the particular areas where antitrust law will need reform in order to adequately deliver competition to consumers. The report also suggests the establishment of a specialist competition court to hear all private and public antitrust cases which would allow judges to develop some expertise. The committee believes that vigorously enforcing the antitrust laws under these conditions would be likely to increase entry in digital platform industries, competition, and consumer welfare. Moreover, such enforcement would likely result in remedies to restore competition that has already been lost, as well as serve as a deterrent to future anticompetitive conduct.

However, because technology platforms present the enforcement challenges detailed above, even effective enforcement may not be enough to generate competitive digital markets in a timely fashion. Therefore, the report suggests that Congress should consider creating a specialist regulator, the Digital Authority. The regulator could be tasked with creating general conditions conducive to competition. The committee also suggests separating out some types of regulation that will apply to virtually all market participants while other regulation will apply only to companies with bottleneck power. “Bottleneck power” describes a situation where consumers primarily single-home and rely upon a single service provider, which makes obtaining access to those consumers for the relevant activity by other service providers prohibitively costly.

The Digital Authority could routinely collect data on digital transactions and interactions, with an emphasis on data from businesses with bottleneck power. These data – made public to the extent possible – would allow policy makers and researchers to assess the performance of the sector. The DA could have a mandate to create “light touch” behavioral nudges when they will make markets more competitive. An example of a regulation that would enhance competition is data portability. The DA could set up rules that allow users to easily port their data from one service provider to another and monitor compliance. The DA may also promote open standards in such areas as micro-payments and digital identities. Should Congress request it, the DA could oversee a mandate for interoperability in any market where market power has become entrenched and threatens long term harm to competition. The Report also suggests that the DA could carry out a parallel merger review that would be set up to incorporate necessary antitrust reforms and modern standards.

Some regulations could apply only to firms that meet the DA’s definition for bottleneck power. Because the cost of false negatives is high and there is uncertainty, the public interest requires the DA to take a more interventionist approach in these settings. The DA could have merger review authority over even the smallest transactions involving digital businesses with bottleneck power because nascent competition against these entities is very valuable for consumers. Non-discrimination rules could protect against a complement that is a potential competitor of the platform itself, or one that operates only on the platform as a rival provider of content.

When a company has been found liable for violating the antitrust laws, part of the current process is that antitrust authority devises a remedy to restore the lost competition. Data sharing, full protocol interoperability, non-discrimination requirements, and the unbundling of content from a platform are all tools that the regulator, in conjunction with the antitrust authority, could apply and monitor over time in order to restore competitive markets.

II. IMPORTANT FEATURES OF THE DIGITAL BUSINESS ENVIRONMENT

Digital technologies are a central driver of future prosperity, hopefully delivering waves of innovation, efficiencies, and consumer welfare. These technologies have revolutionized the way consumers shop and communicate, the way businesses deliver value, the way people work together in collaboration, and—the subject of this report—the overall dynamics of competition.

These transformative changes, while immensely beneficial, have also triggered growing concerns about the power of a small number of firms to control and influence billions of lives. As an increasing volume and range of commercial activities have been digitalized, society has witnessed the emergence of certain key platforms and gatekeepers and a shift in market dynamics.

This section outlines the key features of the digital environment to set the foundation for the discussion of problems and solutions.

a. The Structure of Digital Markets

i. An Economic Perspective on the Digital Market Structure

Despite the predictions of some early observers that the internet would create competitive—even perfect—markets,² certain digital firms have been able to acquire significant market positions and preserve them over time. Many of the most innovative internet-derived digital markets, such as search engines, social networks, network operating systems, ecommerce, and ride-sharing, are highly concentrated and have been dominated by one or a few firms for a number of years. The lack of entry of competitors in these important markets—despite high profits—suggests either barriers to entry or exclusionary conduct, or both. We first discuss the nature of entry barriers in digital platforms and why they are difficult for an entrant to surmount.

1) A Unique Setting Subject to Tipping

From an economic perspective, there is no single new characteristic that would make competition in digital platforms different from more traditional markets. Rather, it is the coincidence of several factors at a scale that has not been encountered before that makes the problem unique and requires new analysis of market structure and market power. In particular,

² See, e.g., Erik Brynjolfsson & Michael D. Smith, *Frictionless Commerce? A Comparison of Internet and Conventional Retailers*, 46 MGMT. SCI. 563, 563 (2000) (“The conventional wisdom regarding Internet competition . . . is that the unique characteristics of the Internet will bring about a nearly perfect market.”); Jeffrey R. Brown & Austan Goolsbee, *Does the Internet Make Markets More Competitive? Evidence from the Life Insurance Industry*, 110 J. POL. ECON. 481, 482 (2002) (“The traditional economic view suggests that . . . the Internet should reduce search costs for consumers and thereby reduce prices and make markets more competitive.”).

the platforms with which this report is most concerned demonstrate extremely strong network effects, very strong economies of scale, remarkable economies of scope due to the role of data, marginal costs close to zero, drastically lower distribution costs than brick and mortar firms, and a global reach.

Markets with these combined features are prone to tipping—a cycle leading to a dominant firm and high concentration. Digital markets are prone to tipping for two primary reasons. First, because fixed costs play such an important role in digital markets, these markets feature especially large returns to scale. Second, many digital markets are driven by network effects that strengthen large incumbents and weaken new entrants.

When markets are prone to tipping, the competitive process shifts from competition *in* the market to competition *for* the market. In that case, consumers may only benefit from competition among several firms for the relatively short time period in which the firms compete to be the ultimate winner of very large economic profits. The winner's monopoly profits serve as the inducement for entry and investment. After a market has tipped, a potential rival for the market can only overcome the incumbency advantage of established networks through significant innovation. However, even an innovative entrant may not be able to create competition that benefits consumers in the presence of the factors that led to the tipping, leaving open a role for public policy to allow for competition for the market. Moreover, a competitor is even less likely to enter the market if the incumbent platform is able to leverage its powerful position to disadvantage or exclude potential entrants.

There are many well-known problems that follow from lack of competition, including higher prices, less innovation, and lower quality in all its forms. Policy may be needed to address the cause of such symptomatic problems. In the view of this committee, protecting entry for existing and potential competitors is the most important way to protect or improve consumer welfare in digital platforms. Initial competition for a market should be conducted on the merits without any anticompetitive practices, and later entrants should face a level playing field and no exclusionary conduct as they contest the market. Regulation may be required to prevent incumbents from erecting improper barriers to entry.

As it is traditionally recognized, the reward for the winner's innovative activity is the ability to extract rent from the platform through the exercise of market power.³ However, we highlight three deviations from this principle. First, the winner must have “won” on the merits of its product, without the use of any anticompetitive conduct. Correcting illegal practices by dominant firms that have won in a tipped digital market can be difficult, but is necessary or the firm will earn profits from its illegal behavior—and harm consumers along the way. Second, the reward of the entire market that propelled the winner to innovate must be available to the next entrant. If

³ See *United States v. Alcoa*, 148 F.2d 416, 430 (2d Cir. 1945) (“The successful competitor, having been urged to compete, must not be turned upon when he wins.”) (Hand, J.).

the incumbent is able to withhold those rents by excluding the entrant, or reduce those rents by limiting the entrant's share, then the pace of innovation will slow. The economic literature demonstrates that vibrant innovation and entry is the most important source of consumer welfare over time—hence the focus of the report on ensuring that entry functions well both when a market is created and thereafter.⁴ Third, there are sources of platform rents that society may determine through appropriate regulation should not be part of the winner's reward. For example, investments in complements offered on the platform may be best incentivized and encouraged to compete if the platform owner is not entitled to exclude them. (As used in this report, a complement is a good or service offered on or through the platform that increases the value of the platform to a consumer.) Digital markets at issue today may not have featured free entry and lack of anticompetitive conduct in the past. This report covers that case by describing how antitrust can be used to look backward, as well as forward, for antitrust violations. We also suggest regulation that can look forward to protect entrants, and thereby consumers, in these other cases.

2) Increasing Returns to Scale

Digital markets are used to exchange information goods and services. Typically, information goods involve increasing returns to scale because their production requires a fixed cost and no or little variable cost.⁵ In other words, when an additional user is served, costs do not go up proportionately. For example, an eBook, once produced, can be distributed at almost no cost to all users with access to the internet. The same holds for information services that are subject to fixed design and development costs and fixed maintenance and updating costs; Google can update Google Calendar for 100 million users with similar fixed expenses as would be needed for only a fraction of such users.

In contrast to traditional media or cultural markets that have had to incur physical distribution costs, digital markets are largely able to avoid such costs. The fact that information services can be delivered to any geographic location with no or minimal cost is one reason for the abundance of such services. The capacity to reach a large scale at small cost changes the nature of business growth. While a traditional business often starts with local implementation followed by gradual expansion through investment as reputation and financial resources increase, many online businesses aim at rapid large-scale expansion. This rapid growth may reduce the length of the competition-for-the-market phase, as market winners can establish dominance and begin exercising their market power quickly. It took only five years for Facebook, the “move fast and

⁴ See, e.g., Joseph Farrell & Paul Klemperer, *Coordination and Lock-In: Competition with Switching Costs and Network Effects*, in 3 HANDBOOK OF INDUSTRIAL ORGANIZATION (Mark Armstrong & Robert Porter eds., 2007), <https://www.sciencedirect.com/science/article/pii/S1573448X06030317>; Wen Wen & Feng Zhu, *Threat of Platform-Owner Entry and Complementor Responses: Evidence from the Mobile App Market*, (Harvard Business School Working Paper 18-036, 2018), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=284853.

⁵ Increasing returns to scale occur when the average unit cost decreases when sales expand.

break things” company, to go from a million users in 2004, the year of its founding, to more than 350 million users in 2009, when it overtook MySpace for good.⁶

The implications for market structure are well known: increasing returns to scale lead companies to invest in fixed costs in order to have the best product to attract customers.⁷ Then, with a larger customer base, the firm can enjoy lower average costs per consumer, allowing it to make an offer to consumers that is attractive in both quality and price. The increasing returns to scale create barriers to entry: New firms cannot offer the quality of the incumbent without the same large-scale operation to pay for the fixed costs. But the firm can only achieve a large scale if quality is high. Thus, a potential entrant, foreseeing that it will not be profitable at the smaller scale, will not enter the market to challenge the incumbent.

3) Economies of Scope

Platforms also have powerful economies of scope in the form of their relationships with users and brands. In digital markets specifically, scale offers an additional advantage. Firms can apply machine learning to extensive data sets to improve their products and expand their activities into new areas. Because machine learning yields better insights when it is trained on larger datasets, firms with access to large amounts of data can raise the quality of their services in ways that smaller firms cannot. This creates a form of dynamic economies of scale, allowing large firms with large amounts of data to raise product quality at lower costs than small firms. Firms may also be able to leverage the data, or the insights due to machine learning, that they receive from an existing service to enter into an adjacent market with a higher quality product, demonstrating a novel form of economies of scope. Combining mapping software in a platform that already offers email, for example, allows that platform to offer a higher quality restaurant recommendation product. Moreover, firms serving a larger customer base with a greater variety of products are able to generate more advertising revenue per consumer through more effective targeting.⁸ The development of machine learning technologies and data analysis is a source of increasing returns to scale and scope that can contribute to digital market concentration.

⁶ See Chloe Albanesius, *More Americans Go to Facebook Than MySpace*, PC MAG. (June 16, 2009), <https://www.pcmag.com/news/241432/more-americans-go-to-facebook-than-myspace>; Ami Sedghi, *Facebook: 10 Years of Social Networking, in Numbers*, GUARDIAN (Feb. 4, 2014), <https://www.theguardian.com/news/datablog/2014/feb/04/facebook-in-numbers-statistics>. See also Steven Levy, *Mark Zuckerberg on Facebook's Future, From Virtual Reality to Anonymity*, WIRED (Apr. 30, 2014), <https://www.wired.com/2014/04/zuckerberg-f8-interview> (reporting Mark Zuckerberg noting that “[w]e’ve changed our internal motto from ‘Move fast and break things’ to ‘Move fast with stable infrastructure’”).

⁷ See generally JOHN SUTTON, SUNK COSTS AND MARKET STRUCTURE (1991).

⁸ Such economies of scope are leading to a rapid expansion of the capture and use of personal information by firms. For example, many large firms are starting to expand beyond internet platforms in order to collect more data from consumers. The rise of voice-assistant products (including Microsoft’s Cortana, Apple’s Siri, Google’s Google Voice, and Amazon’s Alexa) can enable firms to gather information from offline consumer behavior and then feed that information into online advertisement-targeting algorithms. One study estimates that major internet platforms, data brokers, credit card companies, and healthcare data companies derived nearly \$76 billion in 2018 from selling personal consumer information directly or indirectly via targeted ads. Robert Shapiro & Siddhartha Aneja, *Who*

4) Network Effects

Most information services involve some form of positive network effects, in which consumer benefit grows as the number of users increases. The simplest network effects flow directly from interacting with other users, as in social networks or peer-to-peer services, such as eBay or Venmo, where the more users there are on the network, the richer the users' experience is likely to be. (In these examples the platforms choose not to be interoperable, so the network effects apply to a single firm, rather than an industry.) Multi-homing lessens network effects because a consumer can enjoy the size of both networks, rather than having to choose one. For example, a consumer that carries both Visa and American Express credit cards can shop at stores that accept either card, or both. Many other network effects are indirect, in that they are mediated by a "complement" to the network. A complement is a good or service that increases the value of another good or service to a consumer. For example, the ability to not only make calls, but also to play music on a handset increases the value of the handset to users. Complements today often come in the form of applications ("apps") or a specific type of content. The more complements a platform has, the more popular it is with users. Just as customers of a popular app store receive an indirect network effect when more and better developers are attracted to app stores with big customer bases, customers of a widely-used social media site benefit from the many games designed for that social media site, which in turn are driven by the large number of consumers. These network effects can also be seen in recommendation systems or driving directions that exploit larger datasets of users' purchasing behavior or travel paths to offer higher quality advice.

Markets with network effects are prone to concentration because consumers benefit from being on the same network as other users. No one wants to be on their own social media site. However, when network effects are exhausted relatively quickly (as can occur, for example, in messaging apps⁹) or when there is heterogeneity in preferences (e.g. teenagers prefer not to be on the same social network as their parents¹⁰), the market structure may be oligopolistic.

Owns Americans' Personal Information and What Is It Worth?, FUTURE MAJORITY (Mar. 8, 2019), <https://assets.futuremajority.org/uploads/report-for-future-majority-on-the-value-of-people-s-personal-data-shapiro-aneja-march-8-2019.pdf>.

⁹ To send a message to someone, a user only needs that single person to be on a particular messaging app, rather than everyone they would want to send a message to. This explains why many messaging apps can live alongside one another—WhatsApp, Snapchat, SMS, and Facebook Messenger all have significant customer bases. *See Most Popular Mobile Messaging Apps Worldwide as of January 2019*, STATISTA (Jan. 2019), <https://www.statista.com/statistics/258749/most-popular-global-mobile-messenger-apps>.

¹⁰ *See* Mark Sweney, *Is Facebook for Old People? Over-55s Flock in as the Young Leave*, GUARDIAN (Feb. 12, 2018), <https://www.theguardian.com/technology/2018/feb/12/is-facebook-for-old-people-over-55s-flock-in-as-the-young-leave>.

Some indirect network effects are multi-sided: A user of one type (e.g., a buyer) benefits from the participation of other types of users (e.g., sellers). For instance, in ecommerce platforms, which intermediate trade between sellers and buyers, a buyer does not directly benefit from the presence of other buyers but does benefit from the presence of more sellers—who are in turn attracted by the presence of the buyers. Multi-sided network externalities are prominent on the internet for two reasons. First, business models like ecommerce are plentiful. Second, and more importantly, a great deal of activity on the internet is financed by paid advertising on the relevant site. Advertising-financed services are platforms exploiting two-sided network effects between advertisers and consumers. Advertising can be more valuable when there are more consumers viewing a site, while consumers are attracted by content that may be of higher quality when financed by many advertisers competing for space.

On multi-sided platforms, one or more sides may be subsidized if their participation attracts paying customers on the other side. Thus, we may see a monetary price of zero in one part of a very lucrative business model. Shoppers on eBay can buy without paying fees because eBay understands that fees would drive them away, whereas their presence draws in sellers who can be charged fees. Users of Gmail pay a monetary price of zero but allow Google to read their email so that advertisers can market to them based on personal information. Google can then charge a high price for the ads. Payment platforms such as credit cards or PayPal similarly charge end consumers low or negative fees because a large group of consumers bring in retailers who pay the payment platform for access.

Network effects can lead to consumer-friendly competition at early stages. Economic theory and market observation indicate that during the phase when competitors are all trying to tip the market towards themselves, they compete intensely. This phase is characterized by vigorous competition between firms trying to build market shares and generate bandwagon effects. For example, Uber and Lyft have hotly contested the market for ride-sharing—and spent billions of dollars subsidizing riders’ fares along the way.¹¹ One 2016 estimate suggested that payments from Uber customers covered only about 40% of the cost of their rides.¹² If network effects are

¹¹ See Shannon Bond & Nicole Bullock, *Uber IPO Prospectus Shows Ride-Hailing Revenues Stalled*, FIN. TIMES (Apr. 11, 2019), <https://www.ft.com/content/c68d3662-5c76-11e9-939a-341f5ada9d40> (Uber “has lost \$12bn from its operations in total since 2014”); *id.* (““We will not shy away from making short-term financial sacrifices where we see clear long-term benefits,” wrote Dara Khosrowshahi, [Uber’s] chief executive.”); Megan McArdle, *Uber and Lyft Are Losing Money. At Some Point, We’ll Pay for It.*, WASH. POST (Mar. 5, 2019), https://www.washingtonpost.com/opinions/uber-and-lyft-are-losing-money-at-some-point-well-pay-for-it/2019/03/05/addd607c-3f95-11e9-a0d3-1210e58a94cf_story.html (In 2018, Lyft “lost more than \$900 million after expenses”).

¹² See Izabella Kaminska, *The Taxi Unicorn’s New Clothes*, FIN. TIMES (Dec. 1, 2016), <https://ftalphaville.ft.com/2016/12/01/2180647/the-taxi-unicorns-new-clothes>. Many of the paradigmatic firms of the dot.com bubble also followed this strategy of subsidizing for growth—often sending the firm to oblivion. See Greg Bensinger, *In Kozmo.com’s Failure, Lessons for Same-Day Delivery*, WALL ST. J. (Dec. 2, 2012), <https://blogs.wsj.com/digits/2012/12/03/in-kozmo-coms-failure-lessons-for-same-day-delivery>.

strong, however, the market will tip in favor of one competitor, who then becomes the monopolist.

5) Low Marginal and Distribution Costs

Digital goods often have low to zero marginal costs of expansion to another user, as mentioned above. Distribution costs, one of the major expenses of expanding in a brick and mortar world, are largely also zero on the internet. Indeed, poor internet infrastructure in the United States and elsewhere may be the main distribution cost for many digital platforms.¹³ Some digital platforms do have positive distribution or marginal costs such as a piece of hardware, ecommerce warehouses, or maintenance of scooters for example.

6) Global Reach

Lastly, many of the digital platforms we discuss in this report have a global reach. Those that are focused on licensed digital content, rather than user-generated content, must negotiate licensing and other legal issues in new jurisdictions. Reaching consumers in many languages is another cost of expanding globally, as is dealing with local transportation regulations. However, the total cost of expansion is generally lower than in traditional brick and mortar businesses.

ii. Barriers to Entry and Expansion

In this section, we explore the implications of the characteristics discussed above and the possible effects of the increased market power created by barriers to entry. Outlined below are some of the drivers that make market power more sustainable and disruption less likely in digital markets.

1) Cost and Benefit Barriers to Entry

As mentioned above, network effects and scale economies are two significant barriers to entry. The winner in these settings has a massive cost advantage from its scale of operations, and a massive benefit advantage from the scale of its data. An entrant cannot generally overcome these without either a similar installed base (network effects) or a similar scale (scale economies), both of which are difficult to obtain quickly and cost-effectively. It is possible for an entrant to arrive with scale and an installed base because it is a competing digital platform. Such entrants may create effective competition for an incumbent platform that benefits consumers.

¹³ See, e.g., Drew FitzGerald, *Facebook Looks to Build Underwater Ring Around Africa*, WALL ST. J. (Apr. 7, 2019); Michael Sheetz, *Here's Why Amazon Is Trying to Reach Every Inch of the World With Satellites Providing Internet*, CNBC (Apr. 7, 2019), <https://www.cnbc.com/2019/04/05/jeff-bezos-amazon-internet-satellites-4-billion-new-customers.html>; Press Release, Think Big With a Gig: Our Experimental Fiber Network, GOOGLE (Feb. 10, 2010), <https://googleblog.blogspot.com/2011/03/ultra-high-speed-broadband-is-coming-to.html>.

Barriers to equivalent data resources, a side effect of not having the history, scale, or scope of the incumbent, can inhibit entry, expansion, and innovation.¹⁴ The same effects that drive the quality of digital services higher as more users join—a positive feedback loop—makes the strong stronger and the weak weaker.¹⁵ Data feeds the development of algorithmic and AI training processes that enables more profitable exploitation of consumer attention through advertising. A data advantage over rivals can enable a company to achieve a virtuous circle of critical economies of scale leading to network effects, and a competitive balance in its favor, leading to the gathering of yet more data. A new entrant is likely to experience this in reverse—a vicious cycle—as it fails to surmount the entrance barrier.

Choosing a business model that is scalable, and has strong economies of scale, is of paramount importance to creating entry barriers. A social media platform that chose to monitor harmful content might need to hire many workers to keep ahead of users that game the algorithms. Hiring workers is costly, slows down the ability to grow, and makes the platform less profitable both in the short run and in the long run by limiting economies of scale. A platform aiming to tip the market in its favor quickly will not choose this business model if it can gain consumers at lower cost.

Because cost and benefit barriers are so powerful, digital platforms have powerful incentives to pull slightly ahead of any rival. Due to the positive feedback loop described above, a small advantage can turn into a large one. This powerful incentive to disadvantage a competitor raises the possibility that some competitors will choose to violate the antitrust laws in order to stay ahead. In general, to maintain or improve their competitive advantage, incumbents have strong incentives to limit openness or interoperability and to be averse to data-portability policies. For example, in a recent case, the upstart ethernet switch firm Arista alleged that the incumbent Cisco encouraged openness and interoperability while it was dominant, but once a rival mounted a serious challenge, claimed copyright protection on the previously open user interface, thus cutting off the entrant from locked-in users.¹⁶

¹⁴ The key themes below are discussed in greater detail in ARIEL EZRACHI & MAURICE E. STUCKE, *VIRTUAL COMPETITION: THE PROMISE AND PERILS OF THE ALGORITHM DRIVEN ECONOMY* (2016). See also Ariel Ezrachi & Maurice E. Stucke, *Digitalisation and Its Impact on Innovation: Report Prepared for the European Commission* (DG Research & Innovation Working Paper, July 2018) (on file with authors).

¹⁵ See *Data-Driven Innovation for Growth and Well-Being: Interim Synthesis Report*, OECD (Oct. 2014), <http://www.oecd.org/sti/inno/data-driven-innovation-interim-synthesis.pdf>, at 29 (citing CARL SHAPIRO & HAL R. VARIAN, *INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY* (1999)).

¹⁶ See Jan Wolfe, *Arista to Pay \$400 Million to Cisco to Resolve Court Fight*, REUTERS (Aug. 6, 2018), <https://www.reuters.com/article/us-cisco-arista-settlement/arista-to-pay-400-million-to-cisco-to-resolve-court-fight-idUSKBN1KR1PI>; Don Clark, *Arista Networks Files Antitrust Claims Against Cisco*, WALL ST. J. (Jan. 25, 2016), <https://www.wsj.com/articles/arista-files-antitrust-charges-against-cisco-1453754642>.

2) Barriers to Entry Created by Consumer Behavior

Market power is, ironically, generated by the very consumers who are harmed by it. Consumers do not replace the default apps on their phones, do not scroll down to see more results, agree to settings chosen by the service, and take other actions that may look like poor decisions if those consumers like to choose among options and experience competition. Often the actions needed to generate choice for the consumer seem trivial, such as a download and installation, opening another app, or a few clicks. Consumers make these “mistakes” because of inherent behavioral biases such as discounting the future too much and being too optimistic. The situation is worse when the information needed to counteract bias is hard to obtain. For example, consumers tend not to run the same search on a different search engine to compare the results, so they may never find out the relative quality of the default search engine they use.

Research into behavioral biases and their consequences is several decades old and has already produced ample and convincing evidence of the nature and existence of these biases on the part of consumers. In 2002, Daniel Kahneman received the Nobel Prize in Economic Sciences for his pioneering work on behavioral economics.¹⁷ Fifteen years later, the Nobel Prize was awarded to Richard Thaler in recognition of the progress of research in this domain and of the huge amount of knowledge that has been produced.¹⁸

In his Nobel lecture, Thaler pointed to the key insight from Kahneman and Amos Tversky: people exhibit “bounded rationality,” meaning that in a complex world they use consistent rules of thumb to make predictions and decisions. Thaler called on economists to use “psychological realism” to improve their understanding of human decision making.¹⁹ That psychological realism combined with the economics toolkit produced the field of behavioral economics.

Behavioral economics has had a profound influence in the conduct of economic policy that will become even more prevalent as more knowledge is digested and applied.²⁰ It is of great relevance for our understanding of internet economics because, as information flows improve and some physical barriers are removed, human factors are more likely to provide the frictions that have increasing effects on market outcomes. These frictions in decision-making, and the fact that consumers can be manipulated to take advantage of their biases, render consumers sticky—

¹⁷ Daniel Kahneman—Facts, NOBEL PRIZE (2019), <https://www.nobelprize.org/prizes/economic-sciences/2002/kahneman/facts>.

¹⁸ Richard Thaler—Facts, NOBEL PRIZE (2019), <https://www.nobelprize.org/prizes/economic-sciences/2017/thaler/facts>.

¹⁹ Richard H. Thaler, *From Cashews to Nudges: The Evolution of Behavioral Economics*, 108 AMER. ECON. REV. 1265, 1266-1267 (2018).

²⁰ See, e.g., Cass R. Sunstein, *The Storrs Lectures: Behavioral Economics and Paternalism*, 122 YALE L.J. 1826 (2013); Richard H. Thaler & Cass Sunstein, *Libertarian Paternalism*, 93 AMER. ECON. REV. PAPERS & PROCEEDINGS 175 (2003).

that is, people are slower to move to a superior product than they would be absent the manipulation. This in turn makes demand less contestable and less favorable for an entrant.

One lesson from behavioral economics is that small differences (nudges) in how choices are presented can have large effects on what choices people make.²¹ A nudge to use a particular browser as a default, for example, can entrench a platform's browser. Another lesson is that consumers overweight their immediate benefit relative to their welfare in the future. A consumer searching for a solution to a particular problem will be inclined to click or use the first result or recommendation, rather than searching on another page or scrolling down to examine many listings. The tendency to choose in this manner entrenches the market power of the platform that can control the display of content. Similarly, consumers' preference for instant gratification may lead them to sign away privacy rights they otherwise say they value.²² This allows incumbent platforms to gather data from these consumers that further entrenches their market position. In general, the findings from behavioral economics demonstrate an under-recognized market power held by incumbent digital platforms.

A second way consumers create entrenched market power is by single-homing. A multi-homing user, for example, checks the price of a ride on both Uber and Lyft each time she needs a car. A user that single-homes bestows market power on the platform she uses exclusively because advertisers and other content providers *can only* get the user's attention by going through that platform. While users sometimes have the ability to employ multiple services, there is usually a convenience cost to doing so. Making multi-homing easier will be a key element in encouraging competition.

3) Barriers to Entry Created by an Incumbent Rival

Because platform market power is higher when users single-home, platforms try to get users to do so. Sometimes this results in higher quality services: A mapping service can alert a user that it will take 45 minutes to get to the airport when it sees a flight entry on the user's calendar. If the user buys those services from different platforms, she does not get the alert and experiences lower quality. However, it is often possible for the data from one service to be read by a rival, so platforms may also encourage single-homing by preventing interoperability.

²¹ See Thaler, *supra* note 19, at 1283.

²² See Alessandro Acquisti et al., *The Economics of Privacy*, 54 J. ECON. LIT. 442 (2016); Alessandro Acquisti et al., *Privacy and Human Behavior in the Age of Information*, 347 SCIENCE MAG. 509, 510 (2015); Alessandro Acquisti, *Privacy in Electronic Commerce and the Economics of Immediate Gratification* (Fifth ACM Conference on Electronic Commerce, 2004), <https://www.cs.drexel.edu/~greenie/privacy/privacy-gratification.pdf>; see also *Americans' Attitudes About Privacy, Security, and Surveillance*, PEW RESEARCH CTR. (May 20, 2015), https://www.pewresearch.org/wp-content/uploads/sites/9/2015/05/Privacy-and-Security-Attitudes-5.19.15_FINAL.pdf, at 17 (reporting that 74% of survey respondents believe it is "very important" to be "in control of who can get info about you").

