Personalized Pricing as Monopolization

Ramsi A. Woodcock

Follow this and additional works at: https://opencommons.uconn.edu/law_review

Recommended Citation
Article

Personalized Pricing as Monopolization

RAMSI A. WOODCOCK

The advance of the information age will allow firms to engage in personalized pricing, a form of price discrimination that is profitable for firms, but unambiguously harmful to consumers. Antitrust can protect consumers from personalized pricing—also called perfect price discrimination—by condemning the steps firms must take to prevent resellers from undermining firms’ personalized pricing schemes. To personalize prices successfully, a firm must prevent those to whom the firm wishes to charge low prices from reselling the product to those to whom the firm wishes to charge high prices. Otherwise, resellers will compete away any difference in prices. But such steps amount to conduct that harms competitors—here, resellers—and ultimately the consumers who pay the personalized prices that result. A firm that personalizes prices must therefore do the three things that together constitute illegal monopolization under Section 2 of the Sherman Act: harm competition, and consumers, in order profitably to raise prices. The right to refuse to deal with competitors, which would normally exempt this conduct from antitrust scrutiny, does not apply to personalized pricing because an available remedy—an order prohibiting personalized pricing, but not forcing firms to sell to resellers—does not lead to the forced sharing and judicial price administration that the right to refuse to deal is meant to avoid.
ARTICLE CONTENTS

INTRODUCTION..................................................................................................................313

I. ARBITRAGE PREVENTION AS MONOPOLIZATION ..................321
   A. ANTICOMPETITIVE CONDUCT .................................................................321
      1. Personalized Pricing Harms Consumers .............................................321
      2. The Principal Economic Defenses of Price Discrimination Ignore
         the Harmfulness of Personalized Pricing to Consumers ...............326
      3. Arbitrage Prevention Harms Competition ..........................................332
      4. The Refusal to Permit Trade in Purchase Rights as Arbitrage
         Prevention ..........................................................................................338
   B. MONOPOLY POWER .............................................................................342
      1. Personalized Pricing Is Evidence of Monopoly Power ..............342
      2. Challenging Antitrust’s Bias in Favor of Interbrand Competition...
         ........................................................................................................345
      3. Defining the Relevant Product ..........................................................350
   C. THE RIGHT TO REFUSE TO DEAL DOES NOT APPLY ............354
      1. United Shoe ......................................................................................354
      2. Prior Dealings and Other Considerations ........................................356
      3. The Irrelevance of Reliance ..............................................................360
      4. Remediability ....................................................................................362

II. PERSONALIZED PRICING AS A STANDALONE ANTITRUST
    VIOLATION .................................................................369

CONCLUSION .................................................................................................372
Personalized Pricing as Monopolization

RAMSI A. WOODCOCK *

INTRODUCTION

Price discrimination, the charging of different prices to different consumers for the same product, appears to have taken the economy by storm in recent years, spreading from early pioneers in the airline business to nearly every corner of the economy: from Amazon, which varies the prices of thousands of items hundreds of time per day, to Broadway shows, which now vary ticket prices based on day-to-day sales trends, to Disney World, which now varies entrance fees based on expected demand.1

* Assistant Professor of Law, University of Kentucky College of Law, Secondary Appointment, Department of Management, University of Kentucky Gatton College of Business and Economics. Russell D. Covey, Allen Grunes, Thomas Horton, Friedemann Kainer, Lauren Sudeall Lucas, Nirej Sekhon, and participants at the 18th Annual Loyola Antitrust Colloquium and the 2018 Annual Conference of the Mannheim Centre for Competition and Innovation provided helpful comments.

1 The technical definition of “price discrimination” is the earning of different rates of return on units of the same product, meaning that the difference between unit cost and price is different for different units. See HERBERT HOVENKAMP, FEDERAL ANTITRUST POLICY: THE LAW OF COMPETITION AND ITS PRACTICE 621 (4th ed. 2011). By contrast, economists call the charging of different prices to different consumers “differential pricing.” See id. This Article is concerned with a particular form of price discrimination, namely, personalized pricing, that seeks to charge each consumer the maximum that the consumer is willing to pay for the product. See infra note 11 and accompanying text. Other than in the unlikely case that all consumers have the same maximum willingness to pay for all units of the product that they purchase, personalized pricing will therefore always involve the charging of different prices for different units, and so will always be differential pricing. It therefore will not be necessary, in this Article, to distinguish between the earning of different rates of return and the charging of different prices.


When a firm changes prices over time, the firm may be engaged in price discrimination or in dynamic pricing. Unlike price discrimination, which is the adjusting of prices based on old information about consumer characteristics, dynamic pricing is the adjusting of prices based on new information about demand. The firms listed here, like virtually all firms that charge consumers different prices for the same product, claim to be engaged in dynamic pricing, rather than price discrimination. See Ramsi A. Woodcock, Dynamic Pricing as Monopolization, 105 IOWA L. REV. (2019) (manuscript at 9–13) (on
Consumers are only slowly starting to realize that there are few purchases left for which they are likely to pay the same price as a neighbor.\(^2\)

All price discrimination has a single ultimate end, to charge each individual consumer a price personalized to match that consumer’s maximum willingness to pay for the product, because charging the highest possible prices that consumers are willing to pay maximizes profits.\(^3\) Achieving that goal is difficult, however, because it requires hyper-accurate information about consumer willingness to pay.\(^4\) Charge a price too high, and no profit is earned at all because the consumer will not buy. Charge a price too low, and money is left on the table. The last-minute airline passenger who pays more for an economy class seat than the passenger across the aisle pays more because the airline knows that last-minute buyers tend in fact to be willing to pay more.\(^5\) But the airlines do not yet know exactly how much more each individual last-minute buyer would be willing to pay, limiting the airlines’ ability at present to extract the maximum possible profit from consumers.\(^6\) As firms learn more about their customers, and artificial intelligence and machine learning make it easier for them to understand the data, firms will improve their accuracy in predicting how much each individual consumer is willing to pay.\(^7\) The airlines will no longer rely only on the time when a consumer purchases in trying to infer whether a consumer is willing to pay more.\(^8\) Purchase histories, income data, the

file with author). But it is difficult to tell whether a price that varies over time is responding to old or new information, and it is therefore likely that some of the new variability of pricing practiced by firms represents price discrimination, and not dynamic pricing.


\(^8\) See Niejadlik, supra note 6, at 11 (arguing that artificial intelligence and machine learning will enable personalized pricing in the airline industry); Anita Ramasstry, Personalized Pricing in the Air? Why Consumers Should Be Wary of a New Airline Pricing Proposal, JUSTIA: VERDICT (May 13, 2015), https://verdict.justia.com/2015/05/13/personalized-pricing-in-the-air-whyconsumers-should-be-wary-of-a-new-airline-pricing-proposal (discussing a 2014 grant of approval by the U.S. Department of Transportation to the airlines to collect personalized customer data that could be used to charge personalized prices).
movement of the consumer’s mouse on the airline’s webpage, and much more, will give the airline a rich portrait of who the consumer is, and through that picture, how much the consumer is willing to pay. As this learning process spreads across the economy, consumers will enter a world in which the consumer will pay a price personalized with increasing accuracy to equal the maximum the consumer is willing to pay for every single purchase that the consumer makes.

Prices tailored to the individual maximum that a consumer is willing to pay, called first-degree price discrimination or personalized pricing here, harm consumers, by ensuring that each consumer gives up a value, in the form of the price paid, that is equal to the value the consumer places on the good, leaving the consumer no better off than if the consumer had never made the purchase at all. In economic terms, the practice deprives consumers of the entire surplus generated by the transaction. One approach to protecting consumers from personalized pricing would be to use the antitrust laws to impose a ban. The Robinson-Patman Act, which is part of

---

9 See Niejadlik, supra note 6, at 15 (arguing that airlines will need “shopping and conversion, customer behavior, and ancillary sales data” to personalize prices); Woodcock, supra note 7, at 1372–74; Nitasha Tiku, The Dark Side of ‘Replay Sessions’ That Record Your Every Move Online, WIRED (Nov. 16, 2017, 6:00 AM), https://www.wired.com/story/the-dark-side-of-replay-sessions-that-record-your-every-move-online/.

10 Uber took a step in this direction when it moved to “route-based” pricing from mileage-based pricing. See Eric Newcomer, Uber Starts Charging What It Thinks You’re Willing to Pay (May 19, 2017), https://www.bloomberg.com/news/articles/2017-05-19/uber-s-future-may-rely-on-predicting-how-much-you’re-willing-to-pay (“[Uber] detailed for the first time in an interview with Bloomberg a new pricing system that’s been in testing for months in certain cities. On Friday, Uber acknowledged to drivers the discrepancy between their compensation and what riders pay. The new fare system is called ‘route-based pricing,’ and it charges customers based on what it predicts they’re willing to pay. It’s a break from the past, when Uber calculated fares using a combination of mileage, time and multipliers based on geographic demand.”).

11 See HAL R. VARIAN, INTERMEDIATE MICROECONOMICS: A MODERN APPROACH 446 (7th ed. 2006) (observing that under first-degree price discrimination consumers are “just willing to purchase the good”); COUNCIL OF ECON. ADVISORS, EXECUTIVE OFFICE OF THE PRESIDENT OF THE UNITED STATES, BIG DATA AND DIFFERENTIAL PRICING 4 (Feb. 2015) (associating the term “personalized pricing” with first-degree price discrimination). Personalized pricing is also sometimes called tailored pricing, individualized pricing, or perfect price discrimination.

12 See DAVID M. KREPS, A COURSE IN MICROECONOMIC THEORY 306 (1990). An important qualification is that personalized pricing may strengthen competition between oligopolists, creating a counterbalancing downward pressure on prices. The condition for this to occur is that the substitute products sold by the members of the oligopoly not be too different from each other. Lars A. Stole, Price Discrimination and Imperfect Competition, 3 HANDBOOK INDUS. ORG. 34, 7 (2003). For a discussion of this qualification, see infra note 65.

13 See Woodcock, supra note 7, at 1415–16. Two other options are deconcentration of markets and use of big data by government to set prices in all markets. See id. at 1376–77; Ramsi A. Woodcock, Personalized Price Regulation as an Income Tax Alternative 5–6 (2019) (working paper on file with author). I consider these options in detail elsewhere, but do not address them further in this Article. See Woodcock, supra note 7, at 1400–1415; Woodcock, supra note 13, at 49–57 (working paper on file with author). Both alternative approaches have the virtue of allowing firms to realize the efficiency benefits of personalized pricing while preventing firms from using personalized pricing to extract too much profit.
the antitrust laws, might at first appear to be the appropriate vehicle, because the Act bans certain types of price discrimination.\textsuperscript{14} But the Robinson-Patman Act is in fact of little help. The Act targets bulk discounts made by manufacturers to large retailers, such as discounts to retail behemoths like Walmart or Amazon that put small retailers with low sales volumes at a competitive disadvantage.\textsuperscript{15} But the Act does not apply to the pricing of goods sold to consumers, and is rarely enforced even within its limited ambit, making it useless as a tool for banning personalized pricing.\textsuperscript{16} A ban on personalized pricing might instead be achieved by new legislation.\textsuperscript{17} This

from consumers. \textit{See infra} Section I.A.2 (discussing the efficiency benefits of personalized pricing). Indeed, government exploitation of personalized pricing would even permit use of personalized prices efficiently to redistribute wealth in favor of consumers, rather than firms. A ban on personalized pricing would not realize the efficiency benefits of personalized pricing, but would prevent firms from using personalized pricing to extract excessive profits from consumers. \textit{See} Woodcock, \textit{supra} note 7, at 1415.

\textsuperscript{14} 15 U.S.C. § 13(a) (2018) ("It shall be unlawful for any person engaged in commerce, . . . either directly or indirectly, to discriminate in price between different purchasers of commodities of like grade and quality . . . ."); \textit{see} HOVENKAMP, \textit{supra} note 1, at 629 (describing the act as "disguised as an antitrust law").

\textsuperscript{15} \textit{See} HOVENKAMP, \textit{supra} note 1, at 629 ("[Congress was] concerned that small businesses, particularly small retailers, were rapidly losing market share to large 'chain stores' that were able to underbuy and thus to undersell the small operators.").


The inapplicability of the Act to price discrimination in consumer markets arises from the Act’s requirement that the effect of the discrimination be to injure competition in some way. \textit{Id.} (prohibiting price discrimination “where the effect of such discrimination may be substantially to lessen competition”). Price discrimination has this effect in supply markets, because bulk discounts to larger retailers make it difficult for small retailers to compete. \textit{Cf.} Kirkwood, \textit{supra} note 16, at 359 (lamenting the fact that despite this orientation, the Act has not actually been used against large retailers that are believed to have a competitive advantage arising from obtaining bulk discounts from suppliers). But in consumer markets, price discrimination is a symptom of the absence of competition, not its cause. \textit{See infra} text accompanying note 104. A retailer can personalize prices to consumers only if other retailers are unable to undercut those prices. \textit{See infra} text accompanying note 59. Accordingly, the act of price discrimination itself cannot be shown to injure competition in such markets. Like the Robinson-Patman Act, the Sherman Act also requires a showing of injury to competition. \textit{See}, \textit{e.g.}, Somers \textit{v.} Apple, Inc., 729 F.3d 953, 963 (9th Cir. 2013); HOVENKAMP, \textit{supra} note 1, at 655 (noting that the “antitrust injury” requirement applies to “virtually all of the antitrust laws”). It is for this reason that in developing a price discrimination claim under Section 2 of the Sherman Act, 15 U.S.C. § 2 (2018), this Article characterizes the prevention of resale in aid of price discrimination, rather than price discrimination itself, as the illicit conduct that violates the Act. \textit{See infra} note 22. That approach cannot be taken under the Robinson-Patman Act because the Robinson-Patman Act prohibits price discrimination, but not the prevention of arbitrage.

\textsuperscript{17} Legislatures have a long history of limiting price discrimination though prohibitions on “undue discrimination” in pricing contained in rate regulatory regimes. \textit{See} J. Stephen Henderson & Robert E. Burns, \textit{An Economic and Legal Analysis of Undue Price Discrimination}, Nat’l Regulatory Research Inst. 26 (1989) ("One of the most nearly universal obligations imposed by
Article shows how, by contrast, the courts might ban personalized pricing without new legislation, by interpretation of the prohibition on monopolization contained in Section 2 of the Sherman Act.\[18\]

The approach centers on a practice that is key to the viability of personalized pricing: the prevention of arbitrage between low- and high-price units. Personalized pricing is possible only if those consumers charged low prices by the firm are unable to resell the units they buy to those consumers charged high prices by the firm.\[19\] If resale is possible, then resellers compete down the high prices and the price discrimination scheme collapses.\[20\] Preventing arbitrage is therefore key to the success of personalized pricing. This Article shows that the prevention of arbitrage counts as monopolization under Section 2 of the Sherman Act because the resellers shut down by the prevention of arbitrage are in effect competitors of the firm, and the fact that shutting them down enables the firm to charge higher prices to high-price buyers is direct evidence that the firm has monopoly power. These two elements—anticompetitive conduct and monopoly power—combine with the harm to consumers of personalized pricing to make out a complete monopolization claim.\[21\]

The prevention of arbitrage is an example of what antitrust\[22\] calls a refusal to deal: the firm engaged in the personalizing of prices refuses to sell units to low-price buyers who intend to resell the units to high-price buyers.\[23\] Antitrust has traditionally been wary of treating refusals to deal as monopolization, even going so far as to recognize a general right of any firm to choose with whom to do business and on what terms.\[24\] But there are exceptions, and the factors courts have relied upon to grant the exceptions


\[19\] See KREPS, supra note 12, at 306.

\[20\] See HOVENKAMP, supra note 1, at 626–27, 627 n. 7.

\[21\] 15 U.S.C. § 2 (2018). For an introduction to antitrust monopolization claims, see RICHARD A. POSNER, ANTITRUST LAW 193 (2d ed. 2001). Only arbitrage prevention in aid of personalized pricing should be treated as monopolization, because consumer harm exists for certain only when prices are personalized to equal the maximum that each consumer is willing to pay. See infra text accompanying note 97.

\[22\] “Antitrust” throughout this work means not only the antitrust laws of the United States, but also the judges who apply them, the enforcers who enforce them, and the commentators who discuss them. For an overview of the law, see POSNER, supra note 21, at 33–43. For an overview of enforcement, see ANDREW I. GAVIL ET AL., ANTITRUST LAW IN PERSPECTIVE: CASES, CONCEPTS, AND PROBLEMS IN COMPETITION POLICY 1025–26 (2d ed. 2008).

\[23\] See generally HOVENKAMP, supra note 1, at 317–22 (discussing the antitrust law of refusals to deal).

apply to the prevention of arbitrage in personalized prices. Perhaps the most important factor is whether the refusal amounts to the termination of a prior profitable course of dealing, a termination that signals to the courts that the refusal to deal was motivated by “dreams of monopoly.” This factor weighs in favor of recognizing an exception to the right to refuse to deal for arbitrage prevention, because a price-personalizing firm terminates a prior profitable course of selling units to low-price buyers when the firm refuses to sell additional units to low-price buyers who intend to resell them.

Courts are loath to condemn refusals to deal because the natural remedy for a refusal to deal is an order requiring the refuser to start selling to competitors. Courts shrink from ordering such compelled dealing because it requires courts to set the terms of sale, including price, a task the courts believe they lack the expertise to carry out successfully. But rather than remedy arbitrage prevention directly, by ordering dealing, courts can instead attack the effects of arbitrage prevention, by ordering firms that prevent arbitrage to cease personalizing prices. Such a non-personalization remedy would preserve the discretion of the firm to set all the usual terms of dealing, including price, subject only to the requirement of non-personalization. By embracing non-personalization rather than compelled dealing as a remedy, the courts would bring the remedy for arbitrage prevention within a core judicial competency: the policing of discriminatory behavior.

Indeed, the courts should not stop at condemning the prevention of arbitrage as monopolization. They should treat the act of personalizing prices itself, and not just the act of preventing arbitrage, as the trigger for antitrust liability. Direct condemnation of personalized pricing is needed, because personalized pricing always harms consumers, but firms need not always take affirmative steps to prevent arbitrage in order to enable personalized pricing, allowing some personalized pricing to escape the antitrust dragnet if the prevention of arbitrage alone is the trigger for liability. Sometimes consumers charged low prices will fail to avail themselves of arbitrage opportunities, even when those opportunities are available, whether out of laziness, incompetence, or a lack of interest in profit. Condemnation of only arbitrage prevention is therefore underinclusive, failing to preclude personalized pricing in all cases in which

---

25 See infra Section I.C.
26 Trinko, 540 U.S. at 409.
27 See infra text accompanying note 243.
28 See HOVENKAMP, supra note 1, at 339–40.
29 See Trinko, 540 U.S. at 407–08.
30 See infra Section I.C.4.i.
31 See infra text accompanying note 293.
32 See infra Part II.
33 See United States v. Aluminum Co. of Am., 148 F.2d 416, 429–30 (2d Cir. 1945) (recognizing that firms “may become monopolists by force of accident”).
it is possible.

Fortunately, the courts in recent decades have shown flexibility in adapting antitrust’s liability triggers to match the scope of the harm done to consumers by anticompetitive conduct. 34 Indeed, the courts in recent decades have used antitrust’s consumer welfare standard severely to restrict the set of conduct that can trigger liability, out of concern that much formerly-illicit conduct is not actually harmful to consumers. 35 By treating personalized pricing as a stand-alone violation of the antitrust laws, the courts can seize the opportunity to expand the set of conduct subject to antitrust condemnation in an area in which all of that conduct is in fact harmful to consumers.

