

# Big Data, Price Discrimination, and Antitrust

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*Antitrust law today guarantees a particular distribution of wealth between consumers and firms by promoting competition in some markets, but allowing firms to retain pricing power in other markets, such as those in which a firm has achieved power through oligopoly or by fielding a superior product. By giving firms the power to identify individual consumers at the point of sale and determine the maximum price that each consumer can be made to pay for a product, big data will soon allow firms with pricing power to charge each consumer the highest price that the consumer is able to pay, upending the current distribution of wealth. Current antitrust rules cannot respond because those rules determine the distribution of wealth only indirectly, through regulation of competition, instead of directly through the regulation of prices, leaving firms with pricing power free to use their data to raise prices. As a political matter, a response will be necessary, however, because consumers will rebel against attempts to diminish their wealth.*

*Two options preserve the current distribution of wealth. One is to change antitrust rules to require more competition in markets that are exempt from antitrust scrutiny today. The traditional objection to such a deconcentration campaign, that it might reduce rewards to firms for innovation, would not apply because the purpose of deconcentration here would be to restore the current, presumably sufficiently rewarding, distribution of wealth. The other option is use by government of big data to set prices designed to maintain the current distribution of wealth. Big data would make price regulation of this kind possible by allowing regulators to calculate precisely how much wealth a given pricing policy lets consumers retain in a given market. One advantage of price regulation over deconcentration is that regulators would be able to use big data to tailor prices to achieve social justice ends, such as ensuring that the neediest consumers obtain the most value from their purchases.*

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## INTRODUCTION

Before too long, it may be impossible for any consumer to get a good deal on any purchase. The seller of a bar of soap, for example, will know enough about the consumer, including how much the consumer earns, when the consumer is paid, when the consumer's rent or mortgage payment is due, and whether the consumer needs to save for dinner with friends next week, to predict how much money the consumer can spend on that soap bar.<sup>1</sup> The seller will also know enough about the consumer,

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1. See Lois Beckett, *Everything We Know About What Data Brokers Know About You*, PROPUBLICA (June 13, 2014, 1:59 AM), <http://www.propublica.org/article/everything-we-know-about-what-data-brokers-know-about-you> (reporting that one data company "collects detailed salary and pay stub information for roughly 38 percent of employed Americans").

including how long the consumer goes between purchasing soap bars, how much the consumer spends on other hygiene products, and whether the consumer has a psychological profile that suggests frequent bathing, to predict just how badly the consumer wants a new soap bar right now.<sup>2</sup> Based on all that, the seller will charge the consumer a personalized price designed to be the highest price the seller can charge without discouraging the consumer from buying at all. Each person leaving the store with a bar of soap will have paid a different price for it. The consumer might try to escape this trap by trying another seller, but many markets are controlled by a small number of large firms, all of which will tailor prices in the same way.<sup>3</sup>

The consumer might instead try to use a disguise to fool the seller, but the same massive access to information that permits firms to tailor pricing permits them to defeat attempts at anonymization. The consumer might wear a mask to defeat facial recognition technology in stores, but the seller will identify the consumer by the length of the consumer's stride as the consumer walks down the aisles, or the car the consumer has parked in the store's parking lot, or innumerable other personal characteristics, some of which the consumer will be unable to hide.<sup>4</sup> The consumer might use private browsing technology to obscure the consumer's identity online, but the way the consumer browses, from the size to which the consumer sets the browser window to the rhythm with which the consumer types in credit card information to pay online, will

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Data on dining reservations might be obtained directly from a reservation website, such as OpenTable, or by purchasing browsing and search history data from a data broker and inferring from repeat visits to OpenTable or a restaurant website that a meal is imminent. See Benjamin Reed Shiller, *First-Degree Price Discrimination Using Big Data 6–7* (Jan. 30, 2014) (unpublished manuscript) (on file with Author) (describing data on web browsing history for tens of thousands of people purchased by a researcher from a data broker).

2. Health conditions, presumably including mental health conditions, may be inferred from data on purchases, among other things. See Beckett, *supra* note 1 (reporting that “[o]ne health insurance company recently bought data on more than three million people’s consumer purchases in order to flag health-related actions”).

3. For a discussion of market concentration, see *infra* note 142.

4. See, e.g., Ryan O’Hare, *Nowhere to Run: Software Can Identify You by the Way You WALK Even in Grainy CCTV Footage—and Putting on a Limp Won’t Fool It*, DAILY MAIL (Feb. 15, 2016, 3:19 PM), <http://www.dailymail.co.uk/sciencetech/article-3447957/Nowhere-run-Software-identify-way-WALK-using-grainy-CCTV-footage.html> (describing technology that identifies gaits); Akiva A. Miller, *What Do We Worry About When We Worry About Price Discrimination? The Law and Ethics of Using Personal Information for Pricing*, 19 J. TECH. L. & POL’Y 41, 45, 52 (2014) (“New facial recognition technologies allow sellers to identify and track shoppers through in-store cameras sometimes hidden in mannequins. . . . In the near future, retailers may track customers through employee-worn wearable cameras.”) (internal citations omitted).

give the consumer away.<sup>5</sup> And anyway sellers can discourage successful anonymity by refusing to sell to those whom they cannot identify.<sup>6</sup>

This future poses a profound challenge to the distribution of wealth between producers and consumers that antitrust guarantees.<sup>7</sup> Antitrust strives to achieve a fair distribution of wealth between consumers and producers by preventing firms from acquiring too much power to raise price.<sup>8</sup> To the extent that the success of that struggle has been limited, and there is power in many markets, it has always been some comfort that there is a limit on how high even a powerful firm can raise price. The higher a firm raises a uniform price, the greater the number of consumers who are priced out of the market. Beyond a certain level, the profit lost from this contraction in the size of the market overwhelms the profit gained from the higher price, so monopolies refrain from charging too high a price, leaving some wealth for consumers.<sup>9</sup>

This Article considers the consequences for antitrust if the advance of the information age removes that comfort. My starting point is the assumption that, armed with big data, firms will no longer need to charge a uniform price to any group of consumers, but will instead tailor price to each consumer, allowing firms to raise price to some without pricing others out of the market, a practice known as price discrimination.<sup>10</sup> My assumption is that, as the amount of information on consumers increases, and the algorithms and other analytical tools that may be used on the information increase in power, firms will come to know so much about their customers that they will be able to predict with little error the maximum price that each is willing to pay for any given product at any

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5. See Erik Larkin, *Browser Fingerprints: A Big Privacy Threat*, PCWORLD (Mar. 26, 2010, 6:00 PM), [http://www.peworld.com/article/192648/browser\\_fingerprints.html](http://www.peworld.com/article/192648/browser_fingerprints.html).

6. Cf. Joseph Jerome, *Big Data: Catalyst for a Privacy Conversation*, 48 IND. L. REV. 213, 231 (2014) (observing that a woman who tried to hide information on her pregnancy from data brokers by making baby-related purchases in cash was flagged by a retailer for potential criminal activity).

7. In at least one industry this future has already arrived. Eric Newcomer, *Uber Starts Charging What it Thinks You're Willing to Pay*, BLOOMBERG (May 19, 2017, 10:45 AM), <https://www.bloomberg.com/news/articles/2017-05-19/uber-s-future-may-rely-on-predicting-how-much-you-re-willing-to-pay>. Throughout this Article, the word "antitrust," when used as a noun, refers to the antitrust institution as a whole, understood to include not only the rules of antitrust law, but also the thought and practice of antitrust scholars, lawyers, and enforcers. Specific rules, and their sources, will be identified as they become relevant to my argument.

8. See *infra* Part IV.

9. See *infra* Part III.C.

10. *Id.*; *Big Data and Differential Pricing*, EXECUTIVE OFF. OF THE PRESIDENT OF THE U.S. 2 (2015) ("Big data refers to the ability to gather large volumes of data, often from multiple sources, and with it produce new kinds of observations, measurements and predictions."); Jerome, *supra* note 6, at 214–17 (answering the question "What is Big Data?"). For the technical definition of price discrimination, see *infra* note 73.

given moment.<sup>11</sup> As a result, there will no longer be any natural limit on the amount of wealth that firms can take from consumers.

This big data price discrimination future will render ineffective the current antitrust system, which has been built around preventing the formation of pricing power through anticompetitive conduct, rather than reducing existing power or regulating the manner of its exercise.<sup>12</sup> It is illegal for a firm to become a monopoly by merging with competitors, for example, but not illegal for the firm to be a monopoly, or raise price, once it has become one.<sup>13</sup> This approach makes sense when firms can redistribute more wealth from consumers only by creating power in new markets. But soon firms will be able to use big data to increase their share of wealth in markets over which they already have power. It is a magnification of the effect of existing power, and not the creation of additional power, that will threaten the prevailing distribution of wealth between producers and consumers.

The rise of big data price discrimination will force antitrust to reject a total welfare standard for identifying legally cognizable antitrust harm once and for all.<sup>14</sup> Antitrust has long debated whether it should maintain the current consumer welfare standard, which requires it to protect only consumers from harm, or adopt a total welfare standard, which would require it to protect the economy as a whole from harm, regardless how the economy's fruits are distributed between consumers and producers. Adopting a total welfare standard in a world of big data price discrimination would make antitrust obsolete because price discrimination allows firms with pricing power to maximize total welfare. Price discrimination expands markets, and therefore total welfare, by allowing large firms to lower prices for that subset of consumers who cannot afford to buy at higher prices, bringing those consumers into the market. In contrast to the antitrust obsolescence that would result from adoption of a total welfare standard, maintenance of the current consumer welfare standard would make antitrust even more important than it is at present, because price discrimination inflicts more harm on consumers than does uniform pricing, by tailoring price to the maximum level tolerated by each consumer. Big data price discrimination therefore presents antitrust with the easy choice between obsolescence under a

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11. This is a prediction about the direction of technological development. I elaborate upon it in Part III.B. The focus of this Article is not, however, on making the case that this prediction is correct, but on using it as a starting point in considering the consequences for policy.

12. *See infra* Part IV.

13. *See* 15 U.S.C. § 18 (2012) (prohibiting mergers that “may . . . substantially . . . lessen competition”); *United States v. Aluminum Co. of Am.*, 148 F.2d 416, 429 (2d Cir. 1945) (Hand, J.) (stating that “size does not determine guilt”); HERBERT HOVENKAMP, *FEDERAL ANTITRUST POLICY: THE LAW OF COMPETITION AND ITS PRACTICE* 296 (4th ed. 2011) (“The sale of output at a monopoly price is itself not sufficient to brand someone an unlawful monopolist.”).

14. *See infra* Part III.D.

total welfare standard and heightened relevance under a consumer welfare standard.

While antitrust can avoid irrelevance by maintaining its current mission to protect consumers, antitrust cannot succeed in that mission so long as it continues to condemn only the formation of monopoly power, and not its possession or exercise.<sup>15</sup> I consider three solutions.<sup>16</sup> The first two do not prevent firms from tailoring price, but instead prevent them from harming consumers in doing so. They allow firms to identify consumers who cannot otherwise afford to buy and charge them lower prices, but they prevent firms from maximizing prices and thereby extracting from consumers the full value that consumers place on their products.

The first option is directly to reduce the pricing power of firms through a campaign of deconcentration of industry in the United States. This would restrict the ability of firms to charge consumers the highest possible prices when they price discriminate.<sup>17</sup> This solution may be implemented by a reinterpretation of the antitrust laws to prohibit the possession of pricing power, and not just its acquisition. Alternatively, this solution may be implemented by embracing the legislative deconcentration program put forth by eminent scholars in the mid-20th century, but since abandoned.<sup>18</sup>

The second option is for government itself to use big data to preserve consumer welfare.<sup>19</sup> This approach would build on the United States' tradition of rate regulation by empowering an independent agency to set prices for industry. A price regulator could guarantee to consumers the share of wealth they currently enjoy while still realizing the power of price tailoring to ensure that no consumer who can afford to cover the cost of production is priced out of the market. The power of big data would give regulators tremendous flexibility in distributing wealth, allowing them, for example, to subsidize prices for the poor and raise prices to the rich to cover the cost of the subsidy. The Federal Trade Commission is suited to carrying out this task because of its independence, broad mandate to regulate trade, and experience as a data protection watchdog.

The final option is a ban on the tailoring of prices.<sup>20</sup> Although effective at maintaining the current wealth distribution, this is an inferior

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15. I discuss an exception in Part V.A.2.

16. *See infra* Part V.

17. *See infra* Part V.A.1.

18. *See infra* note 160 and accompanying text.

19. *See infra* Part V.B.

20. *See infra* Part V.D. In this Article, I call the process of charging different prices for different units of a good "price tailoring," and the tailoring of price to the maximum that a consumer is willing to pay for each unit "price discrimination." For more on the definition of price discrimination, see

choice because it would not permit the price reductions to needy consumers that the other two approaches afford. However, because under a consumer welfare standard wealth distribution comes before efficiency, a ban is better than doing nothing. Doing nothing realizes total welfare gains but fails to block redistribution of wealth from consumers to producers.

Outside of antitrust, legal scholarship on big data has focused on the consequences of allowing government,<sup>21</sup> business,<sup>22</sup> or hackers<sup>23</sup> too much information. This literature recognizes price discrimination as a potential problem in passing, but has focused on other concerns.<sup>24</sup> These include facilitation of discrimination against disadvantaged groups, including both the poor and racial minorities,<sup>25</sup> and “filter bubbles” that result when service customization makes it difficult for one user to learn what other users are learning.<sup>26</sup> The scholarly literature on antitrust and big data has tried to show how existing rules can lessen some potential harmful effects of big data on consumers that are unrelated to price discrimination. Big data can give a firm a potentially insurmountable competitive advantage over rivals, creating an incentive for the firm to prevent rivals from gaining access to data.<sup>27</sup> Google, for example, might use contracts that steer consumers to its search services to prevent a

*infra* Part III.A. For a discussion of how a ban on price tailoring might be implemented, see Ramsi A. Woodcock, *Price Discrimination as a Violation of the Sherman Act* (2017) (unpublished manuscript) (on file with Author).

21. See, e.g., Matthew Tokson, *Automation and the Fourth Amendment*, 96 IOWA L. REV. 581, 585–86 (2011) (arguing that data released to and handled by computers should receive Fourth Amendment protection); Julie E. Cohen, *What Privacy Is For*, 126 HARV. L. REV. 1904, 1931 (2013) (arguing that use of big data to personalize public administration, such as by tailoring disability benefits to need, threatens the dignitary interest in privacy).

22. See, e.g., Jerome, *supra* note 6, at 218–23.

23. See, e.g., Justin (Gus) Hurwitz, *Data Security and the FTC’s UnCommon Law*, 101 IOWA L. REV. 955 (2016); James T. Graves et al., *Big Data and Bad Data: On the Sensitivity of Security Policy to Imperfect Information*, 83 U. CHI. L. REV. 117 (2016).

24. See, e.g., Jerome, *supra* note 6, at 218–41 (recognizing that big data can lead to price discrimination but treating this effect as part of a broader problem of privacy associated with big data). The only work of which I am aware to give careful consideration to the welfare effects of big data price discrimination on consumers is that of Hal Varian and a coauthor, which considers the welfare effects of big data price discrimination when consumers have control over the amount of data they reveal and when markets are competitive. See Hal R. Varian, *Computer Mediated Transactions*, 100 AM. ECON. REV. 1, 6 (2010) (summarizing this work, which shows that the harm to consumers when they control their data is limited and that the benefits to consumers when markets are competitive are large). I am concerned with the case in which consumers cannot control the amount of data firms gather on them and markets are not competitive. See *infra* notes 78, 80, and 189, and accompanying text.

25. See Lior Jacob Strahilevitz, *Toward a Positive Theory of Privacy Law*, 126 HARV. L. REV. 2010, 2027–32 (2013) (discussing effect of big data on use by business of proxies such as race to predict whether a customer is valuable and deserves special attention); Cynthia Dwork & Deirdre K. Mulligan, *It’s Not Privacy, and It’s Not Fair*, 66 STAN. L. REV. ONLINE 35, 37 (2013); EXECUTIVE OFF. OF THE PRESIDENT OF THE U.S., *supra* note 10, at 16–17.

26. See Jerome, *supra* note 6, at 220–23.

27. MAURICE E. STUCKE & ALLEN P. GRUNES, *BIG DATA AND COMPETITION POLICY* 170 (2016).

competing search supplier from gaining enough users to optimize its own search algorithms.<sup>28</sup> The scholarly literature on antitrust and big data observes that existing antitrust rules prohibiting exclusion of competitors can prevent firms from denying rivals access to data.<sup>29</sup> This literature also argues that antitrust should promote competition in the provision of privacy.<sup>30</sup> Thus it would treat a merger as suspect if the merger would eliminate a competitor that offers consumers greater control over their data than the acquirer.<sup>31</sup>

The small literature on the antitrust implications of big data price discrimination<sup>32</sup> is skeptical that price discrimination counts as a violation of the antitrust laws, although some contributors believe the law should be reinterpreted to make it a violation.<sup>33</sup> This Article departs from this literature in four main ways. First, unlike other works, which assume that big data will allow only imperfect information on consumer willingness to

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28. *See id.* at 289.

29. *Id.*

30. *See id.* at 259–61.

31. *See id.* at 131–34.