By limiting a rival's access to data, dominant firms can make exclusive reliance on their service either inevitable or the clearly best decision. Sharing data or allowing access to certain pieces of information is often feasible at a technical level, but it is not normally in the interest of the platform that could lose its users. For example, Google has been able to limit its users from visiting (multi-homing on) competitors such as Yelp by displaying their information in the search window directly.²³ To some extent, the limited switchability to the rival is driven by asymmetric information in two places. First, consumers are generally not aware of, or attentive to, the costs of failing to switch; for example, the quality of the content and the extent to which the platform steers consumers to inferior content or product choices may be hard to see. Second, there is often no way to compensate the consumer directly with lower prices—as an entrant such as Warby Parker can do by selling eyeglasses directly to consumers at a lower price—because the money price of services from a platform is often fixed at zero for both the incumbent and the rival.²⁴

For all of these reasons, digital platform market power can become entrenched. The United Kingdom, the European Commission, Australia, and Germany have all published reports concluding that digital platforms' market power has indeed become entrenched.²⁵ Surmounting the existing barriers to entry created by consumer behavior, cost structure, public policy, and any past anticompetitive conduct is extremely difficult. This fact has direct effects on consumers: *without entry or the credible threat of entry, digital platforms need not work hard to serve consumers because they do not risk losing their consumers to a rival.*

b. How Big Data Affects Digital Products and the Sale of Advertisements

i. What Makes Data Big? And Does Big Data Harm Consumers?

1) Targeted Advertising

Technology firms claim that they perform machine learning on big data, and that doing so gives them both a competitive edge over rivals and allows them to better tailor their services to their consumers. How might this work in practice? Consider a search engine with information about a

²³ See Charles Duhigg, *The Case Against Google*, N.Y. TIMES MAG. (Feb. 20, 2018), <https://www.nytimes.com/2018/02/20/magazine/the-case-against-google.html>

²⁴ See, e.g., Competition Decision, Case COMP/AT.39740—*Google Search* (June 27, 2017), http://ec.europa.eu/competition/antitrust/cases/dec_docs/39740/39740_14996_3.pdf. Indeed, as the U.K. Competition and Markets Authority has found, even in industries where prices exist but there are substantial search frictions, consumers do not make choices that would give them substantial savings. See note 31, *infra*, and associated text.

²⁵ See U.K. COMPETITION REPORT, *supra* note 1, at 75; EC COMPETITION REPORT, *supra* note 1, at 112; AUSTRALIAN COMPETITION REPORT, *supra* note 1, at 35; GERMAN COMPETITION REPORT SUMMARY, *supra* note 1, at 2.

given user's search history, including the fact that this user recently searched for a specific pair of Nike running shoes. The ad service can more effectively spend advertisers' budgets by showing the user ads focused on running-related products (or similar shoes to those the user searched for). Advertisers will get a greater return on investment because more of their ads will be shown to users who have demonstrated interest in running products—possibly very similar running products to the ones being advertised. Moreover, users may actually prefer seeing ads for other running products compared to more generic ads. The more personalized matching of advertisement to potential customer would appear to help both the producer and consumer of the advertisement.

This simplified example of personalized advertisement uses very little information about a particular user (only that she had a particular search query) and little to nothing about other users or another augmenting dataset, with the exception of a database of running-related items. Indeed, this level of personalization could be similarly achieved in many low-tech spaces (e.g., running products advertised in running magazines, whose readers have expressed interest in running simply by reading the magazine). What is different about personalized advertisement if the ad server has much more data at its disposal?

Box I

Platform vs. Brick-and-Mortar Advertising and Targeting

Traditional brick-and-mortar stores and online platforms differ greatly in their advertising and personalization capabilities.

At the highest level, local grocers tend not to force shoppers to identify themselves when they shop, rarely verify identification if used, and rarely have the ability to merge purchase history with other detailed information from other aspects of their customers' lives to design targeted advertising. Online retailers, on the other hand, almost always require account creation for purchasing, verify this information for each transaction, and have direct or easy access to detailed non-shopping information about their customers.

Local grocery stores are capable of some data collection and personalization. For example, they normally know that a majority of their customers live relatively close to the grocery store, so they can rely on their knowledge about the general demographics of the neighborhood population. The stores may also ask that consumers use a loyalty card to receive discounts, which then allows them to track per-customer purchasing patterns, offer particular customers with certain purchasing patterns particular coupons or free products, and see the result of such offers on a user's purchase history. Nonetheless, the effectiveness of these methods is limited in comparison to digital shops. Consumers normally retain the option to buy full-priced groceries without tracking (pay in cash), or to intermittently switch their cards with other people they know (for example). More importantly, even if grocers used fingerprints or other unique identifiers to remove the possibility of anonymity, the data they would track would still be entirely comprised of grocery purchase history for its customers.

Platform vs. Brick-and-Mortar Advertising and Targeting (Cont.)

This limitation does not apply to digital platforms. Online groceries require a customer to make an account prior to allowing any purchase. Thus, all purchases belong to a particular account, which also contains identifying information about a customer including their search history, billing, shipping, and email addresses. This ensures that (potentially) all search history and all purchases sent to a particular address (or paid for with a certain mailing address) can be collated and analyzed by the seller and used to design offers or other services for a customer. If this seller has a broader set of services than just grocery retail (for example, the seller is Google or Amazon), the information they can collate together with this purchase history might include email transcripts, calendar information, or search and purchase history of non-grocery products, amongst others. All of this information can allow for much more aggressive marketing to a particular consumer, based on many aspects of their lives beyond their historical grocery shopping habits. A grocery store can take advantage of hungry shoppers by placing a representative selection of junk food in the checkout line. A digital platform, by contrast, can design an individualized tempting “checkout offer” based on that particular consumer’s purchase history, current behavior, time of day, and the emotional content of recent communications.

2) Dimensions Along Which Data Can Be Big

In order to discuss the use-cases of large-scale datasets in online personalized advertising, it helps to define in what sense a dataset can be big. Big data commonly refers to two very different properties of a dataset: either that the dataset has many people’s data in it, or that the dataset has a great deal of information about each person in the dataset. For simplicity we refer to the former as “large population datasets” and the latter as “high dimensional data.” These distinct ways in which a dataset can be big enable very different uses.

Large population datasets allow the possessor to infer both unknown attributes of current users, and statistical facts about individuals not currently in the dataset. If the dataset contains many instances of users’ queries along with their locations at the time they made those queries, an advertiser could use future users’ locations to help predict what those users might search for or be interested in seeing advertisements about. Numerous statistical techniques can be used to show that, for a large population dataset, simple statistics that hold true on the dataset should also hold true for fresh users, assuming they come from a similar pool as those in the dataset. For example, if 30% of queries in the database originating from Cape Cod searched for lobster rolls, there is a 30% chance that a query made by a future user based in Cape Cod will be for lobster rolls, assuming the user is visiting in a similar time frame that the dataset was gathered in, arrived at the search engine in a manner similar to other dataset users, and the number of queries in the dataset originating in Cape Code is sufficiently large. If the dataset has many queries but

fairly few from Cape Cod, statistical techniques will provide lower confidence in their ability to predict future queries emanating from Cape Cod.

High-dimensional datasets allow for different uses than large-population datasets do. Suppose a dataset contains only a few users, but each user's entry contains their entire email history. A quick read of a user's recent emails could give an advertiser a very clear window into what *that* user might be looking to purchase. The richness of a given user's data entry can describe in great detail many facts about her, including her future travel itineraries, plans for large purchases, information about her career and social networks, and so forth. Looking only at that user's information, a deft advertiser could likely select any number of products this user would be much more likely than an average person to find interesting. Hotels in Cape Cod would much prefer to advertise to a user if her recent emails describe travel plans to Cape Cod. However, if only three or four users belong to the dataset, an advertiser can learn very little about new users from studying the rich but poorly-populated dataset; again, statistical techniques have much lower confidence when the datasets they operate on are small.

The most useful datasets, from the perspective of an advertiser or other service provider, are large in both senses: they contain rich information about a huge number of people. This is even more true when the rich information contains different types of data, for example, email, location, and search queries. A dataset of this type allows the provider to both learn high-level population statistics (for which it needs a large population in its dataset) and to carefully tailor its ads to each individual in its dataset (because it has very rich information about users in the dataset). Even more interestingly, the complexity of population-level statements one can make from such a dataset increases. This occurs both because each user's data has more dimensions, so there are more relevant hypotheses to explore, and because as the number of users in the dataset grows, so does the statistical significance of any particular statement that holds for the dataset.

3) Accuracy (and Utility) May Display Increasing Returns

Entrants could have an opportunity if marginal returns were to fall as providers' datasets grow, because the incumbent's marginal cost of acquiring new data would eventually exceed the marginal value. But a simple model shows this may not be the case. Given a fixed dataset of a particular number n of individuals with a certain number k of features (also referred to as attributes), the dataset owner does not face decreasing marginal returns with respect to either n or k .²⁶

Why might datasets show increasing marginal returns in either the number of features or the number of rows already present in the dataset? For a formal treatment of this question, please see the discussion below which works out in detail a particular example in the advertising domain.

²⁶ This holds even in "natural" settings, where each member of the dataset is drawn identically from a normal distribution.

Informally, imagine you are trying to sell a service to people who live in Manhattan and are planning a wedding. Knowing either that a person lives in Manhattan, or that they are planning a wedding, may make almost no difference in determining their willingness to use the service because both are very low-probability events, while having both pieces of information together allows the Manhattan wedding planner to easily pinpoint interested consumers. More generally, as a firm accumulates more information about more people, its marginal returns to new data need not fall.

This last point helps us understand why data has increasing marginal returns. Even if the dataset is large enough that it allows a company to make accurate inferences about a given population, the company will always benefit from having specific information about a given individual, allowing it to become more and more confident about what the consumer wants, and to better tailor its services and ads.

Companies therefore have no incentives to stop looking for and accumulating new pieces of data, entrenching incumbents with large datasets vis-à-vis entrants with smaller databases. Consumers on the internet leave numerous traces of their activities across a range of applications (for example, their location, what they buy, who they talk to, and what they say), and technology allows platforms to identify and analyze these traces. The amount of data on individual behavior that can be collected, merged, analyzed, and stored is rising, and the combination of different dimensions of data generates valuable information about individuals' tastes and behaviors. As individuals rely more and more on a platform to organize their lives through their online social, cultural, or economic activity, their data become more informative about their future choices and firms are willing to pay to influence those choices. Furthermore, the emergence of the Internet of Things means that platforms will have access to yet more data generated by home appliances, cars, and other devices. Indeed, consumers' devices can now track eye movement, mouse movement, body movement, and body position. In parallel with the evolution of the internet that made tracking of billions of individuals possible, advances in data mining and artificial intelligence have enabled firms to learn more from data than was conceivable a few decades ago.²⁷

Many digital markets have tipped and therefore there are only a few entrenched platforms able to gather this breadth of data. As Alessandro Acquisti and colleagues concluded in a recent study, “a few ‘gatekeeper’ firms [will be left] in a position to control the tracking and linking of . . . behaviors across platforms, online services, and sites.”²⁸ When data exhibit increasing returns to

²⁷ Jaron Lanier, a creator of virtual reality, has warned of the problems associated with a “surveillance economy” in which users of digital tools and platforms would be enticed to give up personal data in exchange for “free” products and access. See JARON LANIER, WHO OWNS THE FUTURE? (2013). The data, Lanier argues, could then be monetized by the owners of the platforms and applications, largely through the sale of the data to advertisers and others finding value in the users' personal characteristics and proclivities.

²⁸ Acquisti et al., *supra* note 22, at 444.

dimensionality and size, platforms that can track many users across those dimensions will have economies of scale and scope; they will be able to sell more valuable advertising.

Nonetheless, this targeting can also raise the quality of services provided by platforms. When they can identify individual tastes at fine levels and personalize their services to this taste, they often improve people's lives. Search engines can better answer queries or find a nearby destination, cultural and news websites are able to suggest well-suited content, and ecommerce websites can improve matching between buyers and sellers. These are all part of the consumer benefit described previously.

4) Types of Data

The definition of what constitutes a consumer's data can become complicated. Suppose the consumer's data and those of similar consumers allowed the service to infer characteristics about the consumer (for example, that she has a tattoo) without any action or communication on the topic by the consumer. Is this piece of information part of the "consumer's" data, or is it the intellectual property of the algorithm owner?

The Vestager Report and the Furman Report categorize data as volunteered, observed, or inferred. Volunteered data is intentionally provided by the user to the service -- for example, when a user provides their favorite TV shows to a service in order to receive recommendations. Observed data, such as the history of shows that the consumer actually watches, are automatically gathered by a service. Some observed data may not be intentionally provided by users if they do not understand the privacy protections in the service -- for example, location tracking of a person using a video app. Finally, the service can process volunteered and observed data to *infer* additional information about the user or a group of users.²⁹ We include (but do not always distinguish among) all these types of data in this report's discussions.

²⁹ See EC COMPETITION REPORT, *supra* note 1, at 25. Famously, Target claims to have been able to predict a customer's pregnancy before she knew about it. See Charles Duhigg, *How Companies Learn Your Secrets*, N.Y. TIMES (Feb. 16, 2012), <https://www.nytimes.com/2012/02/19/magazine/shopping-habits.html>.

Box II

Why Data Has Increasing Marginal Returns

For a particular dataset, suppose the first feature is the one the owner wants to predict for future users. For example, this feature might refer to whether or not a user will book a particular hotel if shown an advertisement for it. If $k=2$, and the second feature represents the home zip code of a user, there might be some limited ability to predict interest in a hotel based on this zip code being sufficiently far from the hotel. If $k=3$, consider the case where the third feature refers to the annual household income of each person.

With both zip code *and* income available, we can express much more complex prediction rules for interest in hotel X . For example, we could predict that a user will book the hotel if

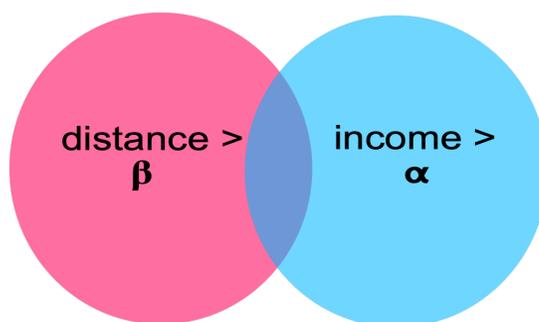
$$\alpha \cdot \text{distance} + \beta \cdot \text{income} \geq \gamma,$$

for some $\alpha, \beta, \gamma \geq 0$. If the *true* relationship between these three features is in fact linear, then the utility of gathering the income variable will be marginally decreasing in the set of other (linearly relevant) features.

However, it might be that the best prediction of whether a hotel will be booked is a nonlinear function of distance and income; perhaps a person will book exactly when they live far enough away *and* make at least a certain amount of money:

$$\text{distance} \geq \alpha \text{ and } \text{income} \geq \beta$$

where users with $\text{distance} > \alpha$ and $\text{income} > \beta$ make up 10% of the distribution. Suppose 40% of the users have $\text{distance} > \alpha$, and 40% of the users have $\text{income} > \beta$.



Why Data Has Increasing Marginal Returns (Cont.)

Knowing a user's zip code (and corresponding distance) gives some limited ability to predict when both the income and distance are sufficiently large, but knowing both the zip code and income will allow them to perfectly predict the 10% of the population that might have interest in staying at the hotel. For this reason, the utility of data owners need not be marginally decreasing in the set of features they have.

To be explicit, fix an advertising firm for the hotel. If the advertising firm purchases the ability to see each potential advertisee's zip code, then showing the advertisement to customers as a function of their distance is now possible. For example, the advertiser could only show the advertisement to customers whose distance is more than β , increasing the probability that the ad is shown to an interested party from 10% to 25%. If the firm then acquired the ability to estimate each advertisee's income, it could use both features together and only show the advertisement to customers with both income $> \alpha$ and distance $> \beta$.

This would raise the probability that a targeted advertisee would be interested in the ad from 25% to 100%. The two features are otherwise identical, and so it would also be the case that first acquiring income and then distance would raise the probability of an advertisement reaching an interested customer from 10% to 25% to 100% if one started with no features, then added income, then distance. Therefore, the utility increase which comes from adding distance first is $.15 *$ (value of showing the ad to an interested customer), while the utility increase from adding distance after first acquiring income is $.75 *$ (value of showing the ad to an interested customer). That is, the distance feature is more valuable *after* first learning about income (and vice versa). This shows that the value of features may not be marginally decreasing in the set of features accrued thus far.

One can also use the same sort of relationship to argue that the dataset owner's utility need not be marginally decreasing in n , the number of people in the dataset. Again, suppose one can only predict interest in the hotel with the conjunction of zip code and income information, but that this relationship is not a priori known to the dataset owner, and they are instead trying to *learn* how to predict hotel interest based on a dataset they have available to them. Using statistical techniques, it won't be possible to learn rules of this form (if x and y then z) to a high degree of accuracy unless the dataset has sufficiently large n . The utility of adding additional people to the dataset can *increase* as the dataset grows, depending on the owner's utility for accuracy of the learned model.

ii. Data Control and Ownership

1) Status Quo

In the United States at present, a consumer has no property or control rights over their data. This stands in contrast to Europe, where the GDPR sets a standard for what a digital business can do with a consumer's data.

In the U.K., regulators have sought to give consumers *useful* control over their financial data. After a lengthy investigation showed that consumers rarely switch banks despite large gains to doing so, regulators sought to use Open Banking to give people the ability to seamlessly move between banks.³⁰ The Open Banking Initiative allows consumers to obtain, see, and transmit their banking activity in a standardized and secure fashion to regulated and approved third-party firms.³¹ This is an example of data portability. Theory suggests that consumers will use that power to move their business to banks that lower prices and improve services. If Open Banking causes more competitive outcomes, it may provide a strong model for regulated portability and interoperability in other markets.³² The Vestager Report defines protocol interoperability and data interoperability as stronger than data portability because they allow continuing communication between two services. It defines full protocol interoperability as a complete linking of the two services in a way that reduces network effects. We will return to these concepts below.

Data intermediaries collect consumers' information that they then sell to third parties. These intermediaries may be large websites obtaining the information through their service to consumers, or data brokers. Data have specific features that make this market unusual. For example, data are “non-rivalrous” meaning a broker can sell the same dataset to many buyers and still retain it, unlike, for example, the sale of apples. Once you've sold an apple, you're out an apple; once you've sold a given piece of information to one buyer, you can sell it again to another buyer. A key feature of data in this context is that data may be either directly shared with the buyer, or withheld (to prevent the buyer from achieving its own economies of scale and scope) but embedded into a service the buyer wants, such as targeting advertising.³³

³⁰ See Alasdair Smith et al., *RETAIL BANKING MARKET INVESTIGATION: FINAL REPORT*, U.K. COMPETITION & MARKETS AUTHORITY (Aug. 2016), <https://assets.publishing.service.gov.uk/media/57ac9667e5274a0f6c00007a/retail-banking-market-investigation-full-final-report.pdf>, at xiii-xiv.

³¹ See U.K. COMPETITION & MARKETS AUTHORITY, *THE RETAIL BANKING MARKET INVESTIGATION ORDER 2017* (2017), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/600842/retail-banking-market-investigation-order-2017.pdf; see also OPEN BANKING LTD., *OPEN BANKING: GUIDELINES FOR PARTICIPANTS* (2018), <https://www.openbanking.org.uk/wp-content/uploads/Guidelines-for-Open-Data-Participants.pdf>; Rowland Manthorpe, *What is Open Banking and PSD2? WIRED Explains*, *WIRED* (Apr. 17, 2018), <https://www.wired.co.uk/article/open-banking-cma-psd2-explained>. Third party firms that customers can elect to give data access are regulated and approved by the Financial Conduct Authority. See Press Release, U.K. Fin. Conduct Auth., *FCA Finalises Revised Payment Services Directive (PSD2) Requirements* (Sept. 9, 2017), <https://www.fca.org.uk/news/press-releases/fca-finalises-revised-psd2-requirements>.

³² There are some signs that Open Banking has seen early success. See U.K. COMPETITION REPORT, *supra* note 1, at 70.

³³ See Dirk Bergemann & Alessandro Bonatti, *The Wild West of Information Markets: What We Need to Know Before Law and Order Can Rule*, *VOX* (Oct. 11, 2018), <https://voxeu.org/article/wild-west-information-markets>; Dirk Bergemann & Alessandro Bonatti, *Markets for information: An Introduction*, (Cowles Foundation Discussion Paper No. 2142, Aug. 29, 2018), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3240310.

2) Externalities

What can a person do with ownership over her data? The previous section describes two ways in which data might be used: First, it might be used to tailor services to a given person; second, it might be used to learn patterns that hold on average for the population from which the dataset was drawn. The former does not necessarily transfer any knowledge about one customer to the treatment of another, while the latter aims to learn about some fraction of a dataset and use that information to affect interactions with future customers. Note that this use of data creates externalities between consumers. Purchase or travel patterns by one person are used to create recommendations or suggestions for similar people, where “similar” is determined by machine learning. For this reason, the value of an individual person’s data is more than the value of using it to market to them. A customer whose data predicts the behavior of many other consumers is very valuable to a platform.

3) Deletions

One might simplistically think that “owning” one’s own data gives a person the ability or right to delete it. The ease with which a customer’s data can truly be deleted depends on the way the firm has created and is using that data. If a user’s own data is used only to personalize her experience, deleting her data will mean that the dataset—and the service’s subsequent behavior—has no trace of the customer ever belonging to the dataset. If, however, the service used the customer’s data to inform population-wide behavior (by analyzing the dataset including this customer and storing the results of those analyses), merely deleting the customer’s data from the dataset does not truly erase her presence—her data will still have a lasting effect on the future behavior of the service.

For example, suppose the service scans the dataset for one representative user from each zip code and remembers the purchasing history of each representative user. Even if the service removes the initial entry corresponding to a particular user in the original dataset, if the service still uses this set of representative users’ purchasing histories, some of the user’s data can still remain in the system. While this example may seem contrived, many machine learning methods do some amount of memorization of some subset of their training data.³⁴

Beyond memorization, there are other, more subtle ways in which a user’s data can affect the long-term behavior of a system and what information the system holds on to. The natural tool to restrict how much a system’s information is affected by one user’s data is to impose *differential privacy*. Loosely speaking, differential privacy restricts the statistics created from the dataset to not reveal if any particular person or observation is in the dataset.

³⁴ For example, support vector machines are explicitly recorded as a small number of datapoints on which the model was learned.

4) Transparency, Choice, and Fraud

According to the Federal Trade Commission, the market for data suffers from a lack of transparency.³⁵ Most consumers have no idea how much information is being collected about them, sold, and used to make a profit.³⁶ One way in which digital platforms exploit their market power is by requiring consumers to agree to terms and conditions that are unclear, difficult to understand, and constantly changing. The terminology in these contracts is legal and the documents are often lengthy; the consequence of the different clauses is difficult to understand and foresee. Moreover, the user of a device or platform makes a choice to sink investments (posts, calendars, media, and so on) in a particular platform at a moment in time when a particular user agreement is in force. After the device or platform updates its terms of service, a user may be locked in. Having bought a phone, they won't immediately want to switch; having built a network of friends, they often won't want to leave. Thus, the user does not have the same set of choices as she did the first time she hit "agree," and some agencies have argued this is no longer a free choice.³⁷ Lastly, a digital platform may describe its data-use policy in its terms of service and then deviate from that, rendering the initial statement fraudulent.³⁸

Box III Digital Identities

Perhaps the next major shift in digital competition will be the quest to control the identification market. Once we create an account with any digital platform, we create a digital identity which incorporates select data on age, sex, address, email address, preferences, and, frequently, much more. These digital identities help companies identify and tag users to the data they generate, be it transactional, social, simple web navigation or even meta data. Digital identities work like access and tracking mechanisms, allowing a user to surpass a wall in exchange for enabling the company to link the data to a given dataset (e.g., using a Facebook login to access a website).

Identity data and control is highly valuable and platforms can monetize it in many ways. They can use it to personalize services and charge subscription fees, provide advertising or market intelligence, or as a way to increase bottleneck power and charge companies for user access. The more privacy protection technologies grow and limit widespread data collection online, the more being the single identification point for users will grow in importance and value.

³⁵ FED. TRADE COMM'N, DATA BROKERS: A CALL FOR TRANSPARENCY AND ACCOUNTABILITY: A REPORT OF THE FEDERAL TRADE COMMISSION (2014), <https://www.ftc.gov/system/files/documents/reports/data-brokers-call-transparency-accountability-report-federal-trade-commission-may-2014/140527databrokerreport.pdf>.

³⁶ *See id.* at 42.

³⁷ *See* Press Release, Bundeskartellamt, Bundeskartellamt Prohibits Facebook from Combining User Data from Different Sources (Feb. 7, 2019), https://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2019/07_02_2019_Facebook.html (determining that Facebook's take-it-or-leave-it under agreements constitute "abuse of market power").

³⁸ *See, e.g.,* Tony Romm & Elizabeth Dwoskin, *U.S. Regulators Have Met to Discuss Imposing a Record-Setting Fine Against Facebook for Privacy Violations*, WASH. POST (Jan. 18, 2019), <https://www.washingtonpost.com/technology/2019/01/18/us-regulators-have-met-discuss-imposing-record-setting-fine-against-facebook-some-its-privacy-violations>.

iii. Digital Platforms are Characterized by Free Services

“Free” is not a special zone where economics or antitrust do not apply.³⁹ A free good is one where the seller has chosen to set a monetary price of zero and may set other, non-monetary, conditions or duties. Zero is a number, just like 10 is a number. If a competitive price is \$10 while the realized price is \$15, there is a \$5 markup above the competitive price. This is the same harm the consumer bears when the competitive price is -\$5 (at this price the digital platform is actually paying the consumer for her data and information in addition to providing her with services) and the realized price is \$0.

Barter is a common way in which consumers pay for digital services. They barter their privacy and information about what restaurants they would like to eat in and what goods they would like to buy in exchange for digital services. The platform then sells targeted advertising, which is made valuable by the bartered information. But, in principle, that information has a market price. It is not easy to see if the value of any one consumer’s information is exactly equal to the value of the services she receives from the platform. However, many digital platforms are enormously profitable, and have been for many years, which suggests that in aggregate we do know the answer: the information is more valuable than the cost of the services. The economics literature has modeled this setting and is able to define a data markup.⁴⁰

The current inability to use both positive and negative prices for digital goods means that the policy discussion cannot focus on dollars alone as the unit of cost. Rather, digital platforms should be analyzed using both price and quality. “Quality-adjusted price” is a metric often used by economists in this situation. If a platform’s price is fixed at zero and the quality of the service improves, then its quality-adjusted price has fallen. Conversely, if a platform’s price remains zero but its quality falls, its quality-adjusted price has risen. When the price is fixed at zero, it is possible to track quality-adjusted price over time: the movement in quality accurately reflects quality-adjusted price.⁴¹

Online platforms offer many services for zero monetary price while they try to raise participation in order to generate advertising revenue. Free services are prevalent on the internet in part

³⁹ See, for example, the current head of the U.S. Department of Justice’s Antitrust Division describing the challenge faced by his division of defining markets when goods are free. Makan Delrahim, U.S. Assistant Att’y General, “I’m Free”: Platforms and Antitrust Enforcement in the Zero-Price Economy, Address at Silicon Flatirons Annual Technology Policy Conference at The University of Colorado Law School (Feb. 11, 2019), <https://www.justice.gov/opa/speech/assistant-attorney-general-makan-delrahim-delivers-keynote-address-silicon-flatirons> (arguing, without regard for quality effects, that traditional antitrust market definition cannot work because “[w]e cannot look at the effects of a five percent increase in price because five percent of zero is still zero”). See also *id.* (arguing that “[c]hoosing variables for measuring market shares also can be more complicated where shares of revenue is not an option”).

⁴⁰ See Dirk Bergemann et al., *The Design and Price of Information*, 108 AMER. ECON. REV. 1 (2018).

⁴¹ The European Commission has noted the importance of assessing product quality in zero-price settings. See Samson Y Esayas, *Competition in (Data) Privacy: ‘Zero’-Price Markets, Market Power, and the Role of Competition Law*, 8 INT. DATA PRIVACY L. 181 (2018).

because internet firms can harness multi-sided network externalities. While the low price can be a blessing for consumers, it has drawbacks for competition and market structure in a world where institutions have not arisen to manage negative prices. Because there is currently no convenient way to pay consumers with money, platforms are able to mark up the competitive price all the way to zero. This constraint can effectively eliminate price competition, shifting the competitive process to quality and the ability of each competitor to generate network externalities. Depending on the context this may favor or impede entry of new products. For example, entry will be encouraged when a price of zero leads to supra-competitive profits, and impeded when a zero price prevents entrants from building a customer base through low price. Moreover, unlike traditional markets where several quality layers may coexist at different price levels (provided that some consumers favor lower quality at low price), markets where goods are free will be dominated by the best quality firm and others may compete only in so far as they can differentiate their offers and target different customers. This strengthens the firm's incentive to increase quality through increasing fixed costs in order to attract customers (known as the Sutton sunk cost effect) and further pushes the market toward a concentrated market structure.⁴²

It is a puzzle that, to date, no entrepreneur or business has found a way to pay consumers for their data in money. For example, a consumer's wireless carrier could aggregate micropayments across all manner of digital destinations and apply the credit to her bill each month. It may be that adverse selection, transaction costs, and coordination difficulties create too large a barrier for today's entrepreneurs, though technical solutions like a verifiable digital identity, mentioned above, would combat adverse selection.⁴³ Furthermore, a carrier that could bargain effectively with platforms on behalf of its subscribers for high payments would likely gain subscribers. Notice that an easy method to pay consumers, combined with price competition for those consumers, might significantly erode the high profits of many incumbent platforms. Platforms likely have no economic incentive to work diligently to operationalize negative prices.