The charging of different prices to different consumers is a natural part of all economic activity: the cost of serving two consumers, even with facially identical products, can differ substantially, due to transportation costs, for example. 36 The argument in this Article is not that a firm must charge the same price for everything the firm sells, or face antitrust liability. Cost-driven differences in price are good for consumers, ensuring that firms can earn enough to engage in production, so cost-driven differences in price cannot lead to antitrust liability. 37 Rather, the argument here is that antitrust can condemn personalized pricing, which is based on the maximum willingness to pay of the consumer, rather than the cost of production of the firm, because unlike cost-based pricing, personalized pricing always harms consumers. 38

To be precise, personalized pricing always harms consumers by design. In practice, firms may never learn enough about consumers reliably to identify each consumer’s maximum willingness to pay, and as a result personalized pricing may in practice never succeed at extracting every last penny of value from consumers. 39 That would seem to undermine the antitrust case against personalized pricing, because imperfectly-executed personalized pricing does not have the characteristic of unambiguous harm to consumers that is central to the antitrust case against personalized pricing. 40 If a firm fails to personalize a price equal to the maximum that each consumer is willing to pay, then it is possible that the losses to

34 See infra Part II.
35 See infra Part II.
36 See HOVENKAMP, supra note 3, at 765–67.
37 See COUNCIL OF ECON. ADVISORS, EXECUTIVE OFFICE OF THE PRESIDENT OF THE UNITED STATES, supra note 11, at 7 (observing that pricing based on the cost of service “can improve economic efficiency”).
38 See infra Section I.A.1.
40 For more on group-based pricing, see infra Section I.A.1.
consumers charged higher prices may be offset by the non-zero surplus enjoyed by consumers charged lower prices.

But that presents no real obstacle to the antitrust case against personalized pricing, for antitrust liability has always been based on harm by design, rather than actual harm. It has never been a defense to a claim of monopolization that the bad actor did not in fact succeed at charging higher prices to consumers and thereby at inflicting harm upon them.\(^{41}\) The dominant firm that engages in anticompetitive conduct violates the Sherman Act, whether in the event the firm succeeds at harming competition or not.\(^{42}\) What matters is that a monopolist has engaged in anticompetitive conduct that could in theory give rise to harm, which is precisely what the prevention of arbitrage in aid of personalized pricing constitutes.

This requirement of theoretical harm also explains why traditional, low-tech forms of personalized pricing, such as street-market haggling, would not be swept up by antitrust condemnation of personalized pricing.\(^{43}\) To be sure, the aim of these traditional forms is to raise price as high as possible, but absent the use of technology—the employment of big data or computer algorithms—they cannot possibly be aimed at identifying a determinate maximum price that a consumer is willing to pay, and so lack the orientation toward perfection, and therefore the theoretic consumer harm, that violates the antitrust laws.\(^{44}\) The case against personalized pricing is a case against an information-age practice, and is circumscribed accordingly.

Part I shows that personalized pricing supported by the prevention of arbitrage constitutes monopolization in violation of Section 2 of the Sherman Act, because the practice inflicts harm on consumers and competition, and is always in itself direct evidence of monopoly power. In particular, Section I.A shows that the prevention of arbitrage is

\(^{41}\) See HOVENKAMP, supra note 3, at 82 (observing that antitrust allows competitors injured by a monopolist’s anticompetitive conduct to sue for lost profits even when consumers have not yet been injured as a result of the harm to competition).

\(^{42}\) See id. at 882.

\(^{43}\) Cf. What Consumers—and Retailers—Should Know about Dynamic Pricing, Knowledge@Wharton, http://knowledge.wharton.upenn.edu/article/what-consumers-and-retailers-should-know-about-dynamic-pricing/ (“‘Dynamic pricing has always been with us,’ says Wharton marketing professor Peter Fader. ‘Think of the classic hagglers in the market of a Middle East bazaar.’”).

\(^{44}\) The bargaining that takes place in the context of bilateral monopoly—a market in which there is but one buyer and one seller—would not run afoul of an antitrust rule against personalized pricing, even if carried out with the aid of big data or computer algorithms, because there would be no separate low- and high-price buyers between whom the seller might prevent arbitrage. Attempts by sellers individually to customize product offerings in order to characterize the market for each unit sold as a bilateral monopoly market, and thereby to exploit this loophole, would fail, however, for the reasons set forth in Section I.A.4. The antitrust ban on personalized pricing, regardless whether supported by affirmative steps to prevent arbitrage, which is proposed in Part II, would, in any event, prevent the seller in a bilateral monopoly from using big data or computer algorithms to charge the buyer the maximum that the buyer is willing to pay for each unit purchased by the buyer as part of the negotiation. For more on this point, see infra note 326.
anticompetitive and harmful to consumers, and Section I.B shows that any firm that personalizes prices must qualify as having monopoly power for purposes of the antitrust laws. Section I.C shows that the right of a firm to refuse to deal does not extend to the prevention of arbitrage in aid of personalized pricing, and Section I.C.4.ii argues that the most administrable remedy for personalized pricing is an order requiring non-discrimination, rather than an order to cease the prevention of arbitrage. Part II argues that the act of personalizing prices, regardless whether supported by the prevention of arbitrage, should trigger antitrust liability.

I. ARBITRAGE PREVENTION AS MONOPOLIZATION

In order for a firm to engage in monopolization in violation of Section 2 of the Sherman Act, the firm must (1) engage in anticompetitive conduct, meaning behavior that both harms consumers and causes the market to deviate from the perfectly competitive ideal, and (2) have monopoly power, meaning that the firm must have the power profitably to raise its prices above some measure of its costs. A firm that engages in personalized pricing will usually meet both criteria.

A. Anticompetitive Conduct

1. Personalized Pricing Harms Consumers

Personalized pricing satisfies the consumer harm requirement, because the charging of a price equal to the maximum that a consumer is willing to pay ensures that the consumer derives a vanishingly small benefit from the transaction. The total gain from trade between the firm and the consumer is the benefit conferred by the product on the consumer—measured by the maximum price that the consumer is willing to pay for the product—less the harm suffered by the firm to produce the product—measured by the firm’s production costs, including the cost of providing investors with a reasonable return on investment. The price the firm charges for the product splits the gain from trade, by forcing the consumer to compensate the firm for its production costs and, if the price exceeds those production costs, to pay out to the firm some of the additional benefit conferred by the product on the

45 See United States v. Grinnell Corp., 384 U.S. 563, 570–71 (1966); HOVENKAMP, supra note 1, at 292. The monopoly power requirement is also sometimes called the “market power” or “dominance” requirement. Compare id. at 292–93 (market power), with GAVIL ET AL., supra note 22, at 583 (monopoly, dominance).

46 The exception is when arbitrage fails to take place even though the firm has taken no steps to prevent it, and the firm is therefore able to personalize prices without engaging in anticompetitive conduct. See infra Part II.

47 See VARIAN, supra note 11, at 446.

48 See id. at 251, 260, 409–10.
consumer.\footnote{See Hovenkamp, supra note 3, at 6 (showing how producer and consumer surplus are determined by the price charged).} It follows that a price personalized to equal the consumer’s maximum willingness to pay forces the consumer to pay out the entire gain from trade to the firm.\footnote{See Varian, supra note 11, at 446.} In practice, firms will personalize prices equal to a vanishingly small amount less than the maximum the consumer is willing to pay. When the price equals the maximum that the consumer is willing to pay, the consumer is technically indifferent between buying and not buying at all, because the price just equals the value the consumer places on the product. Firms set prices slightly below maximum willingness to pay in order to be sure that consumers will buy.\footnote{See id. at 10–109, 446 (observing that at a consumer’s reservation price, the consumer is indifferent between buying and not buying); William J. Baumol, Economic Theory and Operations Analysis 497 (4th ed. 1977) (“[E]very consumer gets out of each transaction something more than he pays for the item he purchases. This must be so because no one forces him to make a purchase.” (emphasis omitted)).} But the infinitesimal gain to consumers from being induced to buy might as well be zero.\footnote{See Amir Alexander, Infinitesimal 9 (2014) (observing that it is a paradox of the vanishingly small that it at once has magnitude and its “size is zero”).} Personalizing prices has the extraordinary characteristic of charging consumers prices so high that consumers are rendered no better off—more or less—than if they had made no purchases at all.\footnote{See Woodcock, supra note 7, at 1390.}

For example, if the maximum a consumer is willing to pay for a Coke is $2.51, and Coca-Cola spends $0.25 to produce a Coke, then the gains from trade with the consumer are $2.26. If Coca-Cola personalizes a price equal to $2.50 to the consumer—a penny below the consumer’s maximum willingness to pay, in order to ensure that the consumer will buy—then Coca-Cola takes virtually all of the gains from trade, or $2.25, because Coca-Cola generates $2.50 in revenues less Coca-Cola’s $0.25 production cost. The consumer still buys, because at $2.50 the price does not exceed the consumer’s maximum willingness to pay, but the consumer’s gain of one penny from buying the Coke is very small. By contrast, if Coca-Cola were to charge $0.26 for a Coke, which is a price at which Coca-Cola will produce and sell Coke because it affords Coke a profit of one penny, the consumer would enjoy a net gain from the transaction of $2.25. That is the value the consumer places on the Coke of $2.51, less the purchase price of $0.26. The consumer would therefore capture virtually all of the gains available from trade. The margin between the cost of production and the maximum the consumer is willing to pay is called surplus, the difference between price and cost is the firm’s share of that surplus, also called profit, and the difference between the consumer’s maximum willingness to pay and price is the consumer’s share of the surplus, also called consumer surplus. By
driving price up almost to willingness to pay, personalized pricing guarantees that the firm captures virtually the entire gain from trade as profits, and drives consumer surplus as close to zero as possible.\textsuperscript{54} Without personalized pricing, consumers always have a chance of capturing some of the gain from trade, and consequently the imposition of personalized pricing harms consumers, by eliminating their access to that gain.\textsuperscript{55} In the absence of personalized pricing, firms can at best charge group-based, rather than personalized, prices, and group-based prices always leave some consumers with a gain from trade, because a group-based price must be the same for all members of the group.\textsuperscript{56} Unless the profit-maximizing price to charge to the group happens to be the price that only the highest-maximum-willingness-to-pay member is willing to pay—and that will not be the case if the gain to the firm from selling to an additional group member exceeds the loss from reducing price to the highest-maximum-willingness-to-pay member that will not be the case—the uniform price charged to the group must be below the maximum willingness to pay of at least one group member, and possibly more.\textsuperscript{57} Those lucky group members who pay a price below the maximum they are willing to pay—known as “inframarginal” consumers—enjoy a consumer surplus. Only the lowest-maximum-willingness-to-pay member of the group among those to whom the firm sells—called the “marginal” consumer—pays a price equal to the consumer’s maximum willingness to pay and therefore enjoys no consumer surplus. When firms switch to personalized pricing, the consumer surpluses available to all but the marginal consumer under group-based pricing go away, and so consumers are harmed.\textsuperscript{58}

The extent of the harm inflicted by personalized pricing depends, however, on the prevailing level of competition between substitute products in the market.\textsuperscript{59} For the maximum willingness of each consumer to pay for a product always depends on the value the consumer places on the

\textsuperscript{54} See HOVENKAMP, supra note 3, at 6, 769.
\textsuperscript{55} See Stole, supra note 12, at 3–4, 6 (observing that under second- and third-degree price discrimination consumers can retain some surplus). This point is discussed in greater depth infra in the text accompanying note 86.
\textsuperscript{56} See id. at 3–4.
\textsuperscript{57} See id. at 4 (observing that if there is some “heterogeneity [in the preferences of group members,] third-degree price discrimination will leave some consumer surplus”).
\textsuperscript{58} To be sure, a firm will price some consumers out of the market under group-based pricing if lowering the group’s price to meet their maximum willingness to pay does not result in a gain for the firm that offsets the lost revenue from selling to the group’s inframarginal consumers at a lower price. But, as discussed more fully below, those consumers who are priced out of the market would enjoy only a vanishingly small consumer surplus under personalized pricing, so the switch to personalized pricing confers virtually no gain upon them. See infra Section I.A.2.
\textsuperscript{59} See Stole, supra note 12, at 6–8.
alternative products offered by the firm’s competitors.\textsuperscript{60} Personalized pricing allows firms to raise prices up to the maxima that consumers are willing to pay, but the level of competition in the market—the appeal of competing products to consumers and the prices charged by their makers—determines how high or low a consumer’s maximum willingness to pay for the firm’s product will be.\textsuperscript{61} Cola buyers, for example, may prefer Coke to Pepsi, and be willing to pay a quarter or two more for a Coke than a Pepsi, but if Coke raises prices by more than, say, fifty cents, those buyers will buy Pepsi instead. By contrast, if there were no alternative to Coke on the market, those buyers would likely be willing to put up with greater price increases—perhaps a dollar or two—before eventually giving up on the purchase of cola altogether and buying cheaper, but less preferred, substitutes, like water. Personalized pricing will therefore extract more value from Coke buyers in a cola market monopolized by Coke than it will in a market contested by Pepsi, because without Pepsi as a backstop, consumers have more to gain from trade with Coke, and Coke therefore has more gain to extract through personalized pricing.

The relationship between competition and maximum willingness to pay means that the harm inflicted by personalized pricing on consumers can be tempered by making markets more competitive.\textsuperscript{62} But it does not mean that in some, more competitive, markets the adoption of personalized pricing cannot harm consumers at all, whereas only in other, less competitive, markets will personalized pricing inflict harm. So long as competitors sell differentiated products, each product will have its loyalists—those willing to pay more for the product than others—and that will allow firms to use personalized pricing to eliminate the consumer surpluses their loyalists enjoy under group-based pricing.\textsuperscript{63} The more competitive the market, the less profit the firm will be able to extract via personalized pricing, because consumers’ loyalties will be weaker, but the opportunity to extract more profit—and to harm consumers—by adopting personalized pricing will

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{60} See \textit{id.} at 7 (“[C]onsumers may . . . obtain considerable non-residual surplus from the presence of competition.”).
\item \textsuperscript{61} See \textit{id.}
\item \textsuperscript{62} See \textit{id.}
\item \textsuperscript{63} See Edward Hastings Chamberlin, \textit{The Theory of Monopolistic Competition: A Re-Orientation of the Theory of Value} 67 (7th ed. 1956) (“As long as the substitutes are to any degree imperfect, he still has a monopoly of his own product and control over its price within the limits imposed upon any monopolist — those of the demand.”); Hovenkamp, \textit{supra} note 1, at 131–32, 623 (“If a price discrimination scheme is profitable at least some purchasers will be paying more than marginal cost for the product, and this necessitates at least a modest amount of market power as to them. However, . . . the amount of market power need not be great and often is no more than that which results from product differentiation . . . . For example, even tiny airlines in intense competition with larger rivals price discriminate in filling their seats. They charge widely different prices to different classes of passengers notwithstanding that the cost of serving them is roughly the same.”).
\end{itemize}
\end{footnotesize}
never go away. 64 Personalized pricing is therefore always, inherently, harmful to consumers, regardless the level of competition in markets. 65

64 See CHAMBERLIN, supra note 63, at 67; HOVENKAMP, supra note 3, at 131–32, 623.
65 See HOVENKAMP, supra note 1, at 627 ("All forms of persistent price discrimination transfer wealth away from consumers and toward sellers. If antitrust policy is concerned with such wealth transfers, then price discrimination presents an antitrust problem."). Sometimes, personalized pricing can itself trigger additional competition that may counteract personalized pricing’s harmful effects on consumers. See Stole, supra note 12, at 7.

For example, consider the following competitive market, initially without personalized pricing. Suppose that in this market a consumer places a $6 value on a box of a particular brand of cookie, and that the current price is $2. Suppose, further, that the consumer places a $5 value on a competing brand of cookie, which also happens to retail at a price of $2. The maker of the second box of cookies might well know that the consumer will buy the first box, because the surplus the consumer derives from purchasing the first box ($6 less the price of $2) exceeds the surplus the consumer derives from purchasing the second box ($5 less the price of $2), but if the maker of the second box must charge uniform prices, at least to certain groups of consumers, the maker of the second box may be unable to compete for the consumer’s business. Lowering the price of the box to $0.50, which would induce the consumer to buy from the second maker (because now the consumer’s surplus of $4.50 would exceed the $4 of surplus associated with purchase of cookies from the first maker), might force the second maker to reduce output, because although the cost to the second maker of producing a box for this consumer might only be $0.25, the cost of producing boxes of cookies for others might be $1.50, and a new uniform price of $0.50 would make production of those units unprofitable. Overall, the decline in output might reduce profits, even if it permitted sale of one new box of cookies to this particular consumer.

But now suppose that personalized pricing is possible. The second maker could lower the price charged for the particular box sold to the consumer down to $0.50, but keep the prices the firm charges for other boxes up above their production cost of $1.50, ensuring that the firm would not be forced to reduce output and overall profits in order to compete for the consumer’s business. If the first maker were to personalize prices as well, and therefore would not need to reduce prices on all units in order to reduce the price charged to the consumer for a box of cookies, then the first maker would respond to the price cut by the second maker with a price cut of its own, perhaps down to $1.25 (assuming that the first maker’s cost of production of the particular box of cookies that the first maker wishes to sell to the consumer, like the second maker’s cost, is only $0.25). The second maker now could not respond with an additional price cut, because to confer on the consumer a greater surplus than what the consumer would get from purchasing the first box at $1.25, the second maker would need to charge a price below the second maker’s production cost of $0.25; making an additional price cut unprofitable. But the consumer would nevertheless have benefitted from the advent of personalized pricing in this competitive market, because the competition made possible by personalized pricing would have driven the price paid by the consumer for the first box down from $2 to $1.25.

(Absent such competitive effects, the harm of personalized pricing to consumers is of course straightforward, because then personalized pricing leads only to a raising of prices up to each consumer’s maximum willingness to pay. Suppose that, to keep the consumer from buying cookies from the second maker, the first maker under uniform pricing had been unable to raise the uniform cookie price above $2 for the firm’s other customers, even though those customers value a box of cookies at $10 and would therefore be willing to pay up to $7 before preferring to buy the second maker’s cookies (which these customers value at $5) at a price of $2. Personalized pricing would allow the first maker to raise price to $7 for its other customers, without raising price to the consumer who only places a value of $6 on the cookies. Those other customers are therefore badly harmed by the advent of personalized pricing. Moreover, if the second maker is unable to lower prices—even with personalized pricing technology—because the second maker’s production costs for all units is $2, for example, instead of $0.25 or $1.50, then there will be no personalized price competition to sell to the consumer that might offset the harm caused by the charging of higher prices to other customers.)

The fact that the introduction of personalized pricing could increase the level of competition in the market, and that increase might result in a partial or complete offset of the consumer-harmful effects of
2. **The Principal Economic Defenses of Price Discrimination Ignore the Harmfulness of Personalized Pricing to Consumers**

This result contrasts with the generally favorable way in which economists treat personalized pricing, a contrast that has three sources. First, when economists celebrate personalized pricing, they celebrate not the effects of personalized pricing on consumers, but the effects of personalized pricing on overall surplus, inclusive of both firm profits and consumer surplus, which is sometimes called total surplus.\(^66\) Firms that do not personalize prices charge group-based prices instead, meaning different prices to different groups of consumers, but uniform prices to all consumers within a given group. In an effort to raise prices to consumers in a particular group who are willing to pay more, firms may charge within-group uniform personalized pricing, cannot, however, serve as the basis for an argument that personalized pricing can be good for consumers. For at the new level of competition created by personalized pricing, each firm will use personalized pricing to charge the highest possible prices—given the new, more competitive environment—to consumers. And that in turn means that personalized pricing minimizes the benefit to consumers of whatever greater level of competition personalized pricing makes possible. That in turn means that consumers are better off achieving any given level of competition through a combination of uniform pricing and greater antitrust enforcement aimed at improving the overall competitive dynamic in the market, than through the application of personalized pricing.