32. The only work devoted exclusively to price discrimination, antitrust, and big data is Douglas M. Kochelek, *Data Mining and Antitrust*, 22 HARV. J.L. & TECH. 515, 516 (2009) (arguing that price discrimination violates antitrust policy but not antitrust law). The only general treatment of big data and price discrimination, which touches on antitrust, is Miller, *supra* note 4, at 69–70, 73–74, 84–87, 104 (identifying consumer harm in the economic sense, as well as fairness and deceptiveness, as potential problems with big data price discrimination, rejecting antitrust as a remedy on the ground that price discrimination does not require market power, and suggesting disclosure of pricing practices and regulation of data collection as possible remedies). A discussion of big data and price discrimination, with a brief treatment of competition, and other, possible policy responses is contained in ARIEL EZRACHI & MAURICE E. STUCKE, *VIRTUAL COMPETITION: THE PROMISE AND PERILS OF THE ALGORITHM-DRIVEN ECONOMY* 83–130, 221, 226–29 (2016) (arguing that big data is improving the ability of firms to price discriminate, concluding that competition law does not prevent the practice, and suggesting that privacy regulation and government-sponsored entry of maverick competitors might be used to combat it). At least one other work touches on antitrust and big data price discrimination in passing. *See* Nathan Newman, *The Costs of Lost Privacy: Consumer Harm and Rising Economic Inequality in the Age of Google*, 40 WM. MITCHELL L. REV. 849, 865–76 (2014) (recognizing the inapplicability of the Robinson-Patman Act to big data price discrimination arguing that antitrust laws should be interpreted to proscribe any big data price discrimination practiced by Google toward purchasers of its advertising services and contending that Google's monopoly in search facilitates the collection by Google of data that enables price discrimination by third parties because that search monopoly prevents others from competing with Google to provide consumers with greater privacy and control over their data). For a discussion of antitrust and price discrimination in consumer transactions that predates big data, see Mark Klock, *Unconscionability and Price Discrimination*, 69 TENN. L. REV. 317, 357–68 (2002) (concluding that the antitrust laws do not proscribe price discrimination directed toward consumers as opposed to retailers).

33. *See* Miller, *supra* note 4, at 73–74 (stating that price discrimination is not normally a violation of the antitrust laws); Kochelek, *supra* note 32, at 516 (concluding that big data price discrimination does not violate antitrust law but that “legislative or judicial augmentation” of antitrust doctrine is required to prevent the practice from harming consumers); EZRACHI & STUCKE, *supra* note 32, at 101, 221 (“[T]he current antitrust tools do not target noncollusive behavioral discrimination [defined to include price discrimination.]”); Newman, *supra* note 32, at 874–76 (same). I consider the merits of banning price discrimination in Part V.D.

pay,<sup>34</sup> I assume here that big data will eventually give firms highly accurate information on consumer willingness to pay, and that information technology will allow firms to use it to engage in perfect price discrimination. Second, I identify the root cause of antitrust's inability to reach price discrimination as its focus on the formation, rather than the possession or exercise, of pricing power. Third, I recognize that perfect price discrimination eliminates the rationale for antitrust regulation under a total welfare standard. Fourth, I consider both deconcentration and price regulation as remedies.<sup>35</sup>

I first provide some background on the concept of surplus, which is another name for the wealth created by production, and the antitrust debate whether to defend consumers' share of it.<sup>36</sup> I argue that antitrust determines a particular division of surplus between consumers and producers that must be defended.<sup>37</sup> I then discuss the effects of price discrimination on the division of surplus, provide an example of the power of big data to facilitate price discrimination, and argue that a consequence of the spread of price discrimination will be that embrace of a total welfare standard would render antitrust obsolete.<sup>38</sup> I argue that antitrust law as presently constituted will be unable to respond to the distributional consequences of the spread of price discrimination because antitrust today is concerned with the formation of pricing power and not its possession or exercise.<sup>39</sup> I next review options for defending the current distribution of wealth. I describe how measures designed to reduce pricing power in the economy, particularly blanket

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34. Kochelek, *supra* note 32, at 529 (stating that "perfect price discrimination exists only theoretically"); Miller, *supra* note 4, at 58 ("[T]he focus on the ghoulish specter of perfect first-degree price discrimination is exaggerated and misguided."). Ezrachi and Stucke, however, appear to agree with my assumption. See EZRACHI & STUCKE, *supra* note 32, at 100 ("[A]s the volume of data collected increases, and the data analytics and categorization of consumers improve, self-learning computer algorithms will continually inch closer to perfect price discrimination.").

35. Existing treatments focus on privacy regulation as a remedy. See Miller, *supra* note 4, at 104 (suggesting limits on collection of consumer data and mandatory disclosure of pricing practices of sellers as possible responses to big data price discrimination); EZRACHI & STUCKE, *supra* note 32, at 226–28 (arguing that forcing firms to announce their use of big data price discrimination will make consumers more aware of the importance of privacy and that privacy protections should be put in place by default, requiring that consumers opt-in before their information may be used by firms). Ezrachi and Stucke recognize that government may use big data to engage in price regulation, but they consider only the use of such regulation to achieve a competitive price, and not to achieve redistributive, or other social justice, ends as well. *Id.* at 212–16. They also consider government-sponsored market entrance, which is a kind of deconcentration initiative, as a remedy for price discrimination. *Id.* at 228–29. They do not, however, consider deconcentration more generally as a remedy.

36. See *infra* Parts II.A & II.B.

37. See *infra* Part II.C.

38. See *infra* Part III.

39. See *infra* Part IV.

deconcentration of the economy, might be implemented.<sup>40</sup> I discuss the promise of price regulation for achieving the same result.<sup>41</sup> Finally, I compare deconcentration and price regulation and then consider the merits of a ban on price discrimination.<sup>42</sup>

## I. THE WELFARE ECONOMICS OF ANTITRUST

### A. SURPLUS

A great deal of the discussion that follows is built around the concept of economic surplus, which accordingly requires a brief introduction here. Production is costly. The value of a product is the maximum that its consumer is willing to pay for it. The difference between value and cost is surplus or welfare. Price divides this surplus between producer—that is, the firm—and consumer. If price equals value, then the consumer pays out the entire surplus that the consumer might otherwise get from the product to the producer. If price is at cost, then the producer receives no share of the value enjoyed by the consumer. An intermediate price splits the surplus between the two.<sup>43</sup>

A price at cost does not dissuade the producer from producing because cost includes just enough compensation to make the producer prefer production over any alternative use of the producer's resources. Similarly, a price equal to value does not dissuade the consumer from buying, because the maximum price a consumer is willing to pay is just low enough to make the consumer prefer purchase over any other use of the consumer's resources.<sup>44</sup>

A producer may increase surplus in three ways. First, the producer may improve the product, making the consumer willing to pay a higher maximum price for it.<sup>45</sup> Second, the producer may reduce the cost of production.<sup>46</sup> Third, the producer may produce an additional unit and sell it to an additional consumer at a price equal at least to cost. When a

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40. See *infra* Part V.A.

41. See *infra* Part V.B.

42. See *infra* Part V.D.

43. For an introduction to, and numerical example of, surplus, see Ramsi A. Woodcock, *Property, Efficiency, the Commons, and Theft*, in RES. HANDBOOK ON POL. ECON. & L. 531 (Ugo Mattei & John D. Haskell eds., 2015).

44. These “just enoughts” are vanishingly small steps beyond the amounts that leave the parties in question indifferent toward consumption or production.

45. The notion that product improvement drives up demand is old. See, e.g., EDWARD CHAMBERLIN, *THE THEORY OF MONOPOLISTIC COMPETITION: A RE-ORIENTATION OF THE THEORY OF VALUE* 96–97 (3d ed. 1938) (“If any seller can increase his profits by improving his ‘product’ . . . [s]uch an improvement would increase demand . . . and also increase costs[.]”). For a recent introduction, see F. M. Scherer, *First Mover Advantages and Optimal Patent Protection*, 40 J. TECH. TRANSFER 559, 563–65 (2015).

46. The modern treatment of such process improvements starts with WILLIAM D. NORDHAUS, *INVENTION GROWTH, AND WELFARE: A THEORETICAL TREATMENT OF TECHNOLOGICAL CHANGE* (1969).

producer fails to sell to all consumers who are willing to pay at least cost, perhaps because the producer is charging a monopoly price too far above cost for some consumers to afford, then surplus will fall below its potential.<sup>47</sup> The lost surplus is called deadweight loss, and the market is said to be inefficient.<sup>48</sup> I shall refer to surplus interchangeably as total welfare, to the share of surplus enjoyed by consumers as consumer surplus or consumer welfare, and to the share enjoyed by producers as producer surplus or producer welfare, or simply profit.

## B. THE CONSUMER AND TOTAL WELFARE STANDARDS

Ever since antitrust stopped worrying in the 1970s about promoting competition as an end in itself, and turned to welfare analysis instead, antitrust has debated whether antitrust should protect the welfare of consumers alone or of both producers and consumers as a group.<sup>49</sup> A consumer welfare standard prevents producers from increasing their share of surplus at the expense of consumers, thereby forcing producers to expand total welfare in order to improve their fortunes. A total welfare standard allows producers to take surplus from consumers so long as producers do not destroy some surplus in doing so. Thus, from the perspective of consumers, a total welfare standard allows producers to thief so long as they do not also waste. So far, the consumer welfare standard has prevailed.<sup>50</sup>

Often the distinction does not matter: a practice that harms producers and consumers as a group often harms each individually as

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47. See HOVENKAMP, *supra* note 13, at 19–21 (defining deadweight loss as arising when consumers “are not willing to purchase the monopolized product at the monopoly price, even though they are willing to buy it at the competitive price.”).

48. See ANDREW I. GAVIL ET AL., *ANTITRUST LAW IN PERSPECTIVE: CASES, CONCEPTS AND PROBLEMS IN COMPETITION POLICY* 28–29 (2d ed. 2008) (“[Deadweight] loss is a reduction in aggregate surplus. It arises because some socially valuable purchases cannot be made.”) (internal quotation marks omitted).

49. For the transition from competition to welfare, see Herbert Hovenkamp, *United States Competition Policy in Crisis: 1890–1955*, 94 *MINN. L. REV.* 311, 360–62 (2009) (describing how the concentration approach fell out of favor); Richard Schmalensee, *Thoughts on the Chicago Legacy in U.S. Antitrust*, in *HOW THE CHICAGO SCHOOL OVERSHOT THE MARK: THE EFFECT OF CONSERVATIVE ECONOMIC ANALYSIS ON U.S. ANTITRUST* 11, 12–13 (Robert Pitofsky ed., 2008) (observing that welfare standards have carried the day); Ramsi A. Woodcock, *The Antitrust Duty to Charge Low Prices*, 39 *CARDOZO L. REV.* \_\_\_\_ (forthcoming 2018) (describing the abandonment of competition as an antitrust goal in the 1970’s). For a brief introduction to the welfare standard debate, see Jonathan B. Baker, *Economics and Politics: Perspectives on the Goals and Future of Antitrust*, 81 *FORDHAM L. REV.* 2175, 2176 n.4 (2012) [hereinafter Baker, *Economics and Politics*] (sources cited therein).

50. See Steven C. Salop, *Question: What Is the Real and Proper Antitrust Welfare Standard? Answer: The True Consumer Welfare Standard*, 22 *LOY. CONSUMER L. REV.* 336, 339–47 (2009) (surveying the institutions and doctrinal areas in which a consumer welfare standard has been embraced).

well, reducing both total, and consumer, welfare.<sup>51</sup> But this obscures the high symbolic stakes of the debate. If consumer welfare is the standard, then antitrust is in the business of policing the distribution of wealth between consumers and producers.<sup>52</sup> This pleases those who want to use regulation to distribute wealth, but outrages others, who see it as the road to serfdom.<sup>53</sup>

No party to the debate argues that antitrust should protect producer welfare. This might be because, at the level of the market, there is no threat to producer surplus in need of extinguishing. In most markets, consumers are numerous and disorganized, and producers few and organized, making consumers powerless to demand a greater share of the surplus from producers.<sup>54</sup> Instead, this balance of power favors redistribution from consumers to producers. The consumer welfare standard prevents this from happening. Producers prefer the total welfare standard because it merely burdens, but does not extinguish, their ability to take surplus from consumers, by requiring that producers destroy no surplus in increasing their share of it.

As is customary in legal argument, the parties to this debate have for the most part chosen not to do battle over the merits of the beliefs that animate their positions, but instead to debate the original intentions of the framers of the laws in question. Consumer welfare advocates argue that the framers of the antitrust laws favored their position and total welfare advocates argue that the framers favored theirs.<sup>55</sup> This proxy

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51. See, e.g., Schmalensee, *supra* note 49, at 13 (characterizing the difference between the standards as “rarely critical in practice”); Jonathan B. Baker, *Competition Policy as a Political Bargain*, 73 ANTITRUST L.J. 483, 516 (2006) (“The two welfare standards commonly lead to the same conclusion as to whether competition has been harmed by the conduct under review.”).

52. Cf. Baker, *supra* note 51, at 516 (“A consumer surplus standard is defended primarily on grounds of distributional fairness to consumers[.]”).

53. See LEE ANNE FENNEL & RICHARD H. MCADAMS, *THE DISTRIBUTIVE DEFICIT IN LAW AND ECONOMICS* 1056 (2015) (arguing that redistribution through regulatory regimes is sometimes required for political reasons); FRIEDRICH A. VON HAYEK & BRUCE CALDWELL, *THE ROAD TO SERFDOM: TEXT AND DOCUMENTS* (2008) (arguing that government attempts to redistribute wealth through regulation of the economy lead to tyranny).

54. A very rough measure of the imbalance in consumer and producer power in the average industry is the ratio of population to the total number of business entities. In 2010, there were 309 million people to 28 million businesses, about ten to one. See *Frequently Asked Questions About Small Business*, SMALL BUS. ADMIN. OFF. OF ADVOC. I (2012), [https://www.sba.gov/sites/default/files/FAQ\\_Sept\\_2012.pdf](https://www.sba.gov/sites/default/files/FAQ_Sept_2012.pdf); Paul Mackun & Steven Wilson, *Population Distribution and Change: 2000 to 2010: 2010 Census Briefs*, U.S. CENSUS BUREAU I (2011). If sellers are few and consumers numerous, then it is common to assume that the consumers are price takers and the sellers price makers. See, e.g., DAVID M. KREPS, *A COURSE IN MICROECONOMIC THEORY* 299, 315 (1990) (“In a monopoly market, we imagine many buyers and a single vendor of a good. . . . Buyers are assumed to be price takers. . . . Somehow. . . the monopoly’s advantage in numbers gives it a credibility about setting and sticking to a price or in sticking to its take-or-leave offer.”).

55. Compare John B. Kirkwood & Robert H. Lande, *The Fundamental Goal of Antitrust: Protecting Consumers, Not Increasing Efficiency*, 84 NOTRE DAME L. REV. 191, 201–11 (2008), with ROBERT H. BORK, *THE ANTITRUST PARADOX: A POLICY AT WAR WITH ITSELF* 56–66 (1993).

debate is of course absurd.<sup>56</sup> The intentions of the framers are of limited relevance because the framers, being dead, have no interest in the application of the law. Moreover, antitrust courts and enforcers have a long tradition of ignoring the framers, and even settled precedent.<sup>57</sup> The best guess at what the framers were thinking is that the antitrust laws should protect small business.<sup>58</sup> That seems to undermine the case for the total welfare standard if one accepts that big business is often more efficient than small business. But small businesses are not consumers, so it does not directly support the case for the consumer welfare standard either.

### C. ANTITRUST AS A DIVISION OF SURPLUS

Jonathan Baker argues that the debate over the proper antitrust standard must be understood against the backdrop of antitrust politics.<sup>59</sup> He argues that post-war antitrust is a political compromise between big business on one side and consumers and their allies on the other.<sup>60</sup> Big business wants to appropriate the entire surplus. Thus big business wants a *laissez faire* regime that allows it to maximize its pricing power through cartelization and merger to monopoly in all markets.<sup>61</sup> Consumers want to appropriate the entire surplus from big business by having price

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56. See Baker, *Economics and Politics*, *supra* note 49, at 2176 (characterizing the debate over intentions as a “proxy battle” over whether the Chicago School should prevail in antitrust).

57. See *id.* at 2176–77 (suggesting that intentions are irrelevant because the U.S. Supreme Court has “accepted the Sherman Act’s dynamic potential”) (internal quotation marks omitted); See GAVIL ET AL., *supra* note 48, at 452–55 (describing how U.S. merger enforcers no longer enforce merger standards that remain U.S. Supreme Court precedent and stating that “[a] researcher familiar with the hierarchy of authority in the U.S. legal system could be forgiven for being perplexed that the foundations of modern U.S. merger policy rest upon the assumption, without the benefit of the Court’s own direct guidance, that the Court no longer means what it once said”).

58. See HOVENKAMP, *supra* note 13, at 60–61 (“A theory with more explanatory power is that the Sherman Act was passed at the behest of small businesses who had been injured by the formation of larger, more efficient firms. . . . If one looks at the ideology of nineteenth century Americans, rather than . . . interest groups . . . , the anti-bigness rationale seems to be very important.”).

59. Baker, *Economics and Politics*, *supra* note 49, at 2180–82.

60. See *id.* at 2184 (“[A]ntitrust rules capture efficiencies, but their distributional consequences are important because competition policy needs to maintain political support.”); Baker, *supra* note 51, at 485–86 (characterizing antitrust as a bargain between “producers” defined to mean “large firms” and “consumers” understood to mean “small firms joining consumers, farmers, workers, and others whose lives were disrupted or threatened by the growth of large enterprise”).

61. It is a presupposition of antitrust law that *laissez faire* leads to monopoly. Without antitrust regulation, one competitor eventually vanquishes all. Baker sees big business as demanding not just *laissez faire* but government guarantees of monopoly power. See Baker, *supra* note 51, at 486 n.7 (“Absent antitrust laws, market power would result in any given industry with probability, not certainty. . . . The government could improve the odds of success through policies favorable to cartelization, such as government enforcement of private cartel agreements or the exclusion of new competition at the behest of incumbents.”).

regulators in every industry set prices as low as possible.<sup>62</sup> In Baker's view, antitrust is a compromise that makes both sides better off than they otherwise would be under their preferred regimes by unlocking gains associated with competition.<sup>63</sup>

Baker sees the compromise as allowing big business to redistribute, but not so radically that consumers rebel.<sup>64</sup> The precise terms fluctuate.<sup>65</sup> In midcentury, they favored consumers, but since the 1980s they have favored big business.<sup>66</sup> Baker suggests that when so much favor has been given to consumers as to threaten to alienate big business into scrapping the bargain, a total welfare standard is appropriate, as it allows big business to increase its share of the surplus.<sup>67</sup> When so much favor has been given to producers as to threaten rebellion, a consumer welfare standard is appropriate, as it stops the erosion of their share.<sup>68</sup> In Baker's view, the bargain has moved too far in favor of big business in recent years and a consumer welfare standard, qualified to permit some consumer-harmful practices with very positive total welfare effects, is appropriate in the near term.<sup>69</sup>

Viewing antitrust as a compromise regarding the economy-wide distribution of surplus between producers and consumers is useful.<sup>70</sup> I build on it by arguing that antitrust at any given moment implicitly

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62. *See id.* at 486 (arguing that consumers seek to “appropriate rents” from producers by advocating a “price controls regime” in which “the government would keep prices low through regulation or legislation” with the effect of “redistributing surplus from producers to consumers.”).