⁴² See SUTTON, *supra* note 7.

⁴³ See ERIC A. POSNER & E. GLEN WEYL, *RADICAL MARKETS: UPROOTING CAPITALISM AND DEMOCRACY FOR A JUST SOCIETY* (2018).

III. PROBLEMS ARISING IN DIGITAL MARKETS

The changing market dynamics, outlined above, raise doubts about the market's ability to ensure ongoing innovation and competition. Increased concentration levels, market power, network effects, and control over data and analytics have in many digital markets tipped the market in favor of the incumbents.

The theme we return to throughout this report is the difficulty of entry into digital platform businesses once an incumbent is established. Whether the entrant is vertical or horizontal, has succeeded to some degree, is nascent, or is a potential entrant, its existence improves consumer welfare. Either the entrant provides more choice, different features, and a chance of higher quality, or the threat of those outcomes spurs the incumbent to provide lower prices, higher quality and innovation, and to do so more quickly.

By focusing on this feature of digital platforms, we are highlighting the *cause* of the market power, not its result. Absent entry barriers of the type discussed above, the tremendous amount of profit available in these markets would stimulate entry. Protecting competition in these markets requires protecting competitors. Entry and potential entry create more competitors (in expectation), and that increase depends on competition working effectively so that a meritorious entrant can successfully dethrone the incumbent.

The categories of economic harms to consumer welfare from digital platforms are the standard ones: price, quality, and innovation. The report will primarily emphasize quality and innovation harms due to their greater complexity and generality. For example, by excluding competitors, dominant firms do not need to innovate as hard as they otherwise would be required to keep their customers. Likewise, when platforms do not face competition, they will be able to reduce quality, for example, by decreasing privacy protections, without losing customers or revenue.⁴⁴ When a service reduces quality without lowering price, it is *raising* quality-adjusted prices, which harms consumers. For example, if a phone service were to lower the quality of service but keep monthly fees the same, it would have raised quality-adjusted price. Because many digital services are purchased with barter, the monetary price paid by consumers is zero, and quality-adjusted prices cannot be directly seen the way a nominal price can be. On the advertiser side of the platform, where monetary prices *are* charged, harms to competition exist in the more ordinary form of higher markups for ads and other services. These markups are eventually paid by consumers because they are built in to the prices of the goods and services that are advertised online.

⁴⁴ See Agustín Reyna, *The Psychology of Privacy—What Can Behavioural Economics Contribute to Competition in Digital Markets?*, 8 INT. DATA PRIVACY L. 240 (2018).

a. Quality Harms

i. Personal Data and Behavioral Economics

1) Behavioral Economics

As discussed above, behavioral economics helps improve our understanding of real consumer choices and suggests that consumer exploitation is common. There are a number of systematic consumer biases that, when incorporated into economic analysis, affect outcomes and welfare. For instance, individuals can be subject to salience effects, putting excessive weight on the most salient information. Confirmation bias can lead them to change their preferences to conform with past choices.⁴⁵ Consumers are often biased toward the status quo even when it is no longer optimal.⁴⁶ Perhaps the most important consumer biases are impatience and lack of self-control. The former refers to the discounting of any payoff that occurs further in the future than the present. The latter is closely related and refers to the extent to which individuals fail to resist short-term impulses in order to achieve long-term goals. The literature in behavioral antitrust argues that status quo, salience, and impatience are the most relevant for antitrust analysis.⁴⁷ Platforms that analyze their consumers' behavior can exploit these biases by framing choices to make certain information salient, designing a status quo that is profitable, inducing addictive behaviors, generating sales through impulsive consumption, and exploiting consumers' disinclination to search. These strategies are common in the brick and mortar world. For example, the candy aisle in supermarket check-out lines, or the rug store that has a special 50%-off sale every day.

2) Using Machine Learning to Take Advantage of Consumers

There are now decades of economic research demonstrating consumer bias and firm responses in offline markets.⁴⁸ For example, gyms offer subscription memberships rather than pay-per-visit

⁴⁵ *Confirmation Bias*, WIKIPEDIA (Mar. 22, 2019), https://en.wikipedia.org/wiki/Confirmation_bias (“Confirmation bias is the tendency to search for, interpret, favor, and recall information in a way that confirms one's preexisting beliefs or hypotheses.”); see, e.g., Thaler, *supra* note 19, at 1266 (“People guess that in the United States today gun deaths by homicide are more frequent than gun deaths by suicide, although the latter are about twice as common. The bias comes because homicides are more publicized than suicides, and thus more ‘available’ in memory.”).

⁴⁶ William Samuelson & Richard Zeckhauser, *Status Quo Bias in Decision Making*, 1 J. RISK & UNCERTAINTY 7, 8 (1988) (“[D]ecision makers exhibit a significant status quo bias. Subjects in our experiments adhered to status quo choices more frequently than would be predicted by the canonical model.”).

⁴⁷ See Amelia Fletcher, *The EU Google Decisions: Extreme Enforcement or the Tip of the Behavioral Iceberg?*, COMPETITION POL. INT. ANTITRUST CHRON. (Jan. 2019), <https://www.competitionpolicyinternational.com/wp-content/uploads/2019/01/CPI-Fletcher.pdf>.

⁴⁸ See, e.g., DANIEL KAHNEMAN & THOMAS GILOVICH, *HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT* (2002); Nicholas Barberis & Richard Thaler, *A Survey of Behavioral Finance*, in *HANDBOOK OF THE ECONOMICS OF FINANCE* (René M. Stulz & George Constantinides eds., 2003); see also, e.g., Daniel Kahneman, Jack L. Knetsch, & Richard H. Thaler, *Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias*, 5 J. ECON. PERSP. 193 (1991).

knowing that members will not come as often as they anticipate,⁴⁹ and credit cards offer teaser rates knowing that consumers plan to have no debt in 6 months' time.⁵⁰ However, the strategies firms have used to date are swamped by what digital businesses can learn by using high-dimensional, large datasets to explore every nook and cranny of consumers' many behavioral shortcomings and biases in real time. This strategy is of serious concern when combined with an understanding of the digital platform business model discussed above. The platform's goal is to use its knowledge of consumers, combined with its market power (and the resulting lack of consumer choice), to extract profit. Some of that profit may come from value creation, or "expanding the pie," but some will come from transfers to the platform from both the consumer side and the advertiser side. Because individuals are subject to behavioral biases, consumers are vulnerable to a platform's exploitative behavior. Additionally, when individuals are workers, as they often are in the "gig" economy, these tools can be used to advantage the platform against the worker.

Digital businesses not only have more information than traditional firms, but they have more variations of products or services and the ability to control the environment and the timing of choices and offers. For example, a firm can hide a component of a good's price to let consumers discover prices only once they have invested significant time and effort into buying the good. This strategy can be differentially employed depending on the consumer's past willingness to pay. Framing, nudges, and defaults can direct a consumer to the choice that is most profitable for the platform. A platform can analyze a user's data in real time to determine when she is in an emotional "hot state" and offer a good that the user would not purchase when her self-control was higher. Consider a supercomputer tracking a consumer, via her cell phone, around the town until she is tired and frustrated in some way, and at that moment presenting her ads and information about junk food. This type of exploitation could depend on input from devices such as eye-tracking sensors, the ability of AI to understand the emotion expressed in texts and email, and all the other data the platform has about the consumer combined at a very large scale. This same tactic can be used to gain advantage against an independent contractor, e.g. a driver, whose behavior and location can be tracked for long periods.⁵¹ In addition, machine learning applied to big data may help differentiate well-informed and sophisticated consumers or workers from poorly informed or more naïve consumers, raising the possibility of further exploitation of those least prepared to resist it.

Internet firms make frequent use of digital defaults, framings, and nudges. When a user is signing up for a new service, the sign-up form may automatically check the box that permits the service to send the user emails.⁵² A user can opt-out of receiving emails by unchecking the box,

⁴⁹ See Stefano DellaVigna & Ulrike Malmendier, *Paying Not to Go to the Gym*, 96 AMER. ECON. REV. 694 (2006).

⁵⁰ See Oren Bar-Gill & Ryan Bubba, *Credit Card Pricing: The CARD Act and Beyond*, 97 CORNELL L. REV. 967 (2012).

⁵¹ <https://www.nytimes.com/interactive/2017/04/02/technology/uber-drivers-psychological-tricks.html>

⁵² This is no longer permitted in the European Union. See Regulation (EU) 2016/679 of the European Parliament and the Council of 27 April 2016 on the Protection of Natural Persons with Regard to the Processing of Personal Data

but doing so is harder than sticking with the default. The results of a search that fits onto one page may all be sponsored, whereas finding the organic links requires paging down. *Homo economicus* is hardly influenced by defaults—to a rational agent, scrolling down or unchecking a box is trivial—but real people are influenced. Nudges are not unique to digital products; for example, an employer offering a default health care plan to its employees nudges employees towards choosing that plan—employees can select a different plan, but doing so is harder than sticking with the default.⁵³ What is noteworthy, however, is the platform’s detailed, personalized, minute-by-minute control over their interface. This control enables platforms to create a façade of competition, choice, and autonomy when in fact users are being directed with behavioral techniques.⁵⁴

With big data and machine learning, firms are able to understand and manipulate individual preferences at a scale that goes far beyond what is possible in traditional markets. This capability is qualitatively new. The environment is characterized by extreme asymmetries of information and analytical capacity between the platform and the user. This enables firms to charge higher prices (for goods purchased and for advertising) and engage in behavioral discrimination, allowing platforms to extract more value from users where they are weak.⁵⁵ The problem is only growing; platforms continue to make investments to extract data, encourage stickiness and addiction, and promote ever-greater use, in order to run data analytics and enable more precise targeting.⁵⁶

The economic literature suggests that competition by itself cannot resolve the issue raised by the exploitation of behavioral biases or poor consumer information. This is because staying profitable in a competitive environment may force firms to exploit behavioral bias to achieve maximal profitability. Firms abstaining from doing so may be driven out of the market. Rather, competition causes a shift of surplus to wiser consumers; profit from exploitation of biased consumers is used to compete for well-informed consumers. For consumers who can guard against exploitation, there are therefore significant gains to be had from competition. But this

and on the Free Movement of Such Data, and Repealing Directive 95/46/EC (General Data Protection Regulation), 2016 O.J. (L 119/1), § 32 (“Silence, pre-ticked boxes or inactivity should not . . . constitute consent.”).

⁵³ Thaler, *supra* note 19, at 1283. Default settings have very large effects, for example, in voluntary organ donation decisions. Countries with an opt-in default generally have the vast majority of the nation’s adults enrolled to donate, while countries with default opt-out decisions see the opposite result. See Eric J. Johnson & Daniel Goldstein, *Do Defaults Save Lives?*, 302 SCIENCE 1338 (2003).

⁵⁴ See ARIEL EZRACHI & MAURICE E. STUCKE, VIRTUAL COMPETITION: THE PROMISE AND PERILS OF THE ALGORITHM DRIVEN ECONOMY (2016) (comparing the façade of choice and autonomy on digital platforms to the Truman Show).

⁵⁵ For a discussion of the use of online price and behavioral discrimination, see Maurice E. Stucke & Ariel Ezrachi, *How Digital Assistants Can Harm Our Economy, Privacy, and Democracy*, 32 BERKELEY TECH. L.J. 1239 (2018); Maurice E. Stucke & Ariel Ezrachi, *Alexa et. al., What Are You Doing with My Data?*, 5 CRITICAL ANALYSIS L. 148 (2018).

⁵⁶ Haley Sweetland Edwards, *You’re Addicted to Your Smartphone. This Company Thinks It Can Change That*, TIME (Apr. 13, 2018, 10:28 AM), <http://time.com/5237434/youre-addicted-to-your-smartphone-this-company-thinks-it-can-change-that>.

will not be true for all people; some will be taken advantage of under perfect competition if consumer protection regulations are insufficient. Hence, while this report focuses on the competition problems created by powerful platforms, related issues raise broader consumer protection concerns that cannot be solved through greater competition.

ii. The Harms from an Advertising-Supported Business Model

1) Market Power Leads to Markups

Access to high-quality data, scale, and scope has allowed a few large platforms to offer efficient targeting services for advertising and to dominate the advertising market. Facebook, Google, and, increasingly, Amazon act as gatekeepers to the online advertising market. The three platforms provide access to billions of users, as well as a data-rich environment, essential for modern online advertising. Being in control of the data and the assets—users—creates market power. That market power generates a profit margin which, for ad-supported platforms, comes from the sale of advertising. One of the characteristics of the digital advertising environment is its opacity: major platforms are able to leave bidders and publishers in the dark with respect to the true success, costs, and profits from placement of advertising. This can be exacerbated when the platform also supplies buyer or publisher tools and analytics. Opacity is partially a consequence of market power. Market power can be used to discourage, or even prevent, multi-homing by buyers. One additional concern is that this opacity may give firms not only the normal ability to exercise market power in intermediation but also to engage in fraud.⁵⁷ Lack of transparency also undermines buyers' ability to measure the effectiveness of digital advertising and therefore to understand its true value relative to price.⁵⁸

A report by the French Competition Authority estimated that publishers received 40% of advertiser sales, with intermediaries collecting the rest.⁵⁹ What justifies such a large markup for intermediaries? Without detailed study we cannot know for sure. However, reasons likely include the fact that very few platforms can target customers (who may be single-homing) using detailed and accurate data, so advertisers cannot take advantage of competition. The platforms do

⁵⁷ See, e.g., Suzanne Vranica & Jack Marshall, *Facebook Overestimated Key Video Metric for Two Years*, WALL ST. J. (Sept. 22, 2016), <https://www.wsj.com/articles/facebook-overestimated-key-video-metric-for-two-years-1474586951>; Mike Shields, *Facebook Says it Found More Miscalculated Metrics*, WALL ST. J. (Nov. 16, 2016), <https://www.wsj.com/articles/facebook-says-it-found-more-miscalculated-metrics-1479303984>; Cyrus Farivar, *Advertisers Allege Facebook Hid the Fact That No One Watches Video Ads*, ARSTECHNICA (Oct. 17, 2018), <https://arstechnica.com/tech-policy/2018/10/advertisers-allege-facebook-hid-the-fact-that-no-one-watches-video-ads> (reporting allegations that Facebook's "average viewership metrics were not inflated by only 60-80 percent; they were inflated by some 150-900 percent").

⁵⁸ This in turn obscures the size of the platforms' markup. See SELECT COMMITTEE ON COMMUNICATIONS, HOUSE OF LORDS, 1ST REPORT OF SESSION 2017–19, HL PAPER 116, U.K. ADVERTISING IN A DIGITAL AGE 14, § 29 (2018), <https://publications.parliament.uk/pa/ld201719/ldselect/ldcomuni/116/116.pdf>; David Pidgeon, *Where Did the Money Go? Guardian Buys its Own Ad Inventory*, MEDIA NEWSLINE (Oct. 4, 2016), <https://mediatel.co.uk/newsline/2016/10/04/where-did-the-money-go-guardian-buys-its-own-ad-inventory>.

⁵⁹ FRENCH COMPETITION AUTHORITY REPORT, *supra* note 1, at 40, § 82.

not sell the data to advertisers, but promise to place the ad in front of the requested demographic. The advertiser lacks transparency or any ability to learn about its customers and potential customers. Moreover, a platform that operates in the advertising placement business holds the keys to a second black box through its control of the pricing process.⁶⁰ The integration of the business of running the price-discovery mechanisms as well as tools for each side of the platform enables opacity, which helps maintain market power. When a platform bundles services such as advertising placement and return-on-investment analysis with advertiser data such as completed purchases, it can further enhance its market power.⁶¹ The platform generally never shares the data with advertisers or publishers, but keeps it to itself, preventing disintermediation by a brand or publisher, further sustaining its large profit margin.

2) Incentives Created by Markups

Ad-supported platforms' high markups provide a powerful reason to try and keep users online for another minute in order to show more ads. These profits push platforms to design their firms around “engagement”—an obsession with keeping users on their system for as much time, and with as much attention, as possible.⁶² As much of the behavioral literature cited above shows, advertising-supported digital businesses can use consumer biases to hold people's attention in ways that ultimately harm them. Early empirical work has found such effects in social media. In a recent working paper, Hunt Allcott and colleagues found that Facebook users who were paid to leave the site for four weeks wound up with higher subjective well-being than similarly situated people randomly assigned to a group not offered the payment.⁶³ Users who took the break from Facebook had a “large and persistent reduction in Facebook use after the experiment,” along with reduced political polarization and news knowledge.⁶⁴ For the platform, engagement serves two reinforcing purposes. First, the more time a user spends on a platform, the more the platform knows about her. Second, the longer a user is on the platform, the greater its income from ads and services. Thus, the more time a user is on the platform, the more ads the platform can sell, and the more it can charge per ad.

⁶⁰ For example, Google's ownership of the ad platforms formerly known as DoubleClick and AdWords. See Todd Spangler, *Google Killing Off DoubleClick, AdWords Names in Rebranding of Ad Products*, VARIETY (July 27, 2018), <https://variety.com/2018/digital/news/google-doubleclick-adwords-rebranding-1202859088>.

⁶¹ See generally Einer Elhauge, *Tying, Bundled Discounts, and the Death of the Single Monopoly Profit Theory*, 123 HARV. L. REV. 397 (2009).

⁶² See, e.g., Mark Bergen, *YouTube Executives Ignored Warnings, Letting Toxic Videos Run Rampant*, BLOOMBERG (Apr. 2, 2019), <https://www.bloomberg.com/news/features/2019-04-02/youtube-executives-ignored-warnings-letting-toxic-videos-run-rampant> (“The company spent years chasing one business goal above others: ‘Engagement,’ a measure of the views, time spent and interactions with online videos.”).

⁶³ Hunt Allcott et al., *The Welfare Effects of Social Media* (NBER Working Paper No. 25514, Apr. 2019), <https://web.stanford.edu/~gentzkow/research/facebook.pdf>.

⁶⁴ *Id.* at 1.

This financial incentive may explain the growing use of tracking and the creation of ecosystems that are based on the ability to manipulate the user into staying longer on the platform.⁶⁵ This opens the door to exploitative tactics or content as a method of increasing engagement.

Furthermore, a second element to the large margin earned by a platform may be the low cost of the purchased content that keeps users on the platform. An important question (addressed more fully by the Media committee) is whether the prices for that content are set competitively. In a bargaining environment, the market power of the platform may allow it to negotiate a price for content that is below competitive levels, potentially creating dynamic harm to input providers.⁶⁶

The financial incentive created by a large markup can lead to anticompetitive behaviors as well as exploitative ones. Platforms may seek to reduce interoperability and awareness of outside options. For example, platforms may exclude certain services or increase friction in accessing third parties' services. High search and switching costs are used to "lock in" users and reduce the ability of competitors to access those users. Platforms may adopt strategies to reduce multi-homing to obtain more market power over their users. We will return to this theme below.

3) Resulting Quality of Content

As discussed in detail below, the cheapest way to keep users on a platform is to present content as being more attractive than users thought at the moment when they were ready to leave the platform, or to make departure more costly in other ways, so that users stay longer. (See a similar discussion in the Privacy Report.) The platform is essentially degrading the quality of the content offered in a way that present-biased human beings find engaging. As discussed further below, content that instantly engages most effectively is content that generates outrage, not necessarily content that is truthful or thoughtful. Simple strategies such as more advertising minutes per minute of content also lower quality. Low-quality content represents an increase in the quality-adjusted price of platform services experienced by consumers.

This business model, and the opacity that accompanies it, makes it difficult for either advertisers or consumers to realize they are being charged a markup and makes entry into these advertising markets extremely difficult. Because the advertiser side is where a platform earns its revenue, this is obviously a key entry barrier. The question of how an enforcer or regulator might enable entrants to overcome this barrier to entry is an important part of the discussion in Section III.B of the report.

⁶⁵ See Maurice E. Stucke & Ariel Ezrachi, *The Subtle Ways Your Digital Assistant Might Manipulate You*, WIRED (Nov. 29, 2016, 8:00 AM), <https://www.wired.com/2016/11/subtle-ways-digital-assistant-might-manipulate>.

⁶⁶ See Maurice E. Stucke & Ariel Ezrachi, *Looking Up in the Data-Driven Economy*, COMPETITION POL'Y INT'L (May 15, 2017), <https://www.competitionpolicyinternational.com/looking-up-in-the-data-driven-economy>.

4) Welfare and Efficiency

When analyzing the impact of online advertising and the behaviors it creates, one should keep in mind that antitrust aims to promote effective competition for the benefit of consumers.

Competition authorities tend to treat advertisers as any other customers of a service. The premise is that market power in advertising channels impedes the ability of brands to reach consumers and inform them about their products. Such a treatment of the welfare from advertising relies on the implicit view that i) the role of advertising is solely to inform consumers; and ii) competition in the advertising market leads to efficiency. The economic literature tells us that both assumptions are questionable, as does observation of digital markets.⁶⁷ In competition policy, when assessing the impact of a decision or a regulation involving advertising, it is important to focus on the final impact on consumers and market efficiency rather than on the advertisers' surplus.

On the one hand, targeted advertising to wise and well-informed consumers is welfare-improving insofar as it allows advertisers to send the right information to the right people, improving their choices and fostering competition among suppliers. On the other hand, in the modern economy this simple model becomes more complex because of the cost to the consumer, namely loss of privacy. There is an open empirical question as to whether the tradeoff is worthwhile to consumers.⁶⁸ We discuss the problem of measuring welfare in a setting where consumers are manipulated below.

iii. Online Exploitation and Addiction

1) Human Reward Systems

Digital platforms' manipulation of their users—in part designed to get users addicted—is getting a considerable amount of attention from the public. These actions lower the quality of a platform and harm users.

As discussed above, some platforms have deliberately incorporated features that feed human “reward” centers into their products to induce users to give more and more of their time—and data—to the platform. These tools are designed for scale—they become even more valuable the more traffic they carry and the more users they garner—and hence the competition among producers has been described as a competition for eyeballs.⁶⁹ Because the digital tools and

⁶⁷ See, e.g., Anderson, S. P., Waldfogel, J., & Stromberg, D. (Eds.). *Handbook of Media Economics*, vol. 1A (2016). Elsevier; Goldfarb, A., & Tucker, C. Digital economics. *Journal of Economic Literature*, 57(1), 3-43 (2019).

⁶⁸ See, e.g., Elizabeth Aguirre et al., *Unraveling the Personalization Paradox: The Effect of Information Collection and Trust-Building Strategies on Online Advertisement Effectiveness*, 91 J. RETAILING 34 (2015); Justin P. Johnson, *Targeted Advertising and Advertising Avoidance*, 44 RAND J. ECON. 128 (2013).

⁶⁹ See, e.g., Doni Bloomfield, *High-Speed Ad Traders Profit by Arbitraging Your Eyeballs*, BLOOMBERG (Nov. 7, 2014), <https://www.bloomberg.com/news/articles/2014-11-07/high-speed-ad-traders-profit-by-arbitraging-your-eyeballs>.

networks have been designed for use at scale, and because there is relatively little cost and considerable benefit associated with adding more users, producers want as much user engagement as they can get. The creators of digital products have benefited from social science and neuroscience findings that concern, for example, how certain colors or mechanics can feed a user's dopamine, much as nicotine does.⁷⁰ The Center for Humane Technology, which calls the problem the “hijacking of our society,” describes the issues as follows:

Facebook, Twitter, Instagram, and Google have produced amazing products that have benefited the world enormously. But these companies are also caught in a *zero-sum race for our finite attention*, which they need to make money. Constantly forced to outperform their competitors, they must use increasingly persuasive techniques to keep us glued. They point AI-driven news feeds, content, and notifications at our minds, continually learning how to hook us more deeply—from our own behavior.⁷¹

This business model is based on acquiring a large volume of data to generate income, and it has led to unprecedented investment in addiction—ensuring continuing use of the interface. From diaper apps,⁷² to rewarded ads (in which viewers are given in-app rewards, such as another “life” in a video game, in return for watching an ad)⁷³ internet firms harness their knowledge of second-to-second individual responses alongside social science learnings about human biases for maximum attention.⁷⁴ Researchers do not yet know the full extent of the harm (or potential harm) that may come from this sort of addiction and manipulation, but they are now actively engaged in relevant research.⁷⁵ What is known is that a business that depends on users staying online to watch ads and have their preferences harvested will focus its resources on keeping

⁷⁰ See Edwards, *supra* note 56.

⁷¹ Ctr. for Humane Tech., *Our Society is Being Hijacked by Technology*, HUMANE TECH (2018), <http://humanetech.com/problem>.

⁷² Edwards, *supra* note 56.

⁷³ *Rewarded Ads: A Win for Users, Developers, and Advertisers*, GOOGLE ADMOB (2018), <https://admob.google.com/home/resources/rewarded-ads-win-for-everyone>.

⁷⁴ The video app TikTok may have taken this approach to its logical conclusion. See John Herrman, *How TikTok is Rewriting the World*, N.Y. TIMES (Mar. 10, 2019), <https://www.nytimes.com/2019/03/10/style/what-is-tik-tok.html> (“TikTok assertively answers anyone’s *what should I watch* with a flood . . . [the app] has stepped over the midpoint between the familiar self-directed feed and an experience based first on algorithmic observation and inference. . . . It’s an algorithmic feed based on videos you’ve interacted with, or even just watched. It never runs out of material. It is not, unless you train it to be, full of people you know, or things you’ve explicitly told it you want to see. It’s full of things that you seem to have demonstrated you want to watch, no matter what you actually say you want to watch.”).

⁷⁵ See, e.g., Daria J. Kuss et al., *Problematic Mobile Phone Use and Addiction Across Generations: The Roles of Psychopathological Symptoms and Smartphone Use*, 3 J. TECH. BEHAVIORAL SCI. 141 (2018); José De-Sola Gutiérrez et al., *Cell-Phone Addiction: A Review*, 7 FRONTIERS PSYCHIATRY 175 (2016) (noting “a consensus about the existence of cell-phone addiction, but the delimitation and criteria used by various researchers vary”). The field is still nascent and there is no consensus that internet addiction exists or is a distinct psychological condition. See Francesca C. Ryding & Linda K. Kaye, “Internet Addiction”: *A Conceptual Minefield*, 16 INT. J. MENTAL HEALTH & ADDICTION 225 (2018) (criticizing the cavalier use of the term “internet addiction” without a firmer grasp of the problem); Kristyn Zajac et al., *Treatments for Internet Gaming Disorder and Internet Addiction: A Systematic Review*, 31 PSYCH. ADDICTIVE BEHAVIORS 979 (2017).

users online—for example, with intelligent and flexible algorithms.⁷⁶ The algorithm will learn from, and respond to, these basic human preferences, thereby delivering—perhaps along with good content—a large quantity of low-quality content.⁷⁷

2) Examples

There are many examples of exploitation of consumers who have sunk costs in a platform and may not be fully informed. For example, app designers have enticed children into playing free games that are built around in-app purchases, leading children to make large purchases without parental knowledge or permission. The U.K.’s consumer protection agency, the Office of Fair Trading, found that such purchases could be pricey: “A My Little Pony game, for example, offer[ed] users a virtual ‘mountain of gems’ for a real-life £69.99.”⁷⁸ Regulators around the world have cracked down to force companies to refund large payments that children make on their parents’ phones.⁷⁹ More disturbing examples of low-quality content are YouTube recommended videos that lead the viewer towards false or dangerous content.⁸⁰ Prior to having these patterns made public and criticized, a Google search about the earth’s geology would lead to a chain of recommendations that resulted in “flat earth” content;⁸¹ YouTube would offer

⁷⁶ Beginning in 2014, Twitter followed Facebook in centering around algorithm-selected content rather than simply displaying tweets from accounts a user chooses to follow in reverse chronological order. See Will Oremus, *Twitter’s New Order*, SLATE (Mar. 5, 2017),

http://www.slate.com/articles/technology/cover_story/2017/03/twitter_s_timeline_algorithm_and_its_effect_on_us_explained.html.

⁷⁷ See Paul Lewis, ‘Fiction is Outperforming Reality’: How YouTube’s Algorithm Distorts Truth, GUARDIAN (Feb. 2, 2018), <https://www.theguardian.com/technology/2018/feb/02/how-youtubes-algorithm-distorts-truth>; Paul Lewis & Erin McCormick, *How an Ex-YouTube Insider Investigated its Secret Algorithm*, GUARDIAN (Feb. 2, 2018), <https://www.theguardian.com/technology/2018/feb/02/youtube-algorithm-election-clinton-trump-guillaume-chaslot>; see also *Aim of the Project*, ALGOTRANSAPRENCY, <https://algotransparency.org/methodology.html?candidat=Francois%20Fillon&file=ytreco-presidentielle-2017-06-10>.