In other words, if personalized pricing happens to promote competition, the first cookie maker will charge $1.25 after competing on personalized prices with the second cookie maker, not the $1.00, or even $0.25, that the first maker could afford to charge given its costs. And personalized pricing will allow the first maker to maintain that $1.25 price even if the firm must charge lower prices to other customers to compete for their business against different rivals. Compare that to a world in which, starting with the original uniform prices charged by the cookie makers, antitrust authorities were to promote competition in the market, perhaps by compelling the first maker to disclose its secret recipe to competitors and forcing the first maker to turn its production facilities into an open platform. The second maker, whose inferior recipe was only valued at $5 by the consumer, and whose production costs on some units were as high as $1.50, in excess of the $0.25 cost of production of the first firm, could now produce cookies with a $6 value to the consumer (and with an even greater value to others) at the same cost as the first firm. Because now the second firm would be offering a product that the first firm’s customers value as highly as the first firm’s product, competition would drive the uniform price of the cookies sold by both firms down to production cost of $0.25, and because prices would be uniform, all customers would gain, making consumers as a group much better off than under the competition that arrives incidental to the adoption of personalized pricing.


\(^66\) See, e.g., POSNER, supra note 21, at 80 n.37; VARIAN, supra note 11, at 445–47.
prices that price low-willingness-to-pay consumers out of the market entirely, even when those low-willingness-to-pay consumers would be willing to pay prices that cover the costs of producing the product for them. 67

An airline charging a uniform price to the group consisting of last-minute fliers prefers to let some seats go unfilled, for example, even though the marginal cost of providing access to those remaining seats is near zero, in order to charge a higher price to the last-minute fliers who do still buy at higher prices. 68 That reduces total surplus, by precluding purchases by fliers who have a low willingness to pay, but who are nevertheless willing to pay more than the costs of production. 69 Economists celebrate personalized pricing because the practice breaks this tradeoff between profits and total surplus. 70 Personalized pricing allows firms to charge high prices to those with a high willingness to pay and low prices to those with a low willingness to pay, allowing the firm to profit without pricing low-willingness-to-pay consumers out of the market and therefore without reducing total surplus. 71

While personalized pricing may produce more total surplus than does group-based pricing, personalized pricing does not, however, produce more consumer surplus than does group-based pricing. Indeed, personalized

---

67 See Varian, supra note 11, at 429–33.


69 The reduction in total welfare is sometimes called “deadweight loss.” See Hovenkamp, supra note 1, at 20, 86.

70 See Varian, supra note 11, at 445–47.

71 See id. Economists recognize, however, that personalized pricing can induce firms to overinvest in product development in pursuit of the greater profits associated with the personalized pricing of a product relative to the uniform pricing of the product, and that this overinvestment can reduce total surplus, by converting some of that surplus into increased, and unnecessary, research and development costs. See Vincenzo Denicolò, Do Patents Over-Compensate Innovators?, 22 Econ. Pol’y 680, 690 (2007) (modeling the relationship between expected profits and research and development expenditure). By increasing profits, personalized pricing may also cause firms to waste resources, and reduce total surplus, in trying to harm sellers of competing substitute products in order to protect those higher profits. See Hovenkamp, supra note 3, at 772–73. These problems temper the positive effect of personalized pricing on total surplus. A further tempering effect comes from the cost of implementing and maintaining personalized pricing itself. The acquisition and analysis of consumer data, not to mention the creation of an information technology infrastructure that permits the delivery of personalized prices to consumers, are all necessary to implement personalized pricing, and these are costly, further reducing total surplus.

Economists also recognize that price discrimination can impose search costs on consumers, as consumers seek to avoid the high end of the firm’s pricing schedule and to find units sold by the firm at the low end of that schedule. See Varian, supra note 4, at 33. These costs reduce total surplus. There should be no search costs associated with the peculiar form of price discrimination that is personalized pricing, however, because the firm’s ability accurately to identify each consumer and charge that consumer a personalized price implies that consumers will be unable to take steps to escape the prices personalized to them and so will not waste resources attempting to do so. But to the extent that firms’ technology is imperfect, and they succeed only at approximating personalized pricing, there may be scope for consumers to take steps to confuse personalized pricing systems—and obtain lower prices thereby—and the resources that consumers expend on doing so would count as a cost of personalized pricing and would therefore further reduce total surplus.
pricing drives consumer surplus almost to zero. Because consumer surplus, and not total surplus, matters to antitrust, economists’ ardor for the total-surplus-expanding effects of personalized pricing is quite irrelevant to antitrust policy and obscures the conflict between personalized pricing and antitrust’s mission to protect consumer welfare.72 The aim of personalized pricing is to set the prices charged to all buyers, including low-willingness-to-pay buyers, as close as possible to the maximum that each buyer is willing to pay, ensuring that the surplus enjoyed by each buyer, including any low-willingness-to-pay buyer who is able for the first time to buy as a result of the personalization, is nearly zero.73 However much personalized pricing may expand total surplus, personalized pricing ensures that the entire expansion in surplus goes to firms in the form of profits, along with any share of the existing surplus that consumers would have enjoyed under group-based pricing. To return to the airfare example, personalized pricing fills every last seat on the plane, in stark contrast to group-based pricing, but each passenger pays such a high personalized price that each passenger feels that the price is so high that the trip is very nearly not worthwhile. That is true no matter how urgent the passenger’s need to travel, because personalized prices adjust to reflect the urgency that each passenger places on the trip. Because antitrust’s mission is to protect consumer surplus, not total surplus, a practice that increases the gains from trade, but allows only firms, and not consumers, to capture those gains, merits no antitrust deference.74

The second source of the generally favorable treatment of personalized pricing by economists is the belief of some economists that the greater ability to extract value from consumers made possible by personalized pricing may be necessary to allow firms to cover their costs of production, particularly large fixed costs.75 This cost-coverage view is closely related to the view, just discussed, that personalized pricing permits firms to sell to buyers who might otherwise be priced out of the market.76 According to the

72 See Woodcock, supra note 7, at 1389–90; HOVENKAMP, supra note 3, at 769 (“[F]irst degree price discrimination is often said to be as efficient as perfect competition, even though one result of perfect price discrimination is that customers are far poorer and the seller far richer.”).
73 See supra Section I.A.1.
76 See HOVENKAMP, supra note 3, at 769.
cost-coverage view, firms with very high fixed costs may not be able to
generate enough revenue through group-based pricing in order to cover their
costs.  
77 Personalized pricing provides a solution, the argument goes, by allowing the firm both to extract additional revenues from inframarginal consumers and to bring more consumers into the market and extract further revenues from them as well.  
78 The trouble with this view is that it is not clear that group-based pricing is actually unable to cover all the fixed costs of production.  
79 The assumption that group-based pricing cannot cover costs implies that the economy as it exists today, on the eve of the personalization of prices, is under-investing in production.  
80 But there is no reason to suppose that is so.  
81 Preventing personalized pricing from spreading across the economy would not reduce the revenues available to firms to cover costs, but only prevent an expansion in those revenues.  
82 To defend personalized pricing on cost-coverage grounds therefore requires an argument in favor of expanding the revenues available to firms relative to current levels, an argument that has not for the most part been made.  
83 The third source of the generally favorable treatment of personalized pricing by economists is that economists usually mean imperfect, or third-degree, price discrimination when they celebrate personalized pricing, rather than true personalized pricing, which economists call first-degree, or perfect, price discrimination.  
84 Third-degree price discrimination, which is almost universal today, is group-based pricing: the division of consumers into groups and the charging of uniform prices tailored to extract the maximum profit from each group.  
85 Economists like third-degree price discrimination

---


78 See id.

79 See Woodcock, supra note 7, at 1402–03.

80 See id.

81 See id.

82 See id.


85 See A.C. Pigou, The Economics of Welfare 279 (Palgrave Macmillan 2013) (4th ed. 1932) (“A third degree would obtain if the monopolist were able to distinguish among his customers n different groups, separated from one another more or less by some practicable mark, and could charge a separate monopoly price to the members of each group.” (emphasis omitted)). For the prevalence of third-degree price discrimination, see HOVENKAMP, supra note 3, at 767 (“Sporadic price discrimination is an everyday occurrence in competitive markets.”); Varian, supra note 4, at 3 (describing third-degree price discrimination as “perhaps the most common form of price discrimination; examples are student discounts, or charging different prices on different days of the week”). This prevalence is particularly clear given that second-degree price discrimination should count as a form of third-degree price
because it has the potential to increase consumer surplus relative to uniform pricing across all consumers of a product. 

Suppose, for example, that a firm becomes able to segment its market into two groups of consumers: those who currently buy at the prevailing uniform price and those who are willing to pay the cost of producing additional units of the product but who cannot afford to buy the product at the prevailing price. The firm might then start to charge two prices, the old price to existing customers, and a new lower price to low-willingness-to-pay customers designed to induce some of them to start buying the product. Because, in a third-degree-price-discrimination scheme, the firm will charge the new lower price uniformly to all the members of the low-willingness-to-pay group, some inframarginal consumers within that group will enjoy a consumer surplus at that new lower price. 

Because the existing consumers continue to pay the same price as before, their consumer surplus will not change, and so the aggregate consumer surplus enjoyed by all consumers will increase thanks to implementation of the third-degree price discrimination scheme. Of course, the firm may find it profitable to take advantage of the firm’s power to segment high-willingness-to-pay consumers into a separate group to raise the price charged to that group, instead of keeping it unchanged. That would drive some high-willingness-to-pay consumers out of the market, eliminating their consumer surplus, and would further reduce the consumer surplus of the inframarginal high-willingness-to-pay consumers who remain in the market. These consumer surplus reductions might offset the gains in consumer surplus associated with the lower price charged to low-willingness-to-pay consumers. But gains remain possible, making economists reluctant to condemn third-degree price discrimination out of

discrimination. Second-degree price discrimination is a seller’s structuring of a product or price schedule to induce consumers to self-sort based on willingness to pay. See Stole, supra note 12, at 4. It ought to be treated as a subcategory of third-degree price discrimination because the self-sorting induced by the practice results in group-based pricing. The only difference between second-degree price discrimination and archetypical third-degree price discrimination is that in second-degree price discrimination the price charged, or product offered, to group members is constrained by the need to use the price or product as a sorting mechanism.

See Klein & Wiley, supra note 84, at 612. This point is also discussed briefly supra in the text accompanying note 55.

See Kathleen Carroll & Dennis Coates, Teaching Price Discrimination: Some Clarification, 66 S. ECON. J. 466, 472 (1999) (stating that under third-degree price discrimination “the group members will derive consumer surplus . . . that the firm cannot extract”); Varian, supra note 4, at 3 (observing that under third-degree price discrimination within-group prices are constant). For the definition of inframarginal consumers, see supra text accompanying note 57.

See Klein & Wiley, supra note 84, at 612.

See id.

See Carroll & Coates, supra note 87, at 472–73 (stating that third-degree price discrimination may be “not only less efficient than first-degree price discrimination, it is also less efficient than no price discrimination”).
hand.\textsuperscript{91} Personalized pricing lacks third-degree price discrimination’s potential to benefit consumers because under personalized pricing low-willingness-to-pay consumers who are brought into the market for the first time by the personalization of prices enjoy almost no consumer surplus. Firms personalize prices as close as possible to the maximum willingness to pay of each consumer, including the low-willingness-to-pay consumer who is priced into the market, and so personalized pricing generates no gains for new, low-willingness-to-pay consumers with which to offset the losses of inframarginal consumers who would have bought at a non-personalized price.\textsuperscript{92} Under personalized pricing, all consumers pay the highest possible prices and enjoy almost no consumer surplus.\textsuperscript{93} As advances in information technology allow firms to segment consumers and their purchases into increasingly small groups, the third-degree price discrimination prevalent today will come increasingly to resemble personalized pricing.\textsuperscript{94} At each step, consumer surplus may rise, or fall, because the effects of third-degree price discrimination are ambiguous, but at the last step, from a uniform price charged across two purchases to a unique price charged for a single purchase alone, consumer surplus must fall, and fall to zero.\textsuperscript{95} That step, from a world of group-based, uniform pricing, to personalized pricing, unambiguously harms consumers.\textsuperscript{96}

To ensure that in hastening to condemn personalized pricing antitrust does not preclude third-degree price discrimination, and its potential benefits to consumers, courts must require plaintiffs challenging personalized pricing under Section 2 to prove that the defendant is personalizing prices to individual consumers on a unit basis.\textsuperscript{97} In general, evidence of

\textsuperscript{91} See Klein & Wiley, supra note 84, at 612.
\textsuperscript{92} See VARIAN, supra note 11, at 445–47.
\textsuperscript{93} See supra Section I.A.1.
\textsuperscript{94} See Niejadlik, supra note 6, at 3 (“Rather than relying on static product bundles at pre-determined prices, we envision a system that develops a customized offer at the right price for each customer. To realize this vision, fundamental changes are necessary in the way we approach pricing, revenue management, and merchandizing. These systems must move beyond industry constraints and rigid data silos to become more flexible and utilize new technologies to be successful.”).
\textsuperscript{95} For the effect of personalized pricing on consumer surplus, see supra Section I.A.1. Third-degree price discrimination transforms into personalized pricing only once firms are able to segment consumers into groups of one for each individual unit purchased by the consumer and to charge a personalized price for each such unit. If each consumer buys only one unit of a particular good, prices for that good are personalized once firms succeed at segmenting consumers into groups of one. When consumers buy multiple units of a particular good, however, personalized pricing exists only if each consumer is charged the consumer’s maximum willingness to pay for each unit that the consumer buys. See Klein & Wiley, supra note 84, at 612. In this multiple-unit-per-individual-consumer context, segmenting consumers into groups of one will not be enough to achieve personalized pricing, so long as the consumer is still charged a uniform price for all units that the consumer purchases.
\textsuperscript{96} See VARIAN, supra note 11, at 445–47.
\textsuperscript{97} For the significance of personalizing prices for each unit sold, see supra note 95.
personalization will not be hard to find in cases in which the activity is genuinely taking place. Personalized pricing requires the use of information technology to identify the consumer at the point of sale and the use of datasets to determine the consumer’s reservation prices. This requires a substantial infrastructure that is difficult to hide. Personalization can also be inferred from data on the actual prices charged by a firm for different units of the same product.

Additional proof that the defendant is tailoring prices to the maximum that consumers are willing to pay, as opposed to some more equitable price level, should not be required, however, because any profit-maximizing firm will seek to charge the highest possible prices, and when prices are set on a personalized basis, the highest possible prices are the maximum prices that consumers are willing to pay. Of course, in the absence of perfect information on consumers, firms will fail always to charge the absolute maximum that each consumer is willing to pay, but the fact that a firm has chosen to charge a personalized price for each unit is evidence that the firm’s goal is to charge a price equal to the consumer’s willingness to pay and therefore evidence enough of consumer-harmful conduct for antitrust purposes.

3. Arbitrage Prevention Harms Competition

There is a long and perhaps legitimate tradition in antitrust, and economics more generally, of thinking of price as a byproduct of the level

---

98 For an example of the data and econometric methods required to attempt personalized pricing, see BENJAMIN REED SHILLER, FIRST-DEGREE PRICE DISCRIMINATION USING BIG DATA 1–4 (Apr. 9, 2014) (unpublished manuscript), http://benjaminshiller.com/images/First_Degree_PD_Using_Big_Data_Apr_8_2014.pdf; Niejadlik, supra note 6, at 11 (observing that personalized pricing will require “new advances and techniques in Artificial Intelligence and Machine Learning” as well as “massive amounts of historical behavioral data”).

99 See Lynn DeLain & Edward O’Meara, Building a Business Case for Revenue Management, 2 J. REVENUE & PRICING MGMT. 368, 370 (2004) (discussing the systems required for implementing a “revenue management” system of the kind used by the hospitality industry and estimating costs as ranging from $3 million to $10 million in the first two years).

100 Of course, any differences would have to be adjusted for differences in production cost. See HOVENKAMP, supra note 3, at 765 (“[T]echnically, two sales are discriminatory when they have different ratios of price to marginal cost.”). But in some cases, such as when consumers buy multiple units of a good at the same time, cost differences can be presumed small and information on unit-by-unit price differences may be sufficient for an inference of personalized pricing.

101 See VARIAN, supra note 11, at 446. Antitrust makes a similar assumption about the height of the uniform prices charged by cartels and monopolies. See United States v. Microsoft Corp., 253 F.3d 34, 57 (D.C. Cir. 2001) (“If monopoly power has been acquired or maintained through improper means, the fact that the power has not been used to extract [a monopoly price] provides no succor to the monopolist.”) (internal quotation marks omitted); United States v. Socony-Vacuum Oil Co., 310 U.S. 150, 222–23 (1940) (declaring “immaterial” to a price fixing violation whether prices were “fixed at the fair going market price”).

102 See supra note 41 and accompanying text.
of competition in markets, rather than as a cause. If a pricing practice harms consumers, the argument goes, that can only be because competition is failing to drive prices down, and if antitrust wishes to solve the problem, antitrust must target any anticompetitive practices that have undermined competition, rather than the pricing practice itself. According to this view, antitrust should treat the competitive disease, not the pricing symptom. This view precludes a monopolization claim targeting personalized pricing itself, but does not prevent a monopolization claim targeting the underlying anticompetitive practice that makes personalized pricing possible.