63. *See Baker, Economics and Politics, supra* note 49, at 2183 (“[T]he United States adopted competition policy as the primary approach to economic regulation, in order to reach a generalized economic goal of obtaining and sharing the efficiency benefits of competition.”); Baker, *supra* note 51, at 524–25 (defining the payoffs to big business and consumers to reflect efficiency gains from competition). Presumably, Baker endorses many of the standard antitrust arguments that competition increases total welfare, including the argument that it does so by avoiding deadweight loss. *See supra* note 48 and accompanying text (defining deadweight loss); W. KIP VISCUSI ET AL., *ECONOMICS OF REGULATION AND ANTITRUST* 80–92 (4th ed. 2005) (discussing the costs of monopoly). Baker also argues elsewhere that competition promotes innovation that benefits consumers. Jonathan B. Baker, *Exclusionary Conduct of Dominant Firms, R&D Competition, and Innovation*, 48 *REV. INDUS. ORG.* 269 (2016).

64. *See Baker, Economics and Politics, supra* note 49, at 2184 (“The bargain will persist so long as neither group thinks it can do better by giving up on it and mobilizing politically to seek a different policy.”).

65. *See id.* (“The resulting bounds have left a great deal of room within which the courts can maneuver, particularly in specifying the details of antitrust doctrine.”).

66. *See id.* at 2185.

67. *See id.* at 2184.

68. *See id.* at 2185–86.

69. *See id.* at 2186.

70. I differ with Baker in that I do not view the competition created by antitrust as the only possible total-welfare-maximizing economic structure. *See supra* note 63. The extremes identified by Baker of state-guaranteed monopoly power or price control might already be as efficient as an antitrust regime. If not, the fact that big data price discrimination makes it easier for a monopoly or government price regulator to price efficiently suggests that these other regimes might soon be as efficient. *See infra* Part V.B.

determines an economy-wide distribution of wealth between producers and consumers, which might be calculated by adding up consumer welfare and producer welfare over all markets in the economy. As I will describe, big data price discrimination will reduce the overall size of consumer welfare relative to overall producer welfare if the law does not change.<sup>71</sup> If antitrust may be understood as espousing a particular compromise distribution of wealth between producers and consumers, then antitrust must change in order to preserve the present distribution.<sup>72</sup>

## II. PRICE DISCRIMINATION

### A. BASICS

Price discrimination is charging different prices to different buyers for the same product based on the maximum amount each buyer is willing to pay for the product.<sup>73</sup> To function, the seller must have some knowledge of the maximum price that each buyer is willing to pay, allowing the seller to avoid losing sales by over-charging.<sup>74</sup> The seller must also be able to prevent low-price buyers from reselling to high price buyers.<sup>75</sup> Otherwise, low-price buyers will buy the entire market demand from the seller at low prices and then resell most of it to buyers who would otherwise be charged a high price by the seller.<sup>76</sup> This “no arbitrage” requirement is an instance of a more general precondition for price discrimination: the inability of any competitor, whether a low-price

71. See *infra* Part III.C.

72. See *infra* Part V.

73. Technically, price discrimination is the sale of identical products at different rates of return. Two sales of a unit each at different prices counts as “price discrimination” if the costs of the two units are the same, but not if, for example, the difference in cost between the two equals the difference in price, in which case the rate of return on both units is the same. See, e.g., HOVENKAMP, *supra* note 13, at 621 (distinguishing the mere charging of different prices as “differential pricing”). In this Article, I make the simplifying assumption that each consumer buys only a single unit of a given good, and cost is the same over all units. The definition of price discrimination in the text follows immediately. The assumptions make it easier to write about price discrimination, but my results apply with equal force to markets in which cost varies, buyers take multiple units, and price is tailored to the willingness of a buyer to pay for each unit.

Economists distinguish three types of price discrimination. First degree price discrimination tailors price to the buyer’s willingness to pay for each unit. Miller, *supra* note 4, at 55. Second degree price discrimination tailors price to the character or quantity of the product sold; a volume discount is an example. *Id.* Third degree price discrimination tailors price to group membership; a discount for seniors is an example. *Id.* By price discrimination, I mean in this Article only first degree price discrimination.

74. See KREPS, *supra* note 54, at 306 (listing knowledge by a monopoly of “the precise utility function of every consumer” as a necessary condition for the monopoly to make a “‘take-or-leave’ offer to each individual consumer”).

75. See *id.* (stating that the ability to “control absolutely any resale of the good being sold” is a necessary condition for a monopoly to be able to make a “‘take-or-leave’ offer to each individual consumer”).

76. See *id.*

buyer also acting as a seller, or anyone else, to undercut discriminatory prices. This means that the seller must have some level of power to exclude competitors from the market, and therefore some power to raise price, in order to engage in effective price discrimination.<sup>77</sup>

## B. BIG DATA

This Article assumes that pricing power pervades the economy of the United States.<sup>78</sup> To the extent that price discrimination has not so far flourished, this has not been due to an absence of power. Instead, this has been due to an absence of ability to determine maximum prices cheaply and to prevent arbitrage.<sup>79</sup> Big data will bring down the cost of achieving both. Absent regulations burdening data collection,<sup>80</sup> the internet permits producers to amass large amounts of data on consumers, which will permit firms cheaply to determine the maximum amount any buyer is willing to pay for a product.<sup>81</sup> A producer will be able to make a take-it-or-leave-it offer to a consumer at the consumer's maximum price because the producer will have a high degree of confidence that it knows what

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77. See HOVENKAMP, *supra* note 13, at 623 (“[P]ersistent price discrimination requires that a seller . . . have at least some market power. . . . In a competitive market disfavored purchasers will simply seek out a different seller willing to sell to them at the competitive price.”).

78. I mean this in two senses. First, market power is pervasive because product differentiation is pervasive, and a seller always has some power over price with respect to a differentiated product. See CHAMBERLIN, *supra* note 45, at 56–57 (observing that not only the quality of a product, but everything from packaging to the location and reputation of its seller may differentiate it from another and concluding that “it is evident that virtually all products are differentiated, at least slightly, and that over a wide range of economic activity differentiation is of considerable importance”); HOVENKAMP, *supra* note 13, at 37, 623 n.1 (“[I]f the product is differentiated customers may value alternative brands by differing amounts. Price discrimination will be possible even if the firms are not colluding.”). Second, I mean it in the sense that in the United States there is something less than full competition both in most undifferentiated product markets and in most markets for differentiated products that are substitutes. See *id.* at 38 (“Economies of scale, cartelization and monopoly, imperfect competition, market imperfections created by the patent system and many other phenomena taint all aspects of the general market system.”); *infra* note 141.

79. See KREPS, *supra* note 54, at 308 (“[I]t seems unlikely that a monopoly would have [enough] knowledge and power” to price discriminate).

80. Arguments that big data can lead only to limited price discrimination are based on the assumption that the law prevents some forms of data collection, or at least empowers consumers to decide when to release their data. See Alessandro Acquisti & Hal R. Varian, *Conditioning Prices on Purchase History*, 24 *MARKETING SCI.* 367, 367–68 (2005) (arguing that the harm of price tailoring to consumers is limited because consumers can use anonymization technologies and their right not to participate in loyalty programs, among other strategies, to withhold access to their information). In Part V.D, I consider briefly the use of data collection restrictions to remedy the effects of big data price discrimination. But in describing the problem of big data price regulation, I work on a blank slate, assuming that current limits on data collection will be ineffective at preventing big data price discrimination.

81. For surveys of the sorts of data that firms collect on consumers and how firms can use it to estimate how much consumers are willing to pay, see EZRACHI & STUCKE, *supra* note 32, at 101–13; EXECUTIVE OFF. OF THE PRESIDENT OF THE U.S., *supra* note 10, at 8–13; Miller, *supra* note 4, at 45–54.

that maximum is.<sup>82</sup> It is not as well appreciated as it should be that big data will also permit firms to eliminate the arbitrage problem because it will allow them to identify, and cut off, low-price buyers who resell the product.<sup>83</sup> The rise of big data will therefore make possible price discrimination across the economy that will increase as the amount of data increases and the cost of its analysis falls.<sup>84</sup>

A recent study that used web browsing histories to determine the probability with which individual consumers would subscribe to Netflix demonstrates the potential of big data.<sup>85</sup> Tracking firms record the web browsing histories of consumers by working with popular websites uniquely to identify visitors.<sup>86</sup> Benjamin Shiller bought some from 2006 for about 61,000 computer users who had visited about 4,800 websites.<sup>87</sup> Guessing that anyone viewing more than two pages per visit to the Netflix website probably has a subscription to its DVD rental service,<sup>88</sup> Shiller used statistical analysis to find the web browsing behaviors that best predicted whether a consumer would have a Netflix subscription.<sup>89</sup> For example, he found that those who used Wikipedia were more likely to have a subscription and those who browsed the internet during the day on Tuesdays and Thursdays were less likely to have one.<sup>90</sup> Shiller used these factors to determine the probability that each individual consumer in his dataset would subscribe to Netflix, finding that some consumers had a chance of subscribing as low as 0% whereas others had a chance as high as 99.8%.<sup>91</sup> Without benefit of those factors and the big data supporting them, he could say only that each person in the dataset had a

82. See EZRACHI & STUCKE, *supra* note 32, at 100 (“[W]ith advances in pricing algorithms and the collection of a greater variety and volume of personal data, online companies can more closely approximate our reservation price. They may find the road to perfect price discrimination and increased profits irresistible. They will compete in refining their pricing algorithms’ many independent variables, and in more precisely classifying individuals into smaller sub-groups. . . . [A]s the volume of data collected increases, and the data analytics and categorization of consumers improve, self-learning computer algorithms will continually inch closer to perfect price discrimination.”).

83. The internet makes selling easier, but it does not follow that it facilitates arbitrage. *Cf.* EXECUTIVE OFF. OF THE PRESIDENT OF THE U.S., *supra* note 10, at 14–15 (“The Internet has also strengthened the ability of arbitrageurs to undermine differential pricing by making it easier for buyers to become sellers.”).

84. See Shiller, *supra* note 1, at 2 (stating that first degree price discrimination “has been extremely rare in practice, because the requisite information on individuals’ reservation values was simply unavailable. Times may be changing.”); *cf.* RICHARD A. POSNER, *ANTITRUST LAW* 80 (2d ed. 2001) (“[P]erfect price discrimination . . . is never feasible.”) (italics in the original).

85. Shiller, *supra* note 1.

86. See Chris Jay Hoofnagle et al., *Behavioral Advertising: The Offer You Cannot Refuse*, 6 HARV. L. & POL’Y REV. 273, 276–77, 281–85 (2012) (discussing third party cookies and other tracking methods).

87. Shiller, *supra* note 1, at 5–7 (data purchased from comScore).

88. *Id.* at 6.

89. *Id.* at 10–11.

90. *Id.* at 5.

91. *Id.* at 4.

sixteen percent chance of subscribing.<sup>92</sup> Shiller estimated that his data would have permitted Netflix to increase its profits by twelve percent and drive down consumer surplus by eight percent if Netflix were to have used the data to lower price to those with a low probability of subscribing and raise price to those with a high probability of subscribing.<sup>93</sup>

The extraordinary thing about this result is how little data Shiller actually used. While his data is big in the sense that it includes large browsing histories for many consumers, it is little in the sense that Shiller did not have access to as much data as Netflix itself has on its customers. Shiller had to guess which people in his dataset have Netflix subscriptions, whereas Netflix knows who its subscribers are. Netflix also knows its customers' viewing preferences, payment methods, and purchase histories, all of which might improve the quality of Netflix's predictions and the amount of consumer surplus it can arrogate to itself. Unlike Shiller, Netflix could also use test prices to determine the precise shape of the demand curve for each consumer.<sup>94</sup> The evidence that firms have already started implementing tailored pricing is limited.<sup>95</sup> But given the power of that practice even at this early stage, they will implement it eventually.

### C. EFFECTS

To appreciate the effects of the pervasive price discrimination that big data will bring about, it is necessary to consider first the current distribution of wealth between consumers and producers. At present, producers cannot tailor price to individual consumers; the price that each charges is therefore the same for all buyers.<sup>96</sup> This creates a tradeoff

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92. *Id.*

93. *Id.*

94. See EXECUTIVE OFF. OF THE PRESIDENT OF THE U.S., *supra* note 10, at 10–11 (discussing how firms may vary prices over time or randomly assign different prices to consumers in order to “explore the demand curve”). I am grateful to Glenn W. Harrison for pointing out to me that the ability to interact dynamically with consumers using information technology allows firms to generate data on consumer willingness to pay that they might not be able to glean from other sources. By forcing consumers to buy through auction processes, for example, a firm can determine the willingness to pay of a consumer without needing to know anything about the consumer before the auction process begins. See Hal R. Varian, *Online Ad Auctions*, 99 AM. ECON. REV. 430, 430 (2009) (describing how search engines can use ad auctions to maximize the value they can extract from advertisers). The use of test prices is a crude form of this data extraction approach.

95. EXECUTIVE OFF. OF THE PRESIDENT OF THE U.S., *supra* note 10, at 13 (“The relative scarcity of personalized pricing examples suggests that companies are moving slowly or remaining quiet, perhaps due to fears that consumers will respond negatively, but also because the methods are still being developed.”). At least one company, Uber, has however announced that it will implement tailored pricing. See Newcomer, *supra* note 7.

96. Producers often do tailor prices to different groups, but within any group producers charge the same price to all of the group members. See HOVENKAMP, *supra* note 13, at 625 (describing second and third degree price discrimination, which are different approaches to charging different prices to different groups of consumers based on willingness to pay, as “common”). The promise of big data is

between gain and loss from price increases that ensures that even monopoly producers cannot extract the entire surplus from consumers. As the uniform price rises, more consumers are priced out of the market, reducing the number of consumers from whom a producer can profit. Eventually, the losses from consumer defections exceed the gains from the higher price paid by the remaining consumers.<sup>97</sup> In order to avoid pricing too many consumers with a low willingness to pay out of the market, a monopoly producer will not be able to raise price to the maximum level that the other consumers in the market would be willing to pay, leaving those others some surplus from their purchases and therefore consumers as a group a certain base amount of consumer welfare that prevails even in a monopolized market.

A price-discriminating producer faces no such tradeoff. By tailoring price to the maximum that each individual consumer is willing to pay, a monopoly producer can extract the maximum surplus from each consumer without pricing any out of the market.<sup>98</sup> The result is that the limited redistribution from consumers achieved by a uniformly-pricing monopolist is replaced by the complete redistribution achieved by the price-discriminating monopolist.<sup>99</sup> Price discrimination therefore has two effects in markets in which producers already have pricing power and therefore already charge a uniform monopoly price.<sup>100</sup> First, price discrimination permits a producer to raise price to buyers who would otherwise purchase at the uniform monopoly price.<sup>101</sup> This redistributes surplus to the producer. Second, price discrimination permits a producer to reduce price to buyers who would be priced out of the market at the uniform monopoly price.<sup>102</sup> These buyers can now purchase the product, eliminating deadweight loss and increasing total welfare.<sup>103</sup> But price

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that it will allow firms eventually to reduce the size of each group to one, permitting producers to charge a different price to each consumer.

97. See GAVIL ET AL., *supra* note 48, at 26 (observing that whether a cartel will find it profitable to raise price “depends . . . on how many sales [the cartel] would lose . . . [and] the profit margin . . . on those lost sales”).

98. See HOVENKAMP, *supra* note 13, at 624–25 (“In price discrimination of the first degree, or ‘perfect’ price discrimination, every buy[er] must pay the highest it is willing to pay for each individual unit of output.”).

99. See *id.* at 625 (“Everything that would be consumers’ surplus in a competitive market may become monopoly profits under perfect price discrimination.”).

100. See *id.* (identifying these effects). If the pricing power in the market is due to oligopoly, then the effects described occur only if the competing products sold by the oligopolists are sufficiently differentiated. See Lars Stole, *Price Discrimination and Imperfect Competition*, 3 HANDBOOK INDUS. ORG. 34 (2003) (manuscript at 7).

101. See GAVIL ET AL., *supra* note 48, at 876 (stating that price discrimination can harm buyers by “permit[ting] the seller to raise price to a group of buyers”).

102. See *id.* (stating that price discrimination can “make[] a product available to a group of buyers who otherwise would be unserved”).

103. See POSNER, *supra* note 84, at 80 n.37 (stating that price discrimination “eliminate[s] the deadweight cost of monopoly, though not the rent-seeking costs”).

discrimination permits the producer to tailor price to the maximum each of these new buyers is willing to pay, denying these new buyers any surplus from their purchases and giving the entire surplus to the firm.<sup>104</sup>

Taking both effects together, price discrimination increases total welfare and redistributes all of that welfare, including the part that consumers receive under uniform-pricing monopoly, and the additional amount created by price discrimination, to producers, leaving consumers with nothing. Price discrimination makes consumers worse off and eliminates deadweight loss for the exclusive benefit of producers.<sup>105</sup> I call the rise of big data price discrimination the “scouring” of the economy, because price discrimination allows firms to scour out the residual share of surplus enjoyed by consumers in uniform-price monopoly markets.<sup>106</sup>

The effect in dollar terms of an embrace of price discrimination throughout the economy will likely be large. By a rough estimate, price discrimination would have reduced consumer welfare in the United States by \$672 billion, and redistributed half of that amount from the poor to the rich, if it had been fully implemented in 2015 without any accompanying policy action to halt its redistributive effects. The estimate may be arrived at by relying on the work of economists from the middle of the last century, who measured the total size of deadweight loss in the economy in order to determine how much good antitrust might do under a total welfare standard. An early study suggested that deadweight loss is actually small and antitrust therefore of little importance, at least from a total welfare perspective.<sup>107</sup> But a later study suggested that deadweight loss is much larger: at least 4% of total welfare.<sup>108</sup> This implies that the total welfare gains from price discrimination, which eliminates deadweight loss, are four percent of total welfare and, because of some basic assumptions underlying the study, that the consumer welfare loss from price discrimination relative to monopoly uniform pricing must also be four percent of total welfare.<sup>109</sup> If the four percent share holds today,

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104. I explain these two effects by reference to the graph in Figure 1 in the caption accompanying that figure.