⁷⁸ Hilary Osborne, *OFT Warns Free Online Games Pressure Children Into In-app Purchases*, GUARDIAN (Sept. 26, 2013), <https://www.theguardian.com/money/2013/sep/26/free-online-games-children-apps>.

⁷⁹ See Press Release, U.K. Competition & Markets Authority, CMA Refers 3 Games to the ASA (June 4, 2015), <https://www.gov.uk/government/news/cma-refers-three-childrens-online-games-to-the-asa>; Press Release, Fed. Trade Comm’n, Apple Inc. Will Provide Full Consumer Refunds of At Least \$32.5 Million to Settle FTC Complaint It Charged for Kids’ In-App Purchases Without Parental Consent (Jan. 15, 2015), <https://www.ftc.gov/news-events/press-releases/2014/01/apple-inc-will-provide-full-consumer-refunds-least-325-million>; Press Release, Euro. Union, In-app Purchases: Joint Action by the European Commission and Member States is Leading to Better Protection for Consumers in Online Games (July 18, 2014), http://europa.eu/rapid/press-release_IP-14-847_en.htm.

⁸⁰ See Bergen, *supra* note 62.

⁸¹ See Casey Newton, *How YouTube Helps Flat-Earthers Organize*, VERGE (Feb. 20, 2019), <https://www.theverge.com/interface/2019/2/20/18232524/youtube-flat-earth-recommendation-algorithm-conspiracy>; Press Release, Google, Continuing Our Work to Improve Recommendations on YouTube (Jan. 25, 2019) (noting that the company was planning to “begin reducing recommendations of borderline content and content that could misinform users in harmful ways—such as videos promoting a phony miracle cure for a serious illness, claiming the earth is flat, or making blatantly false claims about historic events like 9/11”); see also Kevin Roose, *YouTube Unleashed a Conspiracy Theory Boom. Can it Be Contained?*, N.Y. TIMES (Feb. 19, 2019), <https://www.nytimes.com/2019/02/19/technology/youtube-conspiracy-stars.html>.

teenage girls interested in diets videos about how to get anorexia, and so forth.⁸² It is important to realize that this content is not chosen by human curators at the platform. Rather, the algorithm learns what content people will click on, and what content will cause them to stay on the platform longer, through many millions of small experiments; that is the content that is suggested and viewed. Exploitation and addiction caused by the optimization of the platform is a harm to consumers because they are likely watching lower-quality content than they would choose if they were fully informed in advance about how the content is chosen, or perhaps if they had alternative platforms to choose among.

iv. Privacy

Another worry is that the privacy of consumers on digital platforms is violated; this too is a decline in the quality of the product. For example, Facebook recently announced that it will merge the infrastructures of Facebook Messenger, WhatsApp, and Instagram. As the New York Times noted, “[t]he integration plan raises privacy questions because of how users’ data may be shared between services. WhatsApp historically required only a phone number when new users signed up. By contrast, Facebook and Facebook Messenger ask users to provide their true identities. Matching Facebook and Instagram users to their WhatsApp handles could harm those who prefer to keep their use of each app separate.”⁸³ Germany’s competition regulator responded to this announcement by prohibiting Facebook from combining data from different sources (such as WhatsApp or Instagram) with data from Facebook.com without a user’s explicit and voluntary consent.⁸⁴ Facebook’s eagerness to get third-party apps connected to its network has led to mass data leaks, exposing sensitive information from hundreds of millions of people.⁸⁵ And Facebook is hardly alone.⁸⁶

⁸² See Nicholas Thompson, *When Tech Knows You Better Than You Know Yourself*, WIRED (Oct. 4, 2018), <https://www.wired.com/story/artificial-intelligence-yuval-noah-harari-tristan-harris/> (reporting Tristan Harris, head of the Center for Humane Technology, arguing that “[t]he problem is [YouTube] doesn't actually care about what you want, it just cares about what will keep you next on the screen. The thing that works best at keeping a teenage girl watching a dieting video on YouTube the longest is to say here's an anorexia video”).

⁸³ Mike Isaac, *Zuckerberg Plans to Integrate WhatsApp, Instagram and Facebook Messenger*, N.Y. TIMES (Jan. 25, 2019), <https://www.nytimes.com/2019/01/25/technology/facebook-instagram-whatsapp-messenger.html>.

⁸⁴ See Bundeskartellamt, *supra* note 37.

⁸⁵ See, e.g., *Data on 540 Million Facebook Users Exposed*, BBC (Apr. 4, 2019), <https://www.bbc.com/news/technology-47812470>; *Millions of Facebook Passwords Exposed Internally*, BBC (Mar. 21, 2019), <https://www.bbc.com/news/technology-47653656>.

⁸⁶ See, e.g., Douglas MacMillan & Robert McMillan, *Google Exposed User Data, Feared Repercussions of Disclosing to Public*, WALL ST. J. (Oct. 8, 2018), <https://www.wsj.com/articles/google-exposed-user-data-feared-repercussions-of-disclosing-to-public-1539017194>; Chaim Gartenberg, *Twitter Advising All 330 Million Users to Change Passwords After Bug Exposed Them in Plain Text*, VERGE (May 3, 2018), <https://www.theverge.com/2018/5/3/17316684/twitter-password-bug-security-flaw-exposed-change-now>.

b. The Assessment Problem

i. Measuring Consumer Welfare in a Behavioral World

Each of these issues results in fundamental difficulties in applying standard antitrust analysis—which is related to the assessment of the welfare effects of various practices or of a merger—to digital markets. Adequate measures of volume, quality, and consumer surplus may be difficult to obtain. The number of users choosing a certain option may not reflect their true preferences if the platform can make that choice a default that is difficult to see or to change. The number of clicks on ads may not correlate with greater welfare if higher volume of clicks is obtained by exploiting lack of self-control and addictive behaviors.

Given the prevalence of behavioral effects in the digital economy, the measurement of consumer welfare must be carried out very carefully. As we have mentioned, behavioral economics is now a well-established discipline that can help sort different online behaviors and business practices. Incorporating this knowledge into the legal practice’s toolbox may help develop better measures of output and quality.⁸⁷ We caution, however, that the legal structure of US antitrust law is not well set up to accommodate this complexity as it opens the door for judges to weigh all manner of social concerns as well as traditional economic effects. We see two approaches that might be more fruitful. First, the fastest route to more accurate measures of welfare might well be for a digital regulator to limit the business models that serve harmful content, the way regulators limit the harm from mortgages by restricting debt to income ratios, the harm from prescription drugs by requiring access through a physician, and the harm from automobiles by requiring airbags and crash tests, to name a few examples. If platforms had little or no incentive to deliver harmful content to consumers, the standard consumer welfare toolkit would be more accurate in this market. Second, harmful content is also, from the viewpoint of the consumer’s long run or ex ante self, low-quality content. Analytical paradigms in antitrust analysis commonly deal with low quality and quality-adjusted prices, and could incorporate the role of exploitative content in this way.

Another reason to be pessimistic about measuring traditional surplus concepts is related to the barter nature of the exchange: Users barter attention and personal data for services. With a “free” service, consumers are paying for any expansion of activity with their attention to content. When facing a zero-money price, and when quality is difficult to observe, consumers are not receiving salient signals about the social value of their consumption because the price they believe they face does not reflect the economics of the transaction, and they are ignorant of those numbers.

⁸⁷ For a view of the role behavioral economics can play in legal practice, see *THE OXFORD HANDBOOK OF BEHAVIORAL ECONOMICS AND THE LAW* (Eyal Zamir & Doron Teichman eds., 2014).

ii. Assessing the Social Welfare of Advertising

Behavioral economics also calls for careful use of standard economic surplus measures when applied to the supply of advertising. Unlike supply of goods, higher value of advertising need not imply higher social value. As discussed above, when advertising efficacy relies on psychological nudges that bring people into consumption they would consciously avoid otherwise, more advertising may well mean less consumer welfare.

Moreover, while price competition directly benefits consumers, competition through persuasive advertising may waste resources.⁸⁸ To see this point, consider the following example: Two firms share the market equally without advertising. If one then uses advertising and shifts the demand toward that firm (perhaps by some psychological effect), it will then have a larger share of the market. However, if both firms decide to advertise, they will continue to share the market equally. If the advertising cost is not too large, both firms will advertise in order to preserve their market share. Therefore, despite advertising spending, the equilibrium sales and consumption are the same as without advertising. Here, allowing for advertising only induces wasteful spending, which in our setting is captured by the platform as profit. This is an extreme example, but it highlights that a higher volume of advertising—and greater platform profits—may not indicate an increase in social welfare in the same way we normally think a higher output of, for example, shoes, would indicate.

c. Harms to Investment and Innovation

i. Rents

Successful platform-style strategies pre-date the internet. For example, the key to Microsoft's business was the orchestration of ecosystem-wide innovation—the personal computer industry—to benefit its own core offering as well as complements provided by third-party partners.⁸⁹ The strategy we highlight in this section of the report is a successful platform's choice of how much rent to expropriate from these complementors. For example, Microsoft turned PC hardware—an essential complement to an operating system—into a commodity business with the main exception of the microprocessor made by Intel. However, PC applications software—again an

⁸⁸ Although subtler, the same point has been shown to hold in the economic literature about informative advertising that conveys useful information about products such as existence, location, and other product characteristics. See Kyle Bagwell, *The Economic Analysis of Advertising*, in 3 HANDBOOK OF INDUSTRIAL ORGANIZATION (Mark Armstrong & Robert Porter eds., 2007), [https://doi.org/10.1016/S1573-448X\(06\)03028-7](https://doi.org/10.1016/S1573-448X(06)03028-7); Simon P. Anderson & Régis Renault, *Advertising Content*, 96 AMER. ECON. REV. 93 (2006). In this case advertising brings real value to consumers. But competition to steer consumers from other suppliers and/or to preserve market share may still lead to excessive spending on advertising.

⁸⁹ See ANNABELLE GAWER & MICHAEL A. CUSUMANO, PLATFORM LEADERSHIP: HOW INTEL, MICROSOFT, AND CISCO DRIVE INDUSTRY INNOVATION (2002) (detailing the characteristics of these types of platforms).

essential complement to the OS—remained (in part) an area where other firms could enter, compete, and earn profit.

The level of market power attached to a successful platform is so high that it often gives the platform owner the ability to expropriate almost the entire surplus available on its platform. And the ability to add that surplus to its existing core profit is the incentive to do so. For example, Microsoft's actions to favor Word over WordPerfect expropriated surplus from an existing software complement to its operating system. Importantly, in this example, WordPerfect was not a potential entrant into, or substitute for, a PC operating system, so there was not an exclusionary theme. The distinction between complementors that could disintermediate the platform and are therefore potential rivals, and those that cannot is critical for the antitrust analysis below. When the platform owner takes steps to disadvantage complementors who have no market power, the complementors may resist by using non-market (political and legal) strategies. Such complainants were part of the antitrust cases against Microsoft. We see this response to current platforms by firms in Europe today.

Chamath Palihapitiya, a venture capitalist, has quoted Bill Gates as arguing that a platform exists whenever “the economic value of everybody that uses it exceeds the value of the company that creates it.”⁹⁰ In that world, complementors earn rents. By contrast, Ben Thompson, a tech journalist, argues that Facebook and Google are what he calls aggregators—firms that completely control the relationship between suppliers and users.⁹¹ His point is that this control allows the aggregator to exercise market power over one side of the platform, control access by the other side, and extract all the rents. This emphasis on the creation of complementor rents and their distribution or expropriation is a theme that runs through this Report.

When and how a platform appropriates the rents of its complementors varies and may engender different responses from complementors. At root, the reason the complementor is there in the first place is because the platform originally needed content to attract consumers, so it invited the complementors onto the platform. Businesses selling widgets on ecommerce sites, games on social media, and mapping apps on handsets, are all examples of complements that were critical to successfully launching a platform. The complementors make these investments thinking they will obtain a return, and that expected return leads to efficient levels of investment. If investments were made knowing that the returns would be zero, there might well be dynamic harm because the platform would not be able to get off the ground. (Or alternatively, the owner of the platform would have to vertically integrate into many applications and provide them

⁹⁰ Interview by Semile Shah with Chamath Palihapitiya, CEO, Social Capital (Sept. 16, 2015), <http://haystack.vc/2015/09/17/transcript-chamath-at-strictlyvcs-insider-series>.

⁹¹ Ben Thompson, *Tech's Two Philosophies*, STRATECHERY (May 9, 2018), <https://stratechery.com/2018/techs-two-philosophies> (contrasting platforms, such as Microsoft and Apple, which “need 3rd parties to make them useful and build their moat through the creation of ecosystems,” with aggregators, such as Facebook and Google, which “attract end users by virtue of their inherent usefulness and, over time, leave suppliers no choice but to follow the aggregators’ dictates if they wish to reach end users”).

itself.) A significant source of discontent today seems to come from complementors who invested believing that they could capture surplus with a good product and who are later expropriated by the platform. A second discontented group are the complementors that existed in the brick and mortar world and now have no choice but to use a dominant platform, so they have no bargaining power despite providing valuable products or services.

If the expropriation is accomplished using a tool that is anticompetitive, it may violate competition laws. In the United States, this antitrust violation can be established when the complementor may be able to disintermediate the platform and is therefore a potential rival, for example, Netscape and Windows.⁹² If such a move is not a violation of competition law but violates the expectations of market participants, it may be viewed as unfair. On the other hand, if the platform has significantly improved quality or engaged in innovation, market participants may think the platform fairly earned those rents.

Digital platforms have a variety of rent-extraction strategies that seem to be loosely related to the social scrutiny they are receiving.⁹³ For example, the news industry had no choice but to use Facebook. But Facebook has been reluctant to share any of its profits with news companies—and its market power has meant it hasn't had to.⁹⁴ Interestingly, when content providers have market power, the platform cannot always extract rents, even when it has a high market share. Take the hypothetical case of a fragmented travel platform industry in a geography where the airline market is concentrated. In that setting airlines could disintermediate a travel site by withholding their participation in the site, or by favoring their own sales channels. The equilibrium division of platform rents in this case will favor the powerful content providers, the airlines, rather than the platforms.⁹⁵ Market participants observe that Facebook has slowly commoditized most companies which supply attention to its users—from news and content markets to games and apps, companies' profits deriving from Facebook have slowly diminished as Facebook appropriated most of the gains.⁹⁶ These trends may be part of the reason there is growing attention to Facebook's business model today.

⁹² The antitrust theories of harm that cover this case are discussed below.

⁹³ See, e.g., Josh Dzieza, *Prime and Punishment: Dirty Dealing in the \$175 Billion Amazon Marketplace*, VERGE (Dec. 19, 2018), <https://www.theverge.com/2018/12/19/18140799/amazon-marketplace-scams-seller-court-appeal-reinstatement> (discussing the fear Amazon sellers have of the firm and its ability to shut them down with little or no explanation); Izabella Kaminska, *Amazon (sub)Prime?*, FIN. TIMES (Mar. 20, 2019), <https://ftalphaville.ft.com/2019/03/20/1553085361000/Amazon--sub-Prime->

⁹⁴ See Ben Thompson, *The BuzzFeed Lesson*, STRATECHERY (Jan. 28, 2019), <https://stratechery.com/2019/the-buzzfeed-lesson/> (“[C]ontent suppliers are absolutely commoditized: Facebook doesn't need to do anything to keep them on the platform, because where else will they go? Might as well keep the money for itself.”).

⁹⁵ For a related setting, see Fiona Scott Morton et al., *Benefits of Preserving Consumers' Ability to Compare Airline Fares*, (unpublished manuscript, 2015) (on file with authors).

⁹⁶ See, e.g., Thompson, *supra* note 94; Pete Brown, *More Than Half of Facebook Instant Articles Partners Have Abandoned It*, COLUM. J. REV. (Feb. 2, 2018), https://www.cjr.org/tow_center/are-facebook-instant-articles-worth-it.php; Harrison Weber, *Facebook Kicked Zynga to the Curb, Publishers Are Next*, VENTUREBEAT (June 30, 2016), <https://venturebeat.com/2016/06/30/facebook-kicked-zynga-to-the-curb-publishers-are-next>.

Today's prominent tech companies most likely learned from older tech businesses that those older businesses had "lost," or shared, a too-high percentage of profits with their ecosystems. While older businesses were continually confronted with questions about what to own versus what to cede to partners on their platform, without today's technological advancements (including advanced data analytics and greater computational power), older platforms were not as swift and flexible in capturing value as current digital platforms can be. The increased scale and scope of control has provided modern digital platform owners with increased power over their ecosystems. Today's platforms understand that they can obtain higher margins if they either make all of the necessary complements themselves or position themselves as a mandatory bottleneck between partners and customers—leading to many platforms taking a significant commission on sales on their platform or extracting value through barter of information. In particular, today's digital platforms are very careful to maintain complete control over the user relationship so that they do not face any threat of disintermediation. These choices can be used to reduce the possibility of successful entry by an innovator in the platform's space. The next section turns to this problem of entry.

d. Harm to Entry, Including Disintermediation

i. The Practical Consequence of Entry Barriers

When evaluating entry as the main source of competition against a platform, as discussed above, the entrant has a significant disadvantage relative to the platform. Venture capitalist investors will often evaluate a startup based on its ability to either access or build enough data swiftly enough, all with the aim of reaching enough insights to take advantage of all the forces discussed above. In other words, a new entrant starved of data, quantitatively and qualitatively speaking, relative to a tech giant, is at a significant competitive disadvantage, and investors will be unlikely to invest if they view that data deficit as insurmountable. Although it can be attractive for a VC to invest in a firm that may be acquired by Facebook, Google, or Amazon, the road to a successful acquisition is fraught with danger, most notably the ability of any of these three giants to replicate a specific feature, functionality, or business model should other considerations such as intellectual property rights, team quality, defensibility, or time to market not weigh against such copycat strategy. Additionally, investors do not always fare well in these acquisitions.⁹⁷

ii. Incumbent Incentive to Leverage Entry Barriers

There is growing evidence that conglomerate digital platforms are in an advantaged position to stop or block entry by more focused rivals when compared to traditional businesses. Companies like Alphabet, Amazon, and Facebook operate in multiple business verticals (for example, mail,

⁹⁷ See, e.g., Rachel Kraus, *Amazon Bought Eero for \$97 Million and Employees Still Got Screwed*, MASHABLE (Apr. 5, 2019), <https://mashable.com/article/amazon-eero-wifi-router-sale/#HN0veV33jPqc> ("Ultimately, thanks to a 'last in, first out' philosophy, Eero's Series D investors, led by Qualcomm, will recoup 84 percent of their investments. The seed round and Series A-C investors will all get back 31 cents on the dollar.").

maps, and search), collecting different dimensions of data on a consumer (for example, identity, location, and purchase intent) which give faster intelligence on competitive threats and new chinks in the platform's competitive armor. These companies can then derive superior insights into what firms they should block, which they should buy, and how they should grow strategically. This gives the platform an advantage over a rival entrant considering the same set of opportunities, and increases their abilities to exclude such rivals. A rival platform with similar economies of scope, data insights, and installed base may be a more formidable entrant.

If large digital platforms have both the incentive and ability to purchase and block entrants that compete with them, or might compete in the future, the question is whether they have done so. The evidence that platforms have bought a series of potential competitors in recent years is anecdotal but fairly robust.⁹⁸ For example, many observers believe that Instagram and WhatsApp might well have been serious competitors for Facebook.⁹⁹ The evidence that platforms have blocked potential entrants is likewise anecdotal¹⁰⁰ and was used in the Android and AdSense cases the European Commission has brought against Google.¹⁰¹ More formal research in this area is essential.

iii. Disintermediation and Foreclosure of Potential Platform Entrants

In addition to *de novo* entry, platforms fear disintermediation by a partner. If a platform's partner is able to directly access and serve the platform's customers, it can overtake the platform. Disintermediation can also occur through commoditizing services so that one side (normally the end consumer) is willing to substitute away from the platform—leading to a loss of profits.

The threat of disintermediation has important implications for the analysis of market entry and foreclosure. Modern platforms have an incentive to regularly thwart companies that compete with them for user demand. A platform that has total control of demand can steer customers to content and complements it owns rather than to those provided by independent firms that might challenge its market power. And because of potential harm to competition and complements, US regulators have often been tasked with preventing discrimination, foreclosure, and similar strategies in specific industries.¹⁰² Without a great deal of insight into the technology and the strategy of the platform, foreclosure will be difficult to observe by outsiders. Technological tools such as mobile hardware technologies, advances in computing power, communications technologies, application

⁹⁸ See U.K. COMPETITION REPORT, *supra* note 1, at 49, tbl.1A.

⁹⁹ Tim Wu, *The Case for Breaking Up Facebook and Instagram*, WASH. POST (Sept. 28, 2018), <https://www.washingtonpost.com/outlook/2018/09/28/case-breaking-up-facebook-instagram>.

¹⁰⁰ *American Tech Giants Are Making Life Tough for Startups*, ECONOMIST (June 2, 2018), <https://www.economist.com/business/2018/06/02/american-tech-giants-are-making-life-tough-for-startups>.

¹⁰¹ Press Release, Eur. Comm'n, Antitrust: Commission Fines Google €1.49 Billion for Abusive Practices in Online Advertising (Mar. 20, 2019), http://europa.eu/rapid/press-release_IP-19-1770_en.htm.

¹⁰² See Lina Khan, *The Separation of Platforms and Commerce*, 119 COLUM. L. R. (forthcoming 2019), <https://papers.ssrn.com/id=3180174>.

programming interfaces (API), cloud computing technologies, and data analytics enable a strategy of keeping the attractive content from establishing a relationship with the user and thereby possibly entering as a competitor. Platforms have bluntly moved to prevent disintermediation and have engaged in foreclosure to block potential rivals. For example, Facebook acted to suppress the growth video-capture-and-sharing app Vine when Vine attempted to link its users to their Facebook friends.¹⁰³ Facebook CEO Mark Zuckerberg personally approved the decision to prevent Vine users from finding friends on the app via Facebook.¹⁰⁴

Exclusive contracts and loyalty contracts can also be used to achieve exclusion. For example, a long-term contract that requires an advertiser not to use an entrant can foreclose demand from that entrant, leading to exit. An exclusive contract with a global reach can prevent an able niche competitor from growing larger and obtaining economies of scale. Bundling of services by the incumbent platform can be designed to exclude entry or foreclose existing rivals. Contracts between platforms and advertisers that allow for individual negotiation can protect an incumbent from losing individual targeted sales to an entrant without requiring the incumbent to lower its prices across the board. An incumbent platform with market power will often have the incentive and ability to undertake these strategies and thereby preserve its profit.

iv. Foreclosure of Complements to Capture Rents

One critical place to control the relationship is platform access. Amazon and Facebook regularly make decisions over which app or vendor is able to sell or is denied access to their stores and customers. Platforms often have a financial incentive to steer customers to particularly profitable products and can use the power of defaults and ordering to accomplish that effectively. Vendors operate in a risky environment where the platform's whims can determine its future as much or more than consumer satisfaction. If it chooses, a platform can steer demand elsewhere and the vendor loses access to its customers—because these customers are another company's users who single-home and buy from the default choice at the top of the page. Provided the consumer continues to find the totality of the platform experience positive, this bargaining power allows the platform to dictate business terms. The Vestager Report describes the setting clearly:

Other platforms impose rules and institutions that reach beyond the pure matching services and shape the functioning of the marketplace and, potentially, the relationship between the various platform sides, e.g. by regulating access to and exclusion from the platform, by regulating the way in which sellers can present their offers, the data and APIs they can access, setting up grading systems, regulating access to information that is generated on the platform, imposing minimum standards for delivery and return policies,

¹⁰³ See Adi Robertson, *Mark Zuckerberg Personally Approved Cutting Off Vine's Friend-finding Feature*, VERGE (Dec. 18, 2018), <https://www.theverge.com/2018/12/5/18127202/mark-zuckerberg-facebook-vine-friends-api-block-parliament-documents>.

¹⁰⁴ See *id.* Several years after buying Vine, Twitter shut it down. See Casey Newton, *Why Vine Died*, VERGE (Oct. 28, 2016), <https://www.theverge.com/2016/10/28/13456208/why-vine-died-twitter-shutdown>.

providing for model contracts, imposing price controls and MFN clauses, etc. Such rule-setting and “market design” determine the way in which competition takes place.¹⁰⁵

The way competition takes place determines the level of profit achieved by the platform and each complement. In and of itself, a platform setting the terms of trade, quality levels, services, and so on may not be problematic if the purpose of the change is to “grow the pie” in a way that complementors view as fair (i.e., not involving expropriation). For example, Amazon, Facebook, or Google know in real time which products are sold to whom, at what price, and which packaging or incentives work, which may drive their rules. However, if these rules become opaque and uncertain or the insights gleaned from an app or vendor are biased or used against it in an asymmetrical manner, then the rule changes may not be about increasing everyone’s revenue, but about moving a larger share to the platform.

Merchants or vendors can find themselves banned, demoted in search results, or required to bear higher costs without the ability to move to a competing platform because either there is none or because the customers single-home, will not depart the platform because of the loss of one vendor, and cannot be reached elsewhere. The EC’s Android case describes the disadvantage faced by independent apps that compete with the Google apps that are included in the mandatory bundle.¹⁰⁶ Twitter has vertically integrated into video streaming by foreclosing the rival service Meerkat.¹⁰⁷ Likewise, by selling logistics services to many of its sellers, Amazon gains an advantage when it wishes to launch a store brand. It can analyze the data from its rivals to develop an entry plan against those sellers. It is important to measure whether, and how much, quality increases with these strategies.

It is not clear what profits such complementors expected or achieved from the platform relationship, nor if there was significant relationship-specific investment required. Vendors may be less likely to enter the market at all, or to innovate, if they know they must distribute through a particular platform and their most successful products will be quickly copied. Businesses that could grow on a platform and increase the platform’s attractiveness to consumers will be unwilling to invest if their profits are not secure, and this may be a source of dynamic inefficiency. However, platforms have an incentive to attract good complements in order to

¹⁰⁵ EC COMPETITION REPORT, *supra* note 1, at 60.

¹⁰⁶ The recent Spotify complaint against Apple in Europe is another example. See James Vincent, *Spotify Files Antitrust Complaint Over ‘Apple Tax,’* VERGE (Mar. 13, 2019), <https://www.theverge.com/2019/3/13/18263453/spotify-apple-app-store-antitrust-complaint-ec-30-percent-cut-unfair>.

¹⁰⁷ See Feng Zhu, *Friends or Foes? Examining Platform Owners’ Entry Into Complementors’ Spaces*, 28 J. ECON. & MGMT. STRAT. 23, 23 (2018) (“Meerkat, a mobile app that enabled Twitter users to broadcast live video streaming to their followers, vanished after Twitter acquired its competitor Periscope and cut off Meerkat’s access to Twitter’s social graph.”); see also Chris Welch, *Tumblr ‘Truly Disappointed by Twitter’s Decision’ to Block Friend-Finding On the Blogging Service*, VERGE (Aug. 22, 2012), <https://www.theverge.com/2012/8/22/3261270/tumblr-removes-twitter-find-people-you-know>. Twitter acquired Periscope, a competing startup, and then decided to shut out Meerkat. On October 2016, Meerkat was shut down. Currently, Periscope is fully integrated with the Twitter platform and claims 1.9 million daily users (last updated and released info as of 2017).

attract users. This incentive limits the platform's desire to expropriate complementor rents under some circumstances.

e. Harm to Innovation

i. Competition Promotes Innovation

There is significant theoretical and empirical research that concludes that anticompetitive creation or maintenance of market power will cause a reduction in the pace of innovation.¹⁰⁸ This result is intuitive in the sense that firms “run faster” when they face competitors; competing firms will try to offer a better product on any dimension consumers care about, including innovation. Engaging in successful innovation is certainly both feasible and common for a large platform with its enormous collection of data and other assets. These companies routinely spend large sums on R&D, launch new products and services, and are more able than other competitors to derive superior insights into how they should innovate based on the data collected from aggregating demand and advances in machine learning and advanced data analytics. However, the relevant counterfactual is whether the pace of innovation would be faster if platforms faced more robust competition.

ii. Entry Barriers and Innovation

The lessening or blocking of innovative entry is of particular concern given its value. A VC will usually be wary of outright investing in an innovative startup that will implicitly or explicitly compete head-on with a tech giant. Given the tech incumbents' ability to block or foreclose a threatening entrant, the chance of successful entry is tiny. VCs would rather invest in businesses that are creating new categories or solving common technical issues. Take Google's search engine as an example. To our knowledge there is only one search engine that has reached a successful market size as a standalone business: Duck Duck Go. Google search is the dominant firm in this category with high entry barriers; despite the enormous size of this market, VC investors apparently do not want to fund an entrant. By contrast, VCs are attracted to startup teams that solve a specific issue for Google (and have a chance of buyout) as opposed to funding a team that wants to compete head to head. This dynamic leads to a self-fulfilling prophecy. Reduced VC investment due to the inability to enter successfully in fact causes less entry; and less investment also causes less differentiated innovation in the sector. This can be seen increasingly by evidence of platform acquisitions.¹⁰⁹ Despite very high and stable profit margins, markets like social media and search have faced little entry.

