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Protecting Competition in the American Economy: Merger Control, Tech Titans, Labor Markets

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In the United States, we have a robust set of antitrust laws and antitrust institutions designed to protect and promote competition. These laws date back to the passage of the Sherman Act in 1890, supplemented in 1914 by the Clayton Act and the Federal Trade Commission (FTC) Act. They are enforced by the Antitrust Division of the Department of Justice (DOJ) and by the FTC, together with private antitrust litigation, in which plaintiffs are awarded three times any damages they have suffered. For more than a century, a rich body of case law interpreting these statutes has grown up, heavily influenced by economic research and economic evidence. Indeed, over the twentieth century, the United States led the world in creating and implementing competition policies to control cartels and mergers and to rein in monopoly power.

Yet evidence is mounting that the largest US firms account for a growing share of economic activity, and that profits and price/cost margins at these firms have grown sharply in recent decades. Meanwhile, the economic might of the largest tech firms seems to grow without bound. Have our antitrust laws and institutions failed us?

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This article makes the case that we need to reinvigorate antitrust enforcement in the United States in three areas. The clearest area where antitrust enforcement has been overly lax is the treatment of mergers. The accumulated evidence indicates that competition would be protected and promoted if the Department of Justice and the Federal Trade Commission were willing and able to block more horizontal mergers. The second area where antitrust enforcement has become inadequate is the treatment of exclusionary conduct by dominant firms. The fundamental problem in this area is that the Supreme Court has, over the past 40 years, dramatically narrowed the reach of the Sherman Act. The third area concerns the market power of employers as *buyers* in labor markets. Historically, antitrust enforcement has largely ignored labor markets. Greater antitrust attention and oversight are warranted, although it is too soon to know whether more robust antitrust enforcement in US labor markets would make a significant difference for the wages earned by employees as a group.

Before discussing antitrust policy in these three areas, it is helpful to lay some groundwork by briefly summarizing some of the evidence that has been accumulating regarding competition and market power in the US economy. Baker (2019) skillfully reviews this evidence in greater detail. Largely on the basis of that evidence, he too advocates for stronger antitrust enforcement.

First, there is clear evidence that corporate profits have risen significantly over the past few decades. The share of US GDP accounted for by corporate profits rose by about half from 1985 to 2016, from around 7.5 to over 11 percent (Shapiro 2018). Barkai (2017) argues that excess profits, meaning the return to capital above the level required to attract investors, have risen sharply as the risk-free rate of return to capital has fallen. Furman and Orszag (2018) report that the premium on the return to all private capital over safe assets has risen from about 200 basis points in 1985 to more than 800 basis points in 2015, and that the return to capital has become much more skewed among US publicly traded nonfinancial firms. The current market capitalizations of the leading US firms further indicate that investors expect these high profits to persist. High and persistent economic profits suggest substantial and durable market power.

Second, there is evidence that price/cost ratios in the United States have risen in recent decades.[1] De Loecker, Eeckhout, and Unger (2018) report a sizable increase in the weighted average ratio of price to marginal cost for publicly traded firms in the United States, from 1.21 in 1980 to 1.61 in 2016, with most of that increase occurring at the top of the distribution. However, measuring price and marginal cost accurately on the basis of public financial accounting data is extremely difficult, especially because large, publicly traded firms produce many products and services.[2] Traina (2018) finds that the ratio of price to marginal cost at nonfinancial, nonutility, publicly traded firms in the United States rose very modestly from 1980

[1] Industrial organization economists have long looked at price/cost margins as indicators of market power. For early reviews and contributions, see Schmalensee (1989), Salinger (1990), and Hall (1988).
[2] The issues surrounding the proper measurement of price/cost ratios are addressed in detail in the articles by Basu; Syverson; and Berry, Gaynor, and Scott Morton in a companion symposium in this issue.

to 2016, from 1.1 to 1.15, if one includes marketing and management expenses when measuring marginal costs. Hall (2018) finds that the weighted average ratio of price to marginal cost increased from 1.12 in 1988 to 1.39 in 2015. The International Monetary Fund (2019), looking across a number of advanced economies, finds that the ratio of price to marginal cost rose by about 8 percent between 2000 and 2016, with that increase concentrated among a small fraction of highly productive and innovative firms. Calligaris, Criscuolo, and Marcolin (2018) obtain similar findings. The antitrust analysis below accepts as a stylized fact that the ratio of price to marginal cost has generally risen over the past 20 to 30 years at the largest, most efficient US firms.

Third, there is convincing evidence that larger, more efficient firms have been growing at the expense of their smaller, less efficient rivals, causing various measures of broad industry concentration in the US economy to increase.[3] Autor et al. (2017a, 185) state, "Our hypothesis is that technology or market conditions—or their interaction—have evolved to increasingly concentrate sales among firms with superior products or higher productivity, thereby enabling the most successful firms to control a larger market share." They call these more efficient firms "superstar firms." Van Reenen (2018) reaches a similar conclusion, based on extensive empirical evidence: "In recent decades the differences between firms in terms of their relative sales, productivity and wages appear to have increased in the US and many other industrialized countries." Bessen (2017) links increases in broad industry concentration to the adoption of information technology. Looking across broad industries, Ganapati (2018) finds a positive correlation between increases in the share of revenue captured by the top four firms and growth in productivity and real output. Crouzet and Eberly (2019) find that the growing role of intangible capital is associated both with the rising share of the largest firms and with productivity gains. None of these conclusions should be surprising, given the extensive literature showing very large and durable differences in efficiency across firms, even in a given industry (Syverson 2011; Van Reenen 2018). The growth of superstar firms may also explain in part the long-term decline in business dynamism (Decker et al. 2016, 2017). The analysis below accepts as a stylized fact that the advantages enjoyed by efficient market leaders over followers and entrants have grown considerably over time.

Fourth, labor's share of GDP has significantly declined since the 1980s. Autor et al. (2017a, b) show that this decline is due to the reallocation of activity toward firms with low and declining labor shares, namely the superstar firms that have

[3]This Darwinian mechanism does not appear to be operating as strongly in Europe as in the United States. Europe has not experienced a similar increase in the share of economic activity accounted for by the largest firms. Gutiérrez and Philippon (2018) report that from 1995 to 2015, the weighted average Herfindahl–Hirschman index (HHI) for the United States measured at the broad sector level rose from about 500 to about 650, while the comparable HHI in each of ten large EU countries fell from about 800 to about 600. (They find lower HHIs in the EU overall than in individual member countries.) Likewise, Valletti (2018) finds no increase in concentration in EU countries from 2010 to 2015 at the broad sector level. Note that these measures of concentration are uninformative regarding market power because these broad sectors bear no relation to relevant product markets.

gained market share in recent years. The declining labor share also naturally raises the question of whether employers have growing market power in labor markets, especially given the declining role of unions, driving down wages and exacerbating inequality in the distribution of income and wealth.

None of these trends necessarily indicates that US antitrust policy has been deficient. Indeed, the fact that price/cost margins have risen in many high-income countries suggests that growing economies of scale and globalization are the cause, not domestic policy changes. Nonetheless, these trends compel us to take a closer look at recent antitrust enforcement in the United States, to ask whether stronger enforcement is now needed, and to see how that can be accomplished.

This article does not address one core aspect of antitrust enforcement: the prohibition on cartels and price-fixing. The Department of Justice regularly brings criminal charges against individuals who engage in price-fixing. Companies found to have participated in cartels are subject to fines assessed by the government plus liability for treble damages to customers who were overcharged. Over the past ten years, the DOJ's Antitrust Division has assessed roughly $10 billion in criminal fines and penalties (Department of Justice 2019) and has thrown quite a few executives in jail. This experience shows that antitrust vigilance regarding cartels is vital to a competitive economy. Cartels continue to form and persist in many industries. Levenstein and Suslow (2006, 2011) find that the average duration of cartels is about eight years. Improved detection of active cartels would do much to promote competition.

Merger Control

Under the Clayton Act, mergers that "may substantially lessen competition" are illegal in the United States. Merger control works together with the criminal prohibition on cartels to protect competition. Without merger control, rivals could achieve collusive outcomes by merging.

In 2017, about 15,000 merger and acquisition deals were announced in the United States, representing about $2 trillion in total value. Merger control policy greatly affects the set of deals that are proposed as well as which deals obtain antitrust clearance and are consummated.

The Department of Justice and the Federal Trade Commission have the authority to investigate and challenge proposed mergers *before* the merging parties are permitted to consummate their merger. If the DOJ or FTC can convince a federal judge that a merger is anticompetitive, that merger is blocked. Economic analysis plays a central role in this process. The DOJ and the FTC publish Horizontal Merger Guidelines that explain to the business community and the courts how they analyze horizontal mergers (Department of Justice and Federal Trade Commission 2010).