105. See HOVENKAMP, *supra* note 13, at 625 (“[F]irst degree price discrimination is often said to be as efficient as perfect competition, even though one result . . . is that customers are far poorer and the seller far richer.”).

106. See KREPS, *supra* note 54, at 306 (stating that price discrimination “extracts from the consumer all the surplus that this consumer would otherwise obtain from consumption of the good in question”); James Boyle, *Cruel, Mean, or Lavish? Economic Analysis, Price Discrimination and Digital Intellectual Property*, 53 VAND. L. REV. 2025–26 (2008); Kochelek, *supra* note 32, at 522.

107. See Arnold C. Harberger, *Monopoly and Resource Allocation*, 44 AM. ECON. REV. 77, 82 (1954) (concluding that the total deadweight loss caused by monopoly from 1924 to 1928 amounted to one tenth of one percent of the economy).

108. See Keith Cowling & Dennis C. Mueller, *The Social Costs of Monopoly Power*, 88 ECON. J. 727, 736–37, 740 (1978) (finding total welfare losses as high as thirteen percent of the economy).

109. Cowling and Mueller assume that demand is linear and firms maximize profit. *Id.* at 729 (concluding that deadweight loss is half of profit, which follows if demand is linear and firms maximize

and 2015 GDP of \$16.8 trillion captures total welfare, then consumer welfare loss, as well as total welfare gain from big data price discrimination, would each be \$672 billion in 2015 alone. Assuming that approximately half of the surplus redistributed from consumers to producers is not recouped by consumers in their roles as producers,<sup>110</sup> and that consumers tend to be poorer than producers,<sup>111</sup> then if big data price discrimination were pervasive in 2015 there would have been a net redistribution of wealth from consumers to producers, and from poor to rich, of at least \$336 billion. If the four percent share estimate, which is based on 1960s profit data and conservative assumptions, were updated to account for today's probably more concentrated economy, the estimate would likely be larger, leading to a larger figure for consumer loss.<sup>112</sup>

#### D. THE END OF THE TOTAL WELFARE STANDARD

Because price discrimination eliminates deadweight loss at the same time that it redistributes wealth away from consumers, price discrimination always both increases total welfare and reduces consumer welfare.<sup>113</sup> This makes price discrimination a wedge issue in the debate over the consumer and total welfare standards. Supporters of the

profit); VISCUSI ET AL., *supra* note 63, at 90–91 (discussing the assumptions underlying the Cowling and Mueller study). It follows that under uniform pricing consumer welfare equals deadweight loss. (Because marginal revenue falls twice as fast as demand, the quantity demanded at the monopoly price equals the quantity not demanded as a result of monopoly pricing. Because demand falls at a constant rate, the value to consumers of the quantity demanded must equal the value to them of the quantity not demanded.) Cowling and Mueller's deadweight loss estimate is therefore also an estimate of the consumer welfare that prevails at a uniform monopoly price. Price discrimination eliminates that welfare, making it also an estimate of the loss to consumers associated with moving from uniform-pricing to price-discriminating monopoly.

110. Cf. Kenneth J. Arrow & Joseph P. Kalt, *Why Oil Prices Should Be Decontrolled*, 3 REG. 13, 17 (1979) (assuming that about half of the surplus redistributed from consumers to producers as a result of a rise in oil prices is not recouped by consumers in their role as producers).

111. Wealth is unequally distributed. See Thomas Piketty & Emmanuel Saez, *Income Inequality in the United States, 1913–1998*, 118 Q. J. ECON. 1, 10 (2003) (updated data associated with this Article show that the richest ten percent controlled 47.8% of wealth in 2015 (<http://eml.berkeley.edu/~saez/TabFig2015prel.xls>)). If I can assume that the poor do not own businesses, but do buy from them, then it follows roughly that any redistribution from consumers to producers that is not recouped by consumers in their capacity as producers counts as redistribution from poor to rich. See PHILLIP AREEDA ET AL., ANTITRUST ANALYSIS: PROBLEMS, TEXT, CASES 20 (2004) (“[O]wners of firms tend on average to be wealthier than consumers[.]”).

112. In the model employed by the study, higher profits translate into greater deadweight losses. See Cowling & Mueller, *supra* note 108, at 735–36, 738–39 (“To the extent one believes monopoly power is more . . . or less pervasive in other sectors our estimates must be raised or lowered.”); *infra* note 141.

113. See Baker, *supra* note 51, at 518 n. 128 (“[A] shift from uniform pricing at a price in excess of marginal cost to perfect price discrimination would increase aggregate surplus while reducing consumers' surplus.”).

consumer welfare standard must condemn it and supporters of the total welfare standard must welcome it.<sup>114</sup>

Because big data will make price discrimination pervasive, it will force antitrust finally to choose between the standards. The consequences of the choice are stark. If antitrust embraces the total welfare standard, then the antitrust laws will effectively be repealed. In an economy in which all monopolists price discriminate effectively, monopoly will no longer cause harm to total welfare. There will no longer be any reason to condemn it.<sup>115</sup> If antitrust maintains the current consumer welfare standard, however, then big data price discrimination will make antitrust potentially more relevant than ever because big data price discrimination will magnify the harm that pricing power can inflict on consumers.

It has been argued that the main harm to total welfare caused by monopoly is not the deadweight loss associated with uniform pricing, but rather the resources that a firm wastes in creating and defending its pricing power.<sup>116</sup> This waste can run as high as the entire monopoly profit because a firm trying to acquire a monopoly will be willing to spend up to that amount in order to enjoy that amount as reward.<sup>117</sup> If the harm of monopoly includes this kind of waste, then big data price discrimination increases harm to total welfare.<sup>118</sup> Indeed, if monopoly creates waste, big data price discrimination poses a threat from both the total and consumer welfare perspectives and there will be no need to choose between them to preserve antitrust's relevance after the rise of big data price discrimination.<sup>119</sup> There is no reason to believe, however, that most

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114. *See id.* at 518 (stating that “practices that facilitate price discrimination” could “be considered unreasonable if reviewed under a consumer welfare standard but reasonable under an aggregate welfare standard”).

115. Unless the price discrimination is costly to administer or executed poorly. *See Kochelek, supra* note 32, at 529 (“[A]lthough perfect price discrimination and perfect competition result in the same number of goods consumed, price discrimination leads to wasted resources on arbitrage transfers, arbitrage prevention, and discriminatory price determination and implementation. Furthermore, because perfect price discrimination exists only theoretically, imperfect price discrimination creates deadweight losses that may exceed deadweight losses in imperfectly competitive markets.”). Such problems will disappear as firms refine their price discrimination skills.

116. *See* Richard A. Posner, *The Social Costs of Monopoly and Regulation*, 83 J. POL. ECON. 807, 809 (1975) (“Obtaining a monopoly is itself a competitive activity, so that, at the margin, the cost of obtaining a monopoly is exactly equal to the expected profit of being a monopolist.”).

117. *See id.*

118. *See id.* at 822 (“Even when price discrimination is perfect, so that the deadweight loss of monopoly is zero, the total social costs of a discriminating monopoly are greater than those of a single-price monopoly.”).

119. *See* Kochelek, *supra* note 32, at 523 (arguing that price discrimination reduces total welfare because its practitioner must waste resources on maintaining its pricing power, consumers waste resources on arbitrage, and, to the extent that price discrimination is imperfect, sales are lost through mispricing).

monopolies create waste. It is reasonable to suppose, however, that many monopolies create no waste.<sup>120</sup>

### III. THE INADEQUACY OF CURRENT LAW

Antitrust law as presently interpreted cannot prevent big data price discrimination from redistributing wealth from consumers to producers. Antitrust law cannot do so directly, by prohibiting price discrimination, because its existing rules limiting price discrimination apply only in narrow circumstances.<sup>121</sup> Antitrust law cannot do so indirectly, by regulating the amount of pricing power in the economy, because current law regulates only the formation of pricing power, and not its exercise.<sup>122</sup> But it is by changing the manner in which firms with pricing power exercise that power, allowing them to use that power to tailor prices, rather than to fix a uniform price, that big data price discrimination will allow firms to extract more surplus from consumers.<sup>123</sup> Regulation of pricing power that does not reduce existing power cannot respond to big data price discrimination. If antitrust's regulation of the formation of power were strong, then in the long run this might not be a problem, because overall levels of power in the economy would decline as existing power erodes and is not replaced. But antitrust regulation of the formation of power is spotty at present, and the stock of existing power is increasing, magnifying the threat of price discrimination to consumers.<sup>124</sup>

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120. See Franklin M. Fisher, Comment, *The Social Costs of Monopoly and Regulation: Posner Reconsidered*, 93 J. POL. ECON. 410, 414 (1985) (“[T]he incumbent can, in fact, be earning monopoly rents above the costs expended to secure them (the fact that he would have been willing to spend more if necessary has no bearing). Successful monopolists enjoy inframarginal rents, and there is no general mechanism that competes those rents away.”). Moreover, the costs of creating and defending monopoly may be avoided by the legislative settling of monopoly rights on firms, which renders unnecessary any wasteful attempts by firms to create or defend their monopolies on their own. If Congress were to grant such monopoly rights, then price discrimination would create no harm under a total welfare standard and the need to retain the consumer welfare standard in order for antitrust to remain relevant after the rise of big data price discrimination would reappear. Edmund Kitch argues that the patent system functions in this way. By allowing an inventor to obtain exclusive control of an invention before its commercial prospects and potential monopoly profits are clear, the patent system forestalls wasteful competition to turn inventions into innovations and obtain monopoly profits thereby. See Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J. L. & ECON. 265, 266 (1977).

121. See *infra* Part IV.A.

122. See *infra* Part IV.B.

123. See *supra* Part III.C.

124. Cf. Baker, *Economics and Politics*, *supra* note 49, at 2185–86 (calling for an adjustment of antitrust law in favor of consumers because pro-producer rules of recent years threaten to breach a political bargain with consumers and make consumers see themselves as better off abandoning antitrust and competition in favor of price regulation).

### A. THE ROBINSON-PATMAN ACT

Antitrust prohibits some forms of price discrimination under the Robinson-Patman Act.<sup>125</sup> However, because the act was intended to protect only small retailers from losing out on wholesale discounts granted by manufacturers to larger chains, the act protects only those who receive unfavorable prices in relation to their competitors.<sup>126</sup> Consumers, who are not usually in competition with each other in the sale of anything, are not generally protected.<sup>127</sup> Furthermore, the act applies only to the sale of commodities, which is a major limitation in a service economy.<sup>128</sup> That the act is rarely enforced is in part a measure of its narrow scope.<sup>129</sup>

### B. THE REST OF ANTITRUST LAW

Antitrust's current rules aimed at regulating the power of firms over price will also be of no help in responding to big data price discrimination. To appreciate their weakness, an overview of the relationship between wealth distribution, pricing power, and antitrust is required. The prevailing overall distribution of wealth between consumers and producers depends on the stock of existing pricing power in the economy. If the stock is high, then the distribution favors producers, if low, then it favors consumers. The size of the stock itself is determined by the rates of power formation and erosion. Large firms are constantly being created, and are constantly dying out.<sup>130</sup> Whether markets are becoming more or less subject to pricing power depends on whether more large firms are being born than are dying.

Under *laissez faire*, meaning in the absence of regulation, the rate of formation tends to exceed the rate of erosion, so that in the long run the

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125. 15 U.S.C. § 13(a) (2012).

126. See HOVENKAMP, *supra* note 13, at 629.

127. 15 U.S.C. § 13(a) (banning price discrimination “where the effect of such discrimination may be substantially to lessen competition or tend to create a monopoly in any line of commerce, or to injure, destroy, or prevent competition . . .”); FREDERICK M. ROWE, PRICE DISCRIMINATION UNDER THE ROBINSON-PATMAN ACT 173 (1962) (observing that “some competitive nexus” between customers is required for a Robinson-Patman Act violation).

128. 15 U.S.C. § 13(a) (2012) (making it illegal “to discriminate in price between different purchasers of commodities”); Klock, *supra* note 32, at 358 (noting the importance of this limitation in a service economy).

129. HOVENKAMP, *supra* note 13, at 629 (observing that the Department of Justice has not enforced the Robinson-Patman Act since 1977 and the FTC “largely ignores it as well”).

130. See POSNER, *supra* note 84, at 114 (“Over time, . . . we would expect concentration . . . to erode as the monopoly price charged by the leading firms induced the entry of new competitors[.]”); JOSEPH A. SCHUMPETER, CAPITALISM, SOCIALISM, AND DEMOCRACY 87 (Harper Colophon 1975) (3d ed. 1950) (“[B]oth as a fact and as a threat, the impact of new things—new technologies for instance—on the existing structure of an industry considerably reduces the long-run scope and importance of practices that aim, through restricting output, at conserving established positions and at maximizing the profits accruing from them.”).

stock of power reaches its upper limit, and consumer welfare is driven to zero.<sup>131</sup> Antitrust's job under a consumer welfare standard is to prevent that reduction in consumer welfare.<sup>132</sup> The reduction may be mitigated by direct price regulation, which forces large firms to charge low prices.<sup>133</sup> But another approach is to try to reduce the stock of power itself. One way to do that is to try to increase the rate at which power erodes, by, for example, breaking up large firms, a practice known as deconcentration.<sup>134</sup> Another approach is to reduce the rate of power formation, ensuring that as natural erosion takes a toll on existing power, that power will not be replaced.<sup>135</sup>

Antitrust, as presently constituted, is primarily focused on reducing the stock of power by reducing the rate of power formation. Antitrust makes almost no attempt to reduce the rate of erosion. Antitrust recognizes so many exceptions to its rules against power formation, however, that antitrust has failed to bring the rate of formation below the rate of erosion and appears in fact to be allowing power to increase at present. Baker calls for a conditional consumer welfare standard to counteract this creeping-up of power.<sup>136</sup> Power forms in three ways: firms combine, one firm excludes others from the market, or one firm simply gets lucky,<sup>137</sup> as competitors melt away due to incompetence or force majeure.<sup>138</sup> In order for antitrust to stop power formation, it must block those three routes. Antitrust does a bad job of this because it makes no

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131. Cf. Robert Liefmann, *Monopoly or Competition as the Basis of a Government Trust Policy*, 29 Q. J. ECON. 308, 315 (1915) (“[C]ompetition, pushed to the extreme, becomes monopoly. The climax of competition is monopoly, and all competition is nothing but a striving for monopoly.”); POSNER, *supra* note 84, at 114 (“If concentration persists, where are we to seek an explanation?”).

132. See *supra* Part III.D.

133. I argue below that this approach can be used to respond to big data price discrimination. See *infra* Part V.B.

134. See *infra* Part V.A.1.

135. See *infra* Part V.A.2.

136. See Baker, *Economics and Politics*, *supra* note 49, at 2185–86.

137. See Oliver E. Williamson, *Dominant Firms and the Monopoly Problem: Market Failure Considerations*, 85 HARV. L. REV. 1512, 1518 (1972) (“Although all of the firms in an industry may have been performing in a fully creditable, but unexceptional, manner, the dominant firm may be thrust ahead of its competitors by an unusual sequence of fortuitous events.”).

138. See Thomas G. Krattenmaker et al., *Monopoly Power and Market Power in Antitrust Law*, 76 GEO. L. J. 241, 249 (1987) (characterizing collusion as “Stiglerian power” and exclusion as “Bainian power”); Williamson, *supra* note 137, at 1518–22 (discussing monopolies that arise by “historic accident”).

attempt to stop power formation through luck<sup>139</sup> and recognizes a host of exemptions to its rules against combination and exclusion.<sup>140</sup>

The exemptions are these. Oligopoly, in which firms operating in markets with small numbers of competitors are able to coordinate price or output levels without entering into explicit agreement,<sup>141</sup> is likely the greatest source of pricing power in the economy,<sup>142</sup> but antitrust condemns only combinations of competitors created through explicit,

139. See *United States v. Aluminum Co. of Am.*, 148 F.2d 416, 429–30 (2d Cir. 1945) (“[P]ersons may unwittingly find themselves in possession of a monopoly, automatically so to say: that is, without having intended either to put an end to existing competition, or to prevent competition from arising when none had existed; they may become monopolists by force of accident. . . . [I]t would be not only unfair, but presumably contrary to the intent of Congress, to include such instances [as violations of the Sherman Act].”).

140. The doctrinal hook for antitrust’s regulation of combinations is Section 1 of the Sherman Act, which prohibits “[e]very contract, combination . . . in restraint of trade.” 15 U.S.C. § 1 (2012). The Clayton Act provides a ground for the regulation of mergers, prohibiting them where they “may . . . substantially . . . lessen competition.” 15 U.S.C. § 18 (2012); see GAVIL ET AL., *supra* note 48, at 432. The doctrinal hook for antitrust’s regulation of exclusionary conduct is Section 2 of the Sherman Act, which states that “[e]very person who shall monopolize . . . trade or commerce” violates the law. 15 U.S.C. § 2 (2012).

141. See HOVENKAMP, *supra* note 13, at 172–78; VISCUSI ET AL., *supra* note 63, at 106; Schmalensee, *supra* note 49, at 15 (“[C]oncentration . . . facilitates collusion, of course, as I think most economists still believe[.]”). Some reject entirely the notion that when the number of firms in a market is small, they tend to compete less with each other. See William J. Baumol, *Horizontal Collusion and Innovation*, 102 *ECON. J.* 129, 131 (1992) (“Since the advent of contestability theory it has become clear that even a severe reduction in the number of firms in an industry or a marked increase in the share of its assets in outputs accounted for by a few of its enterprises need not increase their monopoly power. Two bitter and combative rivals can hold down prices more effectively than a dozen companies, all inclined to live and let live.”).

