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I. INTRODUCTION

Antitrust is worried about the potential of recent advances in technology to increase market power, which is the ability of a firm to undermine competition from sellers of competing brands.² Recent advances are indeed creating opportunities for firms to enhance their market power.³ But as the cost of robots falls to rates affordable by small firms, technology also promises to eliminate many economies of scale, reducing market power. The net effect of technological advance on market power is therefore not determinate in the long run.

The great threat of technology is not that it will increase market power, but that it will increase the power of a firm to convince a consumer to pay the highest price the consumer is willing to pay for a good, given any prevailing level of market power.⁴ Coca-Cola exercises power along this second dimension, for example, if it bargains successfully with individual consumers for higher prices, even though consumers have the option of turning to Pepsi as an alternative. No matter how low Pepsi drops its price, or how much marketing Pepsi directs at a consumer, that consumer might still be willing to pay an extra quarter for a Coke. The ability to induce that consumer to in fact pay that extra quarter is second-dimension power.

Second-dimension power arises from bargaining skill: the ability to guess how much an individual consumer is willing to pay and to manipulate that consumer into paying that price. Advances in data storage, communication and automation, exemplified by digital memory, the internet, and computers, promise to make firms capable of engaging in skillful, tailored bargaining with millions of consumers at a time. Unlike in the case of market power, in the case of second-dimension power any counterbalancing effects of technology that favor consumers are likely to be small. In order for consumers to use technology to put up more than minimal resistance to the enhanced bargaining power of firms, consumers must unite, but technology does not solve perennial problems associated with helping large groups of strangers to agree on terms.

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2 I consider only the U.S. antitrust laws in this essay.

3 See, e.g., Salil K. Mehra, *Antitrust and the Robo-Seller: Competition in the Time of Algorithms*, 100 MINN. L. REV. 1323, 1328 (2015) (arguing that technology will make oligopolies more effective at suppressing competition); John M. Newman, *Antitrust in Zero-Price Markets: Foundations*, 164 U. PA. L. REV. 149, 190, 196–97 (2015) (arguing that by making zero-price markets ubiquitous, technology will harm consumers unless antitrust intervenes); ALLEN P. GRUNES & MAURICE E. STUCKE, *BIG DATA AND COMPETITION POLICY* 170–216 (2016) (laying out the argument that Big Data leads to scale).

4 For a lengthier development of many of the arguments contained in this essay, see Ramsi A. Woodcock, *Big Data, Price Discrimination, and Antitrust*, 68 HASTINGS L.J. ____ (2017), <https://papers.ssrn.com/abstract=2817523>.

The higher prices that result from increases in firms' second-dimension power will upset the prevailing distribution of wealth between consumers and producers, which is implicitly determined by antitrust law. Appropriate antitrust responses include reinvigoration of rules prohibiting exclusion, deconcentration, the promotion of intrabrand competition, or even the promotion of competition within the firm itself.⁵

II. THE SECOND DIMENSION OF POWER

The second dimension of power hides in plain sight in the common assumption that monopoly is accompanied by deadweight loss.⁶ The existence of deadweight loss is due to the uniformity of the price charged by the monopoly, which makes the monopoly unable to charge higher prices to some consumers without pricing others out of the market. Uniform pricing has another equally important consequence: that a monopoly cannot charge the highest price each consumer is willing to pay because in raising price to some it must raise price to all, balancing the extra profits from the higher price for those still able to buy against the losses from the departure of those no longer able to buy.

If a monopoly cannot charge each consumer the highest price that consumer is willing to pay, then the monopoly is not fully winning its negotiation with consumers as a group. The uniformity of price gives consumers as a group a certain minimum level of bargaining power by triggering responses by individual consumers that create a tradeoff for the firm between price and volume. In the classic monopoly diagram, the uniformity of price gives rise both to a deadweight loss triangle to the right of the monopoly quantity and to a consumer welfare triangle above the monopoly price. That consumer welfare triangle, which might be called "herd gain" because it is the result of unconscious group behavior, represents the amount of surplus that consumers are able to extract from a monopoly under uniform pricing.⁷ It shows that consumers can have power along the second dimension even in a monopoly market in which the market power of the firm is at its peak.