In 2017, 2,052 proposed transactions were reported to the antitrust authorities, of which 51 received an in-depth investigation and 21 were subject to an enforcement action (Federal Trade Commission and Department of Justice 2018).

Challenged deals often go forward after the merging parties agree to a remedy, usually an asset divestiture designed to preserve competition. Some deals are abandoned in the face of an antitrust challenge, such as the proposed merger between AT&T and T-Mobile in 2011 and the one involving Halliburton and Baker Hughes in 2016. Very few deals are litigated in court.

The fundamental challenge for merger control is that it is a *predictive exercise*: if one is seeking to identify the subset of proposed mergers that "may substantially lessen competition," one must assess the likely competitive effects of a proposed merger *before* it is consummated.

The Gradual Weakening of Merger Control

Fifty years ago, predictions of merger effects were based largely on market shares, and merger control was very strict. In 1963, relying heavily on the economics literature, the Supreme Court held that any merger producing a firm that controls an "undue percentage share" of the market and that "results in a significant increase in the concentration of firms in that market" is "inherently likely to lessen competition substantially" (*United States v. Philadelphia National Bank*, 374 US 321 [1963]). Such a merger would be presumed to be illegal "in the absence of evidence clearly showing that the merger is not likely to have such anticompetitive effects." This established a "structural presumption" against mergers based on market concentration.

As a prominent—some would say infamous—example of the structural presumption in action, the Supreme Court upheld the Department of Justice challenge to a merger between two grocery chains with a combined market share of 7.5 percent in the retail grocery market in the Los Angeles area (*United States v. Von's Grocery*, 384 US 270 [1966]). One year later, the Court ruled out efficiencies as a reason for allowing a merger, stating that "[p]ossible economies cannot be used as a defense to illegality" (*FTC v. Procter & Gamble*, 386 US 568 [1967]). See Hovenkamp and Shapiro (2018) and Werden (2018) for discussions of merger law in the 1960s.

The merger enforcement policies of the Department of Justice during the 1960s and 1970s reflected these Supreme Court rulings. When the DOJ published its first Merger Guidelines in 1968, they focused very heavily on the market shares of the merging firms. They stated, for example, that the DOJ "will ordinarily challenge" a merger between two firms with 5 percent market share each, or between a firm with a 20 percent market share and a firm with a 2 percent market share.

Since 1968, merger enforcement has evolved significantly along two distinct dimensions. First, the level of market concentration required to trigger the structural presumption has risen. Few if any antitrust economists today would favor applying the low thresholds found in the 1968 Merger Guidelines, given what we now know about the effects of horizontal mergers. Second, merger analysis now puts less weight on market shares and more weight on other evidence to predict the competitive effects of a merger. This shift reflects the accumulation of experience at the Department of Justice and the Federal Trade Commission along with the recognition that each industry has unique features. In Shapiro (2010), I explain this shift and how it took place.

Remarkably, the treatment of proposed mergers under US antitrust law has become much more lenient without Congress changing the substantive standard to be used for merger review and without any updated guidance from the Supreme Court, which has not heard a merger case since 1974. Rather, these changes have resulted from a dynamic involving the lower courts, the antitrust agencies, antitrust lawyers, and economists.

That process began in earnest in 1982, when the Department of Justice dramatically revised the Merger Guidelines, giving less weight to market shares and raising the threshold levels of concentration that would trigger the structural presumption. Within a decade, the courts followed the DOJ's lead. In 1990, the most influential lower court, the DC Circuit, rather brazenly departed from the precedent established by the Supreme Court in the 1960s, stating that "[e]vidence of market concentration simply provides a convenient starting point for a broader inquiry into future competitiveness" (*United States v. Baker Hughes*, 908 F.2d 981, at 984). This ruling weakened the structural presumption, making it harder for the DOJ and Federal Trade Commission to block mergers.

The Department of Justice, joined by the Federal Trade Commission, further revised its Horizontal Merger Guidelines in 1992, 1997, and 2010.[4] With each revision, less weight was given to market shares and greater weight was attached to more direct evidence about how competition has taken place in the industry and how the merger would likely alter that competition. The 1992 guidelines introduced "unilateral effects" into the analysis, shifting attention to the loss of direct competition between the merging firms and away from the overall structure of the market. The 2010 guidelines introduced the concepts of upward pricing pressure, merger simulation, and bidding and auction models into the analysis of unilateral effects. They also addressed nonprice dimensions of merger analysis, including product variety and innovation. In Shapiro (2010), I describe how the 2010 guidelines built on decades of experience with the economic analysis of the competitive effects of mergers, and in Shapiro (2012), I emphasize the importance of competition in spurring innovation.

In principle, the antitrust agencies can more accurately distinguish procompetitive horizontal mergers from anticompetitive ones by undertaking detailed analyses of how a proposed merger is likely to alter competition. However, as the Department of Justice and the Federal Trade Commission have put more weight on direct evidence of competitive effects and less weight on market shares, a gap has opened up between how they evaluate mergers and how the courts do so. Economists at the antitrust agencies engage in sophisticated analysis, interacting with economists hired by the merging parties. But if a DOJ or FTC merger challenge is litigated, a generalist judge may then be faced with conflicting expert testimony that is difficult to decipher.

[4] I led the team at the Department of Justice that drafted the 2010 Horizontal Merger Guidelines. Joseph Farrell, also a professor at the University of California, Berkeley, led the team at the Federal Trade Commission.

The result is that the antitrust authorities still rely heavily on market definition, market shares, and the structural presumption to make their case in court, even when their enforcement decisions are based on other economic evidence, such as bidding data, upward pricing pressure, or merger simulations. But the structural presumption has become weaker as the lower courts place less weight on market concentration and increasingly look for direct evidence of the likely effects of proposed mergers (Hovenkamp and Shapiro 2018). The net result is that the antitrust authorities have found it harder to prevail in court, causing them to be more cautious in the mergers they challenge. Merging firms understand this, and the mix of proposed mergers has adjusted accordingly. This is now highly problematic, given the mounting evidence cited above about rising profits, widening price/cost margins, and the rise of superstar firms.

The Need for Stronger Merger Enforcement in an Economy with Superstar Firms

Accumulating evidence in two broad categories points to the need for more stringent horizontal merger enforcement policy in the United States: (1) evidence showing that the largest and most successful US firms have increasing market power and (2) evidence from merger retrospectives.[5]

The evidence cited above shows that superstar firms are highly profitable owing to durable competitive advantages they enjoy over their smaller rivals and over entrants, which cannot easily or quickly replicate their assets and capabilities. These are precisely the conditions under which mergers involving successful established firms are most likely to lessen competition and harm customers. We also know that higher price/cost margins cause the unilateral price effects from horizontal mergers to be more harmful to customers. Likewise, research and development competition spurs innovation if future sales are contestable (Shapiro 2012; Federico, Scott Morton, and Shapiro forthcoming), so a merger between two firms investing to develop competing products is likely to slow down innovation.

The case for stronger merger enforcement is perfectly consistent with a conclusion that the rise of superstar firms has largely resulted from the normal competitive process in the presence of growing economies of scale, increased globalization, and dramatic improvements in information technology, combined with large and persistent differences across firms in their ability to adopt new technologies and adjust to changing market conditions. After all, we expect a healthy competitive process to result in the most efficient firms gaining market share through internal growth and earning above-normal profits. As emphasized by Valletti and Zenger (2019), merger controls preserve that competition.

Contrary to many popular views, the case for stronger merger enforcement does *not* rest on evidence showing that various broad US industries have become more concentrated over time. Measures of industry concentration based on data

[5] Azar, Schmalz, and Tecu (2018) and Schmalz (2018) argue that growing common ownership of rivals by financial firms has weakened rivalry in many oligopolistic markets. If this claim finds additional support in future research, it would provide an additional basis for a more stringent merger control policy.

from the US Economic Census are simply not very informative for merger analysis because these data are available only at an aggregated level. The modest increases in concentration observed when using these data confirm that the largest firms are responsible for a greater portion of economic activity in many industries, but they tell us very little about concentration in properly defined relevant antitrust markets (Shapiro 2018).

As one important illustration of this point, a great many real-world markets—such as hospital services, supermarkets, and automobile dealers—are local. Reported changes in *national* concentration can vastly overstate or understate changes in concentration in local markets. A local merger creating a local monopoly would not even show up in the national measures. Conversely, if large regional firms are growing and entering many local markets, their entry would cause concentration in those local markets to *fall*. Rossi-Hansberg, Sarte, and Trachter (2018) report that "the *positive* trend observed in national product-market concentration between 1990 and 2014 becomes a *negative* trend when we focus on measures of local concentration."