That underlying anticompetitive practice is the prevention of arbitrage. In order for personalized pricing to work, the firm must be able to prevent low-willingness-to-pay consumers, to whom the firm charges low prices, from making profits by reselling the units they buy from the firm at low prices to consumers who are willing to pay high prices and who would otherwise buy at high personalized prices directly from the firm. By charging these “high-price consumers” only very slightly less than the high prices that the firm would personalize to them, the “low-price consumers” engaged in resale can induce high-price consumers to buy resold units, rather than units sold directly by the firm, while still earning a profit. If the firm fails to prevent this “arbitrage” of its personalized prices, then high-price

---

103 See POSNER, supra note 21, at 113–15.
104 See HOVENKAMP, supra note 1, at 322 (“Antitrust . . . is designed to be a market alternative to price regulation, not merely price regulation by another name.”). The most notable exception is below-cost, also known as predatory, pricing. See generally id. at 370–410 (discussing “predatory and other exclusionary pricing”).
105 See POSNER, supra note 21, at 114 (arguing that if “exclusionary practices” are the cause of “supracompetitive prices” then “the practices can be enjoined or punished”).
106 See HOVENKAMP, supra note 1, at 316 (“Most price discrimination is concerned with extraction, not exclusion. That is, its purpose and generally its effect is not to exclude anyone from the market, but rather to enable a seller to earn higher profits . . . .”). Price discrimination has been treated as in itself anticompetitive conduct at least once, in United States v. United Shoe Mach. Corp., 110 F. Supp. 295 (D. Mass. 1953), aff’d per curiam, 347 U.S. 521 (1954), but the anticompetitive effects at issue in that case are distinct from the effects of personalized pricing that are the subject of this Article. See infra text accompanying note 226. For the argument that antitrust should treat the personalization of prices itself as a standalone violation of Section 2 of the Sherman Act, though not as a violation of Section 2’s prohibition on monopolization, see infra Part II.
107 See HOVENKAMP, supra note 1, at 148 (“[A]rbitrage occurs when the buyers who pay a low price resell the product to buyers asked to pay a high price. If the monopolist cannot prevent arbitrage, then price discrimination may not work.”); Marius Schwartz, Third-Degree Price Discrimination and Output: Generalizing a Welfare Result, 80 AM. ECON. REV. 1259, 1260 (1990) (stating that “with perfect arbitrage, of course, price discrimination would be impossible”).
108 See KREPS, supra note 12, at 306.
109 See POSNER, supra note 21, at 83.
consumers will not buy from the firm, but instead from low-price consumers acting as resellers.\textsuperscript{110} All consumer demand will be satisfied through sales of the firm’s product to low-price consumers, part of which product will be consumed by low-price consumers and part resold to high-price consumers.\textsuperscript{111} The firm will therefore effectively find itself selling its entire inventory at the lowest price the firm personalizes to consumers, and will therefore give up on personalized pricing and revert to uniform pricing, which will allow the firm to choose a higher uniform price at which to sell its product.\textsuperscript{112} The firm cannot prevent arbitrage simply by refusing to sell at all to low-price consumers, because then the firm would sell the product only at the high price to high-price consumers, and the firm would then no longer be engaged in personalized pricing.\textsuperscript{113} The only way for the firm to prevent arbitrage is to sell at the low price to low-price consumers only in an amount equal to the low-price consumers’ personal needs and to refuse to sell any additional units that low-price consumers might use for resale. This refusal of the firm to permit low-price consumers to buy for the purpose of resale is the anticompetitive conduct that brings personalized pricing within the ambit of the antitrust laws.\textsuperscript{114} Personalized pricing itself in fact constitutes a refusal to sell to low-price consumers for resale, making personalized pricing at once a symptom of competitive disease and the disease itself.\textsuperscript{115} Personalized pricing amounts to a refusal to sell for resale because truly personalized prices must automatically adjust upward to account for a buyer’s intent to resell a unit, depriving the buyer of the ability to profit from resale and thereby effectively denying the buyer access to the good for resale purposes. Personalized prices adjust upward when a buyer intends to use a good for resale, as opposed to personal consumption, because a buyer’s willingness to pay for goods that the buyer intends to resell must include the amount of the profit that the buyer will make from resale. Because firms personalize prices to equal each consumer’s maximum willingness to pay for each unit the consumer purchases, the personalized price a firm charges to a buyer who intends to

\begin{itemize}
\item \textsuperscript{110} See \textit{Kreps}, supra note 12, at 306.
\item \textsuperscript{111} See \textit{Carroll & Coates}, supra note 87, at 474–75.
\item \textsuperscript{112} See id. Under personalized pricing with arbitrage, not only will the firm sell its entire inventory at a low price, but all buyers will also buy at that price, so long as resellers compete heavily against each other in reselling to high-price buyers. If there are resale costs, however, then price will not be driven all the way down to that low price, but only down to a price that includes both that low price and those resale costs. See \textit{Hovenkamp}, supra note 1, at 627 (discussing the cost of resale). Regardless the price paid by buyers, under personalized pricing with arbitrage the firm will always earn a price equal to the price it charges to low-price consumers, because those low-price consumers will buy up the firm’s entire inventory at the low price personalized to them.
\item \textsuperscript{113} See \textit{Hovenkamp}, supra note 1, at 148.
\item \textsuperscript{114} See \textit{Posner}, supra note 21, at 234 n.62 (“recognizing that the prevention of arbitrage . . . could be regarded as exclusionary . . . from the standpoint of secondhand dealers”).
\item \textsuperscript{115} See supra text following note 105.
\end{itemize}
resell, in contrast to the personalized price a firm charges to a buyer who buys for personal consumption, should be greater by the amount of profit the reselling buyer expects to earn from resale of the good. Courts have long recognized that charging a price that a buyer cannot afford to pay is tantamount to refusing to sell a product to the buyer.116 So personalized pricing is its own restraint on competition from resellers, and satisfies both the consumer harm and anticompetitive conduct requirements.117

Personalized pricing is its own restraint on competition, however, only so long as the firm personalizes prices accurately. If the firm fails accurately to identify the maximum that each consumer is willing to pay, then the prices the firm personalizes to resellers will not deprive resellers of all of the profits of resale, and may therefore fail to preclude resellers from buying, forcing the firm to resort to additional means of denying resellers access to the firm’s product. As discussed above, cases of imperfectly-implemented personalized pricing can still satisfy the consumer harm requirement for monopolization claims.118 In such cases, the additional means employed by firms to refuse to sell to resellers constitute the anticompetitive conduct required for a monopolization claim.

There are two main ways in which firms can take additional steps to refuse to sell to resellers. The first is simply to refuse outright to sell units to consumers whom the firm believes will use the units for arbitrage, instead of for personal consumption. Supermarkets do this when they place quantity caps on the purchase of discounted goods, forbidding a buyer of discount ice cream, for example, from buying more than four pints at the discounted price.119 When supermarkets combine these quantity limits with the personalization of discount coupons that supermarkets print out for loyalty club customers at checkout, the quantity limits prevent arbitrage of what amounts to personalized prices for coupon items.120

The second means firms may employ to prevent purchase for resale is

116 See e.g., Fishman v. Estate of Wirtz, 807 F.2d 520, 541 (Court of Appeals, 7th Circuit 1986) (“Agreeing to deal on unreasonable terms is merely a type of refusal to deal.”). Of course, whether the charging of a high price is justified, like the broader question whether a refusal to deal of any form is justified, depends on whether the other elements of a monopolization claim are satisfied, including the requirement of consumer harm—which takes the cost to the firm of providing access to the buyer into account—and whether the general right to refuse to deal applies to save the conduct. See supra text accompanying note 45. For the argument that personalized pricing is not justified by costs, see supra text accompanying note 75; Section I.A.1; Section I.C.

117 For the consumer harm associated with personalized pricing, see supra Section I.A.1.

118 See supra text accompanying note 102.

119 See Brian Wansink et al., An Anchoring and Adjustment Model of Purchase Quantity Decisions, 35 J. MARKETING RES. 71, 74 (1998) (arguing that this practice also uses the psychology of anchoring to induce consumers to buy up to the quantity limit).

120 See COUNCIL OF ECON. ADVISORS, EXECUTIVE OFFICE OF THE PRESIDENT OF THE UNITED STATES, supra note 11, at 12; 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, 52 (2014).
to impose resale restrictions either in the grant of title to the product to the buyer or as part of a separate contract. Explicit restraints on the resale of personal or intellectual property often run afoul of the general judicial distaste for restraints on the alienation of property, a distaste that operates independently of the antitrust laws.121 For example, in Kirtsaeng v. John Wiley & Sons, Inc., the Supreme Court applied the first-sale doctrine in copyright law to refuse to enforce a publisher’s restriction on resale of textbooks, a restriction that supported the publisher’s efforts to charge higher prices to students in rich countries.122 The Court emphasized the “importance of leaving buyers of goods free to compete with each other when reselling or otherwise disposing of those goods.”123 The policy against restraints on alienation probably applies both to restrictions placed in grants of title to personal or intellectual property, such as the prohibition at issue in Kirtsaeng, and to restrictions imposed in contracts of sale of personal or intellectual property.124 The courts similarly condemn restraints on the alienation of real property, and in that context also do so regardless whether the restraints are contained in the grant or extracted from the buyer in the form of a separate contractual promise.125

But sometimes firms can skirt these rules and prevent resale anyway, as the defendant in United States v. United Shoe Machinery Corp., a case which will appear again shortly as authority for the treatment of personalized

121 See Impression Products v. Lexmark Intern., 137 S. Ct. 1523, 1531–32 (2017) (referring to “the common law principle against restraints on alienation”).
122 See Kirtsaeng v. John Wiley & Sons, Inc., 133 S. Ct. 1351, 1355–56, 1363 (2013). The restriction placed by the publisher in each of its books read: “Exportation from or importation of this book to another region without the Publisher’s authorization is illegal and is a violation of the Publisher’s rights.” Id. at 1356.
123 Kirtsaeng, 133 S. Ct. at 1363; see also Impression Products, 137 S. Ct. at 1529.
124 For ambiguity on the question whether the policy against restraints on alienability applies to void contract-based prohibitions on resale, see Impression Products, 137 S. Ct. at 1533 (“Once sold, the Return Program cartridges passed outside of the patent monopoly, and whatever rights Lexmark retained are a matter of the contracts with its purchasers, not the patent law.”). For the view, contrary to that taken here, that the policy against restraints on alienation does not prevent contract-based prohibitions on resale, see Tim Scott, The Availability of Post-Sale Contractual Restrictions in the Wake of Impression Products, Inc. v. Lexmark, 581 U.S. 1523 (2017), SSRN Scholarly Paper ID 3218569 250 (Social Science Research Network), Jul. 23, 2018 (“A sale or purchase of a good can be accompanied by a promise not to use that good in a particular way, or only in a particular field or geography. Such a promise would be enforceable against the promisor by way of injunction or damages.”). It should be noted that the law is considerably more tolerant of restraints on alienation that fall short of prohibiting resale outright, at least in the contract context. See Alfred C. Server & William J. Casey, Contract-Based Post-Sale Restrictions on Patented Products Following Quanta, 64 HASTINGS L.J. 561, 623–25 (2012–2013); Leegin Creative Leather Products, Inc. v. PSKS, Inc., 551 U.S. 877, 907 (2007) (ruling that restrictions on resale price are not to be condemned per se).
pricing as monopolization, appears to have done. Instead of selling its shoemaking machinery to customers outright, and prohibiting resale, United Shoe chose instead to lease the machinery to its customers, and to place no-subletting clauses in the leases. This allowed United Shoe to avail itself of a traditional exception to the policy against restraints on alienation, which allows restraints on the resale of leasehold interests. The fact that the government did not challenge the no-subletting clauses in United Shoe on restraint-on-alienation grounds suggests that the tactic was successful.

Courts are far less averse to prohibitions on the resale of services than they are to prohibitions on the alienability of property, with the result that prohibitions on the resale of services, in the form of contractual prohibitions on the assignment of service contracts, are quite common. Courts enforce anti-assignment clauses, and although courts may limit the remedy to money damages, those damages, in the form of the service provider’s lost profits due to resale, are sufficient to render resale of service rights a loss-making business. The airlines are therefore free, for example, to permit only the named ticketholder to fly, thereby preventing ticket buyers from reselling the right to fly to others. Similarly, hospitals are free to prevent patients from assigning their rights to medical services to other patients, and thereby to preclude insured patients from reselling, to uninsured patients, the


127 Id. at 340–41, 344, 349; HOVENKAMP, supra note 3, at 386. For the exception for leasehold interests, see AMERICAN LAW INSTITUTE, supra note 125, at 148 (“Forfeiture restraints which give to the landlord an option to terminate the tenant’s interest if the tenant alienates without the landlord’s consent are widely used in leases.”).

128 For the enforceability of anti-assignment clauses, and limitation of the remedy to money damages, see EDWARD ALLAN FARNSWORTH, CONTRACTS 717 (3d ed. 1999). The money damages suffered by the firm when a low-price consumer resells the right to the firm’s services to a high-price consumer would be the lost profits suffered by the firm as a result of not being able to sell the service directly to the high-price consumer at the high price. A court would likely characterize these as consequential damages, which are in general recoverable in breach of contract actions. See DOUGLAS LAYCOCK, MODERN AMERICAN REMEDIES: CASES AND MATERIALS 54 (4th ed. 2010) (stating that “the trend is certainly to award consequential damages more freely”). Given the information requirements associated with implementing personalized pricing, the firm would be able to prove the lost profits with the requisite level of certainty. Cf. FARNSWORTH, supra, at 718 (stating that “it might not be easy to prove damages for the breach [of an anti-assignment clause] with sufficient certainty”). It should be noted that even in the absence of an express contractual limit on assignment, courts will refuse to permit assignments that would impose a substantial burden on the service provider. See id. at 715. Liberal application of this rule would make resale of services impossible regardless whether a firm takes steps to limit assignment, and would therefore allow firms to personalize service prices without having to engage in anticompetitive conduct and therefore without violating the antitrust laws. But courts have applied this limitation sparingly. See id.

129 Christopher Elliott, Why Can’t Airline Tickets Be Transferable?, USA TODAY (Dec. 23, 2013), http://www.usatoday.com/story/travel/flights/2013/12/23/airline-ticket-transfer-name-change/4174145/ (“If name changes were allowed, then passengers could resell their tickets anytime, subverting an airline’s ability to raise ticket prices as the flight becomes full.”).
insureds’ rights to medical services supplied at the low rates negotiated on their behalf by insurers. 130

4. The Refusal to Permit Trade in Purchase Rights as Arbitrage Prevention

Despite its crippling effect on competition between the firm and low-price buyers who wish to act as resellers, the prevention of arbitrage may not be enough to satisfy the anticompetitive conduct requirement of the antitrust laws, for not all conduct that actually harms competition satisfies that requirement.131 There is an exemption for conduct that improves products.132 All product improvements harm competition, because consumers prefer improved products, and that puts competitors which have failed to innovate at a disadvantage.133 Antitrust generally will not, however, treat product-improving conduct as anticompetitive, because product improvements are the main source of welfare increases for consumers in the economy.134 The courts fear that the process of balancing the benefits to consumers of product improvements against consumer losses from the resulting decline in competition and increase in prices is prone to error, and could result in mistaken antitrust condemnation of consumer-beneficial conduct.135 So the courts simply exempt product-improving conduct, no matter how harmful to competition, from the antitrust laws.136

Many practices that prevent arbitrage simultaneously improve the product offered by the firm, which suggests that many instances of arbitrage prevention may fall within the exemption for product-improving conduct. Clothes-washing machines, for example, are an improvement upon the washing board, but washing machines are heavy, driving up transportation costs and potentially preventing low-price consumers from reselling

130 See Erin C. Fuse Brown, Irrational Hospital Pricing, 14 HOUS. J. HEALTH L. & POL’Y 13, 24–25 (2014) (describing price discrimination by hospitals between the insured and uninsured and observing that at one hospital the cost of a joint replacement was $18,000 for an insured patient but $220,000 for an uninsured patient).

131 See HOVENKAMP, supra note 3, at 364 (“The problem is that most efficient practices are ‘exclusionary’ in the sense that they injure rivals or make entry more difficult.”).

132 See id. at 365 (“[M]ost innovations and expansions by dominant firms that injure rivals are not s. 2 violations, even though they do have the effect of expanding or maintaining monopoly power.”).


134 See id. at 2313.

135 See id. at 2313–14.

136 See United States v. Aluminum Co. of Am., 148 F.2d 416, 430 (2d Cir. 1945) (observing that vanquishing competitors through “superior skill, foresight and industry” is no violation of the antitrust laws); DANIEL J. GIFFORD & ROBERT T. KUDRLE, THE ATLANTIC DIVIDE IN ANTITRUST AN EXAMINATION OF US AND EU COMPETITION POLICY 28 (2015) (“[M]onopoly is generally tolerated when legally acquired on the general rationale of promoting innovation even in specific instances where such a prospect is far-fetched.”); F.M. SCHERER & DAVID ROSS, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE 613–14 (3d ed. 1990).
winding machines to high-price consumers. The firm that first introduced the washing machine to market might plausibly be said to have taken steps to prevent arbitrage in the market for clothes-washing tools, but antitrust would never treat such conduct as anticompetitive, because washing machines are a genuine product improvement relative to washing boards and therefore fall within the ambit of the product-improvement exemption.

The spread of three-dimensional-printing-driven personalization of product design threatens greatly to expand the set of arbitrage-preventing practices that fall within the product-improvement exemption. Firms can now tailor shoes, bite guards, and many other products precisely to fit the bodies of their purchasers. This tailoring prevents arbitrage, because the firm will tailor any additional units that low-price consumers buy for resale to the low-price consumers, not to the high-price consumers to whom the low-price consumers wish to transfer the units, and the high-price consumers will not be willing to buy units that do not fit them. Because design personalization makes products better, however, antitrust will not recognize as anticompetitive the limits that design personalization places on arbitrage.

Even arbitrage-prevention techniques that seem at first glance to have no bearing on product design can have product-improving effects that bring them within the ambit of antitrust’s product-improvement exemption. The airlines’ restriction of travel to named ticketholders not only prevents arbitrage, for example, but also improves security, by allowing governments to keep track of who is flying. The restriction of hospital care to named purchasers ensures that each patient receives customized care. Indeed, virtually all arbitrage-prevention mechanisms have the plausible product-improvement justification that the mechanisms improve the product by allowing the firm to maintain quality control, saving consumers the expense of having to inspect goods purchased from low-price consumers who may have damaged the goods in the process of handling and storing them for

---


138 See HOVENKAMP, supra note 1, at 296, 300 (discussing the antitrust safe harbor for innovations).

139 See Nikolaus Franke et al., Testing the Value of Customization: When Do Customers Really Prefer Products Tailored to Their Preferences?, 73 J. MARKETING 103, 103 (2009).


141 See supra note 136.

142 See Elliott, supra note 129.
resale.\textsuperscript{143}

Despite appearances, the capacity of arbitrage prevention to improve products does not ultimately block antitrust from treating arbitrage prevention as anticompetitive conduct, because for virtually all forms of arbitrage prevention there is a way to decouple any product-improving effects from the restriction on arbitrage, allowing firms to permit resale while still implementing associated product improvements. The ability to decouple improvements from resale restrictions brings arbitrage prevention out of the antitrust exemption for product-improving conduct, since the exemption applies only if the restriction on competition is necessary to bring about the improvement.\textsuperscript{144}

Firms can decouple product improvements from resale restrictions by creating online markets that allow low-price consumers to purchase, at low personalized prices, the right to have a product delivered, and then to resell that right, instead of purchasing the product itself at low prices and then reselling the product itself. Because resale would take place before the firm’s products are ever delivered or customized, any costs of redirecting the products from one consumer to another subsequent to resale, and any barriers to transfer posed by customization, would be avoided. For example, the washing-machine maker could permit consumers to purchase and transfer title to units that have not yet left the factory floor, allowing low-price consumers to buy at low personalized prices and resell at high prices to high-price consumers who could then take delivery of the units directly from the manufacturer, eliminating the cost of trans-shipment between reseller and ultimate buyer, as well as any quality-control concerns surrounding the handling and storage of resold units.\textsuperscript{145}

\textsuperscript{143}See Hillary A. Kremen, Note: Caveat Venditor: International Application of the First Sale Doctrine Note, 23 SYRACUSE J. INT’L L. & COM. 161, 167 (1997) (stating that “[q]uality control is a concern” for resold goods because resellers “are only concerned with the quick sale and neither customer satisfaction nor maintenance”); Scott E. Masten & Edward A. Snyder, United States versus United Shoe Machinery Corporation: On the Merits, 36 J.L. & ECON. 33, 42–43 (1993) (arguing that leasing practices that prevented arbitrage of discriminatory practices were efficient because “[w]hen the prospective reliability and other performance attributes of complex, durable goods are difficult to discern at the time of purchase, outright sales pose well-known moral hazard problems”).

\textsuperscript{144}In other words, the ability to decouple product improvements from resale restrictions means that there exists a less restrictive alternative to any method of arbitrage prevention that happens also to improve the product. See C. Scott Hemphill, Less Restrictive Alternatives in Antitrust Law, 116 COLUM. L. REV. 927, 929 (2016).