III. TECHNOLOGY AND THE SECOND DIMENSION OF POWER

To extract the last ounce of surplus from the consumer herd, the firm must find a way to break the uniformity of price. Low-cost storage, communication and automation allow the firm to achieve this by negotiating individually with each consumer.

A firm charges a uniform price when it is unable to: (1) determine the maximum any individual consumer is willing to pay for a product; (2) identify who is attempting to make a purchase at the point of sale; and (3) adjust the price at the point of sale to reflect the maximum the purchaser is willing to pay.⁸ Low-cost storage allows a firm to draw upon large amounts of data on any consumer to identify a likely maximum price that the consumer is willing to pay, resolving the first problem. Low-cost communication allows the firm to network its points of sale and thereby identify those consumers seeking to do business with the firm at any given time, resolving the second problem. Low-cost automation allows the firm to analyze its data quickly to determine the maximum price any consumer is willing to pay and to update the price charged at the point of sale based on the identity of the purchaser, resolving the third problem. These three areas of technological advance together allow the firm to charge a tailored price to each individual consumer designed to be just high enough to extract the maximum surplus from each without pricing any individual consumer out of the market. This kind of tailored pricing, which is known as first degree price discrimination, eliminates the herd gain triangle.

Under the traditional assumption in economics that consumers always accept take-it-or-leave-it offers, the power to tailor price is enough for a firm to maximize its power along the second dimension, for any given level of market power.⁹ Under this assumption, if the firm is a monopoly, the power to tailor price allows the firm to extract all surplus associated with production from consumers. Without the take-it-or-leave-it assumption, however, consumers may still hold out. The consumer charged a tailored price equal to their willingness to

⁵ For the argument that price regulation is also an appropriate response, see *id.* at 38–45.

⁶ I mean Harberger triangles, and not the cost of acquiring monopoly. See Richard A. Posner, *The Social Costs of Monopoly and Regulation*, 83 J. POL. ECON. 807, 807–12 (1975) (distinguishing the two).

⁷ For a copy of the diagram, see Ramsi A. Woodcock, *Inconsistency in Antitrust*, 68 U. MIAMI L. REV. 105, 110 (2013).

⁸ The ability to adjust price at the point of sale eliminates any power of consumers to defeat tailoring by buying low and selling high, a practice known as arbitrage, because a consumer who intends to resell at a high price has a higher maximum willingness to pay, and technology will allow the firm to guess that. See *infra* note 23.

⁹ See DAVID M. KREPS, *A COURSE IN MICROECONOMIC THEORY* 315 (1990) (observing that textbook economics does not explain why the monopoly's size "somehow . . . gives it a credibility about setting and sticking to a price or in sticking to its take-or-leave offer").

pay may still refuse to buy at that price, perhaps exclaiming “that’s highway robbery!”.

Technology promises to give firms power to undermine the will of the consumer further to hold out. Storage, communication and automation enable tailored marketing designed to catch consumers at their weakest moments, from a psychological perspective, to make them believe that they need the product immediately and at any price. Facebook seems to have acknowledged this when it told advertisers recently that it knows when teens are most vulnerable.¹⁰ Auction schemes are another approach. When Big Data fails to reveal the maximum price a consumer is willing to pay, firms may force consumers to reveal that price by initially charging a high price and then progressively reducing the price until the consumer bites, pitting consumers against each other in bidding wars, forcing them to submit confidential bids in order to buy, steering them to more expensive products or subjecting them to drip pricing.¹¹

Technology does not promise to help consumers counteract the advantage it gives to firms in the second dimension because consumers are numerous, poor and disorganized, relative to firms. In order to use technology to their advantage, consumers must do to firms what firms are starting to do to them: use data and automated interactions to identify the lowest price at which firms are willing to sell and break the will of firms to hold out for a higher price. To do that, consumers must negotiate as a group, as a firm can refuse to do business with an individual who employs these tactics, at little cost to the firm. Group organization requires not just communication, however, but also agreement between consumers concerning the terms of their union, including the collection of dues and the division of gains. Although technology makes it easier for people to collaborate, it does not make it easier for people to reach agreement, absent coercion.¹² Technology enhances consumer bargaining power to a limited degree by allowing consumers to share information about producers or act in unison through outrage and other instinctive modes of group behavior, as exemplified by the recent capitulation of United Airlines in response to public anger over boarding practices, but unless consumers organize, these modes cannot overcome the organized bargaining power of the firm.¹³