¹⁰⁸ For a comprehensive survey of the innovation literature, see the literature summarized in Giulio Federico, Fiona Scott Morton & Carl Shapiro, *Antitrust and Innovation: Welcoming and Protecting Disruption* (NBER Innovation Policy and the Economy, Working Paper, 2019) (on file with authors).

¹⁰⁹ The number of potential competitors purchased by the tech giants is large. For example, Amazon has purchased Zappos, Fabric, CDNow, Quorus, Audible, Goodreads, and Quisdi; Facebook has acquired WhatsApp, Instagram,

As discussed above, large tech platforms can combine enormous financial resources with data resources. Digital platforms have an ability to produce free cash flows at a speed and level that is entirely new because of the combination of almost zero marginal cost, instant distribution, and global reach. This advantage creates both the incentive and the ability for the digital platform to outspend, to out-invest, or to acquire incumbents or new competitors. Incumbents have the incentive and ability to stand in the way of possibly disruptive innovation. With deep pockets, they can purchase possible future disruptors in order to align the path of innovation with their strategies or otherwise control it. This story is widely believed to be the reason that Facebook purchased Instagram and WhatsApp.¹¹⁰

Alternatively, platforms may create “kill-zones” around themselves.¹¹¹ For example, Facebook and Twitter’s aggressive API foreclosure, acquisition of competitors, and copying of new services have boosted their market power.¹¹² Facebook even acquired a mobile phone monitoring app, Onavo, which allows it to spot up-and-coming rivals and buy them or snuff them out.¹¹³ While investment in innovation will continue, the type of innovation that will be funded will be broadly determined by the incumbent and its strategies. Disruptive innovation in markets that are characterized by high concentration levels and network effects is likely to be reduced compared to a competitive market. One of the few sources of entry in digital platforms comes from rival platforms that enter each other’s markets, as these large firms are more able to overcome entry barriers of all kinds.

FriendFeed, and tbn; Google has bought Nest Labs, DoubleClick, YouTube, Waze, AdMob, Teracent, BeatThatQuote.com, Admeld, and Tenor. See *List of Mergers and Acquisitions by Amazon*, WIKIPEDIA (Apr. 12, 2019), https://en.wikipedia.org/wiki/List_of_mergers_and_acquisitions_by_Amazon; *List of Mergers and Acquisitions by Facebook*, WIKIPEDIA (Mar. 25, 2019), https://en.wikipedia.org/wiki/List_of_mergers_and_acquisitions_by_Facebook; *List of Mergers and Acquisitions by Alphabet*, WIKIPEDIA (Apr. 12, 2019), https://en.wikipedia.org/wiki/List_of_mergers_and_acquisitions_by_Alphabet. At times, these firms have barely bothered to disguise their anticompetitive purpose. See Jacob Kastrenakes, *Facebook is Shutting Down a Teen App it Bought Eight Months Ago, Along with Two Others That Languished*, VERGE (July 2, 2018), <https://www.theverge.com/2018/7/2/17528896/facebook-tbn-moves-hello-shut-down-low-usage>.

¹¹⁰ Tim Wu, *The Case for Breaking Up Facebook and Instagram*, WASH. POST (Sept. 28, 2018), <https://www.washingtonpost.com/outlook/2018/09/28/case-breaking-up-facebook-instagram>.

¹¹¹ Google’s, Facebook’s, and Amazon’s annual conferences “held to announce new tools, features, and acquisitions, always ‘send shock waves of fear through entrepreneurs,’” according to one investment firm, and “[v]enture capitalists attend to see which of their companies are going to get killed next.” *The Future of Tech Startups: Into the Danger Zone*, ECONOMIST (U.K. edition) (June 2, 2018), at 61, http://weblogibc-co.com/wp-content/uploads/2018/06/The_Economist_UK_Edition_-_June_02_2018.pdf.

¹¹² See notes **Error! Bookmark not defined.-Error! Bookmark not defined.**, *supra*; see, also, e.g., Erin Griffith, *Will Facebook Kill All Future Facebooks?*, WIRED (Oct. 25, 2017), <https://www.wired.com/story/facebooks-aggressive-moves-on-startups-threaten-innovation>.

¹¹³ See Deepa Seetharaman & Betsy Morris, *Facebook’s Onavo Gives Social-Media Firm Inside Peek at Rivals’ Users*, WALL ST. J. (Aug. 13, 2017), <https://www.wsj.com/articles/facebooks-onavo-gives-social-media-firm-inside-peek-at-rivals-users-15026220031>.

iii. The Reward for Innovation

Entrepreneurs may expect a low payoff to developing a free-standing product because of entry barriers and exclusionary conduct by the incumbent platform. In that case, its best hope is to be the preferred innovator of a complement and sell its business to the platform at an early stage. This source of financial reward is often cited as a reason why large platform acquisitions are good for society. Certainly, a reward of this type (a share in the platform's business model and flow of rents) is better than no payoff and will stimulate some level of innovation. However, it is important to see that this incentive is distorted relative to that of the competitive context. Suppose public policy could reduce entry barriers and prevent anticompetitive exclusionary conduct towards entrants. In that case, the entrepreneur would not have to settle for a small fraction of the platform's profits, but could compete for all of them and try to replace the platform. When a young firm has a chance to compete for the entire market on the merits of its innovation because there is no exclusionary conduct holding it back, success could lead to up to 100% of market profits, rather than a smaller acquisition payoff.¹¹⁴ The availability of this option would allow entrepreneurs to develop improvements, complements, or replacements for a platform according to what has the highest returns. The inability to innovate in pursuit of the whole market leads to lower entry in tech sectors that are already dominated by a single large company.

iv. Current Trends in Innovation

The incipient but growing technical research supports a concern for the impact of big tech on innovation. Much of this research uses startup formation and its fuel, venture capital, as a proxy for innovation. In 2018, Facebook commissioned the consulting firm Oliver Wyman to write a report on this topic.¹¹⁵ Using Facebook, Google, and Amazon as a proxy for big tech platforms, the authors drew four conclusions: i) Facebook, Google, and Amazon contribute a very small portion of the total venture capital in tech; ii) Facebook, Google, and Amazon M&A activity has no impact on aggregate investment levels; iii) Facebook, Google, and Amazon R&D has had no impact on venture capital investment levels; and iv) the presence of Facebook, Google, and Amazon does not dampen venture capital investment in technology relative to other mature sectors.

The first three conclusions are factual and unsurprising. But the fourth conclusion, that the presence of Facebook, Google, and Amazon does not dampen VC activity related to other

¹¹⁴ As previously noted, many of these markets will tend toward concentration naturally, so the size of profits is not affected by effective competition enforcement, but the number of years they can be earned will be affected when an incumbent cannot block entrants.

¹¹⁵ *Assessing the Impact of Big Tech on Venture Investment*, OLIVER WYMAN (July 11, 2018), <https://www.oliverwyman.com/content/dam/oliver-wyman/v2/publications/2018/july/assessing-impact.pdf>.

sectors, is surprising. Ian Hathaway has summarized a straightforward rebuttal.¹¹⁶ The Facebook-commissioned report looked at industry-wide effects. However, as Hathaway points out, viewing the industry in the aggregate masks the effects of dominating firms. By looking at the sub-industries associated with each firm—social platforms (Facebook), internet software (Google), and internet retail (Amazon)—a different trend emerges. Since 2009, change in startup investing in these sub-industries has fared poorly compared to the rest of software for Google and Facebook, the rest of retail for Amazon, and the rest of all VC for each of Google, Facebook, and Amazon. This suggests the existence of so-called “kill-zones,” that is, areas where venture capitalists are reluctant to enter due to small prospects of future profits.¹¹⁷

In a study of the mobile app market, Wen Wen and Feng Zhu come to a similar conclusion: Big tech platforms do dampen innovation at the margin.¹¹⁸ Their study analyzed how Android app developers adjust their innovation strategies in response to entry (or threat of entry) by Google:

[A]fter Google’s entry threat increases, affected developers reduce innovation and raise the prices for the affected apps. Once Google enters, the developers reduce innovation and increase prices further. However, app developers’ incentives to innovate are not completely suppressed; rather, they shift innovation to unaffected and new apps. Given many apps already offering similar features, Google’s entry may reduce social inefficiency.¹¹⁹

Ultimately, these studies are suggestive but not determinative. Much more research needs to be done to properly identify the existence and extent of “kill zones” for market entry and innovation. Nonetheless, the evidence thus far does suggest that current digital platforms face very little threat of entry and are negatively impacting investment in key digital areas. This is reinforced by the fact that the key players in this industry remained the same over the last two technology waves, staying dominant through the shift to mobile and the rise of AI.¹²⁰ In the past,

¹¹⁶ Ian Hathaway, *Platform Giants and Venture-Backed Startups*, IAN HATHAWAY BLOG (Oct. 12, 2018), <http://www.ianhathaway.org/blog/2018/10/12/platform-giants-and-venture-backed-startups>.

¹¹⁷ *Id.*

¹¹⁸ Wen & Zhu, *supra* note 4.

¹¹⁹ *Id.*

¹²⁰ This dynamic affects where we see innovation, and by whom. While distributed technology seems to be a relatively open playing field with the potential for many entrants, the bulk of innovation in other spaces is dominated by tech giants. This is the case, for example, in the AI and voice-assistant space. In the AI field, innovation is driven by startups leveraging and customizing the existing technology and libraries developed by Microsoft, Amazon, Facebook, and Google. These companies have been quick to acquire promising ventures. Since 2011, Facebook has acquired seven AI startups: Face, Protogeo, Wit.ai, Bloomsbury AI, Dreambit, Grokstyle, and Ozlo. Since 2010, Amazon has also acquired seven startups in the AI space: Yap, ORbeu, GoButler, harvest.ai, Graphiq, Body Labs, and Dispatch. Finally, Google has acquired 20 AI startups since 2011, the most notable being Kraggle and DeepMind. *See List of Mergers and Acquisitions by Facebook, supra* note 109; *List of Mergers and Acquisitions by Alphabet, supra* note 109. The AI space may not see a successful IPO because of these dynamics. Similarly, innovation in voice-assistant technology has been dominated by tech giants. Microsoft’s Cortana, Apple’s Siri, Google’s Google Voice, and Amazon’s Alexa are examples of dominant firms leveraging their previous offerings to retain a first-mover advantage in the market.

dominant business found it difficult to navigate innovation or disruption waves. By contrast, Facebook, Google, Amazon, Apple, and even Microsoft were able to ride these waves without significant impact on market share or profit margins. This indirect evidence corroborates the argument that these companies are facing few competitive threats.

There is an informal sense from practitioners that in mobile, cloud computing, and AI the result is the same: Innovation at the core has slowed and is centered around the tech giants.¹²¹ As a result, new innovation waves have emerged, centering around blockchain, distributed ledgers, and decentralized models (the new Silicon Valley growth paradigm); and with specialized AI, niche retail applications, or, in the enterprise sector, b2b models. It should be noted that, apart from blockchain, whose decentralization eliminates network effects (in theory), the other areas of innovation do not necessarily herald a change in future market structure. Some have also argued that, in markets that are characterized by significant market power, innovation will likely shift from focusing on consumer benefit (to entice a rise in market share), to consumer exploitation.¹²²

In summary, unlike last-century's businesses, digital businesses will often lack competition *in* the market. This absence may be redressed by intensive competition *for* the market, as firms compete to be the winner that takes all. However, if dominant firms are able to maintain their dominance, even as the external environment and tastes change over time, consumers may be denied the benefits of competition for the market as well.

f. Old Wine in a New Bottle, or a New Reality?

The market characteristics and problems discussed above in Part I and Part II raise an important question: Is there something new or different about the digital economy, which justifies a revised approach to intervention? Is this simply old wine in a new bottle, the same old problems of network effects and concentration, or do we face a new reality? As we outlined above, we believe the digital platform may be a unique combination of economic forces that requires both new analysis and new public policy.

We expect some to argue that there is no need for action. It is in the interest of the powerful incumbent to deny there is any problem to solve in order to delay while the market remains in its hands. The waiting game allows incumbents to collect profit from the status quo and use those profits to raise doubts or marginalize concerns in order to delay or prevent effective intervention.¹²³

¹²¹ See, e.g., Griffith, note 112, *supra*; *Tech Monopolies Are Stifling U.S. Innovation. Antitrust Enforcement May Help*, BRINK NEWS (Dec. 11, 2018), <http://www.brinknews.com/is-antitrust-enforcement-the-wests-best-weapon-against-chinese-tech>; *Andreessen Horowitz Makes Big Bet on Blockchain*, REALDAILY (Feb. 13, 2018), <https://realdaily.com/andreessen-horowitz-makes-big-bet-on-blockchain>.

¹²² See Ezrachi & Stucke, *supra* note 14.

¹²³ See, e.g., Brody Mullins & Jack Nicas, *Pay Professors: Inside Google's Academic Influence Campaign*, WALL ST. J. (July 14, 2017), <https://www.wsj.com/articles/paying-professors-inside-googles-academic-influence->

Of course, the rapid developments of our digital world are not yet fully understood and merit ongoing study. However, the material above makes clear that when market power becomes entrenched, it is difficult to return to a competitive market. Inaction could create decades of market power leading to weakened innovation, increased rent extraction, and social domination by gatekeeper tech firms. Making no policy change and standing back to let platforms carry out the strategies of their choice carries unusual risk. The new reality of the digital landscape presents new challenges that will not easily be resolved through organic competition or current US antitrust enforcement norms. The United States now risks missing the moment to confront a serious challenge to competition. That risk spurs our search for possible solutions, which we outline in Part IV.

campaign-1499785286 (relating Google's funding of professors for, among other things, research opposing antitrust intervention in the search engine market).

IV. SOLUTIONS

In this part, we outline a range of solutions to address the issues raised above. Needless to say, there is no magic pill. The legislature, judiciary, and regulators will each need to play a role. Each of the proposed solutions brings with it benefits and costs and should be considered as part of a balanced policy. Still, with these limitations in mind, these solutions have the power to address changing market dynamics and enable society to move toward a more efficient, open, and dynamic market environment.

Competition policy is only one facet of society's wider goals. Alongside the promotion of competition policy, policymakers may wish to implement policies to promote privacy, democratic accountability, and fairness. While these goals may be advanced indirectly through the measures proposed below, they can also be addressed more directly through laws and regulations that we do not consider here. Other committees provide valuable insights on possible advancements on that front.

Having established the impact of high entry barriers, we open with a fundamental question about the ability of a market to self-correct.

a. Will Markets Self-Correct When Competition Problems Arise?

The question whether the market will self-correct is central to antitrust policy. It affects the scope of illegality, as well as the zeal with which competition agencies approach intervention. It also affects the gain from implementing both ex ante and ex post solutions to insufficient competition. When there is a reasonable chance that technological progress and innovation will speedily prevent or remove bottlenecks and maintain an active competitive process, intervention should be limited. For example, the stock trading app Robinhood Markets, which slashed per-trade fees to zero, has forced competitors to scramble—even JP Morgan is now offering a free stock trading app for consumers.¹²⁴ Likewise, Amazon and Wal-Mart are currently vigorously competing for fast and cheap delivery services, forcing others to follow.¹²⁵

Acolytes of the Chicago School have persuaded many federal officials and judges that markets will generally quickly self-correct, and that antitrust scrutiny should therefore be limited. This

¹²⁴ See Hugh Son, *JP Morgan to Unveil New Investing App With an Eye-Catching, Disruptive price: Free*, CNBC (Aug. 21, 2018), <https://www.cnbc.com/2018/08/21/jp-morgan-to-unveil-new-investing-app-with-an-eye-catching-disruptive-price-free.html>.

¹²⁵ See Suman Bhattacharyya, *To Compete with Amazon, Walmart and eBay are Spending on Logistics*, DIGIDAY (Jan. 15, 2019), <https://digiday.com/retail/compete-amazon-walmart-ebay-investing-logistics>; Andrea Cheng, *Amazon, Facing Growing Competition, Offers Free Shipping on All Orders for the First Time*, FORBES (Nov. 5, 2018), <https://www.forbes.com/sites/andriacheng/2018/11/05/amazon-free-shipping-holiday-minimum-order-walmart-target/#6c459dc555e1>; Nick Statt, *Amazon and Walmart's Rivalry is Reshaping How We'll Buy Everything in the Future*, VERGE (Aug. 3, 2018), <https://www.theverge.com/2018/8/3/17630604/amazon-walmart-competition-tech-partnerships-grocery-delivery>.

conviction has extended into digital markets. Opponents of government intervention point to the dynamic nature of technology, the role of disruptive innovation, and firms' strong investment in research and development. They defend the adequacy of a free-market, noninterventionist approach, and argue that the cost of over-intervention outweighs the benefits of intervention.

While some markets may self-correct, the findings of this report suggest that rapid self-correction in markets dominated by large digital platforms is unlikely, and that harms to economic welfare from the exercise of market power in such markets are substantial. As discussed above, entrants find it difficult to overcome the high barriers to take on digital platform incumbents. Economies of scale, economies of scope, network effects, and negligible marginal cost all work together to make entry difficult in existing markets. Moreover, while monopoly profits are a lure to competitors, incumbents can use those very profits to entrench themselves and protect their position. No matter how dynamic the technology, an entrant will not unseat a monopolist if the monopolist is permitted to buy the dynamic entrant for a share of monopoly profits. Both parties gain from such a transaction—and the public loses.

The result is less entry than a more competitive environment would create. Less entry into digital markets means fewer choices for consumers, stunted development of alternative paths of innovation, higher prices, and lower quality. Self-correction is not a realistic expectation in this environment—indeed, the available evidence suggests it has not happened—and public policy should not rely exclusively on it. Effective antitrust enforcement and regulation must take account of this reality. If there is a force toward self-correction, it may require active promotion to succeed, and in this way public intervention can be complementary rather than antagonistic to market forces. Indeed, the other reports that have addressed this problem around the world have accepted that policy changes are necessary in order to avoid stagnant and harmful digital markets. We now turn to what policy options exist, and which of these the government might adopt.

b. US Antitrust

i. Basic Principles

Antitrust law is intended to prohibit private conduct by firms that reduces economic welfare. Although application of antitrust principles can be complex and the specific doctrinal embodiments of those principles can seem arcane and arbitrary, at its core US antitrust law is simple.¹²⁶ It can be summarized in a single sentence: *Private conduct that creates or increases market power, other than by efficiency-based competition on the merits, is illegal.*

There are two fundamental components of any antitrust violation. The first is bad conduct, commonly called “anticompetitive conduct.” The second is a resulting harm to economic welfare

¹²⁶ See A. Douglas Melamed, *Response: Antitrust Law is Not That Complicated*, 130 HARV. L. REV. F. 163 (2019).

from the creation of more market power than would otherwise exist. A firm gains market power when the competitive discipline imposed upon that firm by either actual or potential future rivals is reduced. One way to achieve market power is through price-fixing and other forms of collusion, but we will not address such behaviors here. Rather, this report will focus on antitrust law as it applies to mergers and non-merger exclusionary conduct.

Importantly, a firm does not violate the antitrust laws if it gains market power by competing on the merits rather than as a result of anticompetitive conduct. For example, if a firm enters the market with a fantastic new product that has strong network effects, competes solely on the merits of that product with no anticompetitive conduct, and finds itself with 95% market share, it would not have violated the antitrust laws. Similarly, a firm does not violate the antitrust laws if it engages in anticompetitive conduct but that conduct does not harm the market as a whole and fails to result in additional market power.¹²⁷

Box IV

More About US Antitrust Law

There are four substantive elements to any US antitrust violation: Private, as opposed to government, conduct; anticompetitive conduct; creation or increase in market power; and a causal connection between the conduct and the market power. There are three basic types of conduct that can be anticompetitive. They are (i) mergers that lessen competition, (ii) conduct that excludes or weakens actual or potential rivals, and (iii) conduct that constitutes or facilitates collusion (e.g. cartels) among firms that would otherwise compete more vigorously. Possible antitrust problems involving digital platforms are most likely to arise from the first two types of conduct.

Anticompetitive conduct is conduct that is likely to lead to the creation or maintenance of market power for reasons other than an increase in allocative efficiency (i.e., by increasing output or decreasing price where price is not less than marginal cost) or productive efficiency (i.e., by reducing cost or increasing product quality). The range of potential anticompetitive conduct is nearly boundless and can include burning down a rival's factory, designing products to be incompatible with rivals' products, acquiring smaller rivals to shut them down or deny them to other suitors, exclusive dealing and Most Favored Nation clauses (MFNs) in some circumstances, and some forms of tying or bundling multiple products or services. Digital markets are prone to new and innovative violations of the antitrust laws because marginal costs are often close to zero, the business models themselves are often new and innovative, and firms are able to be creative with new product bundles, contracts, and transactions.

¹²⁷ Certain types of conduct, notably agreements among competitors fixing prices or allocating customers or service areas, are regarded as unlawful per se, which means that they are unlawful without proof of harm to competition in the market as a whole. Per se illegality in these circumstances is not a rejection of the principle described in this text. Rather, per se illegality reflects a pragmatic judgment that those types of conduct are so likely to harm competition and so unlikely to provide any welfare benefits that it would be needlessly costly and burdensome to require proof of harm to the market as a whole on a case-by-case basis.

More About US Antitrust Law (Cont.)

Current popular debate often seems to imply that high market share in and of itself is a violation of the antitrust laws. It is important to understand that a firm can violate the antitrust laws *only if it engages in anticompetitive conduct*, even if its conduct causes the firm to gain monopoly power. Thus, for example, a firm does not violate the antitrust laws by gaining market power solely because it has a better product that consumers choose to buy for that reason or because it develops a better distribution channels that consumers find convenient.

Since at least the middle of the twentieth century, US antitrust law has embraced the view that those who do not engage in anticompetitive conduct are entitled to the fruits of their labor, including any market power or dominance that they might have gained. This view rests on the concern that breaking up or restricting firms that obtain their success by competition on the merits would deter the very kind of aggressive but procompetitive conduct that the antitrust laws are intended to encourage. Such no-fault intervention would deter such conduct, both because firms would fear that too much success would end up hurting them and because they would be uncertain about the antitrust implications of their conduct. While firms that achieve durable market power, especially in industries that are regarded as “natural monopolies,” are sometimes subject to sectoral regulation, durable market power is not itself a sufficient basis for antitrust intervention. Society has other legal mechanisms to regulate an industry that is not delivering on social goals.

US antitrust law has also long required that antitrust plaintiffs prove, not just anticompetitive conduct, but also that the conduct harmed competition in the market as a whole.¹ This requirement limits antitrust enforcement to those matters that are important enough to warrant costly and burdensome antitrust proceedings and ensures that antitrust law remains focused on making markets work.

Both the anticompetitive requirement and the market power requirement protect the competitive process, another concern that arises in the popular debate. The conduct requirement does this by focusing antitrust enforcement on conduct that is not efficiency-based and can thus create market power only by distorting competition on the merits. The market power requirement does this by focusing antitrust enforcement on conduct that impairs the competitive discipline of rivals and, in that way, harms the competitive process. Many of the current proposals for more aggressive antitrust enforcement, although couched in antitrust language, would dispense with either the bad conduct requirement or the market power requirement.

Conduct that harms competition without creating any efficiencies can readily be characterized as anticompetitive. Examples of such conduct include mergers among competitors that do not create efficiencies by combining complementary assets, conduct whose only purpose is to harm or exclude competitors, and agreements among competitors about their prices or other terms of trade.

¹ See *Brunswick Corp. v. Pueblo Bowl-O-Mat, Inc.*, 429 U.S. 477, 488 (1977) (“The antitrust laws . . . were enacted for the protection of competition, not competitors.”) (internal citation and quote marks omitted).

More About US Antitrust Law (Cont.)

When conduct both generates efficiencies and impairs the competitive efficacy of rivals, the question whether it is anticompetitive is less clear and will depend on specific facts. The conduct is more likely to be unlawful if substantially all of the efficiencies could be achieved by an alternative that is less harmful to rivals or if the efficiencies are insubstantial and the harm to rivals is great. Courts rarely deem conduct anticompetitive if it generates substantial efficiencies that cannot be realized by an available alternative, regardless of the impact of that conduct on rivals.

As explained in greater detail below, antitrust enforcement decisions are often made with great uncertainty about the efficiencies and market impact of the conduct at issue. For the past 30 years or so, antitrust law has reflected the view that mistakes in the direction of over-enforcement are more problematic than those in the direction of under-enforcement. One premise of this view is that under-enforcement results in market problems that are likely to be corrected by innovation or other market developments. As noted above, this report assesses the state of the evidence on entry and innovation and concludes that such self-correction is unlikely to be prompt and effective, in part because digital platforms that have achieved market power possess formidable barriers that inhibit entry and innovation. The assumption that over-enforcement is costly is reflected in aspects of antitrust doctrine applicable to exclusionary conduct, vertical contracts, and merger review as well as in courts holding antitrust plaintiffs to demanding standards of proof.

The relative concerns about the risks and cost of over-enforcement and under-enforcement embodied in current antitrust law has been subject to increasing criticism. This report concludes that the tolerance of antitrust law for under-enforcement should be reassessed and recalibrated. Careful recalibration of the benefits and costs of different mistakes is likely essential to the development of more aggressive antitrust law that remains consistent with the principles described above.

While US antitrust law has long been flexible in combatting anti-competitive conduct, there is increasing concern that it has been underenforced in recent years. First, there is increasing evidence that the enforcement agencies and courts have permitted too many mergers between competing firms that have led to post-merger price increases and other indications of increased

market power.¹²⁸ Vertical mergers are rarely challenged by the enforcement agencies,¹²⁹ and claimed or expected merger-related efficiencies are often not realized. Second, monopsony—market power of buyers or employers—appears to be a growing problem.¹³⁰ Recent studies suggest that labor markets are less competitive than previously thought and employers have exercised market power against workers in those markets.¹³¹ Third, there have been few antitrust challenges to exclusionary conduct since the government’s 1998 case against Microsoft, and courts have in several instances been hostile to such cases and have imposed daunting proof requirements on plaintiffs. Apparent under-enforcement is in part due to courts’ reliance on so-called Chicago School assumptions that do not have a sound theoretical or empirical basis.

Regardless of whether or not antitrust enforcement has failed to keep up with conduct in the economy more generally, the challenge of enforcing in the area of digital platforms presents new issues. The platforms create new competitive environments; they provide opportunities for new types of anticompetitive conduct; and they create new economic and conceptual challenges for antitrust enforcement. This section is focused on analysis and recommendations designed to help such future enforcement, though that enforcement will often be addressed to conduct that occurred in the past.

The challenges facing future antitrust enforcement are more than just analytical and intellectual. Antitrust law and its application by the courts over the past several decades have reflected the

¹²⁸ See JOHN KWOKA, *MERGERS, MERGER CONTROL, AND REMEDIES: A RETROSPECTIVE ANALYSIS OF U.S. POLICY* 156, 159 (2014); Jonathan B. Baker, Presentation, *Has the US Economy Become More Concentrated and Less Competitive: A Review of the Data* (Sept. 13, 2018), https://www.ftc.gov/system/files/documents/public_events/1398386/georgetown-deck-913.pdf, at 39 (listing six reasons to believe that industry concentration cannot be explained by scale economics, including the fact that various forms of anticompetitive behavior are “insufficiently deterred” and that “market power is durable”); John E. Kwoka, *The Structural Presumption and the Safe Harbor in Merger Review: False Positives or Unwarranted Concerns?*, 81 ANTITRUST L.J. 837 (2017); John Kwoka, *The Changing Nature of Efficiencies in Mergers and in Merger Analysis*, 60(3) ANTITRUST BULL. 231 (2015); Leemore Dafny et al., *Paying a Premium on Your Premium? Consolidation in the US Health Insurance Industry* 102 AMER. ECON. REV. 1161, 1163 (2012) (“[T]he mean increase in local market [firm concentration] between 1998 and 2006 (inclusive) raised premiums by roughly 7 percent from their 1998 baseline”); Orley Ashenfelter & Daniel Hosken, *The Effect of Mergers on Consumer Prices: Evidence from Five Mergers on the Enforcement Margin*, 53 J.L. & ECON. 417 (2010). *But see* Michael Vita & F. David Osinski, *John Kwoka’s Mergers, Merger Control, and Remedies: A Critical Review*, 82 ANTITRUST L.J. 361 (2018). *See also* Robert B. Kulick, *Ready-to-Mix: Horizontal Mergers, Prices, and Productivity* (U.S. Census Bureau, Ctr. for Econ. Studies, Working Paper No. 17-38, 2017), <https://papers.ssrn.com/abstract=2637961>; Bruce A. Blonigen & Justin R. Pierce, *Evidence for the Effects of Mergers on Market Power and Efficiency* (NBER, Working Paper No. 22750, 2016), <https://www.nber.org/papers/w22750>, at 24.

¹²⁹ *See* D. Bruce Hoffman, Acting Director, Bureau of Competition, Fed. Trade Comm’n, *Vertical Merger Enforcement at the FTC*, Address at the Credit Suisse 2018 Washington Perspectives Conference (Jan. 10, 2018), https://www.ftc.gov/system/files/documents/public_statements/1304213/hoffman_vertical_merger_speech_final.pdf (admitting that “vertical merger enforcement is . . . a small part of [the FTC’s] merger workload”).