As another illustration, North American Industry Classification System (NAICS) 3254 is "Pharmaceutical and Medicine Manufacturing," which encompasses a very large number of drugs that are not substitutes for each other. Reported changes in concentration in this four-digit industry tell us little or nothing about concentration in the supply of drugs to treat specific ailments. One simply cannot detect overall trends in concentration in properly defined relevant markets using data from the Economic Census.

Furthermore, it is important to remember that an increase in *concentration* in a properly defined relevant market does not prove that *competition* in that market has declined. Consider an unconcentrated market in which a few of the many suppliers become more efficient and gain share by offering lower prices and improved products, causing concentration to rise. That increase in concentration clearly goes hand in hand with customer benefits and reflects the competitive process at work, not a decline in competition. Industrial organization economists have understood this fundamental point for at least 50 years, and probably much longer (as one leading example, see Demsetz 1973). To properly interpret an observed increase in market concentration, one must understand what *caused* concentration to rise. Rising concentration resulting from increased efficiency by one or a few firms reflects the competitive process at work; rising concentration caused by mergers may well reflect a decline in competition. Distinguishing one fact pattern from the other requires looking at properly defined individual markets and examining what has actually happened over time in those markets.

In any event, regardless of whether one loves or loathes the rise of superstar firms, the implications for merger analysis are unambiguous: proposed horizontal mergers involving highly successful firms should be greeted with considerable skepticism.

The second broad category of evidence supporting more robust horizontal merger enforcement comes from merger retrospectives: studies of the economic

effects of consummated mergers. The most convincing studies identify a control product or geography and use a difference-in-difference methodology to isolate the merger's effect on prices. For example, Ashenfelter and Hosken (2010) look at five mergers this way, four of which resulted in price increases for consumers. Likewise, Whirlpool's acquisition of Maytag led to relatively large price increases for clothes dryers (Ashenfelter, Hosken, and Weinberg 2013). Blonigen and Pierce (2016) find that mergers in the manufacturing sector have generally been associated with increases in markups but not with increases in productivity.

Mergers in the health-care sector have been especially harmful to competition. Gaynor and Town (2012) report that hospital mergers in concentrated markets typically lead to price increases of at least 20 percent compared with control hospitals. This literature also shows that hospital competition improves the quality of care. Gaynor (2018) presents evidence that "consolidation between close competitors leads to substantial price increases for hospitals, insurers, and physicians, without offsetting gains in improved quality or enhanced efficiency." The Center for American Progress (Gee and Gurwitz 2018) assembles a range of evidence also supporting this conclusion.

Kwoka (2014) provides the most comprehensive review of merger retrospectives. Most mergers in these studies are older ones that took place in a few industries where data were available: banking, hospitals, airlines, petroleum, and journal publishing. Kwoka reports that "most studied mergers result in competitive harm, usually in the form of higher prices" (158). Ashenfelter, Hosken, and Weinberg (2014) review these studies, stating that "[t]he empirical evidence that mergers can cause economically significant increases in price is overwhelming" (S78).

While the overall body of evidence from merger retrospectives, standing alone, does not allow us to predict with confidence the effects of any given merger, it does indicate that merger enforcement has been too lax over the past 25 years.

How to Reinvigorate Merger Enforcement

Merger enforcement can be strengthened in a number of ways, if the Department of Justice and the Federal Trade Commission choose to move in that direction and if the courts cooperate.

First, the structural presumption against mergers that increase concentration in a properly defined relevant market could be strengthened. For example, after the government has defined a relevant market based on substantial evidence, the merging parties could be required to present clear and convincing evidence to contest that definition of the market. Similarly, once the government has established the structural presumption, the merging parties could be required to present clear and convincing evidence to rebut the presumption. Claims by the merging parties that growth by small rivals or entry of new firms into the market will quickly and effectively restore any competition lost due to the merger could be greeted with greater skepticism.

Second, more weight could be placed on evidence that the merging parties are significant direct competitors, without the necessity of defining a relevant

market and measuring market shares in that market, and without requiring the government to quantify the harm to customers that the merger will cause. For example, strong evidence that customers have often obtained lower prices as a result of direct competition between the two merging firms could, at least in some cases, be regarded as sufficient for the government to meet its initial burden of showing that the merger "may substantially lessen competition."

Third, the agencies and the courts could express greater wariness when a dominant incumbent firm seeks to acquire a firm operating in an adjacent market, especially if the target firm is well positioned to challenge the incumbent's position in the foreseeable future. In the language of antitrust law, this would involve lowering the evidentiary requirements necessary for the government to prevail in a merger case based on a loss of "potential competition." For example, the government could meet its initial burden by showing that the target firm is reasonably likely to become a rival to the acquiring firm in the foreseeable future, even if the target firm has not yet made specific plans to do so. This change would reduce the ability of powerful firms to acquire potential rivals before they mature into actual rivals, without stopping them from making acquisitions to improve their offerings or to challenge other firms with entrenched positions.

This change would be especially consequential as applied to dominant firms in the tech sector. Under this standard, Facebook's acquisitions of Instagram and WhatsApp might well have been blocked, if these firms were seen as well placed to mature into rivals to Facebook as social media platforms, and Google's earlier acquisitions of YouTube and DoubleClick would at least have warranted greater scrutiny. But it seems unlikely that Amazon's acquisition of Whole Foods or Google's acquisition of Nest would have raised serious issues even under this stricter standard. More acquisitions by the tech titans involving important inputs or complements could be challenged, but it is unclear how the courts would respond to cases involving such vertical or complementary mergers.

Fourth, the courts could insist that any "fixes" to proposed mergers result in a market structure that preserves competition. This would involve skepticism about divestitures designed to obtain antitrust approval that do not make good business sense, and placing little or no weight on behavioral commitments by the merged entity, such as a commitment not to raise price.

Lastly, the Department of Justice and the Federal Trade Commission could be given more resources to investigate and challenge mergers. With more resources, the antitrust agencies could look more closely at more suspect proposed mergers. They also could investigate more *consummated* mergers to see whether they have harmed competition or are likely to do so, including mergers that were below the size-of-transaction reporting threshold, which is $90 million in 2019. Cunningham, Ederer, and Ma (2018) find that acquired pharmaceutical projects are less likely to be developed when they overlap with the product portfolio of the acquiring firm; these "killer acquisitions" disproportionately occur just below the reporting threshold. Wollmann (2019) also provides worrisome evidence about mergers taking place just below the threshold.

As a practical matter, the case law relating to mergers evolves very slowly, with substantial lags following advances in economic learning and then changes in Department of Justice and Federal Trade Commission merger enforcement policies. Whether the current judiciary has the appetite to support stronger merger enforcement remains to be seen. If not, or if that route is too slow, Congress would need to pass new legislation codifying changes such as the ones suggested above—a heavy lift to be sure.

Antitrust and the Tech Titans

The most talked-about antitrust question of the day is whether and how antitrust should act to limit the economic power of the largest tech firms, often identified as Amazon, Apple, Facebook, and Google. Should they be broken up? Forced to modify their business practices and pay fines for their past sins? Watched carefully? Left alone and applauded?

A first step toward answering these questions is to recognize that the goal of antitrust policy is to protect and promote competition. Antitrust is not designed or equipped to deal with many of the major social and political problems associated with the tech titans, including threats to consumer privacy and data security, or with the spread of hateful speech and fake news. Indeed, it is not clear that more competition would provide consumers with greater privacy or would better combat information disorder; unregulated competition might instead trigger a race to the bottom, and many smaller firms might be harder to regulate than a few large ones. Addressing these major problems requires sector-specific regulation, which is beyond the scope of this article.

Three important and insightful reports have recently been released addressing antitrust in the digital economy: one by the United Kingdom (Furman et al. 2019), one by the European Commission (Crémer, de Montjoye, and Schweitzer 2019), and one by the Stigler Center at the University of Chicago (Scott Morton et al. 2019). All three reports conclude that antitrust can and should do more to promote competition in the digital era, while staying true to its focus on competition issues. All three reports call for regulation to address other public policy issues relating to digital platforms.

Within the realm of antitrust, it is important to understand that under the Sherman Act, it is not illegal for a company to have a monopoly, so long as that position was achieved by offering customers attractive products and services. There is a broad consensus behind this approach, because it would be illogical to urge companies to compete and then tell them they have broken the law when they do so successfully. Judge Learned Hand famously captured this idea in *United States v. Aluminum Company of America* (148 F.2d 416, Second Circuit [1945]):

> A single producer may be the survivor out of a group of active competitors, merely by virtue of his superior skill, foresight and industry. In such cases a

> strong argument can be made that, although the result may expose the public to the evils of monopoly, the Act does not mean to condemn the resultant of those very forces which it is its prime object to foster: *finis opus coronat.* The successful competitor, having been urged to compete, must not be turned upon when he wins.