IV. ANTITRUST RESPONSES

The effect of a strengthening of power in the second dimension is to drive up prices, redistributing wealth from consumers to producers, even if there is no accompanying change in the market power of firms. This must be a matter of concern to antitrust policy because antitrust employs a consumer welfare standard, recognizing practices as illegal when they reduce the wealth of consumers.¹⁴ A strengthening of power in the second dimension is not a concern for antitrust *law*, as presently interpreted, however, because current law seeks to protect consumers only by regulating market power.¹⁵ It is illegal, for example, for a firm to exclude competitors from a market, other than by exercising superior foresight or industry, fielding a better product or being lucky.¹⁶ But it is not illegal for a firm that already has market power to use technology to shift from uniform pricing to tailored pricing, or to engage in marketing.¹⁷

Antitrust policy plays an important role in government, steering the economy between the extremes of state-sponsored monopoly, which is associated with fascism, and pervasive price regulation, which is associated with socialism.¹⁸ By limiting the ability of firms to

10 Sam Levin, *Facebook told advertisers it can identify teens feeling “insecure” and “worthless,”* THE GUARDIAN (May 1, 2017), <https://www.theguardian.com/technology/2017/may/01/facebook-advertising-data-insecure-teens>.

11 See ARIEL EZRACHI & MAURICE E. STUCKE, *VIRTUAL COMPETITION: THE PROMISE AND PERILS OF THE ALGORITHM-DRIVEN ECONOMY* 106–13 (2016) (describing some of these practices).

12 That is, technology does not solve cooperative games. See Robert Cooter, *The Cost of Coase*, 11 J. LEGAL STUD. 1, 18 (1982) (discussing the problem of “the absence of an authoritative distribution of the stakes”).

13 See Erin McCann, *United’s Apologies: A Timeline*, THE NEW YORK TIMES, Apr. 14, 2017, <https://www.nytimes.com/2017/04/14/business/united-airlines-passenger-doctor.html>.

14 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, 338 (2010).

15 One exception is the limit the courts place on the practice of resale price maintenance. That practice makes it easier for a manufacturer to ensure that consumers pay a high price for the firm’s product, regardless the level of market power of the firm. See *Leegin Creative Leather Products v. Psks, Inc.*, 551 U.S. 877, 907 (2007) (subjecting resale price maintenance to rule of reason review).

16 See *United States v. Aluminum Co. of America*, 148 F.2d 416, 429–30 (2d Cir. 1945).

17 See Douglas M. Kochelek, *Data Mining and Antitrust*, 22 HARV. J.L. & TECH. 515, 524–26 (2008) (concluding that the Robinson-Patman Act does not prohibit Big Data-based price discrimination aimed at consumers).

18 See Jonathan B. Baker, *Economics and Politics: Perspectives on the Goals and Future of Antitrust*, 81 FORDHAM L. REV. 2175, 2182–84 (2012)

obtain too much market power, antitrust ensures that a certain amount of the wealth generated by production is preserved for consumers, avoiding state-sponsored monopoly and forestalling populist calls for pervasive price regulation.¹⁹ By reducing the wealth of consumers without increasing market power, technology threatens to bypass antitrust and upset the current political balance between consumer and producer surplus. Consumers will demand a response. The question is only whether government should implement it through antitrust or another legal regime.

Antitrust is an appropriate regime for government to use to respond to an imbalance of power in the second dimension, because power in that dimension is closely related to market power. As market power declines and competition increases, the bargaining power of firms is reduced, because consumers have more alternatives, allowing them to abandon firms that insist on high prices. Thus the weaker a firm's market power, the less it can charge, no matter how great its power in the second dimension. Learning the highest price a consumer is willing to pay, for example, does not help a firm raise price if competitors willing to charge less for an equally appealing substitute product enter the market. Antitrust can counteract the increase in second dimension power that technology will bring about by pursuing with greater intensity its traditional mission of reducing the amount of market power in the economy.