\textsuperscript{145}Of course, the ultimate buyer would be required to pay any incremental cost associated with delivering the good to the ultimate buyer as opposed to the original buyer. But those costs will be smaller than the costs of delivering the good to the reseller prior to resale to the ultimate buyer. If the costs do not fall enough to make resale viable, then there is nothing that the firm can do to facilitate arbitrage of its personalized prices, so the firm is not engaged in the prevention of arbitrage, and, in an important sense, the resold good is not actually the same good as the one that the firm would sell directly to the consumer who would otherwise be the ultimate buyer of the resold good. For more on what constitutes two units of the same product, see infra Section I.B.3.
Similarly, firms could treat the creation of customized products as a service and permit consumers to buy rights to the service, instead of buying the customized product itself. The low-price consumer could purchase rights to the service and then resell those rights to high-price consumers, each of whom could then arrange for the product to be tailored and delivered. The 3D-printer-enabled shoe manufacturer could, for example, sell the right to a pair of customized shoes, as opposed to the customized pair of shoes itself, allowing low-price consumers to resell that right to high-price consumers, who could then arrange for the shoes to be customized to their own feet. Indeed, the sale of service rights unlocks the transferability of all custom services, not just the service of tailoring physical goods to their users. Low-price airline ticket buyers wishing to resell their tickets could, for example, purchase rights to have tickets issued in ultimate-ticket-holders’ names and then resell those rights to high-price buyers. High-price buyers could then use those rights to arrange with the airlines to have tickets issued in their names, ensuring that the airlines would continue to have accurate information about the identity of each passenger.

The low cost of communication and computing power in the information age makes the creation of online platforms for the trading of purchase rights inexpensive and supremely administrable. Of course, a firm that wishes to engage in personalized pricing would never want actually to create such a platform, because doing so would enable arbitrage. But that is the point. The failure of firms to create low-cost systems that facilitate resale is anticompetitive conduct: the prevention of arbitrage. Moreover, the pure refusal of a firm to provide the minimal infrastructure required to allow low-price consumers to buy and sell purchase rights in the firm’s product can never qualify for the product-improvement exemption, because unlike other methods of preventing arbitrage, such as the sale of customized products, the refusal to make a market in purchase rights contributes nothing to the quality of the underlying product. The fact that the refusal to make a

---

146 Of course, the ultimate buyer would be required to pay any incremental cost of customizing the services to the ultimate buyer instead of to the original buyer. See supra note 145.
147 For customized shoes, see supra note 140.
148 See Elliott, supra note 129.
149 See id.
150 For cost declines in the information age, see Bart van Ark, The Productivity Paradox of the New Digital Economy, INT’L PRODUCTIVITY MONITOR, Fall 2016, at 3, 8–9. Indeed, all a firm would need to add to its operations in order to sell purchase rights instead of the underlying goods themselves would be an interface—which could be implemented with information technology—to allow ultimate purchasers to enter delivery or customization information after securing rights from resellers, and perhaps also to allow the firm to take payment for any additional costs associated with delivery to a more distant location or customization to a more difficult subject. Everything else, from sales to fulfillment, could remain the same.
151 See text accompanying note 114.
152 For the product improvement exemption, see supra text accompanying note 136.
market in purchase rights amounts to an omission, rather than an affirmative act, does not make it any less anticompetitive. All refusals to deal are omissions, because all refusals are omissions to do the thing refused, but antitrust has long condemned certain refusals to deal as anticompetitive conduct.

B. Monopoly Power

1. Personalized Pricing Is Evidence of Monopoly Power

Section 2 of the Sherman Act prohibits anticompetitive conduct that harms consumers, such as a firm’s refusal to deal with resellers in aid of a scheme to personalize prices, only when the firm engaging in that conduct has monopoly power. Proving monopoly power can be the hardest part of a monopolization action, but in the case of personalized pricing it is easy, because any firm that is able to personalize prices, even imperfectly, has monopoly power as defined by the antitrust laws. Antitrust defines monopoly power to be the power profitably to raise price above the competitive level, with that level usually chosen to be marginal cost. Firms that charge uniform prices often do not meet this definition because an increase in a uniform price can render low-willingness-to-pay consumers unable to buy. The profits lost from no longer being able to sell to those consumers can exceed the increased profits generated from the higher prices paid by those who do continue to buy, making the price increase unprofitable overall. But this tradeoff between increased profits from inframarginal consumers and lost profits from marginal consumers does not exist when a firm uses personalized pricing to raise prices, because personalized pricing allows firms to raise prices to high-willingness-to-pay consumers without raising prices to low-willingness-to-pay consumers. That in turn allows firms to extract more profits from those who can pay more, without at the

---

154 See generally Robert Pitofsky et al., The Essential Facilities Doctrine under U.S. Antitrust Law, 70 ANTITRUST L.J. 443 (2002) (discussing cases in which denial of access to an “essential facility” was treated as illegal exclusionary conduct).
156 For the difficulty of establishing monopoly power, see Maurice E. Stucke, Does the Rule of Reason Violate the Rule of Law?, 42 U.C. DAVIS L. REV. 1375, 1462 (2009) (stating that “antitrust discovery is inevitably costly and protracted. One reason is that . . . . [d]efining the relevant market, by itself, is fact-intensive, timeconsuming, costly . . . .”).
158 See VARIAN, supra note 11, at 429–32; John B. Kirkwood, Market Power and Antitrust Enforcement 1181 (Seattle Univ. Sch. L., Working Paper, 2017) (“If a firm can price above marginal cost, it must have some ability to raise price without losing all its sales . . . .”).
159 See VARIAN, supra note 11, at 429–32.
160 See id. at 445–46. For another statement of this point, see supra text accompanying note 67.
same time suffering losses from pricing those who are not willing to pay more out of the market.161

Personalized pricing is evidence of monopoly power even for the firm that is able only imperfectly to personalize prices.162 Imperfections in personalization can manifest in two ways: the personalizing of prices that are below a customer’s maximum willingness to pay or the personalization of prices that are above a firm’s maximum willingness to pay. If the price is too low, the firm fails to extract the maximum possible profit from the customer, but it is reasonable to assume that the firm will nevertheless extract more profit than if the firm had charged a uniform price equal to marginal cost, otherwise the firm would not bother to personalize the price. If the price is too high, then the firm will lose the customer’s business, leading to a loss that may offset gains from the charging of personalized prices to other customers. But it is reasonable to assume that a firm will not implement personalized pricing if these losses exceed the gains, because then the firm would generate more profit by continuing to charge a uniform price equal to marginal cost. It follows that evidence that a firm engages in personalized pricing is evidence that the firm is able profitably to raise price above marginal cost, regardless whether the firm is able to personalize prices to perfection.

Recognizing that personalized pricing implies monopoly power would seem to imply that virtually all firms will have monopoly power, because all firms will eventually be able to generate profits through the personalization of prices. Virtually all firms sell differentiated products, and any firm that sells a differentiated product can increase profits by personalizing higher prices to those who prefer the product over the products of competitors.163 It would seem to follow that the law will one day need to hold every firm to the prohibition on consumer-harmful anticompetitive conduct imposed by Section 2 on monopolists.164 Recognizing personalized pricing as proof of monopoly power will not open up the litigation floodgates, however, because firms will always be able to avoid the monopoly characterization as a practical matter simply by refraining from actually engaging in personalized pricing. A firm that does not personalize prices generates none of the evidence of power profitably to raise prices that a court needs to

161 See id. Group-based pricing can also enable a firm profitably to raise prices, and for the same reasons. But unlike group-based pricing, which is profitable only if the losses associated with pricing marginal consumers out of each group do not exceed the gains from charging higher prices to inframarginal consumers, personalized pricing is always profitable, relative to uniform pricing, and personalized pricing alone is therefore always in itself evidence of a firm’s monopoly power.

162 For other implications of imperfection in the personalization of prices, see supra text accompanying note 102.

163 See supra text accompanying note 63. For the ubiquity of product differentiation, see Klein & Wiley, supra note 84, at 609. Product differentiation is discussed in greater detail in Section I.B.2, infra.

164 See supra text accompanying note 45.
conclude that the firm has monopoly power based on personalized pricing. A court might still of course rely on other evidence to conclude that the firm has monopoly power, but establishing monopoly power by other means is normally difficult to do.165

In any case, treating personalized pricing as evidence of monopoly power is no departure from current antitrust doctrine, because the courts have already long treated price discrimination of all kinds as evidence of monopoly power.166 The courts must, a fortiori, treat the peculiarly profitable form of price discrimination that is personalized pricing as evidence of monopoly power.167 Even if the courts choose not to treat personalized pricing as direct evidence of monopoly power, enforcers can still always prove that a price-personalizing firm has monopoly power by using the alternative, indirect, method of proof of monopoly power also recognized by the courts.168 Establishing monopoly power by indirect proof requires showing that the price-personalizing firm has a market share in excess of about seventy-five percent in a properly-defined relevant market. A properly-defined relevant market is one in which, if market participants were to cartelize and raise price together by more than a certain amount above competitive levels, usually five percent, they would increase their aggregate profits.169 Market definition generally starts by asking whether the firm could profitably raise the price of its own product.170 If not, then the firm’s product is considered alongside the closest substitute product sold by a competitor, and the question is posed again: could the prices of both

165 See Stucke, supra note 156, at 1462.
166 See HOVENKAMP, supra note 3, at 158 (stating that “price discrimination is evidence of market power”); Jonathan B. Baker, Competitive Price Discrimination: The Exercise of Market Power without Anticompetitive Effects (Comment on Klein and Wiley), 70 ANTITRUST L.J. 643, 650 (2003) (“The link between price discrimination and market power is well established in antitrust, both in the case law and in the writings of . . . a truly impressive list of scholars.”) (internal quotation marks omitted); ANDREW I. GAVIL ET AL., ANTITRUST LAW IN PERSPECTIVE: CASES, CONCEPTS, AND PROBLEMS IN COMPETITION POLICY 550–51 (3d ed. 2017).
167 For the profitability of personalized pricing, see supra text accompanying note 50.
168 For the distinction between direct and indirect proof of monopoly power, see GAVIL ET AL., supra note 166, at 544–45. For more on the indirect method of proof, see HOVENKAMP, supra note 1, at 92, 293 (stating that a court “usually . . . determines a relevant . . . market . . . and . . . computes the defendant’s percentage of the output in the relevant market thus defined,” and that “[s]everal courts have found a market share on the order of 75% to be sufficient . . . ” to establish the existence of market power (footnotes omitted)) (sources cited therein).
169 See U.S. DEP’T OF JUSTICE & FED. TRADE COMM’N, HORIZONTAL MERGER GUIDELINES, §§ 4.1.1, 4.1.2 (2010) (defining this test and stating that “[t]he Agencies most often use a [price increase] of five percent of the price paid by customers for the products or services . . . .”); Malcolm B. Coate & Jeffrey H. Fischer, A Practical Guide to the Hypothetical Monopolist Test for Market Definition, 4 J. COMPETITION L. & ECON. 1031, 1031 (2008) (describing this test as “well established as the test for market definition at the United States enforcement agencies, the federal courts, and many international antitrust regimes”); HOVENKAMP, supra note 3, at 112, 357 (stating the test in terms of cartelization and indicating that a seventy-five percent market share likely passes the test).
170 See HOVENKAMP, supra note 3, at 111–12.
products be increased without reducing the aggregate profits on the two products earned by the two firms? If yes, then the relevant market includes only the two products. If no, then a third product is considered alongside the first two and the process repeats until a group of products is found for which price could profitably be raised. Once the market has been defined in this way, evidence that the firm’s own product has a high share of the market so defined establishes that the firm has monopoly power.

Generally, enforcers seek to show monopoly power by this indirect route only when the properly-defined relevant market includes more products than just the firm’s own product. The requirement for defining the relevant market to contain just the firm’s own product, that the firm be able profitably to raise the price of the firm’s own product, is precisely the requirement for establishing monopoly power by direct proof—that the firm be able profitably to raise price—and establishing monopoly power by direct proof has the advantage over indirect proof that no additional proof of market share is required. Because personalized pricing always implies the power profitably to raise price for the firm’s own product, it follows that the method of indirect proof is unnecessary and should be discouraged in personalized pricing cases. But that does not mean that enforcers cannot define an own-product relevant market if they choose to do so, and proceed to establish monopoly power by indirect proof. The additional burden should not be too great, because once the own-product market is established as the relevant market, high market share follows almost immediately, because the firm that personalizes prices must prevent arbitrage, and that in turn ensures that no one, not even a reseller, sells the same product as does the firm, implying a market share of 100% in the market for the firm’s own product.

2. Challenging Antitrust’s Bias in Favor of Interbrand Competition

Treating personalized pricing as evidence of monopoly power, whether as direct evidence or as a basis for defining an own-product relevant market under the indirect method of proof, conflicts with a strong tendency in antitrust to respect the power of a firm to prevent competitors from selling products identical to the firm’s own products, and to attack monopoly power

---

171 See id.
172 See id.
173 See id.
174 See id. at 109–10.
175 See id. at 124–30.
176 For the definition of monopoly power as the power profitably to raise price, see Kirkwood, supra note 158, at 1173–74, 1181.
177 For the argument that personalized pricing always implies the power profitably to raise price for the firm’s own product, see supra text accompanying note 156.
178 See HOVENKAMP, supra note 3, at 175 (suggesting that courts rarely, if ever, rely exclusively on direct proof of monopoly power).
179 For the role of arbitrage prevention in personalized pricing, see supra Section I.A.3.
only by promoting competition between differentiated products. The way antitrust normally seeks to prevent harm to consumers arising from the charging of higher prices, whether as part of a price discrimination scheme or simply the increase of uniform prices, is by stopping firms from erecting barriers to competition from other, substitute products. Stop firms from harming competition between different brands, the thinking goes, and consumers will end up with such enviable alternatives to the product offered by the price-raising firm that any attempt to raise prices will just cause consumers to take their business elsewhere, and so firms will desist from personalizing prices or indeed from price increases of any kind.

This preference for promoting competition between different products offered by different firms—known as interbrand competition—instead of promoting competition between identical products offered by a firm and resellers of the firm’s own products—known as intrabrand competition—has nothing to do with economics. Both forms of competition are effective ways of eliminating the power of a firm profitably to raise prices. Indeed, intrabrand competition is probably more effective because interbrand competition drives down prices only to the extent that the different brands resemble each other, and competition then starts to take on the character of intrabrand competition. Price competition between Coke and Pepsi will be fiercer than price competition between Coke and bottled water, for

180 See Hovenkamp, supra note 3, at 124 & n. 58 (stating that “most courts refuse to find single brand relevant markets”) (sources cited therein).

181 See United States v. El du Pont de Nemours, 351 U.S. 377, 392–93 (1956) (“A retail seller may have in one sense a monopoly on certain trade because of location, as an isolated country store or filling station, or because no one else makes a product of just the quality or attractiveness of his product, as for example in cigarettes. Thus one can theorize that we have monopolistic competition in every nonstandardized commodity with each manufacturer having power over the price and production of his own product. However, this power that, let us say, automobile or soft-drink manufacturers have over their trademarked products is not the power that makes an illegal monopoly. Illegal power must be appraised in terms of the competitive market for the product.”).

182 See Hovenkamp, supra note 3, at 177.

183 See id. at 602 (distinguishing interbrand restraints from intrabrand restraints).

184 See Chamberlin, supra note 63, at 7 (“[C]ontrol over price is completely eliminated only when all producers are producing the identical good and selling it in the identical market.”). The tendency of antitrust to ignore the relative superiority of intrabrand competition is illustrated by Herbert Hovenkamp’s insistence that price discrimination in competitive markets is good for competition because it encourages new firms to enter markets. He writes that “sales . . . to . . . high preference purchasers would attract new competitors into at least that part of the market.” Hovenkamp, supra note 3, at 386. While the increased profits made possible by personalized pricing certainly can attract entry from firms offering differentiated, but substitute, products, this entry can never reduce to zero the extra profits allowed firms by personalized pricing, because competition cannot eliminate all differences between products, as Hovenkamp himself admits. See id. at 623 (“[E]ven tiny airlines in intense competition with larger rivals price discriminate in filling their seats.”). So while personalized pricing may be procompetitive in interbrand markets in the sense employed by Hovenkamp, it remains anticompetitive—if supported by measures designed to prevent arbitrage—and harmful to consumers, in intrabrand markets. See supra Section I.A.3.
example, because Coke and Pepsi are both colas, and this similarity makes a consumer of Coke more likely to switch to Pepsi than to water when faced with a Coke price increase. Interbrand competition can never drive price all the way down to marginal cost because consumers prefer some brand names over others, even when consumers are otherwise completely unable to distinguish between products, and trademark law prevents firms from selling under each others’ brand names.\(^{185}\)

This contrasts rather starkly with intrabrand competition, in which multiple sellers have the right to, and do in fact, sell products that are identical in all dimensions, including name. Consumers cannot distinguish between the goods sold by different sellers in intrabrand competition, and so consumers buy based purely on price, leading to competition that in theory should drive prices all the way down to marginal cost, a result achievable by interbrand competition only in the limit, as competing brands come to lock so tightly in competitive embrace that they eventually become identical to each other, trademark rules permitting.\(^{186}\) Consumers will always distinguish between Coke and Pepsi, because the two products are sold under different names, and those who prefer the Coke logo will be willing to pay a premium for that symbol. But consumers cannot distinguish between sold-by-Coca-Cola Coke and resold-by-low-price-buyers Coke on any basis, save perhaps the identity of the seller. To the extent that whether a product is offered by a reseller is less important to buyers than brand name, the intrabrand price competition between Coca-Cola and resellers will be stronger than the interbrand competition between Coke and Pepsi. Thus the promotion of intrabrand competition is likely a more effective competition policy than the promotion of interbrand competition.\(^{187}\)

If the reason antitrust chooses to promote competition in the interbrand market instead of in the intrabrand market has nothing to do with economic necessity, then what exactly is the cause of antitrust’s preference for interbrand competition? The answer is antitrust’s aversion to treating the traditional methods firms use to prevent competitors from entering the

\(^{185}\) See Klein & Wiley, supra note 84, at 609 (“In nearly every real-world competitive market, products are differentiated to some degree. Each firm’s product has some unique characteristics that distinguish it from the products of competitors. One unique characteristic is the product’s trademark.”). The fact that consumers prefer some brand names over others, even when consumers are completely unable to distinguish between products, has been proven in the case of Coke and Pepsi. See Samuel M. McClure et al., Neural Correlates of Behavioral Preference for Culturally Familiar Drinks, 44 Neuron 379, 384–85 (2004).

\(^{186}\) See Chamberlin, supra note 63, at 271 (“When one producer copies the name, symbol, package, or product of another, the result is goods more nearly standardized, and, if the imitator is successful, a reduction in the profits of his rival.”).

\(^{187}\) See id. at 273–74 (observing that intrabrand competition results in lower prices than does interbrand competition).
intrabrand market as violations of the antitrust laws. Firms use property and intellectual property law to prevent competitors from selling products identical to their own. Property law prevents Pepsi executives from walking into a Coke bottler, running the machines, and carting off pallets of Coke for Pepsi to sell on its own account. Patent, copyright, and trade secret further prevent Pepsi from reproducing the production methods, flavor, and promotional materials used by Coca-Cola in Coke production. Finally, and perhaps most importantly of all, trademark forever prevents Pepsi from using and promoting the Coke mark. Antitrust is strongly opposed to treating the bare exercise of a property or intellectual property right as an antitrust violation. But in many cases antitrust would be forced to do that were antitrust to treat the intrabrand market as the relevant market,

---

188 See Ramsi A. Woodcock, Inconsistency in Antitrust, 68 U. MIAMI L. REV. 105, 116–23 (2013) (discussing the antitrust exemption for “property-based exclusion,” which forestalls intrabrand competition by preventing competitors from selling identical products through copying); CHAMBERLIN, supra note 63, at 270–73.