¹³⁰ *See, e.g.*, Michael Kades, *In Conversation with Herbert Hovenkamp and Ioana Marinescu*, *EQUITABLE GROWTH* (Oct. 11, 2018), <https://equitablegrowth.org/in-conversation-with-herbert-hovenkamp-and-ioana-marinescu>.

¹³¹ Elena Preger & Matt Schmitt, *Employer Consolidation and Wages: Evidence from Hospitals* (Washington Center for Equitable Growth Working Paper, 2019), <https://equitablegrowth.org/working-papers/employer-consolidation-and-wages-evidence-from-hospitals>.

now outdated learning of an earlier era of economic thought, and they appear in some respects inhospitable to new learning. Antitrust enforcement better suited to the challenges of the Digital Age may therefore require new legislation.

Box V

EU Competition Law

EU competition law, like US antitrust law and the competition laws of most nations, is intended in large part to promote economic welfare by prohibiting private conduct that injures or is likely to injure competition. Not surprisingly in light of this shared objective, US and EU law are very similar.

With respect to market power, similar to US antitrust law, a firm does not violate the EU Competition laws if it gains power by competing on the merits rather than as a result of anticompetitive conduct. EU Competition law only condemns the abuse of a dominant position. An abuse, under EU law, may however include a wider range of prohibited exclusionary and exploitative practices than under US antitrust law. As a result, some practices which may not trigger enforcement action under US antitrust law, may nonetheless be regarded as infringing EU competition law.

In this context, it is also worth noting the (wider) goals of EU competition law. According to the European Commission, competition on the market is protected ‘as a means of enhancing consumer welfare and of ensuring an efficient allocation of resources.’¹ This notwithstanding, EU competition law has also consistently been held to protect ‘not only the interests of competitors or of consumers, but also the structure of the market and, in so doing, competition as such.’² Moreover, a genuinely indigenous objective is worthy of note, namely that of promoting European market integration.³

The multitude of competition goals, and their position within the wider normative EU values may sometimes contribute to possible inconsistencies between the EU and US analysis.⁴

EU Competition law is enforced both at public and private levels; public enforcement is carried out by the European Commission and by the Competition Authorities of the member states. Private enforcement takes place in the courts of the member states, where private parties may bring follow-on or stand-alone damage claims.

1 European Commission, ‘Guidelines on the Application of Article 81(3) of the Treaty’ [2004] OJ C101/97, para.13 (hereinafter ‘the General Guidelines’).

2 Case C-501/06 P *GlaxoSmithKline Services Unlimited v Commission and Others* [2009] ECR I-9291, para 63. See also Case C-8/08 *T-Mobile Netherlands and Others* [2009] ECR I-4529, paras 31, 36, 38-39; Council Regulation (EC) 1/2003 on the Implementation of the Rules on Competition Laid Down in Articles 81 and 82 of the Treaty [2003] OJ L1/1, Recital 9; European Commission, ‘Green Paper on Vertical Restraints in EC Competition Policy’ COM(96) 721 final, para 180.

3 Information Service High Authority of the European Community for Coal and Steel Luxembourg, ‘The Brussels Report on the General Common Market’ (June 1956) (Spaak Report); David J Gerber, ‘The Transformation of European Community Competition Law?’ [1994] Harvard Intl LJ 97, 102.

4 Ezrachi, Ariel, EU Competition Law Goals and the Digital Economy (June 6, 2018). Oxford Legal Studies Research Paper No. 17/2018. Available at SSRN: <https://ssrn.com/abstract=3191766>

c. Special Challenges Presented by Technology Platforms

Technology platforms present particular challenges for antitrust enforcement. Markets tip and resulting market power is durable, so even effective antitrust enforcement is unlikely to generate fragmented markets. Nonetheless, enforcement that protects competition on the merits in the first stage and prevents exclusionary conduct in the second stage will help ensure that market-participants make unfettered choices among competing platforms and that entry and innovation are not inhibited by private rent-seeking. Additionally, these markets move very quickly in areas such as new product introduction, foreclosure, and tipping. Antitrust litigation does not move quickly. Effective antitrust enforcement should move as rapidly as is practicable. However, enforcers will be most effective when they choose enforcement priorities and remedies to generate optimal deterrence of anticompetitive conduct.

As explained above, digital platforms are able to exploit behavioral biases to their advantage. Economists describe these strategies as falling into two conceptually distinct categories of conduct: exclusive (strategies that foreclose competition) and collusive (strategies that cause higher prices).¹³² The former occurs when platforms exploit behavioral biases to keep consumers attached to their platforms and make switching to alternatives more difficult. These tactics generally make consumers less receptive to competitive alternatives—they lower contestability—and thus raise entry barriers. Platforms also exploit behavioral biases—such as hyperbolic discounting and limited self-control—to extract surplus from both consumers and content providers. Strategies such as offering addictive content at moments when consumers lack self-control increase time spent on the platform and profitable ad sales even as the platform lowers the quality of content. These tactics increase the welfare costs of market power.

Many technology platforms are distinctive because they provide valued services to consumers without charging a monetary price. Instead, consumers barter their attention and data to the platforms in exchange for these services. The platforms use that attention and data to generate monetary payments from advertisers. While a barter transaction is, in principle, subject to antitrust scrutiny just like any other transaction, antitrust enforcement has had vastly more experience with transactions based on monetary prices, and that experience has prompted the development of sophisticated tools to analyze money prices.¹³³ Where monetary prices are fixed at zero while quality changes over time—in response to changes to the nature of the services, privacy protections, content offerings and the like—the quality-adjusted prices change. Because economists, antitrust agencies, and courts have less experience with quality, they lack equally

¹³² See Steven C. Salop, Practices that (Credibly) Facilitate Oligopoly Co-ordination, in NEW DEVELOPMENTS IN THE ANALYSIS OF MARKET STRUCTURE 265 (Joseph E. Stiglitz & G. Frank Mathewson eds., 1986)

¹³³ For example, the US agencies' traditional definition of an antitrust market is one in which a monopolist could profitably raise price by a non-insignificant amount for a significant period of time. See U.S. DEP'T OF JUST. & FED. TRADE COMM'N, 2010 HORIZONTAL MERGER GUIDELINES (2010), <https://www.ftc.gov/sites/default/files/attachments/merger-review/100819hmg.pdf>, at 9, § 4.1 (defining the hypothetical monopolist test).

sophisticated tools for analyzing changes in quality-based prices. This is partially because quality naturally presents itself in a less quantified form than price, but also because in regular markets price often adjusts to quality, not the other way around, so economists have been able to rely on price as one measure of quality. When enforcers are able to quantitatively link quality to price, they will be better equipped to fit digital cases into older, price-centered jurisprudence.

Technology platforms also pose unusual challenges for antitrust merger enforcement. To the extent that platforms are in winner-take-all or winner-take-most markets, mergers among significant, existing competitors, which are the mergers most subject to antitrust challenge, are likely to be rare. Instead, competition in such markets is largely for the future, often in evolving and very different markets. This competition is sometimes called “competition for the market” or “leapfrog” competition. In this context, acquisition by a dominant platform of a much smaller and possibly nascent firm could be very damaging to competition if, absent the acquisition, the smaller firm would develop into a major competitive threat or would lead to significant change in the nature of the market. In a concentrated market structure, this potential competition from very small entrants may be the most important source of competition faced by the incumbent firm.¹³⁴

The problem is that it is very difficult to know at the time of an acquisition whether the acquired firm is likely to develop into a competitor or whether, to the contrary, acquisition by the platform offers the most promising path to the commercial development and use of the acquired firm’s new technology or an essential exit strategy for investors in the acquired firm. Antitrust agencies and antitrust law need to develop a better understanding of the circumstances under which acquisitions of nascent competitors might be anticompetitive.¹³⁵ Enforcers may have to learn to think more as venture capitalists do and understand their analytics in order to better identify

¹³⁴ The D.C. Circuit in *Microsoft* endorsed this principle. See *United States v. Microsoft Corp.*, 253 F.3d 34, 79 (D.C. Cir. 2001) (en banc) (per curiam) (“[I]t would be inimical to the purpose of the Sherman Act to allow monopolists free reign to squash nascent, albeit unproven, competitors at will.”).

¹³⁵ In addition, because small acquisitions are not subject to pre-merger review under the Hart-Scott-Rodino Act, agencies are often unaware of the acquisitions until after they are consummated. The threshold for pre-merger notification was raised in December 2000 from \$10 million to \$50 million. While transactions under the threshold are still subject to Clayton Act enforcement, agencies do not see them in advance, may not find them at all, and can only sue to unwind them after the fact. After the filing threshold increase, there was a sharp uptick of newly non-notified mergers (between \$10 and \$50 million) between direct competitors—the type of mergers that likely would have been blocked during HSR review, had it occurred. Small technology mergers fall in this category also and are rarely reviewed or challenged. See Thomas Wollman, *Stealth Consolidation: Evidence from an Amendment to the Hart-Scott-Rodino Act*, AMER. ECON. REV. INSIGHTS (forthcoming 2019), <https://www.aeaweb.org/articles?id=10.1257/aeri.20180137>. An example of a problematic merger of this type that was challenged by DOJ after consummation is *Bazaarvoice-PowerReviews*. *United States v. Bazaarvoice*, 3:13-cv-00133-WHO, 2014 WL 203966 (N.D. Cal., Jan. 8, 2014). While the government prevailed in that litigation, because the two software firms had gone some way down the integration path, the result was arguably not as favorable for consumers as if the transaction had been notified and blocked ex ante which would have preserved two robust competitors. In general, the evidence demonstrates that firms act quickly to obtain market power in the absence of government enforcement, and that the requirement to notify the government serves as an important deterrent to anticompetitive mergers.

harms. A pattern of repeated purchases of small potential competitors that could have developed into substitutes, or an acquisition price that reflects a sharing of monopoly rents, might be useful indicators of possible competitive risks.

Antitrust law might also have difficulty policing conduct by established technology firms that tends to exclude or marginalize smaller rivals. Recall that at launch a platform invites and encourages complementors to provide content and functionality on its platform. It does this when it is competing for consumers' attention against other platforms because it wants its platform to be attractive. A successful platform creates an ecosystem that is valuable to consumers. However, one or both of the following issues may arise. In the first, a complement to the platform seeks to become its horizontal competitor. In the second, the platform seeks to become a horizontal competitor of one of its complements. Let us take these one at a time.

First, a complement can develop the ability to form a relationship with the end user that is sufficiently free-standing and valuable to take the user off the platform and into a separate relationship with the complement. The platform has an incentive to foreclose the complement to prevent this loss of market power and profit. Because the complement is transitioning into direct horizontal rivalry with the platform, US law does not have any trouble recognizing antitrust violations of this form. For example, content providers like Yelp are Google's complements—people want to be able to find Yelp reviews via Google—but Yelp is also a search engine that could grow to rival Google search. Google has entered the restaurant review market with its map product, and Yelp now alleges that Google is engaging in foreclosure.¹³⁶

Second, if the platform observes that a complement (say, complement Z) is earning strong profits, the platform may seek to enter that complementary market. Because the platform and rival complement Z providers are now horizontal competitors, the platform has the incentive—and, often, the ability—to foreclose those competitors. This could take the form of banning rival complements from the platform, reducing their ability to interoperate, raising their costs, steering customers elsewhere, and so forth. If the platform's new product Z is a wonderful innovation, there will be an efficiency (in the form of higher quality) to weigh against any harms from less competition.¹³⁷ At root, there is a fundamental question about whether all the rents of the platform are part of the competitive return to the creator of the platform, particularly if the complementors' added-value can be driven to zero once the network effects are operational. In a setting with single-homing users, those complements may have no bargaining power *ex post* and the platform may have the incentive and ability to give them a share of zero. This is a

¹³⁶ See Duhigg, *supra* note 23.

¹³⁷ Lina Khan, *Amazon's Antitrust Paradox*, 126 Yale L.J. 710, 780-83 (2017). See also Feng Zhu & Qihong Liu, *Competing with Complementors: An Empirical Look at Amazon.com*, 39 STRAT. MGMT. J. 2618, 2618 (2018) (finding that “[w]hile Amazon's entry discourages affected third-party sellers from subsequently pursuing growth on the platform, it increases product demand and reduces shipping costs for consumers”).

particularly interesting problem when those complementors added value to the platform at a critical competitive moment before network effects and entry barriers protected it.

Addressing this issue, the U.K. Furman Report and the EC Vestager Report both devote significant discussion to platforms being “fair” to complementors. First, a sectoral regulator is likely to be better than the antitrust laws at enforcing fairness norms. Antitrust law is focused, not on fairness itself, but on anticompetitive conduct that creates market power and might therefore permit various types of conduct that some might regard as “unfair” because, for example, a platform extracts the rents of partners that offer a good product but have no bargaining power. Because the complementor is not threatening to replace the platform, the simple exclusion theory of harm explained above does not apply directly. The situation is informally akin to the familiar “open early, closed late” strategy.¹³⁸ In the “open early, closed late,” strategy a firm at first encourages others to become dependent on connecting to it and relying on it, and later uses their dependence to shut out competitors or extract monopoly rents.¹³⁹ This type of behavior might be regarded as exploitation or excessive pricing and thus deemed to be an unlawful abuse of dominance under EU law. It would violate US law only if, among other things, it enabled the platform to gain or preserve market power it otherwise would not have in either the platform market or the market in which the excluded firm did business. In the latter case under US antitrust law, this conduct might be captured under the “duty to deal” framework.

Because large technology platforms have huge scale and benefit from network effects, they are often able to engage in aggressive conduct targeted at rivals without violating existing antitrust standards. The platforms might be able to copy rivals’ innovations or otherwise increase the value of their services to consumers without pricing below cost, and they might be able to insist that rivals using their platforms enter into agreements, such as agreements regarding access to consumer data, that enhance the platform’s ability to compete. A platform might be able to require exclusive contracts or loyalty-based contracts that cause single-homing by one side (e.g. drivers or consumers). Such single-homing might cause the market to tip in the platform’s favor and exclude a competitor. This kind of conduct often has efficiency benefits that make it difficult to challenge the conduct under the antitrust laws. Certain aspects of antitrust law might be adjusted, for example antitrust rules intended to prohibit dominant firms from engaging in conduct that would exclude an equally efficient competitor could be revised to better protect

¹³⁸ See Scott A. Sher & Bradley T. Tennis, *Exploiting Others’ Investments in Open Standards*, COMPETITION POL. INT. (Sept. 15, 2016), <https://www.competitionpolicyinternational.com/exploiting-others-investments-in-open-standards/>; Carl Shapiro, Exclusionary Conduct: Testimony Before the Antitrust Modernization Commission (Sept. 29, 2005), <http://faculty.haas.berkeley.edu/Shapiro/amcexclusion.pdf>, at 15 (“[I]n a network industry, a firm might obtain a dominant position based in part on certain ‘open’ policies that induce reliance by complementary firms, and then later exploit that position by offering less favorable interconnection terms or by refusing to interconnect with them altogether.”).

¹³⁹ For an example, see the discussion of Cisco-Arista at note 16, *supra*, and accompanying text.

smaller competitors. Nonetheless, it is unlikely that such adjustments would entirely eliminate the competitive advantages inherent in large firms with substantial scale and scope economies.

Pinpointing the locus of competition and therefore the relevant market in which technology platforms compete can also be challenging because the markets are multisided and are often ones with which economists and lawyers have little experience. This complexity can make market definition another hurdle to effective enforcement. For example, two platforms might compete in general search, while also each offering social media and mapping functionalities, among other services. Advertisers that buy ads on searches may be a common set of customers. While courts and agencies have substantial experience analyzing advertising markets, for example, they are less knowledgeable about markets for attention or barter transactions involving data made available to providers as an unintended byproduct of using a digital platform. The problems are compounded by the facts that technologies surrounding the products' functions in digital markets are continually changing and changes in quality-adjusted prices are difficult to observe.

Only one litigated US case has explicitly addressed these issues. That case culminated in a 2018 decision by the US Supreme Court.¹⁴⁰ Although the decision has been praised by some conservative commentators,¹⁴¹ it has been widely criticized by others.¹⁴² The case itself involved the credit card business and what the Court called a “transaction platform,” in which the platform (American Express) facilitated simultaneous transactions between consumers and merchants.¹⁴³ It should not, therefore, be legal precedent applicable to other kinds of platforms like Google and Facebook. But the case does suggest that the five-Justice majority on the Court is hostile to antitrust enforcement (at least in vertical and exclusion cases), does not understand multi-sided markets very well, and might be more influenced by ideological preconceptions than by evidence in the case or fact-finding by district court judges.¹⁴⁴

¹⁴⁰ Ohio v. American Express Co., 138 S. Ct. 2274 (2018).

¹⁴¹ See, e.g., FED. TRADE COMM'N, *Transcript: FTC Hearing #3: Competition and Consumer Protection in the 21st Century* (Session 4) (Oct. 15, 2018),

https://www.ftc.gov/system/files/documents/public_events/1413712/ftc_hearings_session_3_transcript_day_1_10-15-18.pdf, at 228-235 (Vinson & Elkins partner Darren Tucker praising the *American Express* decision).

¹⁴² See, e.g., Dennis W. Carlton, *The Anticompetitive Effects of Vertical Most-Favored-Nation Restraints and the Error of Amex*, COLUM. BUS. L. REV. (forthcoming 2019),

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3328628; Herbert Hovenkamp, *Platforms and the Rule of Reason: The American Express Case*, COLUM. BUS. L. REV. (forthcoming 2019),

https://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=3060&context=faculty_scholarship; A. Douglas Melamed & Nicolas Petit, *The Misguided Assault on the Consumer Welfare Standard in the Age of Platform Markets*, 54 REV. INDUSTRIAL ORG. 1 (2019); Michael Katz & Jonathan Sallet, *Multisided Platforms and Antitrust Enforcement*, 127 YALE L J. 1724 (2018). See also FED. TRADE COMM'N, *supra* note 141, at 226 (Goldstein & Russell partner Eric Citron describing the *American Express* decision as “economically illiterate”).

¹⁴³ *American Express*, 138 S. Ct. at 2277.

¹⁴⁴ Anthony Kennedy, one of the members of the five-justice majority in *American Express*, has since retired, but his replacement, Brett Kavanaugh, is likely even more ideological on antitrust matters. See Stephen Calkins, *How Might a Justice Kavanaugh Impact Antitrust Jurisprudence?*, PROMARKET BLOG (July 20, 2018),

<https://promarket.org/might-justice-kavanaugh-impact-antitrust-jurisprudence>.

The harm from lack of competition in digital markets will manifest itself in quality and innovation, as well as from higher prices to advertisers. As detailed by Giulio Federico and colleagues, the impact on consumer welfare of a decline in innovation due to lack of competition is likely to be large, especially in the case of fast-moving technologies that affect many consumers and related businesses.¹⁴⁵ Very often the uncertainty involved in evaluating harms to innovation will be high, especially in contrast to the analysis of price forecasts. It is possible to measure pipeline projects and current R&D to obtain a sense of competitive overlap or trajectory, but the tools do not yet exist to accurately forecast the speed and direction of innovation in the longer run. Likewise, obtaining quantitative evidence about the innovations or products that *would* have been offered to consumers in the absence of the conduct is often not possible.

Perhaps in part as a result of these challenges, US antitrust has not been active in policing allegedly anticompetitive conduct by technology platforms. The government's last monopolization case involving issues raised by platforms was the Microsoft case in 1998. Today, the European Commission and the European National Competition Authorities effectively act as the global enforcers for allegedly exclusionary conduct that operates at a global level in industries such as software, chips, and digital platforms.¹⁴⁶

d. Could a Reformed Antitrust Law be Effective in Dealing with Digital Platforms?

There are many ways that US antitrust law could be revised to make it more aggressive in addressing competition problems while maintaining the objective of prohibiting private conduct that reduces economic welfare. Such changes could improve competition enforcement in digital markets as well as others.

i. Reform by What Means?

With few exceptions, antitrust law has in the past evolved in a common-law-like process by which it has reflected new learning and judicial and market experience. This process is continuing, at least to some extent, as antitrust law and enforcement have recognized, for example, previously unnoticed competition problems in labor markets and doctrine has evolved to incorporate new learning about competitive problems that can be created by most favored

¹⁴⁵ Giulio Federico, Fiona Scott Morton, & Carl Shapiro, *Antitrust and Innovation: Welcoming and Protecting Disruption* (NBER Innovation Policy and the Economy, Working Paper, 2019) (on file with authors).

¹⁴⁶ See, e.g., Press Release, Euro. Comm'n, Antitrust: Commission Fines Google €4.34 Billion for Illegal Practices Regarding Android Mobile Devices to Strengthen Dominance of Google's Search Engine (July 18, 2018), http://europa.eu/rapid/press-release_IP-18-4581_en.htm; Press Release, Euro. Comm'n, Antitrust: Commission Closes Formal Proceedings Against Qualcomm (Nov. 24, 2009), http://europa.eu/rapid/press-release_MEMO-09-516_en.htm; *Report on the Monitoring Exercise Carried Out in the Online Hotel Booking Sector by EU Competition Authorities in 2016*, EURO. COMM'N (2017), http://ec.europa.eu/competition/ecn/hotel_monitoring_report_en.pdf.

nation (MFN) and other vertical agreements. The challenges posed by the big technology platforms and the current populist political climate have, however, put the issue of antitrust reform before Congress in various legislative proposals. There are advantages and disadvantages to both common law evolution and new legislation.

Evolution by a common law-like process takes time. It took the Chicago School roughly 20 years to refocus antitrust law, from the early expressions of its perspective in 1950s and 1960s¹⁴⁷ until the Supreme Court's seminal decision in *GTE Sylvania* in 1977¹⁴⁸—and the obstacles are probably greater now. While there had been ebbs and flows in antitrust enforcement in the mid-twentieth century, there was not a well-formed conceptual framework calling for aggressive enforcement that the Chicago School proponents had to overcome. The structure-conduct-performance paradigm was widely accepted as an economic proposition, but it was not embedded in a rigorous normative and conceptual antitrust framework. By contrast, oversimplified Chicago School thinking has provided a widely accepted framework for antitrust analysis for more than thirty years. Perhaps more importantly, many federal judges, appointed by an increasingly ideological vetting process, are trained in and adherents of that framework. Many seem unaware of new economic research that calls into question many of the tenets of that framework and continue to cite outdated Chicago School publications of the 1970s and 1980s. And, while there has been a great deal of economic research and literature on which a new antitrust paradigm could be constructed, there is not a widely accepted, alternative paradigm that is comprehensible to and administrable by lawyers and judges. Even if such a paradigm were written tomorrow and rapidly became widely accepted, it would likely take years for that paradigm to be manifest in doctrinal changes and market outcomes.

New legislation could in principle be adopted and take effect much more rapidly. New legislation would not need to depart from the dual requirements of bad conduct and harm to competition in the market as a whole. Such legislation might, instead, implement a recalibration of the relative tolerance of antitrust law for the risk of over-enforcement and under-enforcement by prescribing rebuttable presumptions that would ease the high proof requirements currently imposed on antitrust plaintiffs and place on defendants a more rigorous burden of proving efficiencies. Some possible new presumptions and similar reforms are outlined below.

The risk, of course, is that new legislation will not be enacted by experts committed to sound, economically-focused antitrust. It will be designed by Congress in a politically charged environment subject to pressure from the very companies who stand to lose their market power if subject to increased antitrust oversight, or who benefit if their trading partners are subjected to excessive oversight.

¹⁴⁷ See, e.g., Ward S. Bowman Jr., *Tying Arrangements and the Leverage Problem*, 67 YALE L.J. (1957); Robert H. Bork, *Legislative Intent and the Policy of the Sherman Act*, 9 J.L. & ECON. 7 (1966); Robert H. Bork & Ward S. Bowman, Jr., *The Crisis in Antitrust*, FORTUNE, Dec. 1963, at 138, *reprinted in* 65 COLUM. L. REV. 363 (1965).

¹⁴⁸ *Continental T.V., Inc. v. GTE Sylvania Inc.*, 433 U.S. 36 (1977).

There is more at stake than the risk of flawed legislation. Antitrust law has maintained legitimacy and widespread support for nearly 130 years in part because it applies to all forms of commercial activity and is not perceived as special interest legislation. In our view it is very important that antitrust law not have different rules aimed at different sectors—such as technology¹⁴⁹ or agriculture¹⁵⁰—that would differentiate industries and undermine political support for antitrust law in general. For this reason, the report outlines a number of useful digital platform interventions that can be undertaken by a sectoral regulator rather than falling to the task of antitrust enforcement.

Equally important, antitrust law has benefited immensely from the brevity and vagueness of the key statutory provisions because they have enabled antitrust law to evolve in response to new learning. The challenge with new legislation is to embrace enduring normative principles without codifying current economic learning in a way that will prevent the law from evolving to take account of newer economic findings.

ii. Reform of Antitrust Law Through a General Tightening

As noted, most antitrust cases require uncertain decisions about unknowable future events like innovation or entry or about unobservable economic elements like demand curves, marginal cost, and product quality. Much US antitrust law reflects judgments about how to deal with such uncertainty. Those judgments are embodied in rules regarding burdens of proof, evidentiary presumptions, and decision-theoretic approaches to fact finding. They are also embodied in substantive legal doctrine, such as rules regarding predatory pricing and unilateral refusals to deal that are intended to reduce the likelihood of false positives (erroneously finding a business has violated the law) even at the risk of false negatives (erroneously deciding that a business has not violated the law). Digital markets typically have high levels of uncertainty and move quickly.

Given uncertainty, courts must determine how much weight to put on the risk of enforcement mistakes: both the likelihood of a mistake and its cost. Much US antitrust law is driven by a judgment, embraced by the Chicago School, that avoiding false positives (good conduct judged to be bad) is more beneficial to society than avoiding false negatives (anticompetitive conduct judged to be good).¹⁵¹ This judgment rests on the beliefs that false positives are difficult to correct but that false negatives will be quickly corrected by market forces. These beliefs seemed

¹⁴⁹ As suggested, by, e.g., Elizabeth Warren, *Here's How We Can Break Up Big Tech*, MEDIUM (Mar. 8, 2019), <https://medium.com/@teamwarren/heres-how-we-can-break-up-big-tech-9ad9e0da324c>.

¹⁵⁰ As suggested by, e.g., Elizabeth Warren, *Leveling the Playing Field for America's Family Farmers*, MEDIUM (Mar. 27, 2019), <https://medium.com/@teamwarren/leveling-the-playing-field-for-americas-family-farmers-823d1994f067>.

¹⁵¹ For a classic statement of this proposition, see Frank H. Easterbrook, *Vertical Arrangements and the Rule of Reason*, 53 ANTITRUST L.J. 134, 135-36 (1984) (“There are limits on the ability of courts to sort the beneficial from the deleterious manifestations of [restrictive dealing] practices, and most of the time it is better not to try than to try and fail.”). For a criticism of this view, see Jonathan B. Baker, *Taking the Error Out of ‘Error Cost’ Analysis: What’s Wrong with Antitrust’s Right*, 80 ANTITRUST L.J. 1 (2015).

plausible in 1975 in a Chicago School framework, but they have never been empirically demonstrated and have fallen into disrepute. Moreover, their logic is incomplete because the cost to society of a false negative, for example, depends not only on its likelihood, but also on both the magnitude and the duration of the resulting harm.

It is time for antitrust law to recalibrate the balance it strikes between the risks of false positives and false negatives. Underenforcement is likely to be costlier than previously thought because, among other things, market power of large technology platforms is more enduring. False negatives are almost certainly more common than previously thought because certain types of conduct that were previously thought to be benign are now understood to be anticompetitive. Especially in technology markets, the most important competitive threats to incumbent firms are likely to come from new entrants that might be vulnerable to exclusionary conduct or anticompetitive acquisitions when their competitive prospects are uncertain. In addition, false positives might be less common than previously thought because of the development in the past few decades of more sophisticated and reliable econometric and simulation tools for assessing conduct and market power effects. New work by economists studying multi-sided markets, network effects, the economics of nominally “free” goods and services, and restrictive vertical agreements suggests that antitrust agencies and courts will continue to improve in their ability to make sound enforcement decisions. And false positives might be less costly than previously thought because firms are finding new and different ways to realize efficiencies.

A recalibration of this type should influence antitrust law in two basic ways. First, it should provide a basis for revising certain aspects of antitrust doctrine that were adopted explicitly in order to minimize the risk of over-enforcement. Second, it could more broadly provide a basis for courts to impose less demanding proof requirements on antitrust plaintiffs, especially where facts are difficult to observe or prove directly and indirect or circumstantial proof is available. Again, we pursue our theme of harm to entry through the next section. Exclusion of existing or potential entrants is well established in both the economics literature and the antitrust jurisprudence as a harm to competition, but the law is not well calibrated to recognize this familiar tactic in its new setting.