A. Deconcentrating or Policing Interbrand Competition

Antitrust can reduce market power by expanding the two main ways in which it currently regulates that type of power. Antitrust limits the *formation* of market power by prohibiting exclusionary conduct. Since the 1970s, antitrust has virtually stopped enforcing rules against a number of exclusionary practices, probably leading to an increase in the rate of power formation.²⁰ Antitrust can reduce that rate by more vigorously enforcing rules against tying, predatory pricing, refusal to deal and exclusive dealing.

Antitrust also seeks to accelerate the *erosion* of market power by condemning merged firms and price fixing. The *per se* rule against price fixing breaks up that peculiar business form known as a cartel. Mergers may be thought of as breaking up merged firms, even though in practice mergers are usually blocked before they take place. Antitrust can increase the rate of erosion by using retrospective enforcement to break up many of the large firms that antitrust has allowed to form through the lax merger enforcement of recent decades, breaking up large firms generally, or extending its prohibition on the cartel form to the oligopoly form of business organization as well.²¹

Such a deconcentration campaign would likely be more effective at reducing market power than a strengthening of rules against power formation because a deconcentration campaign need not wait, as must a campaign to reduce the rate of formation, for the natural process of power erosion slowly to reduce the overall level of market power. Deconcentration could be implemented through recognition of a no-fault monopolization claim under Section 2 of the Sherman Act, which would require only a showing of market power but no exclusionary conduct for liability to attach.²²

B. Promoting Intra-brand Competition

There are two other, non-traditional, approaches that antitrust might use to protect consumers from technology-enhanced bargaining. Rather than reduce market power, these approaches instead use competition to restrict a firm's second-dimension power directly. One such strategy would be for antitrust to promote competition in the sale of identical products. Antitrust means by market power an absence of competition from differentiated, but substitutable, products. But the ability of a firm to raise price is not determined solely by the extent of such interbrand competition. Some consumers prefer one brand to another, allowing that brand to raise price even when the interbrand market is highly competitive. As interbrand competition falls, this power over price increases. The power of a firm to raise price for a differentiated product regardless of interbrand competition is a kind of second-dimension power. This power can be reduced by allowing competitors to sell products identical in packaging and quality to those sold by the firm. Such competition eliminates the power of the firm to raise price even to those consumers who have a strong preference for the firm's brand in particular, by allowing those consumers to

(discussing this political dynamic and observing that business and consumers accept the bargain because it makes both better off relative to the extremes).

19 See *id.*

20 See Ramsi A. Woodcock, *Per Se in Itself: How Bans Reduce Error in Antitrust* 41–45, 61 (2016) (unpublished manuscript, available at <https://papers.ssrn.com/abstract=2896453>) (providing an overview of these rule changes).

21 See John E. Kwoka, Jr., *Does Merger Control Work? A Retrospective on US Enforcement Actions and Merger Outcomes*, 78 ANTITRUST L.J. 644 (2013) (finding, based on a review of merger retrospective studies, that the remedies imposed by merger enforcers have been inadequate).

22 See Oliver E. Williamson, *Dominant Firms and the Monopoly Problem: Market Failure Considerations*, 85 HARV. L. REV. 1512, 1522–25 (1972) (calling for no-fault monopolization in certain cases).

buy from competing sellers of an identical product.

To promote intrabrand competition, antitrust must start to treat own-product markets as relevant markets more often than it does today. It is unclear why antitrust rarely recognizes own-product markets today. Perhaps firms rarely have enough power to raise prices in own-product markets by more than the five percent threshold recommended by the SSNIP test for market definition. Or it may be that courts and enforcers suffer from a general misconception that antitrust can only promote competition in interbrand markets. The limitation imposed by the five percent threshold will weaken as tailored pricing starts to permit firms to charge higher prices. An explicit embrace by courts and commentators of intrabrand competition as a legitimate antitrust goal might also be required for change.²³

To promote intrabrand competition, antitrust must also start to treat trademark assertion against producers of products of identical quality as illegal exclusion.²⁴ Consumers respond to the use of marks and packaging, even when the underlying products are of the same quality, so antitrust may not be able to promote intrabrand competition unless antitrust can make competitors free to mimic a product's mark and packaging down to the last detail. By treating trademark as illicit exclusion only when used to exclude products of identical quality, antitrust could minimize conflict with the mission of trademark, which is, in important part, to allow consumers to distinguish products of different quality.