Following this core principle, the basic antitrust question for each tech titan is whether that company has engaged in practices that go beyond competition on the merits and are likely to (1) exclude its rivals and fortify its market position or (2) extend its power to adjacent markets. If so, a remedy is needed to restore competition. A behavioral remedy imposes limits and obligations on the company's conduct; this was the outcome in the Microsoft case 20 years ago. A structural remedy breaks up the company; this was the result in the AT&T case in the 1980s. Talk of breaking up the tech titans without reference to a specific antitrust violation is putting a very large cart before the horse.[6]

The Shrinking Scope of the Sherman Act

The portion of the Sherman Act dealing with monopolies is remarkably broad—and vague. Section 2 states, "Every person who shall monopolize, or attempt to monopolize . . . any part of the trade or commerce among the several States . . . shall be deemed guilty of a felony."

From the outset, it was clear that the courts would play a major role in interpreting the broad language of the Sherman Act. As discussed in the companion piece in this symposium by Naomi Lamoreaux, the role of antitrust in the American economy has waxed and waned depending on judicial rulings, which have evolved in response to economic learning and changing market conditions as well as political forces and the makeup of the Supreme Court.

For many years, the Supreme Court recognized the expansive nature of the antitrust statutes. In 1958, the Court stated, "The Sherman Act was designed to be a comprehensive charter of economic liberty aimed at preserving free and unfettered competition as the rule of trade" (*Northern Pacific Railway v. United States*, 356 US 1 [1958], at 4). In 1972, the Court stated, "Antitrust laws in general, and the Sherman Act in particular, are the Magna Carta of free enterprise. They are as important to the preservation of economic freedom and our free-enterprise system as the Bill of Rights is to the protection of our fundamental personal freedoms" (*United States v. Topco*, 405 US 596 [1972], at 610).

The high-water mark for antitrust in the United States was reached during the 1960s. Since then, the Supreme Court has substantially narrowed the scope of the antitrust laws. This narrowing took place along multiple dimensions.

[6]As discussed above, a breakup to unwind a prior anticompetitive acquisition could well be a suitable remedy and would not be novel as a legal matter. This section considers exclusionary conduct by dominant firms, not mergers.

A number of business practices that previously were treated as automatically or per se anticompetitive are now evaluated on a case-by-case "Rule of Reason" basis. For example, it used to be per se illegal for a manufacturer to assign territories to its distributors and to prevent one distributor from selling outside its assigned territory. But in 1977, the Supreme Court ruled that this practice would in the future be evaluated using the Rule of Reason (*Continental TV v. GTE Sylvania*, 433 US 36 [1977], overruling *United States v. Arnold Schwinn and Company*, 388 US 365 [1967]). Likewise, retail price maintenance—when a manufacturer prohibits a retailer from selling its products below a specified price—used to be per se illegal. In 2007, the Court ruled that it would be evaluated using the Rule of Reason (*Leegin Creative Leather Products v. PSKS*, 551 US 877 [2007], overruling *Dr. Miles Medical Company v. John D. Park & Sons Company,* 220 US 373 [1911]).

The Court also erected obstacles to antitrust plaintiffs in situations when the Rule of Reason is applied. For example, in 1993 the Court ruled that a plaintiff in a predatory pricing case had to show that the monopolist was selling below cost *and* that the monopolist would be able to recoup the losses resulting from this below-cost pricing by charging higher prices in the future (*Brooke Group v. Brown & Williamson Tobacco Corporation*, 509 US 209 [1993]). Under this standard, a predatory pricing case by the Department of Justice against American Airlines failed (*United States v. AMR Corporation*, 335 F.3d 1109, Tenth Circuit [2003]). Similarly, in 2004, the Court significantly narrowed the set of circumstances in which an antitrust plaintiff could win on the basis of a monopolist's refusal to sell an essential input to a rival (*Verizon Communications v. Law Offices of Curtis V. Trinko,* 540 US 398 [2004], narrowing *Aspen Skiing v. Aspen Highlands Skiing,* 472 US 585 [1985]).[7]

Collectively, these and other cases represent a significant backing away from antitrust by the Supreme Court. Baker (2015) argues forcefully that many of these judicial decisions were based on erroneous assumptions, including these: that markets self-correct through entry, that oligopolists compete and cartels are unstable, and that business practices prevalent in competitive markets cannot harm competition. This history suggests that it will be challenging for the government to bring a successful Sherman Act case against the tech titans. But ultimately that will depend on the specific facts of the case. A strong case can withstand these headwinds.

The Microsoft case (*United States v. Microsoft*, 253 F.3d 34, DC Circuit [1998]) provides the best guide to what constitutes monopolization in a high-tech setting. This case should be encouraging for those in favor of antitrust action against the tech titans. Microsoft was found to have monopolized the market for Intel-compatible operating systems for personal computers, on the basis of conduct that excluded the Netscape browser and Java software, which together might have facilitated entry

[7]Based on *Trinko*, the Court subsequently limited the circumstances under which a plaintiff can bring an antitrust case based on a price squeeze (see *Pacific Bell Telephone Company v. LinkLine Communications*, 555 US 438 [2009]).

and thus eroded the monopoly power of Microsoft Windows. For an overview of the arguments, see the three-paper symposium in the Spring 2001 issue of this journal.

Applying Antitrust Principles to the Tech Titans

We are now ready to look more closely at Google, Amazon, Facebook, and Apple. These four "GAFA" firms have received by far the most antitrust attention of late as they have become economically and socially important. However, they are not the only firms with powerful positions in the information economy. One could also look for exclusionary conduct by other large high-tech firms, including Microsoft, Oracle, IBM, Salesforce, Adobe, and Uber. Expanding to telecom and media, the list could include AT&T, Verizon, Comcast, Netflix, and Disney. One also could conduct a similar exercise in other industries, such as pharmaceuticals, semiconductors, or airlines.

The point of this discussion is not to offer a view on whether any of these four GAFA firms have violated US antitrust law, but rather to show how antitrust principles can be applied to these tech titans. The analysis is illustrative and is not intended to capture all plausible antitrust cases that might be brought against these firms. Each of these companies is assumed to have sufficient market power to be subject to Section 2 of the Sherman Act. However, is important to remember that these firms' products and services, and their business models, are very different from one another, so it makes no sense to lump them together. Any antitrust analysis must be done company by company, based on that company's practices. Here we briefly consider the potential application of three antitrust doctrines to the tech titans: predatory pricing, exclusion of nascent threats, and extension of market power into adjacent markets.

A monopolist that engages in *predatory pricing*—that is, pricing below cost to drive rivals out of the market so it can then recoup those losses by raising prices to monopoly levels—can be guilty of monopolization. One can ask whether Amazon's (or Uber's) conduct falls into this category, as some have alleged.

Amazon's core online retailing business has clearly generated enormous benefits to consumers by offering low prices, a huge variety of products, and reliable and speedy delivery. Amazon has been a highly successful company, putting great competitive pressure on other retailers. Under Supreme Court precedent, a predatory pricing case against Amazon would fail unless Amazon were shown to have priced below cost. Furthermore, showing the prospect of future harm to consumers would also be a necessary element of any case. Requiring plaintiffs in predatory pricing cases to show some prospect of harm to customers, not just harm to competitors, is critical to the coherence of antitrust policy, to avoid chilling legitimate price competition.[8] Showing such harm to consumers from Amazon's aggressive pricing

[8] In an earlier era, the grocery chain A&P offered consumers a wide range of products at low prices, putting pressure on many smaller grocery stores. A&P was successfully prosecuted by the US Department of Justice, an action now widely seen as misguided (Muris and Neuchterlein 2018). Later, Walmart was the innovator in retailing, putting great competitive pressure on smaller retailers around the country.

and growth strategy would appear to be difficult. Hemphill and Weiser (2018) offer a road map to bringing and deciding predatory pricing cases.

A tech titan also could be challenged for *exclusion of nascent threats*, which means using its dominant position to exclude products or services that it fears may grow to threaten its core business. This was the basic economic logic of the case against Microsoft 20 years ago. The Netscape browser and Java were the potential threats to Microsoft Windows. The *Microsoft* case established antitrust liability for a dominant firm that excludes rivals, even if the threats they pose are "nascent." But the reach of the *Microsoft* case is unclear, since the Supreme Court subsequently ruled in the *Trinko* case that a dominant firm normally has no duty to deal with its rivals. If the Supreme Court applies *Trinko* broadly to the tech titans, then separate regulation might be needed to impose on the tech titans mandated interconnection or data sharing with rivals.