142. Concentration in the United States is high and rising. See *Too Much of a Good Thing*, THE ECONOMIST (Mar. 26, 2016), <http://www.economist.com/news/briefing/21695385-profits-are-too-high-america-needs-giant-dose-competition-too-much-good-thing> (concluding, based on an analysis of U.S. economic census data, that “[t]he weighted average [market] share of the top four firms in each sector [of the economy] has risen from 26% to 32%” between 1997 and 2012); Council of Econ. Advisors, *Benefits of Competition and Indicators of Market Power*, THE WHITE HOUSE 4–6 (Apr. 2016), [https://obamawhitehouse.archives.gov/sites/default/files/page/files/20160414\\_cea\\_competition\\_issue\\_brief.pdf](https://obamawhitehouse.archives.gov/sites/default/files/page/files/20160414_cea_competition_issue_brief.pdf) (observing that recent sector concentration studies, U.S. Census Bureau revenue concentration data, and a decline in new business creation are all consistent with an increase in concentration in U.S. markets). It cannot be said of any other source of market power, whether explicit price fixing or outright monopolization in the extreme sense of a single firm controlling all of a market, that nearly every industry in the U.S. is affected. There are, for example, no manufacturing industries for which the census recognizes a monopoly. See *Concentration Ratios: 2002*, U.S. CENSUS BUREAU (2006), <https://www.census.gov/prod/eco2/eco231sr1.pdf> However great the problem of undetected and unprosecuted cartels, it is hard to imagine that cartels exist in as many industries as those in which the number of firms is few. Indeed, because a cartel becomes harder to administer as the number of conspirators grows, it is reasonable to assume that cartels are only possible in industries with a small number of competitors, in which case cartel industries must always be a subset of oligopoly industries. See POSNER, *supra* note 84, at 60, 102 (“[C]artels [here broadly defined to include any scheme of collusive pricing] are assumed to vary in formality from the full-blown cartel that the Sherman Act probably has largely eliminated in the industries subject to it to the ‘cartel’ that requires no detectable machinery of collusion[.]”); Baumol, *supra* note 141, at 131 (linking concentration and the danger of cartelization).

even if informal, agreement, making this form of combination legal.<sup>143</sup> Antitrust enforcers also do not investigate mergers as a general matter, but examine only mergers of large firms, even though small firms can still monopolize small markets.<sup>144</sup> Moreover, even among mergers of large firms, enforcers tend to challenge only those mergers that reduce the number of firms in a market to three or fewer, which has led to much new pricing power.<sup>145</sup> Antitrust regulates exclusionary conduct, but the types of conduct that it considers exclusionary are few.<sup>146</sup> Antitrust exempts any exclusion that is based on the exercise of a property right.<sup>147</sup> Thus a firm may exclude competitors by refusing them access to essential inputs that the firm owns, such as downtown real estate or intellectual property.<sup>148</sup> Antitrust also exempts exclusion based on innovation or

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143. See POSNER, *supra* note 84, at 53 (“Once the conspiracy approach to explicit collusion became firmly ensconced in the minds of bench and bar, it was perhaps inevitable that tacit collusion would be considered beyond the reach of the antitrust laws because, by definition, it did not involve explicit, detectable acts of agreement or communication.”); HOVENKAMP, *supra* note 13, at 179 (“One reason antitrust law has had so little success with oligopoly is its continued adherence to a common law concept of ‘agreement’ that makes little sense in the context of strategic behavior among competing firms.”); William E. Kovacic et al., *Plus Factors and Agreement in Antitrust Law*, 110 MICH. L. REV. 393, 401 (2011) (“[C]ourts would not find an agreement where the plaintiff showed only that the defendants recognized their interdependence and simply mimicked their rivals’ pricing moves.”).

144. See HOVENKAMP, *supra* note 13, at 545 (“Most mergers are legal[.]”). Only larger mergers must be reported to enforcers before they are consummated. 15 U.S.C. § 18a (2012); see HOVENKAMP, *supra* note 13, at 648.

145. See GAVIL ET AL., *supra* note 48, at 454; John E. Kwoka, Jr., *Does Merger Control Work? A Retrospective on US Enforcement Actions and Merger Outcomes*, 78 ANTITRUST L.J. 619, 631–32 (2013) (reporting that seventy-five percent of fifty-three retrospective studies of mergers, all but two from the 1980s through the 2000s, showed post-merger price increases, with an average increase of nine percent). Before enforcement practices changed in the 1980s, enforcers challenged much smaller mergers. See GAVIL ET AL., *supra* note 48, at 453–54 (describing the change in enforcement); *United States v. Von’s Grocery Co.*, 384 U.S. 270, 280–81 (1966) (involving a challenge to a merger to an eight percent share of a market).

146. Those types of conduct that antitrust considers exclusionary are the extraction of agreements from counterparties not to do business with competitors, the charging of a price below cost that the monopoly can recoup in future once competitors have been driven from the market, the tying of purchase of a product that consumers would prefer to obtain from competitors to purchase of another product that consumers can obtain nowhere else, and the cutting off of a prior profitable course of dealing with a competitor that tends to exclude the competition from the market. See HOVENKAMP, *supra* note 13, at 317–21, 370–72, 435, 478–79 (discussing exclusive dealing, predatory pricing, tying, and refusals to deal). The first and third practices are often treated as collusive as well as exclusionary, because they can involve agreements. See *id.* at 435, 478. Each of these general categories encompasses a number of related practices.

147. For an elaboration of the thesis that antitrust is biased in favor of property-based exclusion, see Ramsi A. Woodcock, *Inconsistency in Antitrust*, 68 U. MIAMI L. REV. 105, 119–23 (2013).

148. See *United States v. Colgate & Co.*, 250 U.S. 300, 468 (1919) (a seller has a right to refuse to sell to anyone absent an intent to acquire a monopoly thereby); HOVENKAMP, *supra* note 13, at 362 n.54 (citing an “unbroken line of decisions” to the effect that “the owner of a patent has no antitrust duty to license its patent to others”). For an attempt to recast all of antitrust policy in terms of the regulation of control over essential inputs, see Woodcock, *supra* note 147, at 136–41.

product improvement.<sup>149</sup> While charging a higher price is sometimes necessary for an innovative firm to cover costs, including the cost of rewarding creativity, antitrust exempts firms that exclude through innovation even where the exclusion leads to prices in excess of what is necessary to induce the firm to innovate. Thus Apple may charge \$800 for an iPhone even if it would have still invented the iPhone in expectation of charging only \$600.<sup>150</sup>

If antitrust were to increase the rate of power erosion, then its failure to impose strict limits on formation would be of no concern. But antitrust does almost nothing to destroy power once it has been acquired. A firm or group of firms that achieves market power by qualifying for one of the formation exemptions, or slipping through cracks in enforcement, is free to exercise its power over price to whatever extent it wishes. The only exception is a cartel, which is subject to prosecution both when it forms and afterward.<sup>151</sup> Although mergers are still subject to enforcement after they are consummated, in practice enforcers devote only about a fifth of their merger investigations to consummated mergers, despite evidence that most mergers lead to higher prices.<sup>152</sup> Antitrust's "conduct requirement" exempts all sitting monopolies from enforcement so long as they do not engage in one of the few kinds of

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149. See HOVENKAMP, *supra* note 13, at 292, 296 ("The framers of the Sherman Act did not intend to condemn someone who merely by superior skill and intelligence got the whole business because nobody could do it as well as he could.") (internal quotation marks and citation omitted); *United States v. Aluminum Co. of Am.*, 148 F.2d 416, 430 (2d Cir. 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.*").

150. For an extended discussion of this point, as well as a graphical model, see Woodcock, *supra* note 147, at 126–36.

151. See *United States v. Socony-Vacuum Oil Co.*, 310 U.S. 150, 213, 224 n.59 (1940) ("The reasonable price fixed today may through economic and business changes become the unreasonable price of tomorrow. . . . [All price fixing agreements are illegal] whether the concerted activity be wholly nascent or abortive on the one hand, or successful on the other. . . . [Price fixing agreements] are all banned because of their actual or potential threat to the central nervous system of the economy.").

152. See *United States v. E.I. du Pont de Nemours & Co.*, 353 U.S. 586, 622–23 (1957) (stating that the absence of a statute of limitations in the Clayton Act and the inapplicability of laches to the Government allow the bringing of a merger challenge at any time) (Burton, J., dissenting); U.S. DEPARTMENT OF JUSTICE ANTITRUST DIVISION, *Antitrust Division Workload Statistics FY 2006–2015* 1–2 (subtracting total merger investigations from HSR investigations in this data reveals an average ratio of non HSR merger investigations to merger investigations of nineteen percent); J. Thomas Rosch, *Consummated Merger Challenges—The Past Is Never Dead*, presented at ABA Section of Antitrust Law Spring Meeting 2 (2012) (stating that consummated merger challenges are about twenty percent of total merger challenges for the FTC); Kwoka, Jr., *supra* note 145, at 631–32 (in seventy-five percent of merger retrospectives examined, prices rose after the merger).

exclusionary behavior actually condemned by antitrust law.<sup>153</sup> As described above, oligopolies are not subject to prosecution, either when they form or thereafter.<sup>154</sup>

The recent elimination of the ban on resale price maintenance is an example of how antitrust has shrunk from regulation of the exercise of monopoly power in recent years.<sup>155</sup> A ban on resale price maintenance prevents a monopoly manufacturer from using its power to drive up prices charged to consumers.<sup>156</sup> A manufacturer with pricing power has little control over the price it charges for its product if distributors compete through discounts. Once distributors have sunk money into acquiring the manufacturer's merchandise, they may be willing to sell the merchandise at a price below cost if competition is fierce. When distributors negotiate prices with the manufacturer, they anticipate the need to discount and therefore have a lower willingness to pay at wholesale. For the manufacturer, this reduces effective demand and drives down price. A manufacturer that fixes a mandatory resale price that all distributors must respect guarantees to distributors that there will be no price wars, allowing distributors to accept higher wholesale prices and the manufacturer to charge them. The Supreme Court eliminated the ban on this practice in 2009.<sup>157</sup>

### C. CONSEQUENCES

As presently constituted, antitrust cannot prevent big data price discrimination from redistributing wealth from consumers to producers.

153. See *Aluminum Co.*, 148 F.2d at 429 (“size does not determine guilt; . . . there must be some ‘exclusion’ of competitors”) (Hand, J.); HOVENKAMP, *supra* note 13, at 296 (“[M]onopolization still requires monopoly power *plus* some form of anticompetitive conduct. The sale of output at a monopoly price is not sufficient to brand someone an unlawful monopolist.”).

154. See HOVENKAMP, *supra* note 13, at 179, 549 (“We condemn mergers that facilitate oligopoly under a fairly aggressive standard because oligopoly itself, once it has been achieved, is most generally out of antitrust’s reach.”).

155. *Leegin Creative Leather Prods. v. PSKS, Inc.*, 551 U.S. 877, 907 (2007).

156. The account of resale price maintenance I give here differs from the two main critiques of the practice, which are that it facilitates collusion by retailers or manufacturers. See THOMAS R. OVERSTREET, JR., *RESALE PRICE MAINTENANCE: ECONOMIC THEORIES AND EMPIRICAL EVIDENCE* 13–24 (1984). For a cousin of my argument, see Raymond Deneckere et al., *Demand Uncertainty and Price Maintenance: Markdowns as Destructive Competition*, 87 AM. ECON. REV. 619 (1997). Deneckere et al. argue that dealers engage in ruinous price cutting when they unexpectedly face low demand. *Id.* at 619–20. Anticipating this, they tend to hold too little inventory, reducing the profit of the manufacturer below the monopoly level. *Id.* By using resale price maintenance to eliminate the danger of price cutting in the face of unexpectedly low demand, the manufacturer is able to induce dealers to hold sufficient inventories to maximize the monopolist’s profit. *Id.* This addresses the problem with my argument that the manufacturer’s cost of production must be zero in order for the market to exist in the absence of retail price maintenance. If cost were not zero, then whatever price the manufacturer were to charge dealers, dealers would fail to recoup due to ruinous competition, and consequently dealers would be unwilling to buy from the manufacturer.

157. *Leegin Creative Leather Consumer Prods.*, 551 U.S. at 907.

By focusing only on reducing power formation, and doing a bad job of it at that, antitrust cannot reduce the stock of existing power, upon which big data price discrimination will operate to reduce consumer welfare. Assuming that the rise of big data price discrimination will not affect the rate of power formation or erosion under current law, it will cause a one-time fall in economy-wide consumer welfare as it enables firms with existing power to extract more value from consumers. If the rate of formation continues to exceed that of erosion, as appears to be the case at present, after the big one-time drop associated with the scouring of the economy, consumer welfare will continue to fall. The rate of power formation will be the same as before. But it will translate into a greater rate of decline in consumer welfare than before because when a producer obtains power in a market, the producer will now impose price discrimination, instead of uniform monopoly pricing, in that market, inflicting more harm on consumers per degree of increase in power.

#### IV. OPTIONS

For a number of reasons, policymakers should strive to prevent the redistribution of wealth that big data price discrimination will bring about. If Baker is right that antitrust is a political bargain, then the redistribution could lead to consumer rebellion.<sup>158</sup> If one believes that the current distribution of the surplus established by antitrust is fair, then it must be defended. And the consumer welfare standard may be read to require that, when pricing power threatens to do more harm to consumers than it has before, antitrust doctrine change to eliminate that threat.<sup>159</sup> If policymakers choose to act, they have three options: (1) reducing the level of pricing power in the economy; (2) price regulation; and (3) an outright ban on big data price discrimination.

##### A. POWER REDUCTION

The level of pricing power in the economy may be reduced through either deconcentration or closing gaps in the regulation of power formation. Closing gaps in the regulation of power formation would drive the rate of formation below the rate of erosion. Over time, as large firms would collapse and be replaced with small firms, the level of pricing power in the economy would fall. Deconcentration would break up existing firms with large amounts of pricing power, causing a one-time reduction in the level of pricing power. If current law equilibrates power formation and erosion, then the reduction would be lasting. If formation exceeds erosion, then the reduction would be temporary, as power would

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<sup>158</sup> See Baker, *Economics and Politics*, *supra* note 49, at 2185–86 (acknowledging, in another context, “the risk that exploited consumers would give up on the political bargain”).

<sup>159</sup> I make the case for this interpretation in Woodcock, *supra* note 49 (manuscript at 10–20).

slowly rise back up, unless the deconcentration were combined with either reform of current antitrust law to reduce the rate of formation or periodic reimplementations of deconcentration as power levels rise.

### I. *Deconcentration*

#### a. *Administrative*

Deconcentration may be accomplished either through legislation tasking an administrative agency with deconcentrating markets, or through reinterpretation of existing law by courts and enforcers. Both approaches have been considered or pursued in the past. During the years of peak antitrust enforcement in the middle of the 20<sup>TH</sup> century, several pillars of the antitrust establishment pushed for administrative deconcentration of the United States economy, advocating creation of an independent agency to carry out the job.<sup>160</sup> The agency would have had the power to break up large firms in a range of industries and fashion smaller competitors from them.<sup>161</sup> The deconcentration movement crested in the 1970s, when legislation was introduced in the Senate, but never approved.<sup>162</sup> By the early 1980s, the movement had disappeared.<sup>163</sup>

160. See CARL KAYSER & DONALD F. TURNER, *ANTITRUST POLICY: AN ECONOMIC AND LEGAL ANALYSIS* (1959). Kaysen went on to serve as Deputy National Security Adviser in the Kennedy administration, taught at Harvard, and became director of the Institute for Advanced Study at Princeton. Bryan Marquard, *Carl Kaysen, 89, MIT Professor, Economist, and JFK Adviser*, *THE BOSTON GLOBE*, Feb. 9, 2010, [http://archive.boston.com/bostonglobe/obituaries/articles/2010/02/09/carl\\_kaysen\\_89\\_mit\\_professor\\_economist\\_and\\_jfk\\_adviser/?page=2](http://archive.boston.com/bostonglobe/obituaries/articles/2010/02/09/carl_kaysen_89_mit_professor_economist_and_jfk_adviser/?page=2). Turner taught at Harvard Law School and headed the Antitrust Division of the U.S. Department of Justice in the Johnson administration. Stephen G. Breyer, *Donald F. Turner*, 41 *ANTITRUST BULL.* 725, 725 (1996). A similar proposal was put forth by a White House task force headed by the dean of the University of Chicago Law School and had the support of future Nobel prize winner George Stigler. See Phil C. Neal et al., *Report of the White House Task Force on Antitrust Policy*, 2 *ANTITRUST L. & ECON. REV.* 11 (1968); Schmalensee, *supra* note 49, at 14. For accounts of the pro-enforcement character of the era out of which this proposal sprang, see Hovenkamp, *supra* note 49, at 354–59; HOVENKAMP, *supra* note 13, at 70.

161. KAYSER & TURNER, *supra* note 160.

162. A bill introduced in the senate in 1972 would have created an Industrial Reorganization Commission charged with investigating industries and suing for their reorganization in a special Industrial Reorganization Court, with appeal directly to the U.S. Supreme Court. See Note, *The Industrial Reorganization Act: An Antitrust Proposal to Restructure the American Economy*, 73 *COLUM. L. REV.* 635, 639–40, 652 (1973) (providing an overview of the bill). The Commission would have had a lifespan of 15 years, after which it would have dissolved, its deconcentration mission complete. *Id.* at 639.

163. See Schmalensee, *supra* note 49, at 14 (“[B]efore the Reagan Administration took office the antitrust mainstream had shifted so significantly that no-fault deconcentration proposals were no longer within it.”); William E. Kovacic, *Failed Expectations: The Troubled Past and Uncertain Future of the Sherman Act as a Tool for Deconcentration*, 74 *IOWA L. REV.* 1105, 1136–37 (1989) (providing an account of this “deconcentration movement”).