C. Promoting Competition within the Firm

Promoting competition within the firm itself is a second non-traditional way in which antitrust might restrict second-dimension power directly.²⁵ A sufficient condition for competitive pricing is that rational actors compete to sell the firm's product on terms that subject the actors to costs and benefits in the same proportion, though not necessarily in the same amount, as those faced by the firm as a whole. For example, suppose that it costs a firm \$50 to produce a unit of a product. Two salespeople for the firm, each of whom is charged 10 percent of cost and provided a commission equal to 10 percent of price for each unit sold, might compete with each other to make a sale. They might compete price to \$50, which is the competitive level, but they would not compete it below that level, because at a price below, say \$49, the winning salesperson would owe the firm ten cents. Thus competition between agents of the firm who are subject to the proper incentives is capable of compelling the firm to charge a competitive price, regardless of the level of market power or second-dimension power that the firm otherwise wields.

Internal competition is closely related to both deconcentration and resale price maintenance. The goal of deconcentration is to deprive a business entity of power over price by reorganizing it, usually into smaller competing entities. Similarly, internal competition seeks to reduce power over price through reorganization, but differs from deconcentration in not seeking to produce formally distinct entities. Internal competition is also akin to limits on resale price maintenance. When a court orders a firm to desist from resale price maintenance, it prevents the firm from exerting centralized pricing authority over its retailers. These retailers then compete in setting the price of the firm's product.

Like deconcentration, internal competition might be implemented as a remedy for a no-fault monopolization claim under Section 2. It might also be implemented through Section 1 of the Sherman Act by treating the informal agreements within a firm that centralize authority in the executive suite as collusion.

D. Antitrust's Advantage over Regulation of the Use of Technology

An alternative to an antitrust response to technology-enhanced bargaining is regulation of the use of technology by firms, which would include limits on data collection or the use of algorithms to tailor pricing or marketing. The advantage of an antitrust response over limits on the use of technology is that antitrust allows the use of technology to help consumers. Tailored pricing allows firms to sell to every consumer willing to pay at least the cost of production without having to reduce the price charged to those who can pay more than cost.

²³ Recognizing own-brand relevant markets would turn restrictions on resale, which a firm must impose in order to engage in tailored pricing, into potentially illegal refusals to deal. I make the case for treating such refusals to deal as antitrust violations in Ramsi A. Woodcock, *Price Discrimination as a Violation of the Sherman Act 8–37* (2017) (unpublished manuscript).

²⁴ See EDWARD H. CHAMBERLIN, *THE THEORY OF MONOPOLISTIC COMPETITION: A RE-ORIENTATION OF THE THEORY OF VALUE* 270–72 (7th ed. 1958) (making arguments similar to those contained in this paragraph).

²⁵ For a more detailed discussion of this option, see Ramsi A. Woodcock, *Competition within Firms as a Substitute for Competition between Firms* (2017) (unpublished manuscript).

Thus it allows the firm to bring the poor into the market. After antitrust has stepped in to reduce a firm's power over price, firms will retain the ability and incentive to maximize profit by selling to all consumers who are willing to pay at least the cost of production. Antitrust merely deprives firms of the power to redistribute wealth to themselves by charging the highest possible prices to each consumer. By contrast, regulations that limit the use of technology prevent firms from tailoring prices altogether, eliminating the advantage of technology, as well as its disadvantage.

V. CONCLUSION

The principal threat of technology to antitrust operates through the second dimension of power, rather than market power. By making it easier for firms to tailor prices to consumers, and to exert psychological pressure on them to buy through tailored marketing, technology will allow firms to extract more wealth from consumers for any given level of market power, upsetting the distribution of wealth between consumers and producers that antitrust has sought to guarantee through the regulation of market power alone. Technology does not help consumers to fight back on their own because it does not solve the problem of consumer organization that is a prerequisite for the use of technological countermeasures. Antitrust can restore the balance between consumer and producer surplus by using reductions in market power to counteract the effects of increased power in the second dimension. These reductions in market power may be achieved by returning to the more vigorous antitrust enforcement of the mid-20th century or embracing a deconcentration campaign that would include oligopoly as a target. Antitrust can also counteract the effects of increased second-dimension power directly by promoting competition in the intrabrand market or promoting decentralization of pricing authority within firms.