One way a dominant firm can exclude rivals is by refusing to sell its product to customers who also purchase from its rivals. In 1951, the Supreme Court ruled that such "exclusive dealing" violated Section 2 of the Sherman Act. That case involved a dominant local newspaper that refused to accept advertisements from those who also placed advertisements on the local radio station (*Lorain Journal v. United States*, 342 US 143 [1951]). A tech titan putting up obstacles to customers seeking to also use rival products could easily face liability under this precedent. As a recent example of exclusionary conduct, Facebook blocked Vine, a video sharing app launched by Twitter in January 2013, from accessing Facebook user data (O'Sullivan and Gold 2018). This prevented Facebook users from inviting their Facebook friends to join Vine. Facebook was applying its policy of restricting access to apps that replicated Facebook's core functionality. In response to the Vine episode becoming public, Facebook stated that it was dropping this policy (Facebook 2018), which appears difficult to defend. Twitter discontinued the Vine mobile app in October 2016.

A third category of candidate antitrust cases against the tech titans involves allegations that a firm is *abusing its dominant position to expand into adjacent markets*. Several tech titans already face cases that focus on whether they have favored their own service over a rival service in an adjacent market.

The European Commission is investigating whether Amazon is using data collected about third-party sellers on its platform to guide its own product offerings in competition against those third-party sellers. Such conduct could be problematic, but note that when one firm simply imitates its rivals, that is normally an important channel for the diffusion of new ideas, so long as the imitation does not involve any breach of contract or infringement of intellectual property rights. Looking more broadly, Amazon could be accused of favoring its own products over those of third parties selling on its platform, by giving its own products preferred placement on Amazon's website or by charging third parties excessive rates to be fulfilled or sold through Amazon. This last type of case would be very difficult in the United States under Supreme Court precedent.

Apple has been accused of discriminating against rivals who rely on the Apple platform to reach consumers. In March 2019, the music streaming service Spotify

filed an antitrust complaint at the European Commission against Apple (Ek 2019). Spotify objected to the 30 percent fee that Apple charges on certain purchases made through Apple's payment system and claimed that Apple had locked Spotify out of Apple Watch. Spotify asserted that it should receive the same treatment at the Apple App Store given to Apple's competing service, Apple Music. In response, Apple claimed that it had worked closely with Spotify for years and that Spotify was not willing to abide by the same rules that apply to all apps on the App Store, which Apple regards as necessary for the operation and security of the App Store. Apple further claimed that Apple approved Spotify for the Apple Watch and that Spotify has been the leading app in the Watch Music category. The European Commission is opening an investigation in response to Spotify's complaint.

The Spotify complaint illustrates the tensions that arise when the company controlling a platform also offers its own services on that platform. Indeed, the boundary between the "platform" and services running on that platform can be fuzzy and can change over time. Similar issues will surely arise for other applications that rely on Apple's App Store to reach customers. For example, Apple recently removed several parental control apps from the App Store. These apps provide alternatives to Apple's own screen-time control tools. Apple explained that it took this action to protect users' privacy and security, but an antitrust complaint here would not be shocking (Apple 2019).

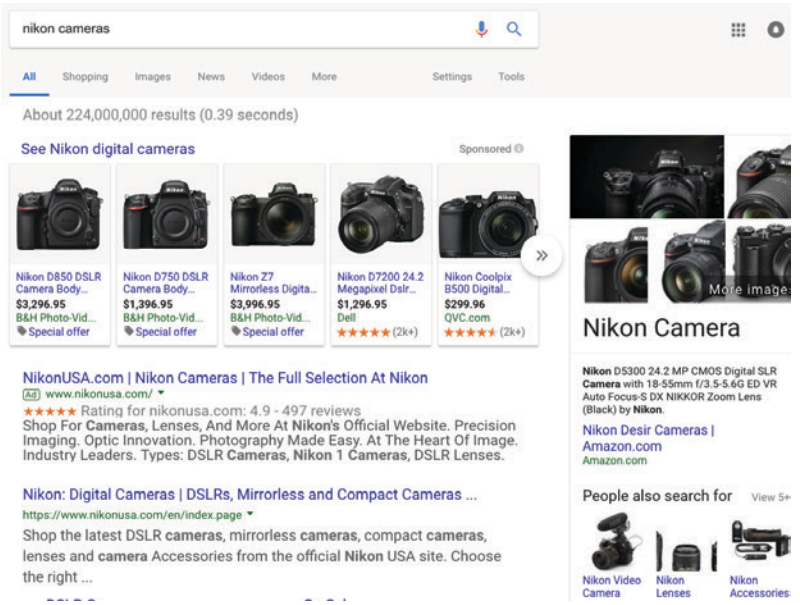
We know a lot more about what a case of this type might look like against Google, because the European Commission issued an antitrust decision in June 2017 against Google involving Google Shopping, including a €2.42 billion ($2.7 billion) fine.[9] Google displays advertisements when users enter queries into the Google search engine that relate to commercial products. For example, Figure 1 shows what one sees on a desktop computer if one searches for "Nikon Cameras" on Google.

All of the images displayed in Figure 1 are *sponsored search results*; that is, they are advertisements paid for by online merchants. Google calls these "Product Listing Ads." A user who clicks on one of these ads is directed to the website of the online merchant sponsoring that ad, and that sponsor pays a fee to Google. The first link to NikonUSA.com is also an advertisement, in text form. The second link to NikonUSA.com is a *generic search result* generated by Google's algorithm, not an advertisement. More generic search results, not shown in Figure 1, follow.

Many press reports have left the impression that the European Commission case was about Google biasing its search algorithm by demoting its rivals, but that is not correct. The European Commission fact sheet states, "The Commission Decision does not object to the design of Google's generic search algorithms or to demotions as such, nor to the way that Google displays or organizes its search results pages (e.g., the display of a box with comparison shopping results displayed prominently in a rich, attractive format)" (European Commission 2017). Instead, the European Commission "objects to the fact that Google has leveraged its

[9] I served as an economic expert for Google in the Google Shopping case. The views expressed here are my own.

Figure 1
Result of a Search for "Nikon Cameras" on Google



Source: Unaltered screen capture of a Google search for "Nikon Cameras" performed by the author in November 2018.
Notes: All of the images in the main column are *sponsored search results*; that is, they are advertisements paid for by online merchants. A user who clicks on one of these ads is directed to the website of the online merchant sponsoring that ad, and that sponsor pays a fee to Google. The first link to NikonUSA.com is also an advertisement, in text form. The second link to NikonUSA.com is a *generic search result* generated by Google's algorithm, not an advertisement. Additional generic search results, not shown in the figure, follow.

market dominance in general internet search into a separate market, comparison shopping. Google abused its market dominance as a search engine to promote its own comparison shopping service in search results, whilst demoting those of rivals."

According to the European Commission, Google did this by displaying Product Listing Ads, such as those shown in Figure 1. This is a peculiar claim, because those Product Listing Ads are very much like the text ads that Google has shown for years, and the European Commission does not object to ads that use text rather than images. Plus, as the European Commission recognizes, there is nothing wrong from a competitive perspective when a content provider earns revenue by selling advertisements. The newspaper and radio industries have done that for a very long time. Furthermore, it is not apparent how the Product Listing Ads "promote" Google's comparison shopping service, since a user who clicks on one of those ads is directed to the merchant's website, not to the stand-alone Google Shopping site.

Lessons

We can distill several lessons regarding the role and limits of antitrust in controlling the tech titans.

First, many of the deepest concerns about the tech titans, including privacy, data security, and information disorder, do not directly involve competition issues. Sector-specific regulation is overdue and badly needed to address these problems. Antitrust cannot solve all manner of economic and social problems and should not be expected to do so.

Second, those who would like to see the tech titans broken up on antitrust grounds are likely to be disappointed, since antitrust does not condemn monopoly as such. Antitrust liability requires that a dominant firm abuse its power in some way, such as by excluding rivals. When liability is found, a suitable remedy is designed to restore the competition lost due to the illegal acts.

Third, establishing that a dominant firm has abused its position has become much harder in the United States over the past 40 years, under a series of decisions by the Supreme Court. This has left antitrust enforcement in the United States notably weaker than in the European Union. That is unlikely to change much in the near future, so look to Brussels for much of the action.

Fourth, many of the antitrust cases against the tech titans in the years ahead will most likely involve allegations that these firms have used their "platforms" to favor their own services over rival services. These cases will be complex, and they will be risky for plaintiffs in the United States given Sherman Act case law and the current makeup of the Supreme Court.[10]

Despite these obstacles, ongoing antitrust oversight and vigilant antitrust enforcement toward the tech titans is critical and can make a real difference, mostly through deterrence rather than litigation. Antitrust can and should prevent the tech titans from entrenching their economic power by engaging in exclusionary conduct that weakens the competitive pressures they face from rivals offering new and disruptive products and services. At the same time, antitrust should take care not to discourage the tech titans from competing with each other, as Microsoft has done with Bing against Google and as Google has done with Android against Apple iOS.