Some of the specific ways in which the law might be revised are set forth below. They could be achieved by common law-like evolution of antitrust law or by new legislation.

iii. Specific Areas of Possible Antitrust Reform [designed for the specialist reader]

To address the issues raised by technology platforms, antitrust enforcement agencies and courts will need to understand the unusual factual context that those platforms often present and be receptive to recent and future economic learning about the implications of that context and how to apply antitrust principles to it. Economists and other experts will need to develop new

understanding and new tools to aid agencies and courts in addressing these matters, among others:

- How to assess the quality-adjusted price paid for a good or service sold in a barter transaction with zero or close to zero monetary price, and how to define and analyze markets in which a substantial portion of the sale take the form of barter transactions.
- How learning from behavioral economics and related disciplines about addictive or exploitative content should be considered in addressing issues regarding economic welfare.
- How technology platforms are able to take advantage of consumer biases (such as salience, status quo bias, or impatience) to bind consumers to their platforms and make switching to alternatives more difficult than imagined by lay intuition (“competition is one click away”).¹⁵²
- How market circumstances affect the likelihood and nature of innovation and how to evaluate innovation, whether using qualitative or quantitative tools, in both its magnitude and direction.
- How to assess potential competition from new or small firms or not-yet-identified future innovators and entrants. This is especially important in markets that depend on technological change and in which competition in the market is less important than leap-frog competition for the market.
- How to assess consumer welfare in a two-sided market. Learnings from platform economics suggests that users on different sides of a platform generally have divergent interests and thus that defining a single two-sided market—rather than two, closely interrelated ones—obscures the analysis. Platform economics also demonstrates that neither the change in the two sided price nor the change in the transaction volume is a sufficient statistic for a how a firm’s conduct affects consumer welfare.¹⁵³

¹⁵² David Wismer, *Google’s Larry Page: ‘Competition is One Click Away,’ (and Other Quotes of the Week)*, FORBES (Oct. 14, 2012), <https://www.forbes.com/sites/davidwismer/2012/10/14/googles-larry-page-competition-is-one-click-away-and-other-quotes-of-the-week>.

¹⁵³ One of the features of such platforms is that, because of the feedback effects between the two sides of a platform and the importance of the relative prices charged on the two sides, increased output by the platform does not necessarily imply increased economic welfare. Whether increased output by the platform will increase economic welfare depends on how the benefits and costs of that output are allocated across the two sides. See Michael L. Katz, *Platform Economics and Antitrust Enforcement: A Little Knowledge is a Dangerous Thing*, 28 J. ECON. & MGMT. STRAT. 138 (2019); Jean-Charles Rochet & Jean Tirole, *Platform Competition in Two-Sided Markets*, 1 J. EURO. ECON. ASSOC. 990 (2003). There is another sense in which increased output of digital platforms does not necessarily increase economic welfare. Because of some of the unique attributes of digital platforms discussed above, consumer demand for digital services does not necessarily reflect consumer welfare from those services. See Section II.1,

Other antitrust reforms, including those below, would require changes to doctrine:

- Antitrust law prohibits unilateral refusals to deal only under very unusual circumstances. Current law reflects, among other things, concerns about the difficulty of determining the required terms of trade and incentive effects of required dealing on both the dominant firm and its rivals.¹⁵⁴ The law thus gives platforms substantial freedom both to refuse to deal with actual or potential rivals, including complements, and to deal with them only on onerous terms. Those terms might include access to customer data, interoperability, and other terms that raise the costs of rivals and enable the platforms to reinforce their dominant positions. This doctrine should be reconsidered in light of the substantial importance of large technology platforms and, in particular, their central role as distribution channels, both of which suggest that the benefits of antitrust intervention might be greater than previously appreciated.
- Predatory pricing law has been shaped in large part to avoid over-enforcement and with explicit acknowledgement that the law permits some forms of anticompetitive pricing conduct.¹⁵⁵ Courts have adopted a narrow and rigid notion of recoupment¹⁵⁶ and have made it almost impossible to prove that prices are below cost, even where it seems likely.¹⁵⁷ Digital goods often have a marginal cost close to zero, which makes tests that require prices to be below incremental or variable cost almost impossible for a plaintiff to meet. The law has also been construed to protect only rivals that are equally efficient at the time of the conduct at issue and thus to disadvantage smaller rivals that have not yet reached efficient scale. Predatory pricing law should be modified so that it will be better able to combat anticompetitive pricing by digital platforms and other firms.
- The paradigm of predatory pricing law has also been relied upon to assess more complex pricing strategies, such as loyalty discounts. Loyalty discounts and similar contracts can be used to drive one side of a platform to single-home, which can cause a market to tip and enhance market power. The efficiency benefits of loyalty discounts are very different from those of low prices in general; for example, unlike low prices themselves, even above-cost loyalty discounts do not necessarily increase static welfare. Antitrust law

supra. This latter concern applies to other products as well, such as mortgages and prescription drugs; and it is very relevant to possible regulation of digital platforms, as discussed below. By contrast, while antitrust enforcers and courts need to understand those attributes of digital platforms in order to understand how the relevant markets work, antitrust law is for several reasons based on the assumption that consumer preferences reflect consumer welfare.

¹⁵⁴ See, e.g., *Verizon Commc'ns Inc. v. Law Offices of Curtis V. Trinko*, 540 U.S. 398 (2004); see also A. Douglas Melamed, *Exclusionary Conduct Under the Antitrust Laws: Balancing, Sacrifice and Refusals to Deal*, 20 BERKELEY TECH. J. 1247 (2006).

¹⁵⁵ See *Barry Wright Corp. v. ITT Grinnell Corp.*, 724 F.2d 227, 231, 234 (1st Cir. 1983) (Breyer, J.).

¹⁵⁶ See C. Scott Hemphill & Philip J. Weiser, *Beyond Brooke Group: Bringing Reality to the Law of Predatory Pricing*, 127 YALE L.J. 2048 (2018).

¹⁵⁷ See, e.g., *United States v. AMR Corp.*, 335 F.3d 1109 (10th Cir. 2003).

should not rely exclusively upon predatory pricing standards to assess loyalty discounts.¹⁵⁸

- The Supreme Court held in *American Express* that a plaintiff in a case involving a vertical restraint must define and prove a relevant market and may not rely on direct proof of harm to competition.¹⁵⁹ This holding was based on the notion that vertical restraints almost always enhance efficiency and almost never harm competition. Scholars over the past 30 years have demonstrated that that notion is false and therefore, that vertical restraints must be evaluated individually on the specific facts.¹⁶⁰ Where there is direct evidence of harm to competition, antitrust law should not require circumstantial evidence via a defined relevant market.
- Courts are generally very reluctant to second guess a defendant's product design decisions, even where the design harms competitors.¹⁶¹ Yet product design decisions involving, among other things, app stores, mobile device screen layouts, data storage and analysis, and interface design are often key elements in digital market competition. Antitrust courts should be more willing to assess product design decisions where appropriate.
- There should be no safe harbor based on the short-term of exclusive dealing agreements and other restrictive vertical agreements when they are used by dominant platforms or firms. Such firms can use their market power to induce desired behavior in trading partners without relying on long-term contracts.¹⁶²

Perhaps most importantly, antitrust law might be revised to relax the proof requirements imposed upon antitrust plaintiffs in appropriate cases or to reverse burdens of proof. Burdens of proof might be switched by adopting rules that will presume anticompetitive harm on the basis of preliminary showings by antitrust plaintiffs and shift a burden of exculpation to the defendant or by ensuring that plaintiffs are not required to prove matters to which the defendants have greater knowledge and better access to relevant information. These proof requirements include the following, which are likely to be important in the application of antitrust standards to technology platforms:

¹⁵⁸ See Hemphill & Weiser, *supra* note 156.

¹⁵⁹ *Ohio v. American Express Co.*, 138 S. Ct. 2274 (2018).

¹⁶⁰ See Steven C. Salop, Revising the Vertical Merger Guidelines: Presentation at the FTC Hearings on Competition and Consumer Protection in the 21st Century (Nov. 1, 2018), https://www.ftc.gov/system/files/documents/public_events/1415284/ftc_hearings_5_georgetown_slides.pdf; Steven C. Salop, *Invigorating Vertical Merger Enforcement*, 127 YALE L.J. 1742 (2018).

¹⁶¹ See *United States v. Microsoft Corp.*, 253 F.3d 34 (D.C. Cir. 2001) (per curiam).

¹⁶² Compare *United States v. Dentsply Int'l, Inc.*, 399 F.3d 181 (3d Cir. 2005), with *Omega Env'tl., Inc. v. Gilbarco, Inc.*, 127 F.3d 1157 (9th Cir. 1997).

- Mergers between dominant firms and substantial competitors or uniquely likely future competitors should be presumed to be unlawful, subject to rebuttal by defendants. This presumption would be valuable, not because it would identify anticompetitive mergers with precision, but because it would shift the burden to the party with the best access to relevant information on issues of competitive effects and efficiencies from the merger.
- Courts should not presume efficiencies from vertical transactions. Crediting of efficiencies should require strong supporting evidence showing merger-specificity and verifiability.¹⁶³
- Courts should be more willing to permit plaintiffs to prove harm to competition by circumstantial evidence, especially where the propositions in question are not observable and there thus cannot be direct evidence.¹⁶⁴

iv. A Competition Court

Revisions to the law may have little effect to the extent that judges see antitrust cases only rarely and have difficulty understanding the economic underpinning of antitrust law. One way to ameliorate this problem would be to establish a specialized antitrust court on which a certain number of Article III judges would sit for a specified term of several years. These judges could be expected to hear multiple antitrust cases and to develop substantial antitrust expertise. And, because they would be chosen from the general federal bench, they would bring the broader perspective of generalist judges. This model could be used at the trial court level, the appellate level, or both. If judges are selected from the larger pool of Article III judges and rotated on and off the specialized court, judges on the specialized court will be less likely to develop an overly narrow intellectual interpretation of antitrust law.

v. A Regulatory Partner Could Enhance Effective Antitrust Enforcement

Digital markets move quickly. Using the internet as a distribution channel to reach an installed base of billions around the globe means that new products can be rolled out quickly—as can anticompetitive conduct. The pace of antitrust enforcement is far slower—judging by the evidence, too slow—to protect small entrants except by creating deterrence. A sectoral regulator, by contrast, could be endowed with the authority to move quickly. By taking steps to preserve competition before markets have tipped or entrants have been purchased, a regulator could prove a valuable complement to antitrust enforcement.

¹⁶³ For an example of the Court presuming efficiencies from vertical transactions with minimal evidence, see *American Express*, 138 S. Ct. at 2289.

¹⁶⁴ See, e.g., *id.* (injury to competition in a two-sided market); *United States v. AMR Corp.*, 335 F.3d 1109 (10th Cir. 2003) (predatory pricing).

Antitrust enforcement proceeds on a case-by-case basis, and, apart from merger enforcement, it is largely backward looking—it looks at conduct already undertaken that is alleged to harm competition. A regulator, by contrast, can look forward and establish rules to constrain future conduct before there has been harm to competition, or before investments by the defendant and third parties have been shaped by the conduct. This is particularly useful in cases where *ex post* conduct remedies would be costly or ineffective.

Effective antitrust enforcement requires effective remedies. Treble damages and financial penalties can compensate for past harms and deter future bad conduct, but they do not restore competition to markets in which competition has been harmed. Even an injunction to forbear from the same or similar anticompetitive conduct going forward will not restore the lost competition if entry barriers are high. For example, if the market has tipped and network externalities are very strong, the firm that became a monopolist through violations of the antitrust laws could stop the conduct at issue and yet retain its monopoly position and the associated stream of profits. An antitrust authority that wants to restore lost competition must induce entry and/or impose structural remedies. Such remedies are likely to require detailed and often technical monitoring and years of effort. Antitrust enforcers are not suited to that type of oversight whereas a sectoral regulator is. One possible solution is to permit antitrust authorities and courts to design antitrust remedies and rely on an expert sectoral regulator to oversee their implementation. A similar approach was approved by the Supreme Court in the *Otter Tail* case.¹⁶⁵

e. Regulation

For the reasons above, we believe the establishment of a sectoral regulator should be seriously considered. Given the tasks detailed by the other committees in this project as well as this one, there would be much for a regulator to do that would improve the impact of digital platforms on society. A digital regulator, should Congress choose to create one, could consider regulations and actions along the following lines. We call this potential regulator the Digital Authority (DA).

The general harm identified above is insufficient entry, and therefore insufficient competition, in digital platforms. Many of the regulations below are designed to lower barriers to entry directly. Others are responsive to the difficulty of effectively prosecuting antitrust cases today in digital markets. Regulations that mimic the antitrust laws but lower the burden of proof for the regulator and allow it to move faster are a way to gain effective enforcement in this sector, if not others.

Regulation offers a valuable addition to antitrust enforcement. It can help design the digital landscape and align the interests and incentives of platforms and key providers with those of consumers and society. When carefully designed, a regulatory regime can limit or even preempt the harmful effects detailed above, while minimizing its impact on the dynamic nature of digital

¹⁶⁵ *Otter Tail Power Co. v. United States*, 410 U.S. 366 (1973).

markets. It can offer clarity and legal certainty as to the boundaries of acceptable competition. Moreover, some of the problems discussed above may have only one structural solution: breakup of the platform. An enforcer might not want to choose that option because it is very disruptive. But less disruptive ex post remedies require ongoing monitoring, which antitrust enforcers are not well-positioned to do. Handing that job off to a regulator might better serve consumers.

Therefore, the committee suggests considering regulatory steps in conjunction with improved antitrust enforcement. It is important that regulation support, and indeed enhance, competition. The report focuses here on regulations targeted at improving competition, not other policy challenges related to digital platforms. And it is critical that any new regulatory framework avoid the well-documented pitfalls that regulation often invites (e.g., agency capture, revolving door syndrome, or incumbent protection). By having a pro-competition mandate, our hope is that the DA will be able to use the tools at its disposal in ways that resist the natural impediments to entry identified in Part I, rather than entrench powerful incumbents.

This combination of enforcement tools applied to one industry is nothing new in the US economy. Virtually every sector of our economy has required both antitrust and specific regulatory oversight, from banking to agriculture to communications, in order to promote competition and other public interest goals. The regulations we propose below are focused on, and limited to, those that will enhance competition.

The communications sector may offer the best guidance for how to approach public accountability for digital platforms. Telephone, cable, and wireless communications networks have many of the same attributes as digital platforms. Large capital expenditures to build networks, declining costs as consumers use the networks and buy more services on the networks, and the difficulties for new players to enter these markets and compete have led to a world of one or few players in each market. And just like social networking, online search, and web-delivered content, communications networks have been the lifeblood of how we communicate and practice our democracy by delivering TV, radio, text, and conversation, making competitive outcomes in the sector critical. The FCC has served as the sector-specific regulator for telecommunications. In complex industries, a sector-specific regulator can have a wider remit than an antitrust authority as is detailed in the box below.

Box VI The FCC Model

In the Telecommunications Act of 1996, Congress sought to affirmatively promote, not just protect, competition.¹ Congress' vision included service availability that was universal and affordable to all and a commitment to local and diverse ownership of news sources to support a robust marketplace of ideas.² It wanted to prevent undue discrimination, limit ownership to prevent excess market power (both horizontally and vertically in some instances), and police against abusive contract provisions that distort fair market practices.³ Some of these goals were achieved with more success than others. And in general, the regulatory process inherently restricts behavior and therefore efficiencies. The net benefits of regulation should factor in these lost efficiencies.

The phone number portability rule was a clearly pro-competitive regulation. The FCC published the Wireless Local Number Portability rule in 2003.⁴ The rule allows cell phone users to keep their phone number when they switch between wireless carriers. Prior to the rule, a consumer who wanted to take advantage of a low price or better quality with a competing provider would have had to change her phone number. This significant switching cost dampened competition between carriers. The number portability rule made switching easier and thereby strengthened competition between carriers.⁵ Similarly, when portability of 1-800 numbers (e.g., 1-800-flowers) was introduced, prices of those services fell.⁶

After Congress found the cable companies to be local monopolies in 1992, Congress identified a dearth in cable competition partially caused by vertically-integrated cable operators' refusal to sell their programming to potential competitors. It therefore temporarily prohibited exclusive programming contracts, banned a variety of abusive contracting practices, and required that vertically-integrated firms sell their content to competitors under reasonable prices, terms, and conditions.⁷

1 H.R. Rep. No. 104-458 (1996) (Conf. Rep.). Even before the 1996 Act, the FCC had already begun the work of promoting competition through the broad authority it had been granted in earlier statutes.

2 47 U.S.C. § 151 (2018).

3 *Id.*; 47 U.S.C. § 160 (2018).

4 See generally *Wireless Local Number Portability (WLNP)*, FED. TRADE COMM'N, <https://www.fcc.gov/general/wireless-local-number-portability-wlnp>.

5 Press Release, Federal Communications Commission, FCC Observes First Anniversary of Wireless Local Number Portability (Nov. 24, 2004), <https://www.fcc.gov/document/fcc-observes-first-anniversary-wireless-local-number-portability> ("Wireless local number portability (LNP) eliminated a barrier to full competition in mobile telephone services and between landline and wireless services").

6 V. Brian Viard, *Do Switching Costs Make Markets More or Less Competitive? The Case of 800-Number Portability* (Cheung Kong Graduate School of Business Research Paper No. 1773R2, 2004), <https://ssrn.com/abstract=371921>.

7 47 U.S.C. § 251 (2018).

The FCC Model (Cont.)

The resulting increased competition in the cable industry enabled the Direct Broadcasting Satellite industry to grow,¹ opened the door for telephone companies and smaller cable providers to compete in the provision of distribution,² and ultimately drove the digital video market to develop today's cable-modem-powered broadband internet services.

The 1996 Telecommunications Act included interconnection requirements between competing carriers to expand competition. The Act outlined a regulatory regime of duties to connect, of parity in quality between connections offered to the incumbent's own affiliates and competitors, and of rates and contract terms that were just, reasonable, and nondiscriminatory.³ The regulation was designed to protect all of the businesses that needed to connect to the long-distance wire for their business but competed with a vertically-integrated local wire. Not only was raising rivals' costs prohibited, but complete foreclosure was also prohibited. This duty to deal in a non-discriminatory way is an example of a policy that arguably promoted entry of cable, local telephone, and long-distance competitors.

Similarly, the FCC developed Customer Proprietary Network Information (CPNI) rules, designed to protect sensitive business data transmitted through public telecommunications networks. The FCC recognized that a dominant platform, such as the telephone company, on which businesses rely in order to reach their customers, could easily gather and take advantage of sensitive business user data to promote the phone company's business and harm competition.⁴ Phone service competitors, as well as data-driven businesses (such as home-security monitoring firms, hotels, and airlines), rely upon these rules to grow their businesses without interference from telecom network owners. The rule was so effective at promoting competition that Congress codified it in the 1996 Telecommunications Act. The harvesting of data flowing through a platform—generated by and belonging to others—is a standard business practice among today's digital platforms.

Of course, these past regulatory efforts have also helped us learn what not to do. Regulations could be and have been used to entrench incumbent firms' market power, erecting regulatory barriers to entry for new or innovative competitors.

1 47 U.S.C. § 548(a) (2018).

2 47 U.S.C. § 521(6) (2018); 47 U.S.C. § 548 (2018).

3 47 U.S.C. § 251 (2018).

4 47 U.S.C. § 222 (2018).

The FCC Model (Cont.)

Regulatory capture is a common problem.¹ For example, AT&T has historically had a symbiotic relationship with the US government.² Perhaps the height of this relationship was the explicit Kingsbury Commitment in 1913, which allowed AT&T, rather than the government, to set the “solution” for managing competition.³ The current Chairman of the FCC, Ajit Pai, has called this “a cautionary tale about the dangers of regulatory capture.”⁴ It was likely this close relationship that allowed the AT&T monopoly to persist for so long, eventually requiring an antitrust case to address the problem.

1 See George J. Stigler, *The Theory of Economic Regulation*, 2 BELL J. ECON. REG. 3 (1971) (arguing that, “as a rule, regulation is acquired by the industry and is designed and operated primarily for its benefit.”); see also Sheldon Whitehouse, *Legal Responses to Regulatory Capture*, ACS BLOG (Nov. 9, 2018), <https://www.acslaw.org/acsblog/blog-post-for-the-american-constitution-society-legal-responses-to-regulatory-capture> (“We unfortunately live in a time of widespread regulatory capture. We should not pretend otherwise.”); Elizabeth Warren, *Corporate Capture of the Rulemaking Process*, REG. REV. (June 14, 2016), <https://www.theregreview.org/2016/06/14/warren-corporate-capture-of-the-rulemaking-process> (“Under the law, it is easy for business groups to challenge a rule for being too strong or too restrictive. But it is much harder for public interest groups or ordinary citizens to challenge a rule for being too weak or riddled with loopholes.”); Daniel Carpenter, *Challenges in Measuring Regulatory Capture*, REG. REV. (June 22, 2016), <https://www.theregreview.org/2016/06/22/carpenter-challenges-measuring-regulatory-capture> (“[T]here are limitations when it comes to preventing capture. Perhaps the most important is that capture is difficult to measure”).

2 Chris Matthews, *AT&T and the Government Have Been ‘Friends’ for a Really Long Time*, FORTUNE (Aug. 18, 2015), <http://fortune.com/2015/08/18/att-nsa>.

3 Ajit Pai, Chairman, Fed. Comm’n Comm’n, Remarks on the 100th Anniversary of the Kingsbury Commitment (Dec. 19, 2013), <https://www.fcc.gov/document/pai-remarks-100th-anniversary-kingsbury-commitment>.

4 *Id.*

i. The Digital Authority

To be effective, a proposed regulatory regime requires an enforcement body capable of carefully designing and enforcing the relevant regulations. We start therefore with a proposal for Congress to pass legislation creating a Digital Authority with the mandate to develop targeted regulation to achieve the goals described above and subsequently engage in monitoring and enforcement.

We anticipate that this regulator will also be tasked with non-competition digital goals, such as those in the areas of privacy, media, data-use restrictions, and consumer protection. While the antitrust agencies will employ structural interventions to protect competitive markets wherever possible, the focus of this regulator will be on both carrying out remedies for the antitrust authority that require ongoing oversight, and on developing regulations going forward that are a combination of structural safeguards, such as unbundling or separation, with limited behavioral interventions in areas where traditional antitrust tools are insufficient. Other jurisdictions that are

assessing competition in digital platforms all propose some form of regulation.¹⁶⁶ Having forward-looking regulations in place will increase business certainty about what conduct is permitted and how enforcement actions are likely to proceed. Ideally, this predictability and clarity will encourage companies to comply with the law, thus requiring fewer government resources for enforcement.

The DA legislation will require Congress to define the scope of regulatory power. The definition must include digital businesses that facilitate transactions of any kind (including the sale of advertising). It should have clear and broad authority over digital business models in order to prevent firms subject to regulation from evading its oversight.

We offer a menu of potential regulation, starting with the least intrusive form and building to the more severe interventions. Each type of regulation comes with costs and benefits which we briefly detail. The size of the costs and benefits will be different across settings, meaning that the choice of the best tool for any particular case may vary. The committee also suggests separating out some types of regulation that will apply to virtually all market participants while others are only appropriate tools to apply to companies with bottleneck power.

1) Bottleneck power

“Bottleneck power” describes a situation where consumers primarily single-home and rely upon a single service provider (a “bottleneck”), which makes obtaining access to those consumers for the relevant activity by other service providers prohibitively costly. As the U.K. Furman Report put it,

[O]ne, or in some cases two firms in certain digital markets have a high degree of control and influence over the relationship between buyers and sellers, or over access by advertisers to potential buyers. As these markets are frequently important routes to market, or gateways for other firms, such bottlenecks are then able to act as a gatekeeper between businesses and their prospective customers.¹⁶⁷

The finding of bottleneck power will employ consideration of the forces that, as discussed above in this Report, tend to impede entry and lead to foreclosure. The Furman Report similarly explains that this single-homing foreclosure tends to happen when users experience high switching costs, such as loss of valued personal data or reputational indicators at the point of switching; contract terms that deter switching; technical barriers to switching, such as complex switching processes or a lack of interoperability between the old service and the new or second service; tying services, which can be by contract or technical; and the inertia of defaults.¹⁶⁸

¹⁶⁶ See, e.g., AUSTRALIAN COMPETITION REPORT, *supra* note 1, at 13-14; EC COMPETITION REPORT, *supra* note 1, at 8-10; U.K. COMPETITION REPORT, *supra* note 1, at 60-61.

¹⁶⁷ U.K. COMPETITION REPORT, *supra* note 1, at 41.

¹⁶⁸ *Id.* at 36.

Digital businesses that have this incentive and ability to develop and preserve a single-homing environment should be considered entities with bottleneck power. The DA, pursuant to congressional guidance, should have the sole authority to define bottleneck power and should update the definition either regularly or on an “as needed” basis. This is not a determination that should be left for definition by generalist judges. If Congress establishes a specialized panel of judges who review antitrust matters (as described above), it would be wise to grant the same panel sole judicial review authority over DA regulatory actions.

2) Data

Should Congress pass any laws concerning consumer data, the authority could set forth pro-competitive rules concerning the consequences of consumers’ control over their data and about user choice in the sharing of data. Where users are simply and clearly informed and given the opportunity to make viable choices about which companies get their data, this valuable competitive information can be shared as the consumer prefers. The DA could design data sharing rules with the general goal of reducing single-homing and promoting entry.

3) Partnership with the Antitrust Agencies

Antitrust enforcement agencies or courts could designate the DA as the administrator and/or architect of remedies in antitrust cases. In cases where structural remedies are not appropriate to restore the lost competition, the DA could be directed to either carry out a remedy designed by the competition authority, or provide an effective behavioral monitoring remedy consistent with the DA’s mandate. Since the difficulty of designing an appropriate and administrable antitrust remedy that can be enforced by a court often limits antitrust enforcement, having the option of an expert regulator to craft the remedy, or to simply be responsible for ongoing monitoring or other execution of the remedy, could better ensure cost-effective enforcement of pro-competition policies.

The DA can partner with the antitrust agency when it observes anticompetitive conduct. Due to their frequent interaction with firms in the industry and their real-time data feed, regulators may observe exclusionary conduct before the antitrust authority, and be able to give it relevant information and data.

ii. Menu of Regulations

We lay out below a menu of regulations that could be used to solve the problems identified above from least interventionist to most interventionist. For each, we describe the likely benefits and the costs.

1) Broadly Applicable Regulations

Some of these regulatory tools should be applied broadly to all firms in the industry, not only to bottleneck firms. It would be appropriate, however, to include a small business exception and perhaps even a new business exception, to allow very small entrants, who may benefit competition, time to ramp up against larger established companies.

a. Data collection

The Digital Authority could regularly collect data on market transactions, with an emphasis on data from businesses with bottleneck power. The information would allow policy makers and researchers to assess the performance of the sector and improve rule enforcement. For example, the data may include, inter alia, a sample of searches at a set of websites, a sample of queries followed by purchases at other sites, a sample of downloads of applications at an app store, or a sample of activity and ads shown on a social media site. The DA may further regularly collect information, including what types of data the business collects, how it uses that data, and who else is bartered or sold access to which elements of the data. It may include experiments to evaluate the true portability of data, the ads generated by certain user information, and other information relevant to assessing how and if competition is taking hold in the market. This program will require ongoing costs to run, but these should be reasonable compared to the benefits.

Box VII

Real Time Regulation in Financial Services

Technological innovation and the data revolution are also disrupting the financial services market, spurring regulators into action. Banks and other companies are undergoing an innovation and digitization spree, partially in response to competition by non-financial institutions and startups. This rapid change increases the challenges for regulators to follow and analyze what regulated companies are doing.

The response by some financial regulators has been to embrace new technologies focused on machine readable regulation (with the help of machine learning and AI) and digital reporting (with the help of data sharing frameworks, APIs, cloud computing, and advanced analytics). This is leading to an important shift from manual and template driven compliance and regulatory reporting to a near real time or real time regulatory reporting and supervision. Examples of authorities adopting this system range from the European Central Bank, various national central banks in continental Europe, the Monetary Authority of Singapore, or more notably, the Bank of England and the Financial Conduct Authority (FCA) in the UK.

Real Time Regulation in Financial Services (Cont.)

The Bank of England and the FCA are arguably the most advanced when it comes to digital regulatory reporting. Both were the first financial regulators to set up innovation labs and programs to interact with startups and new technologies. Their aim is to assess which regulation is suitable for machine reading, what data could be included in a standardized fashion within a digital regulatory reporting framework and how these changes will impact data models currently used for regulatory stress testing, leading to upgrades. This standardization then allows for near real time data sharing, lowering compliance costs to small and big firms alike.

Closer to home, in the United States, the SEC is implementing rules requiring trading firms to report intra-day trading data in real time. The SEC, the CFTC and the FDIC have also each set up fintech/regtech innovation labs to assess fintech solutions in general and regulatory tech solutions in particular. A Digital Authority could learn from, and expand on, these experiences of near real time regulation when overseeing an industry that has data at its core.

These data may be requested by an antitrust agency to aid in an investigation or prosecution. This ability to transfer existing data will speed up the enforcement of antitrust laws. After an investigation is opened, rather than subpoenaing the relevant data from the targeted firms and spending months arguing over definitions and formats, the antitrust authority could immediately begin analysis with the DA dataset.