189 Property law prevents competitors from stealing the firm’s production facilities. See infra note 190. Intellectual property law prevents copying of those facilities, as well as product attributes. See infra notes 191, 192; CHAMBERLIN, supra note 63, at 57–64.

190 Doing so would be trespass. See Thomas W. Merrill, Trespass, Nuisance, and the Costs of Determining Property Rights, 14 J. LEGAL STUD. 13, 13 (1985) (“Generally speaking, when the intrusion is governed by trespass, then there is no exception for de minimis harms, a rule of strict liability applies, and the landholder can obtain an injunction to prevent future invasions.”). For a hypothetical example in this spirit, in which competitors are permitted to enter a factory and run the machines whenever the factory’s owner seeks to restrict output, see Woodcock, supra note 188, at 165–66.


192 See CHAMBERLIN, supra note 63, at 272–73 (discussing the role of trademark in preventing complete copying of a product). Indeed, producing goods identical to those of a competitor is a violation of the common law doctrine of unfair competition, independent of the existence of any trademark protecting the brand. See Hanover Star Milling Co. v. Metcalf, 240 U.S. 403, 412–13 (1916) (“Courts afford redress or relief upon the ground that a party has a valuable interest in the good-will of his trade or business, and in the trade-marks adopted to maintain and extend it. The essence of the wrong consists in the sale of the goods of one manufacturer or vendor for those of another. This essential element is the same in trade-mark cases as in cases of unfair competition unaccompanied with trade-mark infringement. In fact, the common law of trade-marks is but a part of the broader law of unfair competition.”) (citation omitted)). Unlike a patent or a copyright, a trademark has no formal limit to its duration. See Giovanni B. Ramello, What’s in a Sign? Trademark Law and Economic Theory, 20 J. ECON. SURVEYS 547, 555 (2006) (“[A]lthough the duration of the [trademark] right is theoretically infinite, in practice there exist a number of derogations to the property right designed to limit appropriability when the expected social costs exceed the benefits[,]”); 35 U.S.C. § 154(a)(2) (stating that the term of a patent ends 20 years after the date of filing); Peter B. Hirtle, Copyright Term and the Public Domain in the United States, http://copyright.cornell.edu/resources/publicdomain.cfm (last updated Feb. 7, 2019) (surveying byzantine rules regarding copyright term in the United States).

193 See Woodcock, supra note 188, at 118–23 (discussing antitrust’s aversion to condemning “property-based exclusion”).
because promoting competition in an intrabrand market requires that competitors be allowed to appropriate or copy the incumbent’s output.\(^{194}\) So antitrust does not promote intrabrand competition.

Three factors make the promotion of competition in intrabrand markets appropriate as a response to personalized pricing, notwithstanding antitrust’s traditional aversion to interfering with the ability of firms to exercise their property rights. First, forcing firms to deal with resellers is not a particularly radical intrusion into the property rights of firms because the forced dealing would not require firms to sell to consumers with whom they have never dealt before. All low-price consumers who engage in resale also buy the product for personal consumption, which is what gives these consumers access to the product at a low personalized price to begin with.\(^{195}\) The remedy for the firm’s refusal to deal with these consumers is, at most, merely to require firms to sell additional units to these consumers for resale, which amounts to no more than insisting that firms continue a course of dealing they have already embraced.\(^{196}\)

The second factor that makes promoting competition in intrabrand markets the appropriate choice in personalized pricing cases is that most interbrand markets in the U.S. are concentrated, or otherwise uncompetitive, but there is little that antitrust can do to promote competition in these markets under current law.\(^{197}\) For example, much anticompetitive conduct by single firms falls within either the exemption for product-improving conduct or an exemption known as the right to refuse to deal, and much anticompetitive conduct by groups of firms falls within an exemption for tacit collusion.\(^{198}\) Because antitrust cannot do more to promote interbrand competition, attacking anticompetitive behavior in intrabrand markets gives

\(^{194}\) See VARIAN, supra note 11, at 444 (observing that perfect competition requires that competitors sell “identical” products).

\(^{195}\) See supra text accompanying note 113.

\(^{196}\) See HOVENKAMP, supra note 3, at 415–16 (discussing forced sharing as the remedy for a refusal to deal). As discussed in Section I.C.4.ii, the far less burdensome remedy of allowing firms to continue to decide whether and to whom to sell, and only requiring firms to offer any products they choose to sell at non-personalized prices, could be used instead.


\(^{198}\) Section I.C discusses the right to refuse to deal. Section I.A.4 discusses the exemption for product-improving conduct. If the power obtained through product-improving conduct is used to drive prices above costs, then the conduct harms consumers. Woodcock, supra note 188, at 126–36 (using an economic model to show how the benefits of rewarding the creation of superior products or the application of business acumen can fail to outweigh the costs of monopoly power). Tacit collusion between firms that is enabled by high market concentration levels does not violate the antitrust laws, even though it results in higher prices. See POSNER, supra note 21, at 55 (criticizing the exemption of tacit collusion from condemnation under Section 1 of the Sherman Act).
antitrust a new way to intervene to help consumers.199

The third factor that makes promoting competition in intrabrand markets the appropriate choice for antitrust in personalized pricing cases is that personalized pricing magnifies the harm to consumers inflicted by any given level of a firm’s power over interbrand markets, by allowing the firm to extract surpluses from consumers that the firm would not be able to reach through uniform pricing.200 That is what it means for personalized pricing to be able to increase a firm’s profits and harm consumers relative even to uniform pricing at monopoly levels.201 If demand is linear and marginal cost constant, for example, personalized pricing doubles the amount of surplus that a monopoly can extract from consumers.202 As a result, promoting intrabrand competition as a remedy for personalized pricing would not undermine the balance between firm and consumer interests struck by current levels of interbrand competition, but rather would serve only to prevent personalized pricing from upsetting that balance in favor of firms.203

3. Defining the Relevant Product

Recognizing personalized pricing—or the arbitrage prevention required to support personalized pricing—as anticompetitive creates a novel problem for antitrust: determining whether any two products are so similar that charging different prices for them to different consumers should count as the personalized pricing of different units of the same product.204 Treating the personalization of prices for different products—charging a higher price to a buyer of Sprite and a lower price to a buyer of Coke—as anticompetitive

199 See Woodcock, supra note 7, at 1401–6 (arguing that stricter antitrust rules and enforcement are required to counteract the additional harm inflicted by personalized pricing for any given level of market power); Ramsi A. Woodcock, The Bargaining Robot, CPI ANTITRUST CHRON., May 2017, at 40, 41–42, 44.

200 See Woodcock, supra note 199, at 41 (describing this power of personalized pricing to inflict greater harm on consumers for any given level of market power as a “second dimension” of power).

201 See supra Section I.A.1.

202 Suppose that demand is $ax + b$, where $a < 0$, $b$ is the price that just renders quantity demanded zero, $a$ is the rate at which price must fall for demand to increase by a single unit, $x$ is the number of units demanded, and marginal cost is zero. Then total surplus at the uniform competitive price of zero is $-\frac{1}{2}(b^2/a)$. At the uniform profit-maximizing (monopoly) price and quantity of $\frac{b}{2a}$ and $-\frac{b}{2a}$, respectively, the monopolist takes $-\frac{b}{2}(\frac{b}{2a})$, which is half of total surplus at the competitive price, in the form of profit. If the monopolist personalizes prices, the monopolist then takes the remaining surplus, doubling the amount of surplus taken by the monopolist relative to the amount the monopolist takes under uniform pricing. For the characteristic of personalized pricing that it allocates all surplus to the firm, see supra text accompanying note 54.

203 For a related argument, see supra text accompanying note 75.

204 There appears to be no prior literature defining what constitutes units of the same product for purposes of identifying price discrimination. See Michael E. Levine, Price Discrimination without Market Power, 19 YALE J. ON REG. 1, 15–16 (2002) (observing that the definition of the product as the set of perfect substitutes is unrealistic, because consumer tastes differ between “production substitutes” and concluding that “[e]conomics does not have an unambiguous definition of ‘product’”).
would effectively create a duty for any individual firm to charge the same price for all of its products. That would wreak havoc across the economy, forcing an electronics manufacturer, for example, either to embrace a single product line, thereby wasting the economies of scope associated with multi-product operations, or to sell light switches at the million-dollar-per-unit price the firm needs to cover the cost of producing and selling wind turbines.\footnote{See Alfred D. Chandler Jr, Scale and Scope: The Dynamics of Industrial Capitalism 24 (1994) (discussing economies of scope); Council of Econ. Advisors, Executive Office of the President of the United States, supra note 11, at 7 (observing that differences in prices result from differences in costs).}

What, then, does it mean to charge different prices for different units of the same product? What makes one unit the same as another? The answer cannot be that two units are identical only when they are identical in physical form. Not only are no two goods absolutely alike—each will have small differences, perhaps at the microscopic level—but no two goods, even if physically identical, can exist in the same place at the same time. And yet a good here now is meaningfully different, for most consumers, than a good there later, suggesting that time and location are product attributes, and therefore that no two units of a good can really be the same.\footnote{I am grateful to Russell D. Covey for suggesting this argument to me. See Chamberlin, supra note 63, at 56 (observing that product differentiation exists if “any significant basis exists for distinguishing the goods” and “[i]t may also exist with respect to the conditions surrounding [the good’s] sale[,]” including “the convenience of the seller’s location”). The value of location to consumers is reflected in the importance of location to the definition of interbrand markets. See Hovenkamp, supra note 1, at 124 (“The relevant geographic market for antitrust purposes is some geographic area in which a firm can increase its price without 1) large numbers of its customers quickly turning to alternative supply sources outside the area or 2) producers outside the area quickly flooding the area with substitute products.”).}

To avoid the implication of this line of reasoning, which is that personalized pricing is impossible because no two goods are really the same, some rule is required to allow antitrust to treat groups of admittedly individually unique products offered by the same firm as the same product.\footnote{See Levine, supra note 204, at 15–16.} What is required, to draw an analogy to the market definition process associated with indirect proof of monopoly power, is the definition of the relevant product.\footnote{See id.}

Antitrust should define the relevant product to include all units of production for which, if the firm were to personalize prices, arbitrage would be possible. That is, any unit that a high-price buyer would be willing to buy from a reseller in lieu of the unit the firm wishes to sell to the buyer at a personalized high price should count as the same product as the product the firm wishes to sell to the high-price buyer. Letting the possibility of arbitrage define what counts as the same product amounts to letting consumers—or guesses about what consumers would do—decide which goods count as the
same and which do not. Under this test, if consumers would not treat a pair of goods as so alike that they would be willing to substitute a resold unit for the original, then the pair of goods are different and personalized pricing between them would be irrelevant for antitrust purposes. Here products that may look different or exist in different places and at different times count as the same if resellers are capable of overcoming these differences to make a market in them.

Determining whether resale is possible between a set of products is of course a counterfactual undertaking, particularly in the context of an antitrust challenge to personalized pricing predicated upon the claim that the firm has taken steps to prevent resale, which would imply that consumers have not in fact had a full opportunity to buy resold units.209 But proving counterfactuals is nothing new in antitrust.210 To challenge any practice as anticompetitive under Section 2 of the Sherman Act, it is necessary to show that the practice harms competition, and that in turn must rest on the claim that in the absence of the practice competition would be stronger.211 Showing that resale would have been possible between units of a product but for restrictions placed by a firm on arbitrage amounts to doing no more than that.

Whether resale would be possible, and therefore whether a group of products count as the same product for antitrust purposes, depends on how costly resale would be for resellers were the firm to do nothing to restrict resale.212 That is, the counterfactual question whether resale is possible between a set of products must be answered under the assumption that the firm is taking no steps to prevent resale. Making that assumption in turn requires a determination regarding what practices should count as restrictive and what practices should count as benign, even if they may incidentally raise the cost of resale. That determination has already been made in the determination of what practices count as anticompetitive arbitrage prevention under the Sherman Act.213 The answer is that a firm’s adjustment of prices to extract resale profits from consumers who engage in resale, and additional refusal to allow consumers to buy and trade the right to purchase the product at the price personalized by the firm to the consumer, counts as

209 See supra Section I.A.3.
210 See Joseph Farrell & Carl Shapiro, Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition, 10 B.E. J. THEORETICAL ECON. 1, 4 (2010) (describing market definition as difficult and error prone because it requires “the analyst to predict price changes by a counterfactual firm”).
211 See United States v. Microsoft Corp., 253 F.3d 34, 58–59 (D.C. Cir. 2001) (discussing the requirement of harm to competition).
212 See supra text accompanying note 137.
213 See supra Section I.A.4.
the restriction of arbitrage.\footnote{For the adjustment of prices to extract resale profits as a form of arbitrage prevention, see supra text accompanying note 115. For the refusal to allow resellers to trade purchase rights as a form of arbitrage prevention, see supra text accompanying note 151.} For the charging of prices that do not account for resale profits is required to ensure that resellers are able to buy low and sell high, and rights trading is required to decouple resale from transshipment, product customization, and other problems that might in many cases make resale impossible even if the firm were not to charge prices to resellers that would eliminate resellers’ profits from resale.\footnote{See supra text accompanying notes 115, 151.} It follows that if a low-price consumer would be willing to resell a right to purchase a product from a firm at a price personalized by the firm to the low-price consumer without regard to the profits the low-price consumer might earn from reselling the product, and a high-price consumer would be willing to purchase that resold right in lieu of buying another product directly from the firm at a high personalized price, then the two products should count as the same product and the personalization of their prices should count as the personalized pricing of units of the same product.

Defining the relevant product in terms of the possibility of resale ensures that products will be treated as the same for personalized pricing purposes only if any production cost differences are not so large as to explain entirely the difference in prices between the two products.\footnote{See Council of Econ. Advisors, Executive Office of the President of the United States, supra note 11, at 7.} Thus the question whether a Coke offered for $2 in Missouri and another offered for $3 in California is the same product for purposes of personalized pricing would depend upon whether the California buyer would be willing to buy the right to the Missouri Coke—and pay any shipping surcharge associated with delivery of that Coke to California instead of Missouri—were the Missouri buyer to offer that right for a price below $3.\footnote{See supra note 145.} By the same token, defining the relevant product in terms of the possibility of resale also ensures that products are not treated as identical simply in virtue of having identical production costs. It may cost Coca-Cola the same amount to produce and deliver a Sprite or a Coke to a particular consumer, but the two products should be treated as the same only if consumers themselves would treat them as substitutes in the resale market.\footnote{Of course, when different products have the same production costs, the charging of personalized prices for the two products inflicts the same kind of consumer harm that the personalized pricing of one particular product inflicts. Charging a high-willingness-to-pay buyer of Sprite a high price and a low willingness to pay buyer of Coke a low price extracts the exact same amount of consumer surplus as would charging a high price to one buyer of Coke and a low price to another, assuming that Sprite and Coke have the same production costs with respect to all of these buyers. But there can be no claim of anticompetitive prevention of arbitrage in the case of personalized pricing across products so long as consumers do not view the products as substitutes. If the high-willingness-to-pay buyer of Sprite will not

\begin{thebibliography}{99}
\bibitem{Note11} See Council of Econ. Advisors, Executive Office of the President of the United States, supra note 11, at 7.
\end{thebibliography}
C. The Right to Refuse to Deal Does Not Apply

Establishing that the prevention of arbitrage is anticompetitive and harmful to consumers, that the product-improvement exemption does not apply, and that price-personalizing firms have monopoly power, is not enough to make a monopolization claim, because when a firm prevents a low-price consumer from buying for resale, the firm engages in a refusal to deal, and most refusals to deal fall within a broad antitrust exemption that the Supreme Court calls the “long recognized right of trader or manufacturer engaged in an entirely private business, freely to exercise his own independent discretion as to parties with whom he will deal.”219 This “right to refuse to deal” does not, however, apply to the prevention of arbitrage in aid of personalized pricing.220

1. United Shoe

The courts have never squarely addressed the question whether a refusal to deal with an arbitrager is protected by the right to refuse to deal, but United Shoe comes close.221 In United Shoe, clauses in the shoe machinery maker’s leases prevented low-rental-price lessees from subletting shoe-making machinery to high-rental-price lessees, and thereby allowed United

---

219 See United States v. Colgate & Co., 250 U.S. 300, 307 (1919); Pitofsky et al., supra note 154, at 446 (discussing the “the general rule that a firm has no obligation to deal with its competitors”); GAVIL ET AL., supra note 22, at 706 (“For the most part, courts have declined to require monopolists to cooperate with another business entity.”). The legal concept of “refusal to deal” extends beyond outright refusals to sell and includes the placing of any sort of restriction on access by a potential competitor to an input owned by the firm. See IIIB HERBERT J. HOVENKAMP, ANTITRUST LAW, 299–300 n.55 (4th ed. 2015) (listing cases in which restrictions that fell short of outright refusal to deal were treated as covered by the right to refuse to deal). For example, charging a very high price counts as a refusal to deal. See HOVENKAMP, supra note 1, at 328 (treating the charging of a high price as a refusal to deal). For the anticompetitive character of arbitrage prevention, see supra Section I.A.3. For the consumer-harmful character of arbitrage prevention, see supra Section I.A.1. For the monopoly power of firms that prevent arbitrage, see Section I.B. For arbitrage prevention as refusal to deal, see supra text accompanying note 114.

220 See HOVENKAMP, supra note 1, at 321–22 (discussing the existence of an exception to the right to refuse to deal).

Shoe to earn “a higher rate of return where competition is of minor significance, and a lower rate of return where competition is of major significance.” The court responded by ordering non-discriminatory pricing of the leases, a remedy that denies a firm’s right to refuse to deal, at least to a small extent, by regulating the terms of any dealing undertaken by the firm. More significantly, the court also ordered United Shoe to offer shoemaking machinery not just for lease but also for sale, because, “[i]nsofar as United’s machines are sold rather than leased, they will ultimately, in many cases, reach a second-hand market. From that market, United will face a type of substitute competition which will gradually weaken the prohibited market power which it now exercises.” Thus the court forced United Shoe to deal in the sale of shoe-making machines for the express purpose of promoting resale competition. While the court’s remedy was clearly aimed at resale, the court professed to hold United Shoe liable not for preventing arbitrage in aid of its price discrimination scheme, but for using price discrimination—specifically the cutting of prices in competitive markets—to discourage competitors from selling competing brands of shoemaking machinery. Thus liability was based on harm to competition in interbrand markets, rather than harm to competition from resellers seeking to arbitrage United Shoe’s discriminatory prices in intrabrand markets. Courts have broad authority to create remedies for violations of the antitrust laws that do more than just reverse the conduct that gives rise to liability. The fact that the court in United Shoe ordered dealing to promote resale does not therefore guarantee that courts would set aside the right of a seller to refuse to deal in considering whether the prevention of arbitrage should give rise to liability for monopolization. United Shoe is therefore not entirely

222 See id. at 315, 340–41; HOVENKAMP, supra note 1, at 316 (stating that United Shoe's “leasing may have facilitated price discrimination by preventing arbitrage”); POSNER, supra note 21, at 234 (observing that “[b]y leasing instead of selling, the monopolist can prevent a secondhand market from developing”); Michael Waldman, Eliminating the Market for Secondhand Goods: An Alternative Explanation for Leasing, 40 J.L. & ECON. 61, 66 (1997) (recounting the argument of Victor Goldberg in an unpublished manuscript as follows: “In a sales market, price discrimination is difficult because of the possibility of arbitrage, that is, customers offered a low price can purchase and resell to those customers the monopolist is trying to charge a high price. By using the lease-only option United eliminated arbitrage opportunities and then achieved price discrimination through the classic scheme sometimes referred to as metered sales”); John Shepard Wiley Jr et al., The Leasing Monopolist, 37 UCLA L. REV. 693, 717–18 (1990) (making the argument that the leases were in aid of price discrimination).