Antitrust in Labor Markets

Antitrust enforcement in the United States has largely focused on the market power of *sellers*. However, the Sherman Act applies with equal force to the market

[10] Adding to concerns, the Supreme Court recently issued a worrisome and poorly reasoned decision involving payment systems that could greatly complicate any case brought in a "two-sided market" (*Ohio v. American Express*, 138 S. Ct. 2274 [2018]). Justice Breyer's dissent in this case eviscerates the majority opinion. While it is not yet clear how broadly the lower courts will read the *American Express* decision, all four of the tech titans arguably operate in "two-sided markets." Apple connects users with application developers, Facebook and Google connect advertisers with users, and Amazon connects manufacturers and merchants with consumers.

power of *buyers*. When Weyerhaeuser was sued as a buyer for bidding up the price of sawlogs in the Pacific Northwest to a level that prevented rival sawmills from being profitable, the Supreme Court ruled that the legal standard for predatory pricing also applies to cases of predatory bidding (*Weyerhaeuser v. Ross-Simmons Hardwood Lumber*, 549 US 312 [2007]). Last year, the Federal Trade Commission (2018a) held hearings to explore monopsony and buyer power in the US economy.

Likewise, Section 7 of the Clayton Act bans mergers that may create or enhance *buyer* market power. For example, in 2018, the Federal Trade Commission challenged the acquisition by Grifols of Biotest, a challenge based in part on the allegation that the acquisition would lessen competition to purchase human plasma, leading to lower fees for people providing plasma (see the case summary at Federal Trade Commission 2018b). Hemphill and Rose (2018) discuss ways to strengthen antitrust enforcement relating to mergers that harm sellers.

The Sherman Act as applied to labor markets prohibits agreements among employers to refrain from competing to hire workers, while the Clayton Act prohibits mergers between employers that may substantially lessen competition in the hiring of workers. Antitrust is generally associated with keeping consumer prices *down* by controlling seller market power, but antitrust applies equally to keeping workers' wages *up* by controlling employer market power.

It seems clear cut that many labor markets depart rather significantly from the textbook model of perfect competition, in which employers are wage takers and face a highly elastic supply of labor. Labor markets are generally defined according to an occupation and a local geographic area (as emphasized by Moretti 2011). With costs of job search and costs of geographical mobility, employers will have some degree of buyer power. Manning (2011) surveys the literature and concludes that "labor markets are pervasively imperfectly competitive." Employers commonly share relationship-specific rents with workers, so employees working at more productive firms earn higher wages (see, for example, Kline et al. 2017; Card et al. 2018).

Some local US labor markets are highly concentrated on the employer side, but that is not the situation for most workers. Azar, Marinescu, and Steinbaum (2017) use data from CareerBuilder.com to calculate labor market concentration in some 8,000 selected labor markets in the United States. They define these labor markets according to occupation and geography, such as "legal secretaries in the Denver area." On average, 20 employers post job vacancies on CareerBuilder.com in a given market in a given quarter. They calculate an employer's share in the labor market based on the number of vacancies listed by that employer at CareerBuilder.com in a given quarter, and they measure market concentration based on the Herfindahl–Hirschman index (HHI) on the employer side of the market. Weighting the geographic markets by population, the overall mean HHI is 1,691, which antitrust economists would classify as moderately concentrated. This method is likely to overestimate labor market concentration, because only about 35 percent of job openings nationally are listed on CareerBuilder.com.

Antitrust enforcement in labor markets has historically been extremely limited. As discussed by Naidu, Posner, and Weyl (2018), this most likely reflects the view

that most labor markets are reasonably competitive and that most employers face effective competition to attract and retain workers, combined with a view that some combination of unions, regulations, and lawsuits will help protect workers. That overall conclusion is probably true, but antitrust can still play a role in labor markets in two ways: by considering employer power in labor markets in selected mergers and by addressing anticompetitive agreements in labor markets.

Merger Policy That Considers Labor Markets

A merger that may substantially lessen competition among employers to hire workers is illegal under the Clayton Act. Marinescu and Hovenkamp (2018, 1) note that no merger has ever been blocked on these grounds and infer that "the antitrust law against anticompetitive mergers affecting employment markets is certainly underenforced, very likely by a significant amount." Prager and Schmitt (2019) find that hospital mergers resulting in large increases in concentration in markets for skilled workers, including nurses and pharmacy workers, lead to lower wages.

The Horizontal Merger Guidelines (Department of Justice and Federal Trade Commission 2010, sec. 12) explain how the government evaluates mergers that may enhance buyer power. The government could define a relevant labor market and demonstrate that the merger in question would cause that market to become significantly more concentrated. The merging parties might then try to show that the affected workers have many alternative options for employment. For further details on this type of analysis, see Marinescu and Hovenkamp (2018) and Naidu, Posner, and Weyl (2018).

Two thorny issues are likely to arise if the government begins challenging mergers on the basis of harm to competition in labor markets. First, in cases where the merging parties assert that the merger will reduce their labor costs, the court may need to determine whether to credit these reduced costs as an efficiency gain or instead treat them as the exercise of buyer power in labor markets.[11] Second, if a merger is expected to benefit consumers but harm workers, the court may need to determine whether and how to balance the interests of these two groups. Marinescu and Hovenkamp (2018) argue that under current law, a merger that harms workers by lessening competition in the labor market would not be saved by also offering benefits to consumers.

If the antitrust authorities seriously want to explore the possibility of challenging mergers on the basis of harm to competition in labor markets, developing a quick and efficient means of identifying mergers that involve a significant overlap in plausible labor markets would be a good first step.

Anticompetitive Labor Market Practices: No-Poach and No-Hire Agreements

Section 1 of the Sherman Act prohibits agreements among employers to refrain from competing to hire workers, just as it prohibits traditional cartels among

[11] Anthem's claimed purchasing efficiencies were rejected in *United States v. Anthem*, 855 F.3d 345 (2017).

product-market rivals. This raises questions about no-poach and no-hire agreements that arise in certain labor markets.

In a prominent "no-poach" case, the Department of Justice (2010) sued Adobe, Apple, Google, Intel, Intuit, and Pixar for entering into agreements not to recruit certain workers from each other.[12] When Apple CEO Steve Jobs learned that Google was trying to recruit employees from Apple's Safari team, Jobs threatened Google co-founder Sergey Brin, stating that "if you hire a single one of these people, that means war." In response, Google's CEO Eric Schmidt stopped all efforts at Google to recruit anyone from Apple. When this was conveyed to Apple, Apple reciprocated (Koh 2014). Later, when a Google recruiter contacted an Apple employee, Jobs complained to Schmidt, who apologized and made a public example out of that recruiter, who was terminated within the hour.

The Department of Justice and the Federal Trade Commission later released *Antitrust Guidance for Human Resources Professionals*, stating that "[g]oing forward, the DOJ intends to proceed criminally against naked wage-fixing or no-poaching agreements. These types of agreements eliminate competition in the same irredeemable way as agreements to fix product prices or allocate customers, which have traditionally been criminally investigated and prosecuted as hardcore cartel conduct" (Department of Justice and Federal Trade Commission 2016). Notice that this guidance refers to "*naked* wage-fixing or no-poaching agreements." A no-poach agreement between two or more companies could be justified if those companies are engaged in legitimate joint activity, such as a joint venture to develop new products, and if the no-poach agreement is confined to employees involved in that joint activity, especially if the joint activity involves training these employees or providing them with access to confidential information.

No-hire agreements are common in the franchise sector. Krueger and Ashenfelter (2018) report that in 58 percent of major franchisors' contracts with franchisees, including McDonald's, Burger King, and Jiffy Lube, one franchisee is prohibited from hiring workers from another franchisee in the same chain. They find that no-hire agreements are more common in low-wage, high-turnover industries and have become more common over the past 20 years.

Some limited no-hire provisions of this type could be justified if they provide an incentive for franchisees to invest in workers, giving them human capital that is specific to the franchisor but not to the franchisee. As a result, these agreements are more difficult to challenge under antitrust than are "naked" no-hire agreements. Krueger and Posner (2018) describe a court case involving Jack-in-the-Box in which such a challenge failed. Under the Rule of Reason analysis typically used in antitrust to analyze agreements of this type, two important considerations will be how significantly these agreements restrict the number of employment options available to workers and whether they have depressed wages. A quick look may be sufficient to

[12] I was the chief economist at the Department of Justice when this case was brought.

determine that a no-hire provision has no real efficiency justification and tends to suppress wages.