In addition, the DA should make as much of these data public as possible, subject to keeping personally identifiable information and business secrets confidential. This will allow academics and nonprofits to study particular markets and consumer behavior as they do in industries such as airlines (where “Data Bank 1A” is publicly available)¹⁶⁹ to great public benefit. Leveraging the nonprofit and educational sector to help the DA and elected officials understand these markets is likely to be helpful and cost-effective.

b. Restrictions on Practices That Enhance Behavioral “Mistakes”

As described above, it is well known that behavioral “nudges” can lead consumers to make better choices. Better choices promote competition because they generate increased market share for firms that make better offers to consumers. The DA should have a mandate to create such “light touch” rules when they will make markets more competitive. For example, automatic renewals can discourage consumers from comparison shopping when a contract ends. A restriction on automatic renewals in that setting could lower prices market-wide. Regulations that require firms to make salient the most important terms of an offer can improve competition (e.g., a credit card offer must show the APR in large font). The U.K. likely has the most advanced regulatory

¹⁶⁹ See Bureau Transportation Stat., *Sources of Aviation Data*, U.S. DEP’T TRANSPORTATION (2017), <https://www.bts.gov/explore-topics-and-geography/topics/sources-aviation-data>.

regime in this regard, and the DA may be able to learn from it and other jurisdictions that have already taken these steps.¹⁷⁰

c. Data Portability and Mobility

Congress may, at some point, pass a data law of some type that gives consumers control of their data. For this control to translate into more competitive markets, it must be used to lower switching costs and facilitate entry. The DA has a role to ensure that users can easily transfer their data from one service to another in industries where there is a common business model (e.g., social media, banking, or online grocery shopping). The DA will identify industries where porting is likely to aid the competitive process. Being able to port one's data directly lowers the cost of moving from one service to another, which in turn causes businesses to compete harder to keep those customers.¹⁷¹ Consumers who control their data and have the right to receive it in a standardized format from the business will be able to take advantage of a new entrant by porting themselves to it, along with their own data. With information about a user's past purchases, likes, friends, and so forth, the entrant can provide a higher-quality service and grow more quickly.

The DA could propose a standard for exchanging the data, but remain open to options that industry favors, provided the format is not itself an entry barrier. The data porting standard should be updated frequently to accommodate new innovations in the industry. New innovators can think broadly about what services users might like that rely on this data, or are compensated through access to the data.¹⁷² The Vestager Report divides data into personal and not personal; and content into volunteered, observed, and inferred.¹⁷³ The DA could determine which of these types of data must be included in the portability standard.

While a porting regulation lowers consumer switching costs greatly, they may still be high enough that demand is not sufficiently contestable to induce entry.¹⁷⁴ The DA could also set up a process by which a customer can choose to send her data to an entrant by authorizing it to be transferred directly from her former service provider. The DA would need to authorize the entrant to offer this facility to its consumers and establish regulations to require the incumbent to transfer the consumer's data upon the authorized request from the entrant. This may be particularly useful as the Internet of Things becomes more important; a consumer may wish to

¹⁷⁰ See Fletcher, *supra* note 47.

¹⁷¹ This is why incumbents may create or maintain systems that make data portability difficult. See Section I.1.B.1, *supra*.

¹⁷² See, e.g., the RadicalXChange group. *Mission and Values*, RADICALXCHANGE (2019), <https://radicalxchange.org/about/>. The group's chair, Glen Weyl, has argued in a paper written with colleagues that it's a mistake to view internet services priced at \$0 as simply free; instead, data can be viewed as a form of labor or barter. See Imanol Arrieta-Ibarra et al., *Should We Treat Data as Labor? Moving Beyond "Free"*, 108 AMER. ECON. ASSOC. PAPERS & PROCEEDINGS 38 (2018), <https://pubs.aeaweb.org/doi/pdfplus/10.1257/pandp.20181003> (exploring "whether and how treating the market for data like a labor market could serve as a radical market that is practical in the near term").

¹⁷³ See EC COMPETITION REPORT, *supra* note 1, at 8; *id.* at 24.

¹⁷⁴ See U.K. COMPETITION REPORT, *supra* note 1, at 129, § 5.11.

port the food supply service that was bundled with her new refrigerator from Amazon to an entrant. Being able to authorize the entrant to obtain all her data from Amazon will lower the cost of switching. Conceptually, automatic porting is no different from manual porting, but it is mechanized in a way that is likely to raise contestability and therefore can make entry more profitable. The Vestager Report notes that the GDPR Article 20 provides these data portability rights to Europeans. If consumers have the right to quickly and easily patronize an entrant without data lock-in, there will be more incentive to enter into these markets. However, other entry barriers remain, which we discuss below.

d. Open Standards to Promote Competition

The DA should move preemptively to prevent the consolidation of control over users' identities, as this would create a large new source of market power. The DA could create an open standard so that new entrants can easily offer their own digital identity product that allows users to access goods and services online. One example of this type of product is Solid, by Tim Berners-Lee, often named as the creator of the World Wide Web. Solid offers users a "POD" that safeguards their digital identity that they can use to connect with different services.¹⁷⁵ Several government-backed efforts at identity portability are underway across the world. These include Estonia's e-Estonia initiative to give citizens a unique digital identifier; India's Aadhaar, a verifiable 12-digit identity number issued for each citizen which serves as an identifier and authenticator for a variety of offline and online services; Sweden's and Norway's BankId, which allows companies, banks, and governmental agencies to identify and conclude agreements with individuals over the internet; and even self-sovereign identity solutions studied by start-ups that would use blockchain to allow individuals to own their identity credentials and control who can access their data in online services. If an individual could then port their identity to the platforms and providers they wish to use, this would again promote entry of new services and erode the switching costs of established platforms.

The DA could consider creating an open standard that would facilitate micro-payments among consumers and digital entities. The coordination needed among stakeholders to create a successful micro-payment system is substantial, and it likely will require assistance and oversight from a regulator.

e. Merger Review

The behavior that may be of greatest concern to the many policymakers studying powerful digital businesses is their acquisition of potential competitors. These acquisitions often fall below the value threshold under which the buyer would need to notify competition authorities in advance of the deal. As a consequence, authorities have limited or no ability to assess whether a

¹⁷⁵ See *How It Works*, SOLID (2019), <https://solid.inrupt.com/how-it-works>.

given deal is procompetitive or harmful to competition before it closes.¹⁷⁶ Markets move quickly and a competitor's window of opportunity to gain traction against the incumbent is short. For these reasons, Congress could give the DA merger review authority. Similar to the FCC's merger review role, this would be conducted concurrently with the antitrust review done by the FTC or DOJ, but with different standards and tools. It would not be prudent to alter the nation's antitrust laws to accommodate one difficult and fast-moving sector where false negatives are particularly costly. Therefore, giving additional power over merger review to the sectoral regulator is a good solution.

These specific merger regulations should require merging firms to demonstrate that the combination will affirmatively promote competition. This shifting of the burden of proof from the government (to prove harm) to the parties (to prove benefit) will assist the DA by placing the job of demonstrating efficiencies on the parties, who have a greater ability to know what they are. In some cases, the DA's review may be the only merger review conducted, as it should not be subject to the minimum size limitations on HSR filings. In particular, notification and pre-clearance could be required for any acquisition by a business designated as having bottleneck power.¹⁷⁷

In its merger review process, the DA could be explicitly tasked with evaluating a given merger's likely harm to existing as well as potential competition. Another example discussed above is the case of content or complements that could expand from that position to compete with the digital bottleneck business itself. As already noted, entry from elsewhere in the vertical (or conglomerate) chain may be the most effective and promising entry point to challenge an established bottleneck business. Mergers with either of these types of entrants have the effect of neutralizing companies that might one day have posed a competitive challenge to the bottleneck business. This view of potential competition should drive DA merger review.

The decision in *Credit Suisse* and the dicta, or language, in *Trinko* greatly expanded the industries and conduct that have become, for practical purposes, exempt from antitrust scrutiny.¹⁷⁸ The agencies have understandably been skittish to expend limited resources bringing cases that risk being thrown out on *Trinko* grounds.¹⁷⁹ It is important that *Trinko* not be used to

¹⁷⁶ See Section III.2.B, *supra*, for a further discussion of these difficulties.

¹⁷⁷ When network effects are strong, a digital business with bottleneck power will likely only have very small competitors. Therefore, even small transactions can neutralize an important potential competitor that is poised to grow. See Section III.3.B, *supra*.

¹⁷⁸ See *Credit Suisse Securities (USA) LLC v. Billing*, 551 U.S. 264 (2007); *Verizon Communications v. Law Offices of Curtis V. Trinko, LLP*, 540 U.S. 398 (2004).

¹⁷⁹ Howard Shelanski, at the time the FTC's top antitrust economist, testified in Congress on behalf of the Commission a few years after the *Credit Suisse* decision. He argued that a narrow interpretation of *Trinko* was possible. See *Is There Life After Trinko and Credit Suisse? The Role of Antitrust in Regulated Industries: Hearing Before the Subcomm. on Courts and Competition Policy of the H. Comm. of the Judiciary*, 111th Cong. (2010) (statement of Howard Shelanski, Deputy Director for Antitrust in the Bureau of Economics at the FTC), https://www.ftc.gov/sites/default/files/documents/public_statements/prepared-statement-federal-trade-commission-courts-and-competition-policy-committee-judiciary-united/100615antitrusttestimony.pdf [hereinafter Shelanski].

create a no-man's land where neither regulation nor antitrust are applied to harmful behavior. A traditional antitrust savings clause can no longer be relied upon, as the clause in the 1996 Telecom Act was found insufficient to protect antitrust enforcement in *Trinko*. Legislation creating regulation and antitrust enforcement for digital businesses should address this concern head on. The statute must be extremely specific, explaining for each tool and goal whether it is intended to supersede antitrust or not. Antitrust enforcers and other agencies can share dual authority with different review standards and goals. They can account for each other's determinations in a manner that will minimize inconsistencies without having one always take priority over the other. Antitrust must remain in full force except where Congress explicitly says otherwise.

The merger review process must move rapidly. The agency will need a simple and efficient merger review process so that businesses can move forward without undue delay, and the agency does not expend more resources than necessary. These concerns indicate that the burden of proof must primarily be placed on the merging parties who have the incentive, data, and resources to quickly deliver the right information to the authority. Decisions should be subject to judicial review, like a rulemaking process under the Administrative Procedure Act, with reliance on the specialist Competition Court discussed above. However, in light of the difficulty of winning antitrust cases in current US courts, judicial review will be effective at supporting the mission of the DA when combined with a more explicit and tougher enforcement statute or a Competition Court, or both.

In order for the agency to be most efficient, it should use a combination of adjudication and rulemaking for these merger transaction reviews. Rules help businesses know what behavior is proscribed, and help the agency clarify its intentions without having to wait for a good test case—or multiple test cases—to fully explain the issue. Clear rules will help companies avoid proposing anticompetitive transactions to begin with.

The cost of such regulation is duplicative merger reviews. However, given the importance of markets that tip and the uncertainty about whether an acquisition is a substitute or complement, having two reviews is perhaps helpful in getting to the right answer. If the regulator can block an incumbent platform's acquisition of potential competitors, and those competitors have the ability to quickly get their customers' data, entrants will plan to enter and compete with the platform, rather than enter and be bought. If the competitive environment is improved by data portability

Testimony]. The key facts in *Trinko* were that the legislation at issue, the 1996 Telecom Act, went farther than antitrust law; an agency, the FCC, had issued rules directly regulating the conduct at issue; and the FCC actively administered those rules. *See Trinko*, 540 U.S. 398. Shelanski argued that “[w]here a competent agency actively administers a rule whose standard for the competitive conduct at issue in litigation is more demanding on the defendant than antitrust law, the Court was right to find it relevant whether the marginal gains outweigh the potential costs of antitrust enforcement against the same conduct.” Shelanski Testimony at 9. Yet he expressed concern that courts may use much broader interpretations of the line of cases. The Court in *Trinko* expressed concern about misuse of antitrust law by impudent plaintiffs, so some preemption could be limited to private plaintiffs, with expert agencies being given greater leeway.

and the elimination of exclusionary conduct, the chance of success will rise and consumers will benefit from increased competition.

f. Interoperability

There may be settings where the DA is charged by Congress to prevent the creation of market power in the first place due to the importance of the market and the potential harms from the market power. Such a market would be a candidate for open interoperability standards that could be used by all competitors and would promote entry. The DA could oversee the creation of an open standard and its adoption in the market of interest. For example, devices in the home might be required to adhere to an open standard so that any platform could connect with any device. Without such a standard, an Apple thermostat would not function in conjunction with a Google home assistant. Under an open standard, if a consumer had purchased a number of Amazon appliances and then switched her home assistant from Amazon to Apple, she would not need to purchase a new refrigerator, thermostat, and security system because all of those devices could connect to the new platform and stay functional. It is possible that such open standards can slow down innovation that depends on the interface, but open standards will drastically reduce lock-in and market power, leading to greater incentive to innovate on the service itself.

2) Regulations that apply to firms with bottleneck power

Some regulations should apply only to firms that meet the DA's definition for bottleneck power. In these cases, the bottleneck firm has the incentive and ability to harm competition and is an important source of consumer welfare. These firms require extra monitoring to be sure they are not violating antitrust, or other laws, because of the uncertainties in technology and demand, the speed at which platforms tip, the irreversibility of tipping, and the need for expert evaluation of the design of algorithms. For all of these reasons, the cost of false negatives is high and therefore, under conditions of uncertainty, the public interest requires the DA to take a more interventionist approach.¹⁸⁰

a. Mergers

The DA could be given merger review authority over all transactions involving digital businesses with bottleneck power because new competition against these entities is the most valuable for consumers. Businesses with bottleneck power would notify the DA and obtain pre-clearance for an acquisition of any size. While this would potentially result in many reviews for the DA, their number will be limited by the number of platforms with bottleneck power.

The DA may want to use its merger review authority over bottleneck firms to assess consummated mergers, just as the antitrust authority can under section 7 of the Clayton Act. Past

¹⁸⁰ If these regulations fail to create or maintain competitive digital markets, the DA should alert Congress that neither antitrust nor existing regulatory tools are effective so that Congress may consider stronger steps.

mergers of potential competitors that created monopoly positions could be assessed in this way. Similarly, past vertical mergers (e.g. a business that develops tools for brands to place ads and a business that runs mechanisms to set ad prices) may be found to cause higher prices or otherwise lessen competition. Any such anticompetitive mergers could be unwound by the DA.

b. Non-discrimination and foreclosure

Discrimination against current or future rivals is an important tool in a foreclosure strategy by a digital business with bottleneck market power.¹⁸¹ As explained above, there are broadly two types of foreclosure of a complement: one that operates against a complement that is a potential competitor of the platform itself, and one that operates only on the platform between rival providers of content. Because large digital platforms today are conglomerates with large ecosystems of complements, this is an important area in which to enforce competition. Non-discrimination can be a helpful tool in creating a competitive environment in which entrants are protected and can thrive, while allowing a platform to vertically integrate to some degree. Non-discrimination requirements should be used only after careful study because they can also prevent efficient forms of service that enhance competition.

Anticompetitive foreclosure of a firm that is a current or potential competitor can be addressed by the antitrust authority if the antitrust law is strong enough. If not, there will be a role for the DA to develop a stronger rule in order to successfully enforce against such foreclosure by firms with bottleneck power. Furthermore, the DA could use similar rules in a forward-looking regulatory context. Effective non-discrimination rules can foster entry and diversity, create potential sources of disruptive innovation and protect start-ups and other entrants. The goal of the forward-looking regulation is to prevent a digital business with bottleneck power from exercising it in order to protect *entrants on the platform* so that they have the chance to become *competitors of the platform*.

Platform strategies to prevent multi-homing are an important category for the DA to include in its analysis of foreclosure. A platform contract to induce single-homing on one side of a multi-sided market can be used to reduce competition (e.g., a loyalty payment to drivers of a ride-sharing service). Likewise, a platform can make it costlier for users to multi-home among applications on the platform by, for example, limiting data sharing. Such strategies can foreclose entrants and harm competition; appropriate regulation could limit their use by firms with bottleneck power.

The second reason for forward-looking regulation is to prevent digital businesses with bottleneck power from inefficiently expropriating rents created by complements on their platform. As described above, this harm is less well-protected by antitrust laws so the need for enhanced

¹⁸¹ For a deeper discussion of the power of discrimination in preventing entry by disintermediation, see Section II.2.B.3, *supra*.

regulation will be greater when considering foreclosure *on* the platform. The DA may be able to build on the concept of “business to platform” regulation that is developing in Europe to create effective non-discrimination rules.¹⁸² The motivation of this EC regulatory effort is to create a “fair, predictable, sustainable, and trusted legal environment” in which complementors and content providers can invest safely and contribute to social welfare.¹⁸³ The Vestager Report states that platforms “[i]f dominant . . . have a responsibility to ensure that they regulate in a pro-competitive way. Dominant platforms should be subject to a duty to ensure interoperability with suppliers of complementary services.”¹⁸⁴ Likewise, the Furman Report recommends developing a platform code of conduct to ensure fairness.¹⁸⁵

The DA could promulgate regulations prohibiting the foreclosure of a competing content provider on a platform that is vertically integrated. The authority would need to develop rules to identify foreclosure that might depend on finding certain anticompetitive conduct, market share, or market power to make such determinations. The DA must also account for potential pro-competitive innovations that a company with bottleneck power seeks to provide. The data collected by the DA will allow it to examine such outcomes and weigh all factors to make pro-competitive determinations. This balancing will be costly and, despite its best efforts, the regulator may err. However, as the report emphasizes, non-intervention is also costly. Non-discrimination rules in the past suffered from slow and expensive adjudication, which limited their usefulness.¹⁸⁶ Strategies for speedy adjudication are addressed in detail below.

c. Bundling

A digital platform with bottleneck power may have a contract with complementors (e.g., retailers on an ecommerce platform) that bundles together access to their transaction data along with logistics services. This could have harmful anticompetitive effects.¹⁸⁷ As described above, the business may also compete against those retailers on its ecommerce site. The business could use

¹⁸² For regulatory developments, see *Fairness in Platform-to-Business Relations*, EURO. COMM’N, https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-5222469_en.

¹⁸³ *Proposal for a Regulation of the European Parliament and of the Council on Promoting Fairness and Transparency for Business Users of Online Intermediation Services*, at 3, COM (2018) 238 final (Apr. 26, 2018), <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52018PC0238> (“The present proposal aims at ensuring a fair, predictable, sustainable and trusted legal environment for business users, corporate website users, providers of online intermediation services and online search engines alike, which will limit the occurrence and the impact of harmful platform-to-business trading practices occurring in certain online activities, thereby safeguarding trust in the online platform economy and preventing further legal fragmentation of the Digital Single Market.”).

¹⁸⁴ EC COMPETITION REPORT, *supra* note 1, at 71.

¹⁸⁵ See U.K. COMPETITION REPORT, *supra* note 1, at 5.

¹⁸⁶ See *Leased Commercial Access Modernization of Media Regulation Initiative*, Further Notice of Proposed Rulemaking, 33 FCC Rcd 5901 (2018), <https://docs.fcc.gov/public/attachments/FCC-18-80A1.pdf>, at 1, n.2 and accompanying text (noting that “the [Federal Communication] Commission’s 2008 Leased Access Order . . . has [been] stayed for a decade in conjunction with several judicial appeals”).

¹⁸⁷ Retailers may accept what otherwise seems like a bad bargain due to the importance of being available to customers through the bottleneck. See Section II.2.B.4., *supra* for a discussion of bottleneck firms’ ability to dictate business terms.

the retailers' data to learn which products are selling well and expropriate the ideas and strategies of the retailer. That data advantage over rivals can enable a company to achieve and/or maintain critical economies of scale, better predict consumer behavior, and form a powerful barrier to entry for potential competitors.¹⁸⁸ Bundling may also discourage multi-homing.

Another example of possibly harmful bundling could occur when a platform owner requires installation of a bundle of applications. Those apps might be chosen to block the growth of rival apps that were extracting rents from the platform or threatening to be a future competitor of the platform. The Internet of Things will create more settings in which bundling policy will be critical. Will a consumer's new fridge arrive with a supply contract from Amazon's WholeFoods? Will the consumer be able to change that contract in some period of time, or is the consumer permitted to purchase the fridge without any contract?

An antitrust case in these settings may be ineffective in protecting entrants and competition in digital bottleneck businesses due to the complexity of the problem and the slow pace of litigation. However, the DA could establish regulations that prohibit anticompetitive bundling by firms with bottleneck power. Such a firm would be required to demonstrate that its bundle was on balance procompetitive if foreclosure was alleged. The DA could require unbundling and an offer to business customers of a choice of contracts in the case of anticompetitive bundling. The DA would need to enforce such contracts.

iii. DA-Enforced Remedies for Antitrust Violations

When a company has been found liable for violating the antitrust laws, the antitrust authority is tasked with devising a remedy to restore the lost competition. A fine does not restore lost competition. No longer engaging in the illegal conduct may help the next entrant or complement that wishes to interoperate, but it will typically not restore the competition that has already been lost, particularly in the face of durable barriers to entry that protect incumbent digital platforms.

Antitrust authorities are good at enforcing structural remedies that require no ongoing monitoring, such as requiring a divestiture between a platform and its content, or the sharing of a dataset or intellectual property with the entrant, royalty-free. However, reducing entry barriers often requires a remedy that involves ongoing monitoring, as do behavioral remedies, such as firewalls between platforms and content. As mentioned above, the DA could also enforce remedies for antitrust violations identified and addressed by existing antitrust agencies.¹⁸⁹ Below are some types of remedies for which the DA would be a more appropriate body to enforce.¹⁹⁰

¹⁸⁸ See Section I.1.B.1, and Section I.2.A.3, *supra*.

¹⁸⁹ See Section III.3.A., *supra*.

¹⁹⁰ For example, ongoing monitoring. See Section III.3.A, *supra*.

1) Data Sharing

Anticompetitive conduct may result in a market that has tipped in favor of a single provider which then benefits from unparalleled access to data. In those cases, a new entrant may find it impossible to service users with new products as it lacks the scale needed for effective operation. Data sharing could restore the lost competition. The relevant data to share may not be just historical data, but present and future data also. Because data are non-rivalrous, an incumbent can both share its data with a competitor and also keep it. Thus, access to data forms a very important remedy in the toolkit of both the antitrust authority and the DA. The Furman Report recommends that agencies mandate “data openness” (which leads to data sharing) to enhance competition.¹⁹¹ The Vestager Report likewise recognized that data sharing can help level the playing field.¹⁹²

2) Full Protocol Interoperability

Another useful tool that could restore lost competition is an open protocol and interoperability standard that would be available for entrants to use on a continuing basis and allow them to overcome network effects. A bottleneck business whose anticompetitive conduct created a monopoly position could be required to interoperate with its competitors. Entrants, previously rendered uncompetitive by network effects, could use the APIs to bring information from the incumbent bottleneck firm to its own users. In a social media context this would allow the users of the new service to see not only all the content on their own service, but also content from friends on an incumbent site that was subject to an interoperability requirement. The network barrier to entry would no longer protect the incumbent firm, which would then encourage entry into the industry. Interoperability would facilitate ongoing competition on the merits of the user experience, rather than on the size of the installed base, and potentially stimulate robust competition.

Interoperability managed by the DA would be necessary due to the ongoing monitoring needed, the likelihood of technical change, and the incentive for non-cooperation by the incumbent firm. The DA could mandate the standard protocols or APIs to be applied and tightly control the process to avoid having competition undermined by actions of the dominant firm. The DA would need a process to update protocols at the time of the launch of new functionality or innovation. It would need rules to protect the privacy and choice of users on one service as some form of access to them is granted to users of another service. With easy interoperability, users will be free to make a real choice about which service they prefer. This will encourage new market entry and vigorous competition between providers.

¹⁹¹ See U.K. COMPETITION REPORT, *supra* note 1, at 10, 74, § 2.79.

¹⁹² See EC COMPETITION REPORT, *supra* note 1, at 98-107.

3) Non-discrimination

The clear and simple remedy for a case when a bottleneck digital business favors its own content or complement is divestiture of one of the businesses, either the bottleneck business or the content/applications. This removes both the incentive and the ability for the conduct. However, this structural remedy could be costly to consumers in various ways, leading to the conclusion that a behavioral non-discrimination remedy might be more appropriate. Requiring a dominant bottleneck to abide by a non-discrimination rule could induce competitive entry by allowing complementary businesses to thrive and eventually become horizontal competitors to the bottleneck.¹⁹³ The ongoing monitoring necessary to enforce this type of remedy in a specific antitrust case is not an ideal role for an antitrust agency. However, if the antitrust agency determines that such a remedy run by the DA would restore and protect competition, the law would allow it the option of requesting the DA to carry out the remedy. A speedy mechanism to adjudicate complaints would be of key.

4) Un-Bundling

As described above, the requirement to unbundle contracts could be an antitrust remedy that is less onerous than divestiture. Such a remedy would require ongoing monitoring that would best be performed by the DA.

iv. Aligning other policies with competition

In addition to the structural competition tools, the authority should be empowered to align privacy protection, as well as AI and algorithmic oversight, with competition goals. Privacy protections that shield consumers from misuse or over-collection of their data can be set up in a way that raises or lowers entry barriers. This point is often forgotten inside a specialist agency and therefore we strongly suggest that the DA's mandate include evaluating and then directing regulatory solutions in a pro-competitive direction.¹⁹⁴ Mandating that the DA have vigorous competition as one of its goals will help to make sure that potentially complex analysis takes place and that the needs of entrants are taken seriously when making policy decisions. The authority may also need to examine the development and use of algorithms to capture consumer attention, maximize advertising revenue, and drive consumer purchases or information selection, and examine how structural or other tools can promote competition in that space as well.

v. Adjudication Process

Adjudication of disputes by this new authority must be quick. Due to the fast pace of change in these industries, the short amount of time it takes to destabilize or eliminate an entrant, the

¹⁹³ See Section III.2.B.3.E.

¹⁹⁴ It is worth considering whether the competition function and staff of the DA will be more effective when incorporated into other agency tasks or separated into a distinct division.

substantial discrepancy in bargaining power between digital bottlenecks and their business customers, and the necessity to use government resources efficiently, a speedy process is crucial. This could be achieved through mandatory deadlines for dispute resolution or other procedural rules requiring the authority to produce a decision in a fixed number of days, as well as by crafting clear standards that are simple to enforce where possible.

The regulatory framework outlined above would coexist with and complement antitrust enforcement, only blocking transactions and preventing behavior that harm the public interest in ways clearly defined by Congress and that strengthen the reach of antitrust. The authority could help elucidate the common line-drawing problem of what behaviors are in or out of the reach of antitrust through communication with the antitrust enforcement agencies and with the public. An effective regulator will devise rules that promote competition and new avenues for innovation.

V. Conclusion

This report has discussed the unique combination of attributes of large digital platforms and their tendency toward entrenched market power. The entry barriers that result are in part due to certain characteristics of digital technology, but in part also due to behaviors of market participants. Consumers create entry barriers with their behavioral biases, and incumbents create entry barriers through strategic use of contracts and technologies, as well as by engaging in various other activities. The resulting monopoly or concentrated market structures do not serve consumers as well as would a market in which entry is a credible, or actual, reality.

Public policy has been slow to respond to economic harms resulting from these conditions. Such harms include advertising prices that are higher than would be expected in a more competitive environment. The markups distort decision-making and are subsequently passed through to consumers in the goods and services they buy. There are also quality harms. Platforms have incentives to provide low quality in order to keep users “engaged” and sell more ads. More generally, a lack of competition lessens the pressure on any platform to deliver high quality to its customers for fear that they will move to a rival platform. Perhaps most importantly, insufficient competition among and for digital platform position distorts and reduces innovation in a sector that has been—and, under the right conditions, will continue to be—the source of huge benefits for consumers and society.

It is unlikely that these problems will self-correct, meaning new and revised rules and incentives will be needed to prevent market power from entrenching a few dominant tech firms as economic and social gatekeepers. The United States is very far behind the frontier in antitrust enforcement, both because courts have taken a conservative view of what constitutes anticompetitive conduct and because agencies have not yet developed expertise in digital competition cases. Considerable work can be done by academics to help provide new relevant knowledge and tools to both agencies and courts. It also may be necessary for Congress to pass new legislation that revises the antitrust laws, establishes a specialist Competition Court, or

both. The committee believes that vigorously enforcing the antitrust laws under these conditions would be likely to increase entry in digital platform industries, competition, and consumer welfare. Moreover, such enforcement would result in remedies to restore competition that has already been lost as well as serve as a deterrent to future anticompetitive conduct. Finally, because the problems we identify may require action beyond antitrust, we also propose the establishment of a new digital regulatory agency, or Digital Authority.

Such an agency could increase social welfare by establishing baseline market rules and conditions that both promote competition and limit the dimensions of competition to those that benefit consumers, rather than exploit them. In addition, the agency could assist in carrying out modern competition enforcement, using burdens of proof that reflect new understandings of market behaviors.

Whether the platforms that are dominant today have achieved that position entirely on the merits bears further examination. If illegalities are determined, appropriate remedies will be needed to restore the lost competition. However strong antitrust remedies likely will require coupling with market-opening regulations to overcome market power that prevented competitive market entry. Going forward, two important goals for public policy are ensuring entry and competition *for* platforms, as well as creating competition *on* platforms. Forward-looking laws and regulations should be geared to lowering entry barriers as much as possible and vigorously guarding against exclusion, lock-in, and foreclosure in the platform context. Without a swift policy pivot to apply these combined tools, digital markets may tip toward levels of entrenched power that undermine the benefits of innovative digital businesses for American consumers.