Opponents of the deconcentration movement argued that the connection between concentration and consumer harm is tenuous. Their position was twofold. First, they argued that concentration sometimes does not lead to higher prices because even small numbers of firms can compete with each other. Indeed, some argued that even a firm alone in a market may price competitively for fear that higher prices will encourage others to enter.<sup>164</sup> Econometric studies that failed to establish a strong relationship between concentration and profits supported this view.<sup>165</sup> Second, they argued that concentration that leads to higher prices may be virtuous because the higher prices are needed to attract firms with attributes that ultimately benefit consumers, such as inventiveness, or superior management skill.<sup>166</sup> These arguments played a large role in the famous Airlie House Conference on deconcentration, which contributed to the movement's demise.<sup>167</sup>

The old arguments against deconcentration do not preclude use of deconcentration to remedy big data price discrimination. The attack on the connection between concentration and high prices was never convincing, even if it did lead to the deconcentration movement's political defeat. Even if the link between concentration and pricing power is weak as a statistical matter, breaking firms up must reduce pricing power, at least to some extent, in all markets but the few in which the fear of existing competition is so complete as to have already driven prices to their absolute minima. The opponents of deconcentration showed at most that concentrated markets can be competitive. But they did not show that concentration is not a source of pricing power in many markets or that deconcentration cannot reduce power.

The opponents' argument that high prices attract better firms has even less force, at least against deconcentration as a remedy for big data price discrimination, because deconcentration here would not reduce the share of surplus currently enjoyed by firms, but would only counteract any increase in that share. If prices today are high enough to attract

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164. See Harold Demsetz, *Why Regulate Utilities?*, 11 J. L. & ECON. 55, 56-57 (1968).

165. Richard Schmalensee, *Inter-Industry Studies of Structure and Performance*, in 2 HANDBOOK INDUS. ORG. 951, 976 (Richard Schmalensee & Robert D Willig eds., 1989) (reviewing the literature showing a weak relationship); Schmalensee, *supra* note 49, at 15 (observing that the weak relationship suggested that the effects of deconcentration on profits would be small).

166. See Harold Demsetz, *Industry Structure, Market Rivalry, and Public Policy*, 16 J. L. & ECON. 1, 3 (1973) (arguing that profits provide an incentive for firms to provide better services); Schmalensee, *supra* note 49, at 15 (explaining that Demsetz argued that higher profits in some industries might arise because some firms are more efficient than others and breaking them up would simply destroy the reward for good performance). For the argument that this justification for observed excess profits might be based on a misunderstanding of the distinction between profit and cost, see Woodcock, *supra* note 147, at 135 n.75.

167. See generally INDUSTRIAL CONCENTRATION: THE NEW LEARNING (Harvey J. Goldschmid et al. eds., 1974) (collecting papers presented at the conference); Kovacic, *supra* note 163, at 1138-39 (discussing the significance of the conference).

talent, then they will continue to be so under a deconcentration campaign aimed only at counteracting the effects of big data price discrimination. The danger that deconcentration will reduce profit is an advantage once one accepts the legitimacy of the project of restoring the current distribution of surplus.<sup>168</sup> Some today argue that firms' share of surplus is currently insufficient to attract the best firms.<sup>169</sup> From their perspective, the coming of big data price discrimination is therefore good news because it permits firms to cover costs of improvement they cannot now cover.<sup>170</sup> It is important to recognize that this position demands a change in the status quo. In the face of big data price discrimination, deconcentration, if not taken too far, is a status-quo-preserving policy.

*b. Judicial*

Deconcentration may also be implemented through the courts by the use of existing antitrust law to attack not just the acquisition, but also

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168. Mike Schuster has pointed out to me that although a deconcentration campaign might not reduce producer welfare below the level that prevails today, it would distribute it among more firms. He observed that if firms in a given industry currently operate at minimum efficient scale, then distributing producer welfare among more firms in that industry would prevent the firms from covering large fixed costs. A properly executed deconcentration campaign would not deconcentrate industries in which this is the case. The campaign might make up for the lost consumer welfare in such industries by engaging in greater deconcentration of industries in which there is no problem of minimum efficient scale. The problem might also be mitigated through the promotion of joint ventures in research and development and other fixed infrastructure investments. See HOVENKAMP, *supra* note 13, at 212, 218 (observing that joint ventures that are not formed to fix prices are subject to rule of reason review and that a "traditional justification for joint ventures is that they can enable two or more firms working together to perform an activity at minimum efficient scale . . . while a single firm acting alone could not"). If industries in which deconcentration is inefficient are numerous, then this problem of scale efficiencies might make it impossible for deconcentration to restore the current distribution of surplus. See generally F.M. Scherer, *Economies of Scale and Industrial Concentration*, in *INDUSTRIAL CONCENTRATION: THE NEW LEARNING* 16 (Harvey J. Goldschmid et al. eds., 1974) (discussing whether industry in the U.S. produces at minimum efficient scale). In that case price regulation, which I discuss in Part V.B, would be a better remedy, but deconcentration might still be embraced as a partial remedy.

169. See, e.g., Geoffrey A. Manne & Joshua D. Wright, *Innovation and the Limits of Antitrust*, 6 J. COMPETITION L. & ECON. 153, 170–83, 196–97 (2010) (arguing that antitrust has a history of denying firms the profits needed to justify product innovation and calling for a safe harbor in antitrust law for new product introductions).

170. A classic example of the argument that price discrimination is a way of increasing the amount of quasi-profit available for research and development is WARD S. BOWMAN, *PATENT AND ANTITRUST LAW: A LEGAL AND ECONOMIC APPRAISAL* (1973). A version of this approach, updated to account for big data, but betraying a similar lack of interest in the distributive consequences of price discrimination, is Irina D. Manta & David S. Olson, *Hello Barbie: First They Will Monitor You, Then They Will Discriminate Against You. Perfectly.*, 67 ALA. L. REV. 135 (2015). Manta and Olson argue that the first-sale doctrine in intellectual property law should be eliminated in order to help intellectual property holders prevent arbitrage and more effectively use big data to price discriminate. *Id.* at 136. As an aside, I note that the authors fail to perceive that in the long run big data alone is sufficient to prevent arbitrage, because it allows firms to identify and refuse to sell to arbitrageurs. See *infra* Part V.D.

the mere possession, of market power. This approach has a long, if fitful, history, having been tried a century ago and again with various levels of enthusiasm from the 1940s through the 1970s.<sup>171</sup> It is perhaps best exemplified by the mid-century prosecution and breakup of Alcoa.<sup>172</sup> Enforcers and courts have always claimed not actually to be engaged in deconcentration during these periods, pretending instead that their targets were guilty of exclusionary conduct, meaning that they had been formed illegally, rather than that their existence as large firms was itself illegal.<sup>173</sup> This forced courts and enforcers into sometimes absurd interpretations of what counts as exclusionary conduct. In *Alcoa*, for example, the court suggested that the monopoly's offensive conduct was that it had expanded production to meet demand. Judicial deconcentration implemented as a response to big data price discrimination could take a page from these earlier judicial deconcentration campaigns and disguise itself as mere regulation of the formation of pricing power. But it might save enforcers from embarrassment if the courts were to implement deconcentration today by explicitly embracing the notion that the possession of market power in itself can violate antitrust law.<sup>174</sup>

Under either an explicit or implicit judicial deconcentration approach, antitrust would devote more resources to prosecuting and breaking up mergers that appear to have resulted in greater monopoly power, even if the merger was consummated generations ago. Antitrust would also, explicitly or implicitly, eliminate the conduct requirement for monopolization claims, allowing antitrust to break up existing monopolies, even when they have been achieved by property or innovation-based exclusion, or historic accident. Finally, antitrust would assume the power to break up firms in oligopoly markets, even if they are not large enough individually to qualify as monopolies.<sup>175</sup>

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171. See Kovacic, *supra* note 163, at 1112–26 (providing a history of these deconcentration movements).

172. See *id.* at 1132–33; *United States v. Aluminum Co. of Am.*, 148 F.2d 416 (2d Cir. 1945).

173. See, e.g., *Aluminum Co.*, 148 F.2d at 429 (stating that “size does not determine guilt”) (Hand, J.).

174. See Alfred F. Dougherty Jr., *Elimination of the Conduct Requirement in Government Monopolization Cases: A Proposed Revision of the Sherman Act*, 10 ANTITRUST L. & ECON. REV. 37, 871 (1978) (“[Proving bad conduct] is rarely necessary to the determination of the real issues [in monopolization cases]—the existence of substantial, persistent monopoly power and the availability of effective and beneficial remedies.”) (internal quotation formatting omitted); *Aluminum Co.*, 148 F.2d at 431 (“Nothing compelled [Alcoa] to keep doubling and redoubling its capacity before others entered the field. It insists that it never excluded competitors; but we can think of no more effective exclusion than progressively to embrace each new opportunity as it opened[.]”); DUNCAN KENNEDY, *A CRITIQUE OF ADJUDICATION: FIN DE SIÈCLE* 56, 67 (1997) (discussing bad faith in adjudication).

175. See HOVENKAMP, *supra* note 13, at 293 (stating that courts generally require at least seventy percent market share to consider a firm dominant).

## 2. *Strengthening Current Law*

The alternative approach to power reduction, of attacking the formation, rather than the existence, of power, may be implemented by returning to the stricter rules regarding power formation that the courts followed in the three decades after World War II. Those rules, which included a de facto ban on large mergers, have been credited with having increased consumers' share of surplus, suggesting that the rules probably reduced the rate of power formation below that of power erosion.<sup>176</sup> To further reduce the rate of power formation, antitrust could go beyond restoring the old rules, by treating oligopolization as illegal collusion and product improvement as illegal exclusion, and condemning even smaller mergers.<sup>177</sup>

## 3. *Power Reduction and Differentiated Products*

Product differentiation does not prevent the use of either approach to power reduction. Nearly every product is differentiated in the sense that it is not identical to any other product, even those with which it competes.<sup>178</sup> There are therefore really at least two markets for any given product, the narrow market for all products identical to it, and the broader market for products that are not identical to, but are close substitutes for, it. Because only a single producer makes each differentiated product (that is what it means for products to be differentiated), every producer always has pricing power in the narrow market for its differentiated product, regardless the level of competition in the broader market.<sup>179</sup> No other firm can offer an identical product, so consumers make buying decisions based on more than just price in the narrow market, allowing firms to raise price in that market, at least a bit, without having to fear losing customers to competitors. All price discrimination takes place in narrow markets because firms can only choose prices for their own products. The demand curves that firms face are always only their products' own narrow market demand curves.

Even though power cannot be eliminated in the narrow market for a differentiated product, deconcentration can still help consumers.

176. See Baker, *Economics and Politics*, *supra* note 49, at 2185 (The rules in place before modifications that started in the 1970s "likely deterred more anticompetitive conduct than the corresponding modern rules do now."). For a list of the rule changes regarding collusive and exclusionary behavior that antitrust might roll back, see *id.* at 2184.

177. For a discussion of the oligopoly and product improvement safe harbors, see *supra* Part IV. Treating product improvement as illegal exclusion would not chill innovation so long as the remedy, which might include compulsory licensing, would allow the innovator sufficient reward.

178. See *supra* note 52.

179. See HOVENKAMP, *supra* note 13, at 37, 623 n.1 ("Many products in markets that appear competitive are nevertheless differentiated from one another. . . . To the extent that this is true the manufacturer faces a slightly downward sloping demand curve and may charge a price higher than marginal cost.").

Reducing power in the broader market, by allowing in more differentiated, but competing, products, increases consumer surplus, notwithstanding monopolization of the narrow market for each differentiated product, because the proliferation of competing products forces down effective demand for any one product. The existence of a substitute, even one that the consumer values less, places a ceiling on the price the consumer is willing to pay for a particular product that is below the price the consumer would be willing to pay were there no alternative product on offer. As a result, the existence of competing substitutes guarantees a certain level of surplus to the consumer in the consumer's purchase of the good.

Below this ceiling, however, the consumer remains at the mercy of the producer, whose ability to charge a price right up to the ceiling is limited only by the producer's ability to use big data to price discriminate. Reducing power in the broader market increases the number and value of competing products, which drives down the effective demand of the consumer for any particular product and thereby reduces the price, even a tailored price, that its producer may charge for it. In this way, deconcentration and other measures aimed at reducing market power can restore consumers' share of surplus in differentiated product markets.

An important implication of this analysis is that power reduction, as a solution to big data price discrimination in differentiated product markets, does not increase deadweight loss. Power reduction does not prevent firms from continuing to price discriminate, but only restricts the amount of the surplus they are able to obtain thereby. A firm selling a differentiated product in a broader competitive market can tailor prices to ensure that it sells to every consumer willing to pay cost. Power reduction protects consumers without sacrificing the total welfare gains from price discrimination.<sup>180</sup>

#### B. PRICE REGULATION

The price regulation solution to big data price discrimination is for regulators to impose a redistribution requirement on all price discriminators. Under this approach, regulators would harness big data to engage in price regulation in every market. When a firm uses big data to identify the maximum prices that consumers will pay, the firm in effect identifies the demand curve for its product. Regulators can use this same data to mandate the level of surplus that a firm must leave to consumers and to verify compliance.

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180. See Hal R. Varian, *Competition and Market Power*, in *THE ECONOMICS OF INFORMATION TECHNOLOGY: AN INTRODUCTION I* (Hal R. Varian et al. eds., 2014) (observing that in a competitive market in which firms can price discriminate, consumer welfare is maximized).

A major obstacle to effective price regulation is the strategic manipulation of costs by a regulated firm. Big data ensures that a price regulator does not need to know a monopoly's true costs in order to prevent the monopoly from using big data price discrimination to take more surplus from consumers than it would be able to extract today under uniform pricing. Under the traditional approach to price regulation, a firm submits data on costs, and the regulator sets prices at levels that earn the firm some mandated percentage return on those costs.<sup>181</sup> This creates an incentive for firms to overspend in order to increase the base to which the allowed rate of return is applied.<sup>182</sup>

Big data price regulation would avoid this problem by exploiting the availability of data on demand. Knowing the demand curve would allow regulators to calculate the uniform price that a monopoly would charge and the level of consumer welfare associated with it.<sup>183</sup> Regulators could then insist as a general matter that no price discrimination scheme result in consumer welfare below that level. Because they would know the shape of the demand curve, regulators would be able to determine consumer welfare under any pricing scheme and reject schemes that reduce consumer welfare relative to that uniform monopoly price level. No information on costs would be required.

Guaranteeing that consumer welfare will not fall below the level that prevails under uniform monopoly pricing amounts to guaranteeing that consumer welfare will not fall below the level that actually prevails today because in differentiated product markets, which are the vast majority of all markets, firms today charge a uniform monopoly price. As discussed in Part IV.A.3, in those markets, which I call narrow markets, a firm always has pricing power because no other firm sells an identical product. In the pre-big-data-price-discrimination world of today, firms use that power to charge a uniform monopoly price in those markets,

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181. See VISCUSI ET AL., *supra* note 63, at 430–32 (discussing “traditional rate of return regulation”).

182. See *id.* at 419, 433–35 (discussing the Averch-Johnson effect and observing that “the [price regulated] firm has an incentive to overstate its costs”).

183. Martin Loeb and Wesley Magat also exploit this ability to determine consumer welfare using only knowledge of the demand curve and prices. See Martin Loeb & Wesley A. Magat, *A Decentralized Method for Utility Regulation*, 22 J. L. & ECON. 399 (1979). They argue that regulators with good information on the demand curve should use it to determine consumer welfare at the price chosen by the regulated firm and provide the firm with a subsidy equal to that amount of welfare. See *id.* at 400. Loeb-Magat did not call for direct price setting because they worried that regulators do not have good information on the regulated firm's costs, and therefore would not be able to ensure that the share of surplus they mandate for consumers is not so large that it denies producers enough surplus to cover costs. See *id.* at 402 (“The proposed system eliminates the regulatory agency's need for cost data from the utility because price decisions are decentralized.”). I show in the text that when firms have the power to price discriminate and the goal is to limit reductions in consumer surplus to the level under uniform-pricing monopoly, a regulator may efficiently mandate specific prices without needing to know cost.

making consumer welfare under a uniform monopoly price the current level of consumer welfare.

The traditional rate regulation problem of determining costs is avoided here for the same reason that the old rewards objection to deconcentration does not apply.<sup>184</sup> The goal is to preserve for consumers the share of the surplus that they enjoy today. To the extent that producers receive adequate rewards today, rewards under price regulation will also be sufficient.<sup>185</sup> The advantage of avoiding the need to identify costs should not be overstated, however. The same big data revolution that is making it easier to know the characteristics of consumers is also making it easier to know the costs faced by firms. Thus, eventually regulators will be able to go beyond preserving the current level of consumer welfare to set prices that maximize consumer welfare, which is only possible when costs are known, if regulators wish to do so.

Big data price regulation need not be implemented by tasking a government agency with dictating prices to firms. Instead, regulators could simply require that consumer welfare not fall below current levels, and then use firms' own data on demand curves to monitor compliance, or provide firms with the government's own big data to help firms comply. By allowing firms to continue to tailor prices, albeit subject to a consumer welfare requirement, big data price regulation would preserve the good side of tailored pricing, by preserving the incentive and ability of firms to use tailored pricing to eliminate deadweight loss on their own, without being required to do so by regulators. Eliminating deadweight loss, by selling to all consumers willing to pay the cost of production, expands surplus, making it easier for firms to meet the requirement that they give a certain part of that surplus to consumers through better pricing, and indeed allowing firms more surplus to keep for themselves after meeting that requirement. So firms will be careful to tailor prices that not only meet the consumer welfare obligations imposed by price regulators, but also eliminate deadweight loss.

By embracing big data price regulation, regulators could mandate not just the level of consumer welfare but also which consumers receive the surplus and which do not, because big data would give regulators

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184. See *supra* Part V.A.1.a.

185. Daniel Spulber has observed that “[a] regulatory authority intervening in the allocative mechanism is at a double disadvantage as a consequence of asymmetry of information” because the regulator has both less information on demand than consumers and less on cost than firms. DANIEL F. SPULBER, *REGULATION AND MARKETS* 300 (1989). Big data eliminates the regulator's information disadvantage with respect to consumers. The goal of restoring the prevailing level of consumer surplus eliminates any need to know the cost of firms, removing the second information disadvantage.