Conclusion

American antitrust laws date from a time when changes in transportation, communications, and manufacturing technologies generated unprecedented economies of scale, fueling the rise of industrial behemoths. Today, dramatic advances in information technology, combined with globalization, are fueling the growth of large and efficient "superstar firms" that are capturing a growing share of economic activity. The emergence of the tech titans is especially dramatic.

These economic conditions call for a reinvigoration of antitrust enforcement in the United States to promote competition, protect consumers and workers, and spur economic growth. These valuable aims can be achieved by taking a tougher stance toward mergers involving market leaders and by vigilantly preventing dominant firms from engaging in conduct that excludes their rivals. However, moving in that direction is a slow process, requiring the antitrust enforcement agencies to take the lead and convince inertial and possibly skeptical courts to follow. Those who expect dramatic and rapid changes in antitrust will be disappointed, unless new legislation is passed. Likewise, those who expect antitrust to solve problems unrelated to competition will be disappointed. Stronger antitrust enforcement, while needed, is not a substitute for badly needed regulations directed at reducing the political influence of corporations, protecting privacy and data security, and limiting the spread of disinformation.

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References

Apple. 2019. "The Facts about Parental Control Apps." Apple Press Release, April 28, 2019. https://www.apple.com/newsroom/2019/04/the-facts-about-parental-control-apps/.

Ashenfelter, Orley C., and Daniel S. Hosken. 2010. "The Effect of Mergers on Consumer Prices: Evidence from Five Mergers on the Enforcement Margin." *Journal of Law and Economics* 53(3): 417–66.

Ashenfelter, Orley C., Daniel S. Hosken, and Michael C. Weinberg. 2013. "The Price Effects of a Large Merger of Manufacturers: A Case Study of Maytag-Whirlpool." *American Economic Journal: Economic Policy* 5(1): 239–61.

Ashenfelter, Orley C., Daniel S. Hosken, and Michael C. Weinberg. 2014. "Did Robert Bork Understate the Competitive Impact of Mergers? Evidence from Consummated Mergers." *Journal*

of Law and Economics 57(S3): S67–100.

Autor, David, David Dorn, Lawrence F. Katz, Christina Patterson, and John Van Reenen. 2017a. "Concentrating on the Fall of the Labor Share." *American Economic Review* 107(5): 180–85.

Autor, David, David Dorn, Lawrence F. Katz, Christina Patterson, and John Van Reenen. 2017b. "The Fall of the Labor Share and the Rise of Superstar Firms." NBER Working Paper 23396.

Azar, José, Ioana Marinescu, and Marshall I. Steinbaum. 2017. "Labor Market Concentration." NBER Working Paper 24147.

Azar, José, Martin C. Schmalz, and Isabel Tecu. 2018. "Anticompetitive Effects of Common Ownership." *Journal of Finance* 73(4): 1513–64.

Baker, Jonathan B. 2015. "Taking the Error Out of 'Error Cost' Analysis: What's Wrong with Antitrust's Right." *Antitrust Law Journal* 80(1): 1–38.

Baker, Jonathan B. 2019. *The Antitrust Paradigm: Restoring a Competitive Economy*. Cambridge, MA: Harvard University Press.

Barkai, Simcha. 2017. "Declining Labor and Capital Shares." http://facultyresearch.london.edu/docs/BarkaiDecliningLaborCapital.pdf.

Bessen, James E. 2017. "Information Technology and Industry Concentration." Boston University School of Law, Law and Economics Research Paper 17-41. https://ssrn.com/abstract=3044730.

Blonigen, Bruce A., and Justin R. Pierce. 2016. "Evidence for the Effects of Mergers on Market Power and Efficiency." NBER Working Paper 22750.

Calligaris, Sara, Chiara Criscuolo, and Luca Marcolin. 2018. "Mark-Ups in the Digital Era." OECD Science, Technology and Industry Working Paper 2018/10. https://doi.org/10.1787/4efe2d25-en.

Card, David, Ana Rute Cardoso, Joerg Heining, and Patrick Kline. 2018. "Firms and Labor Market Inequality: Evidence and Some Theory." *Journal of Labor Economics* 36(S1): S13–70.

Crémer, Jacques, Yves-Alexandre de Montjoye, and Heike Schweitzer. 2019. *Competition Policy for the Digital Era*. Brussels: European Commission.

Crouzet, Nicolas, and Janice C. Eberly. 2019. "Understanding Weak Capital Investment: The Role of Market Concentration and Intangibles." NBER Working Paper 25869.

Cunningham, Colleen, Florian Ederer, and Song Ma. 2018. "Killer Acquisitions." https://ssrn.com/abstract=3241707.

De Loecker, Jan, Jan Eeckhout, and Gabriel Unger. 2018. "The Rise of Market Power and the Macroeconomic Implications." Available at https://sites.google.com/site/deloeckerjan/research.

Decker, Ryan A., John Haltiwanger, Ron S. Jarmin, and Javier Miranda. 2016. "Declining Business Dynamism: What We Know and the Way Forward." *American Economic Review* 106(5): 203–7.

Decker, Ryan A., John Haltiwanger, Ron S. Jarmin, and Javier Miranda. 2017. "Declining Dynamism, Allocative Efficiency, and the Productivity Slowdown." *American Economic Review* 107(5): 322–26.

Demsetz, Harold. 1973. "Industry Structure, Market Rivalry, and Public Policy." *Journal of Law and Economics* 16(1): 1–9.

Department of Justice. 2010. "Justice Department Requires Six High Tech Companies to Stop Entering into Anticompetitive Employee Solicitation Agreements." Department of Justice Press Release 10-1076, September 24, 2010. https://www.justice.gov/opa/pr/justice-department-requires-six-high-tech-companies-stop-entering-anticompetitive-employee.

Department of Justice. 2019. *Criminal Enforcement Trends Charts through Fiscal Year 2018*. https://www.justice.gov/atr/criminal-enforcement-fine-and-jail-charts.

Department of Justice and Federal Trade Commission. 2010. *Horizontal Merger Guidelines*. https://www.justice.gov/atr/file/810276/download.

Department of Justice and Federal Trade Commission. 2016. *Antitrust Guidance for Human Resources Professionals*. https://www.justice.gov/atr/file/903511/download.

Ek, Daniel. 2019. "Consumers and Innovators Win on a Level Playing Field." Spotify Press Release, March 13, 2019. https://newsroom.spotify.com/2019-03-13/consumers-and-innovators-win-on-a-level-playing-field/.

European Commission. 2017. "Antitrust: Commission Fines Google €2.42 Billion for Abusing Dominance as Search Engine by Giving Illegal Advantage to Own Comparison Shopping Service—Factsheet." European Commission Factsheet, June 27, 2017. http://europa.eu/rapid/press-release_MEMO-17-1785_en.htm.

Facebook. 2018. "Response to Six4Three Documents." Facebook Press Release, December 5, 2018. https://newsroom.fb.com/news/2018/12/response-to-six4three-documents/.

Federal Trade Commission. 2018a. "FTC Hearing #2 on Competition and Consumer Protection in the 21st Century: Monopsony and the State of U.S. Antitrust Law." September 21, 2018. https://www.ftc.gov/news-events/events-calendar/2018/09/ftc-hearing-2-competition-consumer-protection-21st-century.

Federal Trade Commission. 2018b. "In the Matter of Grifols, S.A., a Corporation, and Grifols Shared Services North America, Inc., a Corporation." FTC Matter/File No. 181 0081, updated September 18, 2018. https://www.ftc.gov/enforcement/cases-proceedings/181-0081/grifols-sa-grifols-shared-services-north-america-inc-matter.

Federal Trade Commission and Department of Justice. 2018. "Hart-Scott-Rodino Annual Report: Fiscal Year 2017." Available at https://www.ftc.gov/policy/reports/policy-reports/annual-competition-reports.

Federico, Giulio, Fiona Scott Morton, and Carl Shapiro. Forthcoming. "Antitrust and Innovation: Welcoming and Protecting Disruption." Chap. 4 in *Innovation Policy and the Economy*, vol. 20, edited by Josh Lerner and Scott Stern. Chicago: University of Chicago Press. https://www.nber.org/chapters/c14261.

Furman, Jason, Diane Coyle, Amelia Fletcher, Philip Marsden, and Derek McAuley. 2019. *Unlocking Digital Competition: Report of the Digital Competition Expert Panel*. London: Digital Competition Expert Panel.

Furman, Jason, and Peter Orszag. 2018. "A Firm-Level Perspective on the Role of Rents in the Rise of Inequality." In *Toward a Just Society: Joseph Stiglitz and Twenty-First Century Economics*, edited by Martin Guzman, 19–47. New York: Columbia University Press.

Ganapati, Sharat. 2018. "Oligopolies, Prices, Output, and Productivity." https://ssrn.com/abstract=3030966.