223 United Shoe, 110 F. Supp. at 340–41, 349. It should be noted that the remedy does largely respect the right to refuse to deal, by preserving the discretion of the firm to choose not to sell to any particular buyer at any price. For more on a non-discrimination order as a light-touch alternative to ordering dealing, see infra Section I.C.4.

224 Id. at 350.

225 See id.

226 See id. at 344–45.

227 See id.

228 See GAVIL ET AL., supra note 166, at 1379.
apprate as authority for the proposition that the right to refuse to deal does not block liability for arbitrage prevention. Nonetheless, it remains true that in United Shoe the court ordered a firm to deal for the express purpose of promoting resale.

2. Prior Dealings and Other Considerations

Absent any case directly on point, the question whether the prevention of arbitrage is covered by the right to refuse to deal can be decided only by application of general antitrust rules governing refusals to deal. These rules strongly suggest that the prevention of arbitrage is not protected by the right to refuse to deal. Two Supreme Court cases, Aspen Skiing Co. v. Aspen Highlands Skiing Corp. and Verizon Commc’ns Inc. v. Law Offices of Curtis V. Trinko, serve as the basis for the rules. In Aspen Skiing, an owner of three ski mountains worked with the owner of a fourth mountain to sell a combined pass that allowed skiers access to all four mountains. The owner of the three mountains, Ski, pulled out of the combined pass and refused to sell passes to its mountains to the owner of the fourth mountain, Highlands, even at retail prices, preventing Highlands from reconstructing the combined pass on its own. Highlands challenged the refusal as monopolization and the Court affirmed a jury verdict in Highland’s favor. In Trinko, by contrast, Verizon refused to provide high-quality access to the company’s telephone network to competing telephone service providers who wanted to use Verizon’s telephone network to connect calls, but the Court in that case ruled that the refusal to deal did not violate the antitrust laws. The Court appeared ultimately to decide the case on the ground that because telecom regulators had concurrent authority to compel Verizon to deal with competitors, antitrust intervention would be inappropriate. But the Court also distinguished the case from Aspen Skiing on a number of antitrust grounds to which courts look today in deciding the scope of any antitrust duty to deal with competitors.

229 See United Shoe, 110 F. Supp. at 344–45.
230 See Hovenkamp, supra note 1, at 324–31 (discussing recent lines of refusal to deal cases involving aftermarket repair parts and price or supply squeezes).
234 See Aspen Skiing, 472 U.S. at 588–90.
235 See id. at 589–91, 593, 600, 610–11.
236 See Trinko, 540 U.S. at 402–04, 416.
237 See id. at 411–15.
The Court in *Trinko* suggested that for a refusal to deal to be illicit, the refusal must be motivated by “dreams of monopoly,” which in turn the Court suggested can be established unambiguously only when the refusal to deal represents the termination of a prior profitable course of dealing. A firm does not terminate a profitable course of dealing, the Court reasoned, unless the firm hopes to substitute even higher, presumably monopoly-based, profits in the future for the profits lost through the termination of the prior dealing. Thus the Court held Ski liable in *Aspen Skiing* because Ski and Highlands had made money off of the combined pass for years, and Ski’s refusal to continue participating in the combined pass therefore suggested malevolent intent. Indeed, the Court emphasized in *Trinko* that Ski’s refusal in *Aspen Skiing* to sell tickets to Highland for resale as part of the combined pass, even at the same retail prices at which Ski sold tickets to consumers—prices which were presumably high enough for Ski to cover costs—was particularly damning evidence of a monopolizing purpose. By contrast, the Court in *Trinko* observed that Verizon had never provided competitors access to its network, had tried to provide access only when Congress compelled the firm to do so, and might well have ended up making a loss on those compelled dealings with competitors because the prices Verizon could charge were fixed by regulators. Of course, Verizon’s refusal to deal might still have been motivated by dreams of monopoly, but it could also have just represented good business sense, and for that reason the Court seemed reluctant to condemn the company’s conduct.

Arbitrage prevention easily meets the prior profitable course of dealing test suggested by the Court in *Trinko*. There must always be a prior course of dealing in prevention of arbitrage cases because the price-personalizing firm must permit low-price consumers initially to buy for personal use. If the firm is not willing initially to sell to low-price consumers for personal use, then the firm cannot personalize prices and will end up selling only at a single high price to high-price consumers. The price-personalizing firm must therefore be willing to sell to low-price consumers at low prices, and to cut low-price consumers off only when they wish to go beyond what they need.
for themselves to buy additional units for resale to high-price consumers. But that cutting-off of low-price consumers once they start to buy for resale represents the termination of a prior course of dealing with those low-price consumers. 244

The prior course of dealing between the firm and low-price consumers must have been profitable because a price-personalizing firm will not normally sell initial units to low-price consumers at prices that are below cost and therefore unprofitable. 245 Quite to the contrary, in any personalized-pricing scheme, the firm charges all buyers prices that are above cost in the economic sense. 246 Roughly, the firm charges high-price consumers a price substantially above cost and low-price consumers a price that is only very slightly above cost, indeed, only just high enough to ensure that it is worth the firm’s while to sell units to low-price consumers instead of directing the resources used to produce the units toward their next-most-lucrative uses for the firm. 247 The firm does not make below-cost sales because below-cost sales reduce the firm’s total profit. 248 In other words, all personalized pricing is retail pricing in the sense of pricing high enough to make selling worthwhile to the firm. When the price-personalizing firm sells initial units to low-price consumers who are still buying for themselves and who have not yet started to buy for resale, the firm engages in a profitable dealing with consumers whom the firm later cuts off when the firm refuses to sell additional units to them for resale.

Herbert Hovenkamp has suggested that Trinko also restricts condemnation of refusals to deal only to refusals to deal in goods that the firm could produce with existing production capacity, as opposed to refusals to deal in goods that the firm would be able to produce only by expanding production capacity. 249 Aspen Skiing and Trinko can indeed be distinguished

244 It might be argued in the arbitrage context that the prior dealing required should be in units intended for resale and not in units intended for personal consumption. Then there would not ordinarily be prior dealing in arbitrage prevention cases. Interpreting prior dealing in this way makes the requirement very much like a requirement that the plaintiff have relied on prior dealings in investing in the plaintiff’s business, only to have the investment lost when dealing is terminated. For a discussion of this reliance interpretation, see Section I.C.3. Note also that the firm may cut low-price consumers off simply by refusing to sell additional units to them, by raising prices for those additional units, or using property or contract rules to prevent resale of those additional units. See supra text accompanying notes 115–130.

245 See VARIAN, supra note 11, at 446.

246 See id. (noting that under first-degree price discrimination the firm sells to each buyer “who is willing to pay more than it costs to produce an extra unit of output”). For the economic definition of cost, see BAUMOL, supra note 51, at 593.

247 See HOVENKAMP, supra note 1, at 624 (observing that under price discrimination consumers with low reservation prices “pay a price approaching the competitive price (which is nonetheless profitable)” whereas others pay a price “that could be far higher”).

248 See VARIAN, supra note 11, at 340 (observing that “[i]f the value of marginal product is less than its cost, then profits can be increased by decreasing the level” of production).

249 See HOVENKAMP, supra note 1, at 321.
based on this capacity rule. Offering the combined pass would not have forced Ski to acquire new slopes because Ski appears always to have had enough room on its slopes to accommodate all skiers using that pass.\(^{250}\) By contrast, Verizon needed to modify its network in order to provide access to competitors.\(^{251}\)

The prevention of arbitrage satisfies any excess capacity rule. Units that low-price consumers buy for resale always come from the firm’s existing capacity because any units that high-price consumers buy from resellers are units that those high-price consumers do not buy from the firm. As a result, the firm’s total output remains the same when there is arbitrage as when there is no arbitrage.\(^{252}\) When the firm must deal with resellers, the firm suffers a decline in demand from high-price consumers, because those consumers buy from resellers instead, and an exactly-offsetting increase in demand from resellers, through whom the high-price consumers now make their purchases.

The Court in \textit{Trinko} also touched upon the longstanding rule that for any refusal to deal to be actionable under the antitrust laws, the market must be unable independently to produce what the defendant is refusing to supply.\(^{253}\) The good must, in other words, be essential to competition in the market.\(^{254}\) Otherwise, competitors are not really excluded by a denial of access to the good.\(^{255}\) This requirement was satisfied in both \textit{Aspen Skiing} and \textit{Trinko}, and so did not contribute to the different outcomes of the cases. In \textit{Aspen Skiing}, regulatory obstacles prevented both Highlands and any third party from opening additional slopes to replace those owned by Ski.\(^{256}\) In \textit{Trinko}, competing telephone service providers would have found it very difficult to build their own competing landline telephone networks.\(^{257}\) Indeed, that difficulty had led Congress to order Verizon to provide competing telephone service providers with access.\(^{258}\)

The essentiality requirement is trivially satisfied in the case of arbitrage.

\(^{250}\) See \textit{Aspen Skiing Co. v. Aspen Highlands Skiing Corp.}, 472 U.S. 585, 589–93 (1985) (discussing sixteen years of history of the all-mountain pass without mentioning a capacity constraint).

\(^{251}\) Verizon Commc’ns Inc. v. Law Offices of Curtis V. Trinko, 540 U.S. 398, 410 (2004); see \textit{HOVENKAMP, supra note 1}, at 321 (“[I]n \textit{Trinko}, unlike \ldots \textit{Aspen} \ldots [,] the plaintiff was asking the defendant not merely to share out of its excess capacity, but also to design and build additional systems that it must then share with rivals”).

\(^{252}\) See \textit{HOVENKAMP, supra note 1}, at 625 (observing that the quantity sold is the same under perfect competition and price discrimination).

\(^{253}\) See \textit{Trinko}, 540 U.S. at 411 (describing the “unavailability of access to the essential facilities” as an “indispensable requirement” for liability for refusal to deal); \textit{HOVENKAMP, supra note 1}, at 321 (enforced sharing “should never be offered where the development of alternative sources is feasible”).

\(^{254}\) See \textit{HOVENKAMP, supra note 1}, at 321.

\(^{255}\) See id.


\(^{257}\) See \textit{Trinko}, 540 U.S. at 403.

\(^{258}\) See id. at 402.
prevention, because the only way to sell to consumers who are committed to buying a firm’s product at personalized prices is to resell the firm’s own product to them at lower prices. Those consumers will not accept other firms’ products as substitutes. The reason is that the maximum price that a consumer is willing to pay for a product is the highest price the consumer is willing to pay without giving up on purchasing the product and buying a substitute product sold by a competing firm instead.\footnote{See VARIAN, supra note 11, at 4 (describing the consumer’s reservation price as the highest at which the consumer is still willing to purchase the good). When a firm personalizes prices to equal a consumer’s maximum willingness to pay, or tries but fails and ends up charging a price below the consumer’s maximum willingness to pay, the firm’s product faces no competition from other firms’ products with respect to that consumer, because the prices the firm charges are, by design, low enough to ensure that the consumer prefers to purchase the firm’s product.\footnote{See id.} It follows that the only way for anyone, including a reseller, to compete for that consumer is to offer the same product to the consumer at a lower price than the firm is charging.\footnote{See Carroll & Coates, supra note 87, at 470–71. Another way to compete for the consumer would be to invent and offer a new product that the consumer prefers. The essentiality requirement does not, however, require that the refusal to deal relate to an input that cannot be invented around, only that the refusal to deal relate to an input that is essential for competition given existing technology. Otherwise it would have been no antitrust violation for Ski to refuse to continue to participate in the combined four-mountain pass, because Highlands could have invented a new sport preferred by skiers and uniquely suited to Highlands’ mountain, thereby allowing Highlands to continue to compete with Ski without needing to use the combined four-mountain pass. See Aspen Skiing, 472 U.S. at 589–91, 593, 600, 610–11.} When a firm refuses to sell units of its product to low-price consumers for resale, the firm is therefore refusing to deal in an input that is essential for anyone to compete for the firm’s consumers, given the personalized prices that the firm is charging to those consumers.

3. The Irrelevance of Reliance

Herbert Hovenkamp has also suggested that under Trinko a refusal to deal can be condemned only if the target of the refusal made a substantial investment in reliance on the expectation that the firm would continue a prior course of dealing.\footnote{See HOVENKAMP, supra note 1, at 319–20, 321 (arguing that the exception to the right to refuse to deal covers only cases in which there was reliance and also observing that “[t]he antitrust law requiring a dominant firm to deal with its rivals must be regarded as a severe exception” and “is inimical to antitrust goals”).} The existence of a reliance interest does indeed distinguish Aspen Skiing from Trinko.\footnote{See id. at 319 (“Reading Aspen to create a new obligation to deal where no arrangement had existed before is a significant extension of its holding. It is one thing to condemn a dominant firm’s withdrawal from a venture that the parties had previously developed by negotiation, and one upon which...”)} In Aspen Skiing, Highlands
appeared unable to compete with Ski in the absence of the combined pass. Thus any investment Highlands made in developing and operating its mountain during the decades when the firms offered the combined pass was made by Highlands in reliance on the continued existence of the pass. By contrast, in *Trinko*, there was no suggestion that competitors had ever expected to have access to Verizon’s network before Congress compelled access. So competitors likely had not made substantial investments in reliance upon having access.

If *Trinko* does impose a reliance requirement, then the promotion of arbitrage would not always be illicit. Only low-price consumers who invest in resale in reliance on their ability to buy initial units for personal consumption would be able to challenge the firm’s refusal to sell units for resale. But the weakness of the case for a reliance requirement suggests that arbitrage prevention claims will not face this obstacle. Indeed, there are three good reasons not to read *Trinko* as creating a reliance requirement. The first is that the *Trinko* opinion makes no explicit reference to such a requirement and the lower courts have not read the opinion to impose one. The second is that the concept of reliance plays no role anywhere else in antitrust policy. And the third, and most important, reason is that the only value of reliance as a criterion for distinguishing between licit and illicit refusals to deal lies in reliance’s utility as a proxy for the existence of a prior profitable course of dealing, because firms tend to make investments in reliance on prior dealings. But absent a prior profitable course of dealing, reliance has no independent power to reveal “dreams of monopoly.” A firm may cancel planned dealings with competitors upon which the competitors have relied because the firm has concluded that the dealings would not be profitable at all, rather than because the firm has concluded that the firm can earn monopoly profits from the cancellation. By contrast, absent a change in market conditions, a firm that terminates a prior profitable course of dealing cannot have done so out of concern that continuing the dealing would be

---

264 *See* *Aspen Skiing*, 472 U.S. at 594–95.
265 *See* id. at 595–99, 611.
267 *See* id. at 415–16.
268 *See* HOVENKAMP, supra note 3, at 390 (citing no cases in support of statement approving of condemnation of “a dominant firm’s withdrawal from a venture . . . upon which the lesser firm has come to rely”).
269 The frustration of reliance is of course a powerful weapon wielded by firms against competitors. But condemnation of its use is primarily the province of tort claims such as fraud, which provides recovery to a firm that has reasonably relied upon another firm’s intentional misrepresentation. See John C.P. Goldberg et al., *The Place of Reliance in Fraud Symposium: Dan B. Dobbs Conference on Economic Tort Law*, 48 ARIZ. L. REV. 1001, 1004 (2006).
270 *See* supra text accompanying note 138; *Trinko*, 540 U.S. at 409.
unprofitable, suggesting that the termination must lead to the even greater profits associated with monopoly.  

4. Remediability

i. Forcing Resale Leads Neither to Collusion nor Price Administration

The Court in Trinko also suggested that a major reason for judicial reluctance to condemn refusals to deal is concern that the natural remedy, which is to compel dealing, either facilitates collusion between the parties to the case or puts the courts in the unacceptable position of having to dictate prices and other terms of dealing. Remedies for the prevention of arbitrage do not, however, put the courts in either position.

The natural remedy for an illicit refusal to deal is indeed for the court to order the firm to deal. In the context of the prevention of arbitrage, that means ordering the firm to sell units to low-price consumers for resale. To prevent the firm from discouraging resale by raising prices to extract some of the low-price consumer’s gains from resale, the court must order the firm to charge the low-price consumer the same price on units the consumer wishes to resell as the lowest price the firm charges the consumer for units that the consumer uses for personal consumption. To prevent the firm from relying upon product characteristics such as customization or status as a service to prevent resale, the court must also require the firm to provide consumers with a platform for trading in rights to purchase the firm’s products at the lowest prices personalized to the reseller.

Forcing dealing in this way does not, however, implicate the concerns expressed by the Court in Trinko regarding the remedy of forced dealing.

---

271 See id.
272 See id. at 407–08 (“Enforced sharing . . . requires antitrust courts to act as central planners, identifying the proper price, quantity, and other terms of dealing—a role for which they are ill-suited. Moreover, compelling negotiation between competitors may facilitate the supreme evil of antitrust: collusion.”).
273 See HOVENKAMP, supra note 1, at 322.
274 See HOVENKAMP, supra note 3, at 393 (treating liability for refusal to deal as synonymous with a “duty to deal”).
275 See supra Section I.A.3.
276 For the adjustment of prices to extract resale profits as a form of arbitrage prevention, see supra text accompanying note 115. Requiring the firm to continue to charge the lowest price the firm has offered to the consumer ensures that the firm cannot manipulate personalized prices for consumption units to ensure that under the court order resale units are sold at inflated prices. Of course, the firm could also manipulate the lowest price the firm charges for consumption units in order to target a high price on resale units, but that would shift the entire personalized price schedule up toward the high prices charged to high-price consumers, effectively defeating the goal of personalized pricing, which is to charge different prices for each unit of the product sold.
277 For the refusal to allow resellers to trade purchase rights as a form of arbitrage prevention, see supra text accompanying note 151.
One concern raised by the Court is that enforced dealing could create an environment of cooperation between competitors that might end with collusion and the fixing of higher prices to consumers.\(^\text{279}\) Forcing Ski to work with Highlands to create a four-mountain pass could, for example, lead the two slope operators to collude in ways that harm consumers, by agreeing not to engage in a competitive race to invest in expensive upgrades to facilities.\(^\text{280}\) This concern does not arise in the arbitrage prevention context, however, because it is consumers themselves who are the competitors in this context.\(^\text{281}\) Ordering the price-personalizing firm to deal with competitors in this context would amount only to requiring the firm to sell to its own customers, as opposed to requiring the firm to enter into dealings with firms selling different, but competing, products. There is therefore no danger that forced dealing would require a firm to interact with other firms competing in the same interbrand market, much less lead to cartelization of an industry.\(^\text{282}\) The worst that could result from forced dealing in this context would be that the firm might be able to continue personalizing prices by using profits from sales to high-price consumers to bribe some low-price consumers not to engage in arbitrage.\(^\text{283}\) But even then the remedy would still temper the effects of personalized pricing, because the bribe would return some of the surplus extracted from consumers via personalized pricing back to consumers.