Indeed, big data probably also directly eliminates any information advantage with respect to cost because firms are now able to track costs with the same efficiency with which they track consumers and a regulator with big data authority can plug directly into this information. Big data on costs is not, however, the subject of this Article.

large amounts of information on each consumer, in addition to the power to adjust the price charged to each. Thus, for example, regulators might require that consumers with a low willingness to pay receive a product free and those with a high willingness to pay face price discrimination. In a market in which buyers with a high willingness to pay are also richer buyers, this approach would ensure the greatest possible redistributive effect between rich and poor. Of course, buyers with a low willingness to pay are not always poor.<sup>186</sup> Because big data allows a firm to know the wealth level of a buyer, big data may be used to target surpluses at those buyers with the lowest income and not just those with the lowest willingness to pay.<sup>187</sup> Regulators might even simultaneously tolerate a partial reduction in consumer welfare and still reduce wealth inequality by reallocating the remaining consumer welfare to those buyers with the lowest incomes.<sup>188</sup>

It might be politically difficult to implement the progressive price discrimination strategies just described. The nice thing about big data price regulation, however, is that it can be used to achieve a wide range of allocations of consumer welfare among consumers. A less radical approach to distribution would, for example, allow all buyers, regardless of wealth or willingness to pay, a share of the surplus. One way to implement it would be to distribute surplus among consumers in proportion to the maximum price each consumer is willing to pay. Thus a consumer willing to pay \$10 for a good might be charged \$5 for it, a consumer willing to pay \$5 might be charged \$2.50, and a consumer willing to pay \$2.50 might be charged \$1.25, allowing each consumer to enjoy some surplus.

I capture my price regulation proposal graphically in Figure 1 through Figure 4. The area of the shaded rectangle in Figure 1 gives consumer welfare at a uniform monopoly price. The rectangle on the lower right is the associated deadweight loss. Unregulated price discrimination eliminates deadweight loss, but also consumer welfare. In that case, the entire area under the demand line goes to producers. Figure 2 shows a regulated pricing scheme that offers the product free to

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186. This happens when the poor cannot afford to buy their way out of monopoly markets. For example, those too poor to afford cars may only have access to a single supermarket, making them willing to pay very high prices for the necessities offered by that supermarket. Rich people shopping at the same supermarket might be unwilling to pay such high prices because they can drive to competitors. Cf. Miller, *supra* note 4, at 53 (noting that retailers who target discounts at those who live close to competitors' stores tend to charge higher prices to the poor, who have "fewer shopping options").

187. See *id.* at 94 (stating that data brokers provide data on income).

188. Rate regulators have long tried to achieve redistributive or social goals through regulation. See VISCUSI ET AL., *supra* note 63, at 412–18, 445–47 (discussing nonlinear pricing, Ramsey pricing, the structuring of mid-century telephone service to achieve universal access, and the doctrine of undue discrimination in electricity pricing). Big data makes this easier to do.

consumers with the lowest value and price discriminates against those with the highest value. The deadweight loss is gone and consumer welfare (the shaded area) allocated to the lowest section of the demand line. Figure 3 shows a regulated pricing scheme (dashed line) in which each consumer pays a constant proportion of the value the consumer places on the good.<sup>189</sup> Consumer welfare (shaded area) is spread across all units of the good. There is again no deadweight loss, but here consumers who place the greatest value on the good enjoy the greatest surplus and those who place the least value on the good enjoy the least surplus. Figure 4 shows a regime in which all consumers again enjoy a surplus, but those with the greatest value enjoy the smallest surpluses and some of those with the smallest surpluses obtain the product for free. The areas of the shaded triangles in the four graphs are equal. Thus each is consistent with a government-mandated minimum level of consumer welfare.

The price regulatory approach requires the creation of a general price regulator with authority to generate its own big data and access data gathered by firms. The greater the regulator's data, the better it will be able to estimate demand curves.<sup>190</sup> It is unclear whether firms would continue to invest in big data under price regulation. Eliminating the ability of firms to increase their share of surplus through price discrimination would reduce the incentive to do so. This is hardly a bad outcome, however. Either the government would respond by investing in big data in order to engage in the efficient price regulation described above, or overall investment in big data would fall, preserving uniform pricing and the currently prevailing level of consumer welfare associated with it. While the latter result would not eliminate the deadweight loss associated with uniform pricing, as data-based price regulation would, it would still leave consumers better off than they would be under a *laissez faire* approach to big data price discrimination.

This proposal should sound a bit like central planning; but it differs from it in two important ways. First, big data promises to make planning much more effective than it has been in the past.<sup>191</sup> The major obstacle to effective planning has been the difficulty of acquiring information on demand and supply; big data greatly reduces this concern.<sup>192</sup> Second, the

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189. For ease of exposition, I assume in the interpretation of these figures that each unit of the good sold is purchased by a different consumer.

190. I do not mean to suggest that more data always improves accuracy or is worth the cost, but only that more of the right kind of data, at the right price, and analyzed with the proper methods, improves accuracy. *See, e.g.,* Shiller, *supra* note 1, at 8–10 (discussing the problem of overfitting in datasets with large numbers of variables).

191. *Cf. EZRACHI & STUCKE, supra* note 32, at 212–16 (discussing the possibility that big data will make central planning easier).

192. *See SPULBER, supra* note 185, at 300 (“The main virtue of resource allocation by competitive markets is that consumers possess the best information about their individual preferences and firms

planning proposed here is limited in that it would not tell firms how to organize production, but only the prices they may charge for what they choose to produce. Thus it lies squarely in the long tradition of rate regulation in the United States.<sup>193</sup>

The price regulatory approach would also give macro economy regulators a new policy lever. It would allow regulators seeking to regulate inflation directly to tweak prices in particular industries, instead of using the blunt instrument of interest rates.<sup>194</sup> This might be done by varying the amount of surplus that firms are required to save for consumers, which would cause firms to change their prices to comply.<sup>195</sup>

The Federal Trade Commission (“FTC”) is uniquely qualified among federal institutions to engage in big data price regulation. Its mission has already evolved to include regulation of aspects of trade other than competition.<sup>196</sup> It was designed to bring technical expertise to

possess the best information about their respective technologies. . . . A regulatory authority . . . is at a . . . disadvantage as a consequence of asymmetry of information.”). Another obstacle is corruption of the regulator, which falls outside the scope of this Article. *See generally* Ernesto Dal Bò, *Regulatory Capture: A Review*, 22 OXFORD REV. ECON. POL’Y 203 (2006) (reviewing literature on regulatory capture).

193. *See* Richard A. Epstein, *The History of Public Utility Rate Regulation in the United States Supreme Court: Of Reasonable and Nondiscriminatory Rates*, 38 J. SUP. CT. HIS. 345, 346–48 (2013) (outlining the history of price regulation in Anglo-American law from the 17th century to the present and casting price regulation as a middle term between the extremes of anarchy and the command economy, or “confiscation,” as the article puts it).

194. *See* Glenn Hoggarth, *Introduction to Monetary Policy*, in 1 HANDBOOKS IN CENTRAL BANKING 5 (Simon Gray ed., 1996) (“The key aim of monetary policy for most central banks is to keep inflation low and steady. However, in a market-oriented economy, central banks cannot control inflation directly. They have to use instruments such as interest rates, the effects of which on the economy are uncertain.”).

195. I am thinking here of the expectations-augmented Phillips curve and New Keynesian economics generally. *See* John M. Roberts, *New Keynesian Economics and the Phillips Curve*, 27 J. MONEY, CREDIT & BANKING 975, 979–80 (1995). Workers who expect prices to rise demand higher wages, which allow them to bid up prices, leading to inflation. *See* Edmund S. Phelps, *Phillips Curves, Expectations of Inflation and Optimal Unemployment over Time*, 34 ECONOMICA 254, 255–56 (1967). Limited price reductions brought about by big data price regulation, which might be targeted at those buyers who, as workers, are most likely to bid up wages in response to higher prices, might break this inflation cycle. *Cf.* HUGH ROCKOFF, *DRASTIC MEASURES: A HISTORY OF WAGE AND PRICE CONTROLS IN THE UNITED STATES* 4 (2004) (“[A] consensus exists among mainstream economists that in the right circumstances temporary controls can make a positive contribution to the fight against inflation. This possibility exists because of the role of expectations in the inflationary process.”) (internal citation omitted). The idea of using big data price regulation to fight inflation is related to use of cartelization to stop deflation during the Great Depression, and would almost certainly require legislative sanction to be implemented. *See* Stephen Martin, *Depression Cartels, Market Structure, and Performance*, in *COMPETITION, EFFICIENCY, AND WELFARE: ESSAYS IN HONOR OF MANFRED NEUMANN* 85 (Dennis C. Mueller et al. eds., 2012) (discussing depression cartels).

196. *See* Richard A. Posner, *The Federal Trade Commission*, 37 U. CHI. L. REV. 47, 61 (1969) (“Although the FTC was originally created to grapple with monopoly problems, by its second decade 90 per cent of its orders were directed at deceptive rather than monopolistic practices.”); Earl W. Kintner & Christopher Smith, *The Emergence of the Federal Trade Commission as a Formidable Consumer Protection Agency*, 26 MERCER L. REV. 651, 651–52 (1975) (discussing the changes in statute

bear in regulating trade, and accordingly has a staff of economists, who would be necessary in achieving the highly technical goal of administering price regulation.<sup>197</sup> Its character as an independent agency is essential to a role that would require it to have access to vast amounts of private consumer data, which must be insulated from political manipulation.<sup>198</sup> Its current role as data protection watchdog also uniquely qualifies it to take on the new role of guardian and user of consumer data.<sup>199</sup>

The FTC can probably already regulate prices under its existing powers, but an act of Congress would likely be necessary in practice for it to begin doing so, because price regulation would require an expansion in the FTC's budget.<sup>200</sup> The FTC's current authority to regulate "[u]nfair methods of competition . . . and unfair or deceptive acts or practices" allows it to regulate practices that harm consumers regardless whether they have any effect on competition.<sup>201</sup> Because big data price

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and caselaw that contributed to the transformation of the FTC into an agency "empowered to forbid acts or practices which are unfair to consumers regardless of whether they cause injury to competitors or have any relationship to the antitrust laws").

197. See David Balto, *Returning to the Elman Vision of the Federal Trade Commission: Reassessing the Approach to FTC Remedies*, 72 ANTITRUST L.J. 1113, 1115 (2005); William E. Kovacic, *Administrative Adjudication and the Use of New Economic Approaches in Antitrust Analysis*, 5 GEO. MASON L. REV. 313, 314 (1997).

198. See Marshall J. Breger & Gary J. Edles, *Established by Practice: The Theory and Operation of Independent Federal Agencies*, 52 ADMIN. L. REV. 1111, 1117, 1132-33 (2000) ("The FTC was modeled after the ICC primarily for 'its independent power and authority.' Many believed that the only way to achieve effective business regulation was to establish a trade commission completely removed from the political fray.") (internal citation omitted); William E. Kovacic & Marc Winerman, *The Federal Trade Commission as an Independent Agency: Autonomy, Legitimacy, and Effectiveness*, 100 IOWA L. REV. 2085 (2014) (discussing independence of the FTC).

199. See David Alan Zetoon, *The 10 Year Anniversary of the FTC's Data Security Program: Has the Commission Finally Gotten Too Big for Its Breaches*, STAN. TECH. L. REV. 1, 2-3 (2011) (providing a brief history of FTC data protection efforts).

200. For the argument that enforcement budgets must be taken into account in antitrust policymaking, see Ramsi A. Woodcock, *Per Se in Itself: How Bans Reduce Error in Antitrust* 19-21, 23-28 (2017), <https://papers.ssrn.com/abstract=2896453> (on file with Author).

201. 15 U.S.C. § 45(a)(1) (2012); *FTC v. Sperry & Hutchinson Co.*, 405 U.S. 233, 239, 245-46 (1972) (holding that the FTC may "proscribe practices as unfair . . . in their effect upon consumers regardless of their nature or quality as competitive practices or their effect on competition"); Harry First, *Unfair Drug Prices and Section 5*, CPI ANTITRUST CHRON. 3-7 (Nov. 2015) (calling on the FTC to use this provision to regulate high drug prices). Given the breadth of this language, it is perplexing that the Executive Office of the President of the United States seems to recognize a role for the FTC in regulating big data price discrimination only when that price discrimination involves fraud. See EXECUTIVE OFF. OF THE PRESIDENT OF THE U.S., *supra* note 10, at 17 ("[D]ifferential pricing can cross the line into fraudulent behavior. In such cases, Section 5 of the Federal Trade Commission Act generally provides the FTC with sufficient authority to prohibit 'deceptive acts or practices.'"). I argue elsewhere that Section 2 of the Sherman Act, which the FTC is empowered to enforce, should be read to provide a basis for condemning high prices, subject to a limited remedy. Woodcock, *supra* note 49 (manuscript at 7-9) (arguing that a duty to charge low prices punishable by nominal damages should be recognized); *FTC v. Cement Inst.*, 333 U.S. 683, 691 (1948) (stating that the FTC may enforce the Sherman Act).

discrimination is consumer harm in purest form, that language should be enough to allow the FTC to commence price regulation; no Congressional action should be, strictly, required. Although the FTC is authorized explicitly only to issue cease and desist orders, the courts have not prevented the FTC from using this power to administer the forced licensing of patents, detailed conduct orders mandating certain business conduct, and the sale of business units.<sup>202</sup> Pervasive price regulation is different in magnitude, but not in kind, from these remedies. The FTC might proceed by bringing administrative cases against firms engaging in price discrimination, and seeking as remedies both real-time access to the consumer information generated by those firms, as well as real-time control over the prices they charge.

### C. COMPARISON OF POWER REDUCTION AND PRICE REGULATION

The advantage of the price regulatory approach over the power reduction approach is that price regulation cuts right to the heart of the problem of preserving consumer welfare, whereas power reduction operates by an uncertain indirection. In order to achieve a particular level of consumer welfare under deconcentration, for example, antitrust enforcers must be able to predict the behavior of firms in the market after they have been broken up into pieces.<sup>203</sup> It is not clear why government should go to the trouble of predicting firm pricing behavior when it can just set prices directly.

The advantages of power reduction are these. First, both deconcentration and the strengthening of rules against power formation are achievable without legislative intervention, through judicial

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202. See Balto, *supra* note 197, at 1114–15 n.8 (observing that the FTC has the power to order divestitures, impose “mandatory patent licensing” and “institute[] orders requiring affirmative conduct” such as the imposition of an information firewall, subject to “regular review . . . by FTC staff”); *Charles Pfizer & Co. v. FTC*, 401 F.2d 574, 586 (6th Cir. 1968) (approving FTC compulsory patent licensing order); *FTC v. Ruberoid Co.*, 343 U.S. 470, 473 (1952) (“Congress placed the primary responsibility for fashioning . . . orders upon the Commission, and Congress expected the Commission to exercise a special competence in formulating remedies to deal with problems in the general sphere of competitive practices. Therefore we have said that ‘the courts will not interfere except where the remedy selected has no reasonable relation to the unlawful practices found to exist.’”) (internal citations omitted).

203. For a discussion of the need to take price effects into account in breaking up firms, even when the goal is not to preserve a particular level of consumer welfare, see Woodcock, *supra* note 147, at 158–62. It is not the case that breaking firms into many pieces must always cause competition to prevail in the market, obviating the need for attention to price. Breaking firms up in the wrong way, or into too many pieces, can result in prices too low for the market to persist, or other problems that destroy the otherwise viable market. See Michael A. Heller, *The Tragedy of the Anticommons: Property in the Transition from Marx to Markets*, 111 HARV. L. REV. 621, 623–24 (1998) (observing that when property rights are divided among too many different owners the difficulty of negotiating transactions between the owners can result in underuse of the property); MICHAEL D. WHINSTON, LECTURES ON ANTITRUST ECONOMICS 16–17 (2008) (discussing ruinous competition). Deconcentration is always indirect price regulation.

reinterpretation of existing antitrust doctrine. Second, power reduction might be politically more viable because there have been deconcentration movements and stricter rules regarding power formation in the past.<sup>204</sup> Economy-wide price regulation is not alien to the American system, having been imposed during both world wars and by the Nixon Administration in 1971.<sup>205</sup> But in these cases it was temporary and aimed at inflation.<sup>206</sup> Permanent price regulation designed to combat price discrimination would be something new.<sup>207</sup>

Third, deconcentration vindicates other interests, including those of reducing the political power of big business and promoting small business, which are important, if neglected, policies of the antitrust laws.<sup>208</sup> This leads to the fourth advantage of deconcentration; it is perhaps less susceptible to capture and corruption by its targets than price regulation, because multiple institutions would implement it and their engagement with any particular industry would be sporadic. Subverting deconcentration, particularly if deconcentration were implemented judicially and with the aid of private plaintiffs, would require capture of the two main antitrust enforcement agencies, the FTC and DOJ Antitrust Division, as well as the plaintiff's bar.<sup>209</sup> Deconcentration would be a lumpy process, with intense scrutiny of an industry necessarily followed by long periods of laissez faire, as atomized firms are left to compete on their own.<sup>210</sup> By contrast, a price regulator must engage in constant supervision of pricing, permitting the formation of long-term relationships with industry that can corrupt.<sup>211</sup>

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204. See *supra* Parts V.A.1 & V.A.2.

205. See ROCKOFF, *supra* note 195, at 12.

206. See *id.* at 2–3.

207. If one embraces Baker's thesis that antitrust is a political bargain, big business might view price regulation as breaking that bargain and a point of rebellion. See Baker, *Economics and Politics*, *supra* note 49, at 2183 (describing antitrust as a compromise between the extremes of "industrial policy and direct regulation" on the one hand and laissez faire on the other); *supra* Part II.C. But big business would be mistaken in viewing it this way if price regulation is aimed at restoring the status quo distribution of surplus. Price regulation of this sort merely preserves the bargain through alternative means.

208. See Robert H. Lande, *Wealth Transfers as the Original and Primary Concern of Antitrust: The Efficiency Interpretation Challenged*, 34 HASTINGS L.J. 65, 96–105 (1982) (identifying in the antitrust laws the secondary policies of reducing the political power of big business and protecting small business).

209. See HOVENKAMP, *supra* note 13, at 642, 652. The antitrust laws are also enforced by state attorneys general. 15 U.S.C. §§ 15c, 26 (2012) (authorizing recovery of damages and injunctive relief, respectively); *Georgia v. Pennsylvania R. Co.*, 324 U.S. 439 (1945) (interpreting 15 U.S.C. § 26 to apply to the states).