Gaynor, Martin. 2018. "Examining the Impact of Health Care Consolidation." Statement before the Committee on Energy and Commerce Oversight and Investigations Subcommittee, US House of Representatives, February 14, 2018. https://docs.house.gov/meetings/IF/IF02/20180214/106855/HHRG-115-IF02-Wstate-GaynorM-20180214.pdf.

Gaynor, Martin, and Robert Town. 2012. "The Impact of Hospital Consolidation: Update." Robert Wood Johnson Foundation, Synthesis Project Policy Brief 9. https://www.rwjf.org/content/dam/farm/reports/issue_briefs/2012/rwjf73261.

Gee, Emily, and Ethan Gurwitz. 2018. *Provider Consolidation Drives Up Health Care Costs: Policy Recommendations to Curb Abuses of Market Power and Protect Patients*. Washington, DC: Center for American Progress. https://cdn.americanprogress.org/content/uploads/2018/12/04110830/Consolidation-HealthCare-Costs.pdf.

Gutiérrez, Germán, and Thomas Philippon. 2018. "How EU Markets Became More Competitive Than US Markets: A Study of Institutional Drift." NBER Working Paper 24700.

Hall, Robert E. 1988. "The Relation between Price and Marginal Cost in U.S. Industry." *Journal of Political Economy* 96(5): 921–47.

Hall, Robert E. 2018. "Using Empirical Marginal Cost to Measure Market Power in the US Economy." NBER Working Paper 25251.

Hemphill, C. Scott, and Nancy L. Rose. 2018. "Mergers That Harm Sellers." *Yale Law Journal* 127(7): 2078–109.

Hemphill, C. Scott, and Philip J. Weiser. 2018. "Beyond *Brooke Group*: Bringing Reality to the Law of Predatory Pricing." *Yale Law Journal* 127(7): 2048–77.

Hovenkamp, Herbert J., and Carl Shapiro. 2018. "Horizontal Mergers, Market Structure, and Burdens of Proof." *Yale Law Journal* 127(7): 1996–2025.

International Monetary Fund. 2019. "The Rise of Corporate Market Power and Its Macroeconomic Effects." Chap. 2 in *World Economic Outlook: Growth Slowdown, Precarious Recovery*. April 2019. Washington, DC: International Monetary Fund.

Kline, Patrick, Neviana Petkova, Heidi Williams, and Owen Zidar. 2017. "Who Profits from Patents? Rent-Sharing at Innovative Firms." Institute for Research on Labor and Employment Working Paper 107-17. http://irle.berkeley.edu/files/2017/Who-Profits-from-Patents.pdf.

Koh, Lucy H. 2014. "In Re: High-Tech Employee Antitrust Litigation, Order Denying Plaintiffs' Motion for Preliminary Approval of Settlements with Adobe, Apple, Google, and Intel." US District Court for the Northern District of California, San Jose Division, Case 11-CV-02509-LHK, Filing 974, August 8, 2014.

Krueger, Alan B., and Orley Ashenfelter. 2018. "Theory and Evidence on Employer Collusion in the Franchise Sector." NBER Working Paper 24831.

Krueger, Alan B., and Eric A. Posner. 2018. "A Proposal for Protecting Low-Income Workers from Monopsony and Collusion." Hamilton Project Policy Proposal 2018-05. http://www.hamiltonproject.org/assets/files/protecting_low_income_workers_from_monopsony_collusion_krueger_posner_pp.pdf.

Kwoka, John. 2014. *Mergers, Merger Control, and Remedies: A Retrospective Analysis of U.S. Policy*. Cambridge, MA: MIT Press.

Levenstein, Margaret C., and Valerie Y. Suslow. 2006. "What Determines Cartel Success?" *Journal of Economic Literature* 44(1): 43–95.

Levenstein, Margaret C., and Valerie Y. Suslow. 2011. "Breaking Up is Hard to Do: Determinants

of Cartel Duration." *Journal of Law and Economics* 54(2): 455–92.

Manning, Alan. 2011. "Imperfect Competition in the Labor Market." Chap. 11 in *Handbook of Labor Economics*, vol. 4b, edited by Orley Ashenfelter and David Card, 973–1041. Amsterdam: Elsevier.

Marinescu, Ioana Elena, and Herbert Hovenkamp. 2018. "Anticompetitive Mergers in Labor Markets." University of Pennsylvania Institute for Law and Economics Research Paper 18-8. https://ssrn.com/abstract=3124483.

Moretti, Enrico. 2011. "Local Labor Markets." Chap. 14 in *Handbook of Labor Economics*, vol. 4b, edited by Orley Ashenfelter and David Card, 1237–313. Amsterdam: Elsevier.

Muris, Timothy J., and Jonathan E. Neuchterlein. 2018. "Antitrust in the Internet Era: The Legacy of United States v. A&P." George Mason Law and Economics Research Paper 18-15. https://ssrn.com/abstract=3186569.

Naidu, Suresh, Eric A. Posner, and Glen Weyl. 2018. "Antitrust Remedies for Labor Market Power." *Harvard Law Review* 132(2): 536–601.

O'Sullivan, Donie, and Hadas Gold. 2018. "Facebook Internal Emails Show Zuckerberg Targeting Competitor Vine." *CNN Business*, December 5, 2018. https://www.cnn.com/2018/12/05/media/facebook-six4three-internal-documents-emails/index.html.

Prager, Elena, and Matthew Schmitt. 2019. "Employer Consolidation and Wages: Evidence from Hospitals." Washington Center for Equitable Growth Working Paper. https://ssrn.com/abstract=3391889.

Rossi-Hansberg, Esteban, Pierre-Daniel Sarte, and Nicholas Trachter. 2018. "Diverging Trends in National and Local Concentration." NBER Working Paper 25066.

Salinger, Michael. 1990. "The Concentration-Margins Relationship Reconsidered." *Brookings Papers on Economic Activity* 21(Microeconomics): 297–335.

Schmalensee, Richard. 1989. "Inter-Industry Studies of Structure and Performance." Chap. 16 in *Handbook of Industrial Organization*, vol. 2, edited by Richard Schmalensee and Robert Willig, 951–1009. Amsterdam: Elsevier.

▶**Schmalz, Martin C.** 2018. "Common-Ownership Concentration and Corporate Conduct." *Annual Review of Financial Economics* 10(1): 413–48.

Scott Morton, Fiona, Pascal Bouvier, Ariel Ezrachi, Bruno Jullien, Roberta Katz, Gene Kimmelman, A. Douglas Melamed, and Jamie Morgenstern. 2019. *Committee for the Study of Digital Platforms: Market Structure and Antitrust Subcommittee Report. Draft.* Chicago: Stigler Center for the Study of the Economy and the State, University of Chicago Booth School of Business. https://research.chicagobooth.edu/-/media/research/stigler/pdfs/market-structure—report-as-of-15-may-2019.pdf.

Shapiro, Carl. 2010. "The 2010 Horizontal Merger Guidelines: From Hedgehog to Fox in Forty Years." *Antitrust Law Journal* 77(1): 701–59.

Shapiro, Carl. 2012. "Competition and Innovation: Did Arrow Hit the Bull's Eye?" Chap. 7 in *The Rate and Direction of Inventive Activity Revisited*, edited by Josh Lerner and Scott Stern, 404–10. Chicago: University of Chicago Press.

▶**Shapiro, Carl.** 2018. "Antitrust in a Time of Populism." *International Journal of Industrial Organization* 61(1): 714–48.

▶**Syverson, Chad.** 2011. "What Determines Productivity?" *Journal of Economic Literature* 49(2): 326–65.

Traina, James. 2018. "Is Aggregate Market Power Increasing? Production Trends Using Financial Statements." https://ssrn.com/abstract=3120849.

Valletti, Tommaso. 2018. "Concentration Trends." Brussels: European Commission. https://www.ecb.europa.eu/pub/conferences/shared/pdf/20180618_ecb_forum_on_central_banking/Valletti_Tommaso_Presentation.pdf.

Valletti, Tommaso M., and Hans Zenger. 2019. "Increasing Market Power and Merger Control." https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3387999.

Van Reenen, John. 2018. "Increasing Differences between Firms: Market Power and the Macro-Economy." Centre for Economic Performance Discussion Paper 1576. http://cep.lse.ac.uk/pubs/download/dp1576.pdf.

▶**Werden, Gregory J.** 2018. "The 1968 Merger Guidelines: In Praise of Committing to Restraint." *Review of Industrial Organization* 53(3): 445–52.

▶**Wollmann, Thomas G.** 2019. "Stealth Consolidation: Evidence from an Amendment to the Hart-Scott-Rodino Act." *American Economic Review: Insights* 1(1): 77–94.