210. The Industrial Reorganization Act appeared even to consider deconcentration a one-off affair as it would have terminated all deconcentration after 15 years. See *supra* note 162.

211. See Dal Bò, *supra* note 192, at 214–15, 217–18 (reviewing the literature on capture and the "revolving door" between regulatory and industry employment).

## D. BANNING PRICE TAILORING

The last possible set of solutions to big data price discrimination would seek to make it impossible for firms to tailor prices to individual consumers.<sup>212</sup> This might be structured as a ban on data collection,<sup>213</sup> the use of big data to tailor prices,<sup>214</sup> or measures that prevent arbitrage.<sup>215</sup> The principal objection to bans of this kind is that they make it impossible to use price tailoring for good. Both the deconcentration and price regulation approaches eliminate the consumer harm in price tailoring without eliminating price tailoring itself, allowing firms to contrive to tailor price to accommodate all consumers who are willing to cover the costs of production, thereby eliminating deadweight loss.<sup>216</sup> By contrast, a ban on price tailoring would preserve the status quo distribution of the surplus but also perpetuate the deadweight losses associated with uniform pricing.

Among approaches to limiting tailoring, a ban on data collection is better than the alternatives of a direct ban on the tailoring of prices or a ban on the prevention of arbitrage. The shortcoming of a direct ban on price tailoring, or on the prevention of arbitrage, is that firms may circumvent these bans by using big data to tailor products as opposed to prices. Netflix already tailors the films it recommends to individual viewer preferences.<sup>217</sup> One day it may tailor the films themselves to individual user fantasies. This would hinder arbitrage without running afoul of a ban on arbitrage by reducing the substitutability of goods sold to different consumers. This would also undermine a tailoring ban because Netflix could argue that its offering to each viewer is distinct and therefore when it charges each a different price it is not tailoring prices for the same product but simply charging different prices for different products.

Courts might see their way around these arguments by treating the product as the tailoring service rather than the tailored good.<sup>218</sup> Courts could argue that each Netflix viewer buys an identical viewing service from Netflix that provides a tailored viewing experience, just as each

212. A number of commentators appear to advocate such a ban. See Newman, *supra* note 32, at 875–76; Kochelek, *supra* note 32, at 535.

213. Cf. EZRACHI & STUCKE, *supra* note 32, at 226–28 (recommending measures that would burden data collection).

214. See Woodcock, *supra* note 20, at 44–47 (2017) (arguing that a ban on big data price discrimination may be read into Section 2 of the Sherman Act).

215. One approach to banning prevention of arbitrage would be to treat arbitrage as illegal exclusion of competitors under Section 2 of the Sherman Act. See *id.* at 8–14 (outlining this approach).

216. These results are discussed in Part V.A.3 in the case of deconcentration and in the paragraph following note 188 in the case of price regulation.

217. See Tom Vanderbilt, *The Science Behind the Netflix Algorithms That Decide What You'll Watch Next*, WIRED (Aug. 7, 2013, 6:30 AM), [http://www.wired.com/2013/08/qq\\_netflix-algorithm/](http://www.wired.com/2013/08/qq_netflix-algorithm/).

218. See Woodcock, *supra* note 20, at 23–24.

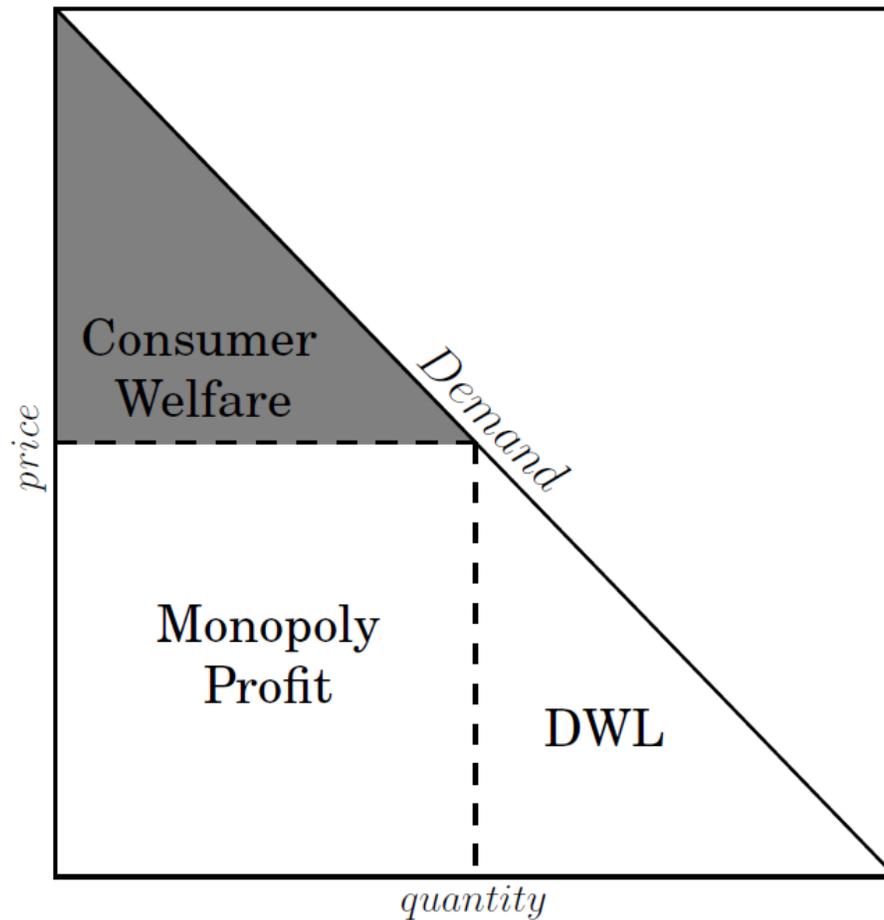
buyer of a shoe of the same size receives an identical product that nevertheless wears differently on each buyer's foot to accommodate the different way in which each buyer walks. Preventing consumers from reselling the service would then amount to prevention of arbitrage, and a firm would need to prevent resale of the service to price discriminate effectively, putting the firm back in violation of an arbitrage ban. The tailoring of price for the service would now also violate a tailoring ban. However effective it might be at preventing circumvention of a tailoring or arbitrage ban, drawing a distinction between the service and the product is an extra step not required for successful implementation of a data collection ban. Banning collection of data deprives firms of the power to tailor either price or product design to begin with.

#### CONCLUSION

Buyer and seller once bargained individually in the bazaar, each with roughly equal power to obtain surplus from their transaction. In the modern era, the seller became the large firm, with a power vastly in excess of that of any individual buyer. However terrible, this result was always tempered by the happy fact that the numerosity of buyers prevented the seller from doing business with the individual, forcing the seller to do business with buyers as a group instead. This group had the unconscious power of the herd. Price was as uniform as the cattleman's prod, and though it was effective at corralling and directing the consumer mass, it could not do so with precision, forcing the big firm to compromise. Thus even when its power was supreme, and antitrust ineffective, the big firm was forced to leave a share of surplus to consumers. In the information age, the anonymity of the consumer, and the consumer's consequent safety in numbers, will disappear, and with it the last bulwark of the individual against the power of big business. The seller will become a Hecatoncheir, roping each calf with one of a hundred arms, observing each with one of a hundred eyes. It goes without saying that this state of affairs will be untenable. The question is not whether a stop will be put to it but how, and after how much discord.

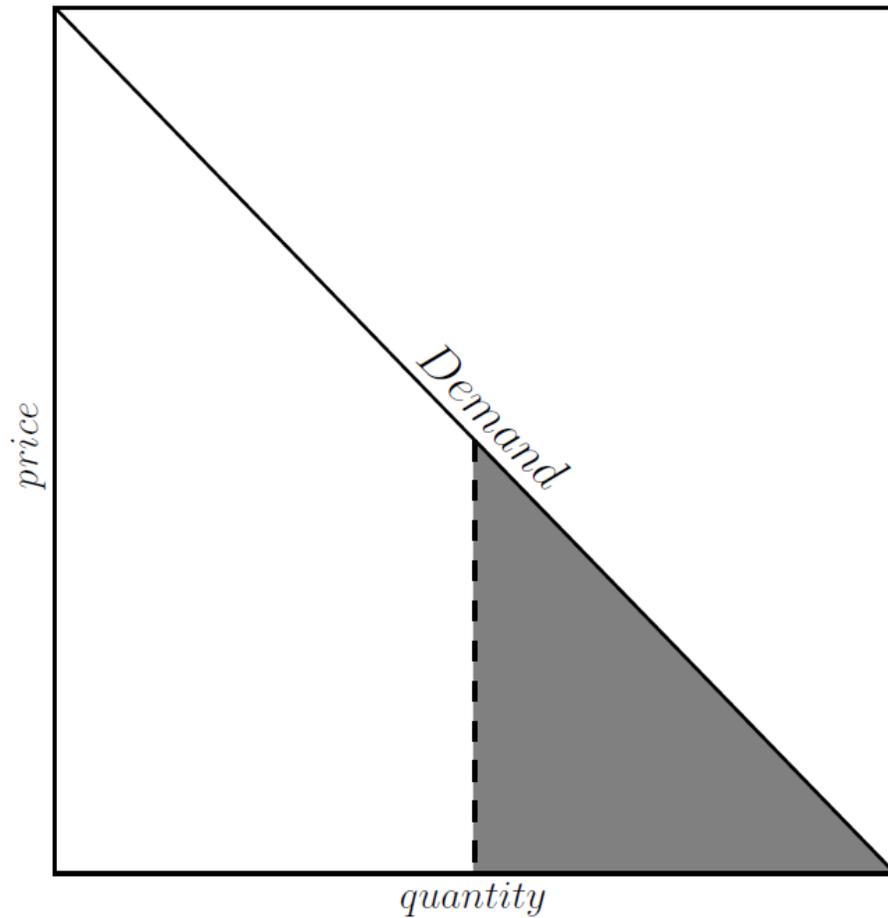
The solution must be the death of the free market, understood as the domain of lax antitrust policy and deregulation. The foundation of the appeal of the free market lay always in the assumption of the existence of a balance of power between buyer and seller sufficient to ensure that each would enjoy a part of the surplus of any transaction. That is the promise of the invisible hand, kept, if only imperfectly, by the recalcitrance of the herd in the monopoly markets into which *laissez faire* decays. The power of information to break the herd destroys that balance of power once and for all.

Big data is the end of the free market. It also conceives a regulatory Phoenix that is potentially more effective and just than ever before.



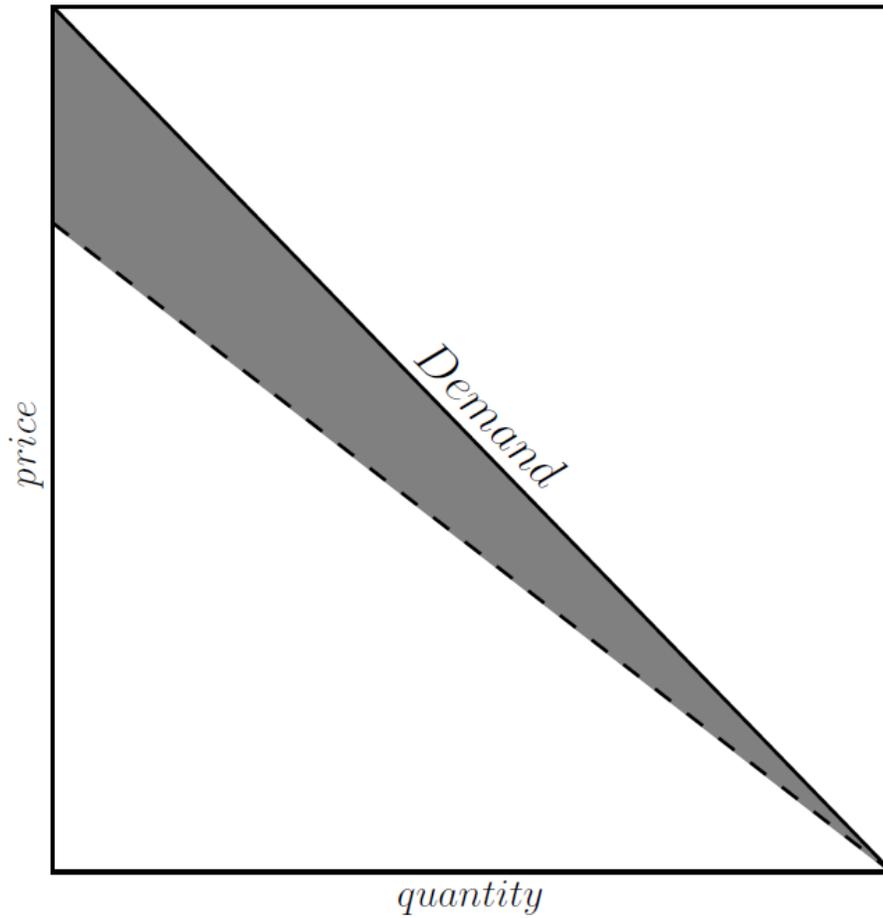
*Figure 1*

This graph shows demand for units of a particular good. The half of the total area of the graph that lies under the downward-sloping demand line is the total welfare created by the good when all units are sold. When pricing uniformly, the seller will sell at the price represented by the dashed horizontal line and quantity represented by the dashed vertical line, earning profit equal to the square that those two lines demarcate. The DWL triangle at bottom right represents deadweight loss, the value lost by the monopolist's failure to sell units of the product in excess of those enclosed by the vertical dashed line. The consumer welfare triangle at upper left is the value that consumers who are able to buy at the uniform monopoly price enjoy in excess of what they pay. Price discrimination allows the seller to capture both this consumer welfare triangle and the deadweight loss triangle, and thereby to enjoy the entire value of the product (i.e., the entire half of the total area of the graph that lies under the demand line).



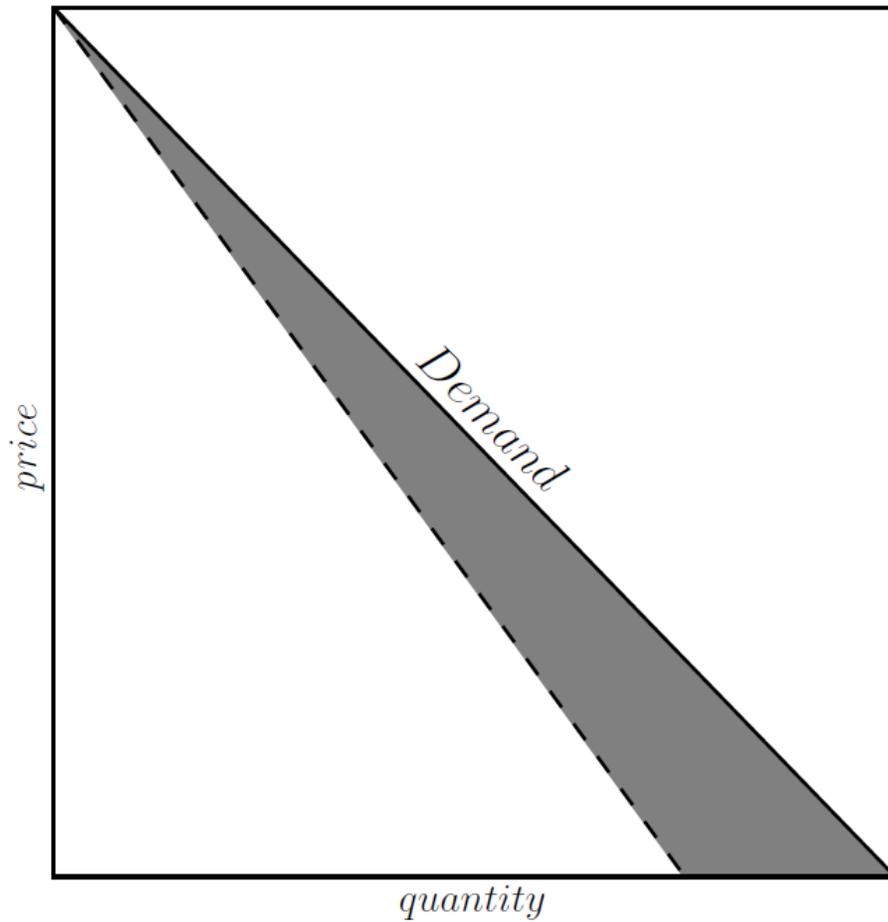
*Figure 2*

The graph shows demand for units of a particular good. Suppose each consumer buys only one unit of the good. Those consumers who place a value on a unit of the good that falls along the portion of the demand line to the left of the vertical dashed line are each charged a price tailored to equal the value the consumer places on the unit. That is, price equals demand for units to the left of the vertical dashed line. All other consumers are charged nothing. As a result, total consumer welfare (the shaded region) is enjoyed only by those consumers who place a value on a unit of the good that falls along the portion of the demand line to the right of the vertical dashed line. Prices are chosen to ensure that total consumer welfare, represented by that shaded region, is equal in size to consumer welfare in the pricing examples depicted by the other three figures. That is, the vertical dashed line is chosen to ensure that the shaded region is equal in area to the shaded region in each of the other figures.



*Figure 3*

The graph shows demand for units of a particular good. Suppose each consumer buys only one unit of the good. Each is charged a price, represented by the dashed line, that is a constant fraction of the value the consumer places on the good, with the fraction chosen to ensure that total consumer welfare, represented by the area of the shaded region, is equal in size to consumer welfare in the pricing examples depicted by the other three figures. That is, the dashed price line is chosen to ensure that the shaded region is equal in area to the shaded region in each of the other figures.



*Figure 4*

The graph shows demand for units of a particular good. Suppose each consumer buys only one unit of the good. Here price, represented by the dashed line, rises with the value placed on the unit by the consumer. That is, the price and demand lines both rise together from right to left. The consumer who places the greatest value on the good pays a price equal to that value (causing the price and demand lines to intersect at top left). Consumers who place the least value on the good pay nothing for it, causing the price line to fall to zero before the demand line falls to zero, at bottom right. Price is chosen to ensure that total consumer welfare, represented by the shaded region, is equal in size to consumer welfare in the pricing examples depicted by the other three figures. That is, the price line is chosen to ensure that the shaded region is equal in area to the shaded region in each of the other figures.