A second concern about forced dealing expressed by the Court in *Trinko* is that forced dealing requires courts to engage in price administration.\(^\text{284}\) The Court famously observed that compelling dealing requires courts to “act as central planners, identifying the proper price, quantity, and other terms of” sale.\(^\text{285}\) The different outcomes in *Aspen Skiing* and *Trinko* may be attributed in part to this concern. In *Aspen Skiing*, forced dealing meant requiring Ski to reinstitute a product that had existed in the past, giving the Court some baseline to use in supervising cooperation between Ski and Highlands going forward.\(^\text{286}\) By contrast, in *Trinko*, in which the Court ultimately refused to find liability, the absence of a prior record of dealing between Verizon and its competitors would have required the Court to set network access prices without having terms of prior dealing to use as a

---

\(^{279}\) Id. at 408.

\(^{280}\) For more on *Aspen Skiing*, see supra text accompanying note 233.

\(^{281}\) See supra paragraph accompanying note 114.

\(^{282}\) See HOVENKAMP, supra note 3, at 191 (describing a cartel as “an agreement among otherwise competing firms”).

\(^{283}\) By contrast, in the absence of arbitrage or collusion of this kind, consumers get no surplus. See VARIAN, supra note 11, at 446.

\(^{284}\) See HOVENKAMP, supra note 1, at 322.


\(^{286}\) See Aspen Highlands Skiing Corp. v. Aspen Skiing Co., 738 F.2d 1509, 1513 (10th Cir. 1984), aff’d, 472 U.S. 585 (1985) (describing the court’s order).
guide. Courts would not need to engage in price administration in order to force firms to permit resale in the personalized pricing context. Just as in *Aspen Skiing*, in the case of personalized pricing there always is a prior course of dealing—namely, the sales made by the firm to low-price consumers for personal consumption—that the courts can use as a baseline in setting the prices at which firms are required to offer purchase rights to low-price consumers.

ii. Compelling Impersonal Pricing Would Be Even Less Burdensome

Although forced sharing neither creates the harms normally to be feared from collusion nor leads to the judicial price-setting normally to be feared from judicially-compelled dealing, and as a result gives no grounds to the courts for exempting arbitrage prevention from condemnation as monopolization, forced dealing is not the remedy that least implicates concerns regarding collusion or price administration. That honor falls instead to the remedy of ordering the firm to stop charging personalized prices and to start charging impersonal prices, whether uniform or group based, instead. Rather than compelling firms to sell units to low-price consumers for resale at the same personalized prices at which the firms sell to low-price consumers for personal consumption, which is what the forced sharing remedy does, the courts could instead simply order firms not to personalize prices, while still leaving it to firms to continue to exercise complete discretion over whether to sell, to whom, and what (impersonal) prices to charge.

An order that a firm not personalize prices can lead neither to collusion nor price administration. Impersonal pricing cannot promote collusion of any degree or kind, because unlike forced sharing an order not to personalize prices does not require that the firm cooperate with resellers at all. An order not to personalize prices simply constrains the manner in which the firm can structure its prices. That is an improvement over forced resale, which, as noted above, could facilitate collusion between the firm and resellers that might preserve some personalized pricing, even if forced resale would not

287 See *Trinko*, 540 U.S. at 408, 410 (observing that “[c]omplaining also requires antitrust courts to act as central planners, identifying the proper price, quantity, and other terms of dealing—a role for which they are ill-suited” and that “the services allegedly withheld are not otherwise marketed or available to the public”).

288 For the forced sale of purchase rights as a component of forced dealing in arbitrage-prevention cases, see *supra* text accompanying note 276. If a buyer purchases multiple units for personal consumption, possibly at different prices given the different valuations the buyer may place on each unit, then the buyer will want to purchase units for resale at the best of the prices at which the buyer purchases the units for personal consumption. The seller should be required to honor those terms. See *supra* note 275.

289 See *supra* Section I.C.4.i.

290 Cf. *Trinko*, 540 U.S. at 408.
PERSONALIZED PRICING AS MONOPOLIZATION

lead to interbrand collusion. An order that a firm not personalize prices would also avoid judicial price administration to a greater extent than would forced resale. Courts issuing an order not to personalize prices would not need to require the firm to deal and therefore would not need to set price, quantity, or other terms, even by reference to past terms. The firm could instead continue to set all the terms of sale, including price, subject only to the condition that the firm not personalize the price the firm charges for each unit that the firm sells.

Courts feel much more comfortable prohibiting discrimination than they feel forcing dealing, which suggests that courts would feel more comfortable enforcing orders prohibiting the discrimination in prices based on individual willingness to pay that is personalized pricing than they would feel forcing firms to sell to resellers. Indeed, the comfort of the courts with prohibitions on discrimination runs very deep. Formal equality is a fundamental principle of the legal system, embodied in the rule of stare decisis that requires that courts themselves not discriminate based on irrelevant characteristics. Like cases must be treated alike. Every time a court concludes that a particular case is governed by precedent, the court decides that the defendant in the case is similarly situated to the defendant in the precedential case and must therefore be treated by the court in the same way as the court treated the defendant in the precedential case. Courts also insist that like be treated alike in business conducted outside of the court system whenever the courts apply the Equal Protection Clause of the Constitution, the Civil Rights Act of 1964, or some other anti-discrimination statute. Under these rules, courts insist, for example, that like job applicants be treated alike by employers. The courts, in other words, know how to police discrimination,

291 See supra text accompanying note 282.
292 For the ability of courts to force resale without administering prices, see supra text accompanying note 287.
293 Cf. Trinko, 540 U.S. at 408.
294 See Planned Parenthood of Se. Pa. v. Casey, 505 U.S. 833, 854 (1992) (“[T]he very concept of the rule of law underlying our own Constitution requires such continuity over time that a respect for precedent is, by definition, indispensable.”).
295 See Andrei Marmor, Should Like Cases Be Treated Alike?, 11 LEGAL THEORY 27, 27 (2005) (“It is a familiar slogan in legal circles that ‘like cases should be treated alike.’”)
296 See Frederick Schauer, Precedent, 39 STAN. L. REV. 571, 595–96 (1987) (“To fail to treat similar cases similarly, it is argued, is arbitrary, and consequently unjust or unfair. . . . Where the consistency among decisions takes place over time, we call our decisional rule ‘precedent.’”)
298 See Mark Kelman, Concepts of Discrimination in “General Ability” Job Testing, 104 HARV. L. REV. 1157, 1164–65 (1991) (“It is illegal to disfavor members of protected groups who are, without any
and do it all the time. Extending their powers to prohibit a particular kind of discrimination in pricing should be easy.

Indeed, policing discrimination in pricing should be no harder for the courts to carry out than policing discrimination in all the other areas in which the courts police discrimination today. In both price and non-price discrimination cases, the key problem is defining similarity.\(^\text{299}\) In the case of employment discrimination in hiring, for example, the key issue is whether two job candidates are similarly qualified for the position, but were treated differently.\(^\text{300}\) That in turn requires courts to make difficult decisions about what constitutes qualification for a job.\(^\text{301}\) In the case of pricing, the existence of discrimination turns on the question whether the products for which the firm personalizes prices are the same in the sense that resellers would be able profitably to arbitrage the price differences if the firm were to make a market in the resale of price rights.\(^\text{302}\) To be sure, that is a complex question, but it is not clear that the question is more complex than the question whether one employee would perform better than another at work. If courts can handle discrimination cases involving complex social questions like equal treatment in employment then they can handle the question whether a firm is personalizing prices.

Enforcing non-personalization in pricing is not only no harder than enforcing non-discrimination in other areas, but also easier than the alternative remedy of enforcing dealing. Recall that firms can prevent arbitrage in two ways: by personalizing prices that extract any profits that a low-price consumer can earn from arbitrage and by refusing to create an online platform that would allow consumers to trade their rights to their personalized prices.\(^\text{303}\) As a remedy for price-based arbitrage prevention, a non-personalization order is less expensive to enforce than an order compelling sale at low personalized prices because a non-personalization order requires only that courts review prices for personalization, whereas a compelled sale order requires both review of prices (to ensure that they are the same low prices charged for personal consumption) and review of the shifts in the organization of employers’ firms, as ‘market productive’ as others who receive the benefits, such as jobs, promotions, or pay, that members of the protected group seek.”).

\(^\text{299}\) See Ernest F. Lidge III, The Courts’ Misuse of the Similarly Situated Concept in Employment Discrimination Law, 67 Mo. L. Rev. 831, 859 (2002) (lamenting the “similarly situated” requirement because “[a]ny court could find, however, that because of one thing or another an employee is not similarly situated to another employee”).

\(^\text{300}\) See McDonnell Douglas Corp. v. Green, 411 U.S. 792, 802 (1973) (requiring a showing that plaintiff was qualified for the job in order to make out a prima facie case of discrimination in hiring); Mack A. Player, Proof of Disparate Treatment Under the Age Discrimination in Employment Act: Variations on a Title VII Theme, 17 Ga. L. Rev. 621, 646–48 (1982) (describing the qualification requirement in discrimination law as “more than any other, . . . difficult to define”).

\(^\text{301}\) See Player, supra note 300, at 646–48.

\(^\text{302}\) See supra Section I.B.3.

\(^\text{303}\) See supra text accompanying note 144.
selling practices of the firm to ensure that the firm in fact sells to all consumers who wish to buy for resale. As a remedy for failure to permit rights trading, a non-personalization order is similarly less expensive to enforce than an order compelling sale of rights to buy at low personalized prices, because a non-personalization order requires only review of prices, whereas a compelled sale order requires not only review of the prices charged by the firm for purchase rights, but two additional things. The court must ensure that the firm supplies all willing buyers with purchase rights and ensure that end consumers are in fact able to redeem their rights in exchange for the product. Thus the forced dealing remedy requires everything that non-personalization requires of courts, and more.

Courts applying the antitrust laws have broad authority to impose any remedy that makes victims whole, not limited to reversing the conduct that serves as the basis for the underlying violation of the antitrust laws, and courts in fact have enforced orders compelling non-discriminatory pricing in lieu of forced sharing. Consider the Ninth Circuit’s review, in Image Tech. Services, Inc. v. Eastman Kodak Co., of an order requiring both sales at judicially-mandated prices and non-discrimination in pricing. The conduct at issue in the case was a refusal by Kodak to sell parts to independent suppliers of copier repair services who competed with Kodak in the repair market. The Supreme Court ruled the conduct potentially anticompetitive and on remand the district court ordered Kodak to sell parts to all buyers at reasonable and non-discriminatory prices. Concerned that the reasonableness requirement “involves the court in a matter generally considered beyond our function, namely, direct price administration,” the Ninth Circuit struck the reasonableness requirement from the district court’s order, reflecting judicial reluctance to engage in price administration. But the court preserved the requirement of non-discrimination in pricing, observing that “Kodak should be permitted to charge all of its customers . . .

---

305 See FTC v. Nat’l Lead Co., 352 U.S. 419, 429–30 (1957) (approving the enjoining of an otherwise lawful pricing practice to remedy an antitrust violation); GAVIL ET AL., supra note 166, at 1379 (“The most common remedy in civil prosecutions is termination of the unlawful conduct. But . . . the typical equitable remedy also includes restrictions on the conduct of the defendants intended to both prevent the conduct from re-occurring and to restore competitive conditions that may have been altered by the conduct.”).
309 Image Tech., 125 F.3d at 1226.
any nondiscriminatory price that the market will bear." The court showed no concern at all about the capacity of the district court to prohibit discrimination in pricing, and affirmed the non-discrimination order even though as a technical matter the conduct that violated the antitrust laws in the case was Kodak’s refusal to deal with independent servicers at reasonable prices, not Kodak’s charging of discriminatory prices to servicers.

Non-personalization of prices is only a viable remedy, however, if the government is the primary enforcer of an antitrust prohibition on arbitrage prevention. The non-personalization remedy reduces the incentives of all other possible enforcers—from low-price consumers who wish to engage in resale, to both low- and high-price consumers buying for personal consumption—to sue. The low-price consumer engaged in resale destroys its own resale market by winning suit for an order to put an end to the personalization of prices, because without the personalization of prices, and the consequent difference between the prices charged by the firm to the low-price consumer and the prices charged by the firm to high-price consumers, resale opportunities disappear. The low-price consumer who buys for personal consumption but not for resale also may not have anything to gain from suing for an order to put an end to the personalization of prices, because non-personalized prices may price the low-price consumer out of the

---

310 Id. at 1225–26.
311 See Eastman Kodak, 504 U.S. at 458, 483, 486. Image Tech. is good authority for the use of an order prohibiting personalized pricing as a remedy for a refusal to deal, but not entirely on point as authority for the proposition that arbitrage prevention is anticompetitive. The purpose of the non-discrimination order in Image Tech. was to ensure that competitors of Kodak in the market to repair copiers—that is, interbrand competitors—would gain equal access to Kodak-made spare parts, not to ensure that independent servicers would have the chance to arbitrage personalized pricing by Kodak of those spare parts (although there was evidence that Kodak had engaged in discriminatory pricing of the parts). See Image Tech., 125 F.3d at 1225 (indicating that the goal of the non-discrimination order is to “end Kodak’s service monopoly”); Eastman Kodak, 504 U.S. at 457 (“Some customers found that the [competitors’] service was of higher quality.”).

In a further reflection of the comfort of the courts with ordering non-discrimination in pricing, the court in United Shoe also ordered United Shoe to stop discriminating in the rates at which the company leased machinery. See United States v. United Shoe Mach. Corp., 110 F. Supp. 295, 349 (D. Mass. 1953), aff’d per curiam, 347 U.S. 521 (1954) (ordering “discriminatory . . . charges . . . removed”). Unlike Image Tech., United Shoe does not stand for the proposition that courts are willing to go beyond mere reversal of the conduct giving rise to antitrust liability in order to compel non-discrimination, however, because in United Shoe the theory of liability was that United Shoe had used discriminatory prices themselves to discourage competitors from entering the company’s markets. See supra Section I.C.1. Thus the non-discrimination order did no more than reverse the conduct that gave rise to antitrust liability.

312 The government is already an important enforcer of the antitrust laws. See generally HOVENKAMP, supra note 1, at 642–50 (providing an overview of government enforcement of the antitrust laws).
313 See generally id. at 652 (discussing private enforcement of the antitrust laws).
314 Resale opportunities disappear only if the firm turns to uniform pricing in response to the order not to personalize prices. If the firm reverts to group-based pricing instead, then resale opportunities lessen, but do not disappear entirely. See supra text accompanying note 85.
market. By contrast, high-price consumers have some incentive to sue for non-personalization of prices, because non-personalized prices are lower for high-price consumers. But because a non-personalization order does not preclude the firm from refusing to sell to any consumer, a vindictive firm might be able credibly to threaten to punish high-price consumers for bringing suit by denying them access to the product forever, eliminating any gains they might enjoy from forcing the firm to charge non-personalized prices. Because private plaintiffs of all stripes lack the full incentive to challenge the personalization of prices, the government must be the primary challenger.

II. PERSONALIZED PRICING AS A STANDALONE ANTITRUST VIOLATION

Recognizing arbitrage prevention as monopolization, and ordering firms not to continue personalizing prices when they are caught preventing arbitrage, would seem at first glance to guarantee a world without personalized pricing. But in fact the power of an order not to personalize prices, or indeed of any remedy, including a forced dealing remedy, is limited, because these remedies can only be imposed in response to conduct that prevents arbitrage. Firms that do not raise prices to extract gains from resale, and which permit the resale of purchase rights, do not violate the prohibition on arbitrage prevention and therefore are not subject to remedial action by the courts. In theory, these firms should be unable to personalize prices. But in practice they might still be able to do so.

The reason is not that resale would somehow remain prohibitively costly, despite the forbearance of firms from practices that restrict arbitrage. If resale were to remain too costly, then the product sold by the firm to low-price buyers would simply not count as the same product as the product sold by the firm to high-price buyers. Recall that the financial viability of resale, after all costs are taken into account, determines whether two products, the resold product and the product for which the ultimate buyer substitutes the resold product, are the same, and therefore whether the

315 See supra text accompanying note 67.
316 See supra text accompanying note 56.
318 See supra Section I.C.4.i.
319 See LAYCOCK, supra note 128, at 1 (“A remedy is anything a court can do for a litigant who has been wronged or is about to be wronged.”). It is the inverse of Blackstone’s famous remark that “where there is a legal right, there is also a legal remedy,” namely, that where there is no legal right, there is also no legal remedy, which is the more scrupulously honored of the two. 3 WILLIAM BLACKSTONE, COMMENTARIES, 23; see John C. Jeffries, Jr., The Right-Remedy Gap in Constitutional Law, 109 YALE L.J. 87, 87 (1999).
320 See LAYCOCK, supra note 128, at 1.
321 See supra Sections I.A.3, I.A.4.
322 See supra Section I.B.3.
personalization of prices for the two products counts as the personalization of prices for the same product. If resale remains prohibitively costly even after firms have eliminated all restraints on resale, it follows that the differentially-priced products in question are not actually the same product, and personalized pricing of the same product is therefore not actually taking place.

The reason, instead, for which personalized pricing might persist despite the absence of restraints on, and concomitant financial viability of, arbitrage is that even when resale is unrestrained and financially viable, there is no guarantee that resellers will in fact fully exploit the opportunity to resell, and therefore no guarantee that personalized pricing will disappear. Antitrust has long recognized that a firm can have a monopoly even without engaging in anticompetitive conduct, simply because, through laziness, incompetence, or pure accident, no competitor mounts a challenge. It follows that, at least in some markets, personalized pricing will persist despite antitrust condemnation of arbitrage prevention, and consumers will therefore continue to be harmed. If antitrust wishes fully to protect consumers from personalized pricing, and antitrust’s consumer protection mission suggests that antitrust should wish to do that, then antitrust should go beyond treating arbitrage prevention as an antitrust violation to treat the act of personalizing prices itself as a violation of the antitrust laws. Without directly

---

323 See supra text accompanying note 216.
324 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.”).
326 For antitrust’s consumer welfare mission, see Robert H. Lande, Wealth Transfers as the Original and Primary Concern of Antitrust: The Efficiency Interpretation Challenged, 34 HASTINGS L.J. 93–96 (1982) (“[T]he legislative debates [surrounding passage of the Sherman Act] strongly suggest that Congress condemned trusts and monopolies because they had enough market power to raise prices and ‘unfairly’ extract wealth from consumers, turning it into monopoly profits.”).
condemning the act of personalizing prices, antitrust cannot hope fully to stamp out that act.

The courts should treat the act of personalizing prices as a free-standing violation of Section 2 of the Sherman Act, tied perhaps to the general language of Section 2, which prohibits “monopoliz[ation]” without defining the term.\textsuperscript{327} The courts cannot take the alternative approach of tying the prohibition to the monopolization rules discussed in this article—the requirements of anticompetitive conduct and monopoly power that have been developed by the courts as interpretations of the language of Section 2—because of the difficulty associated with treating the act of personalizing prices itself as anticompetitive conduct.\textsuperscript{328} Unlike the act of limiting arbitrage, the act of personalizing prices does not itself stifle intrabrand competition, and so the requirement of harm to competition, an essential element of a traditional monopolization claim, is missing.\textsuperscript{329}

Relying upon antitrust’s consumer protection goal to create a free-standing prohibition on personalized pricing out of whole cloth would not be altogether unprecedented, because antitrust has relied on the consumer welfare standard radically to alter antitrust rules in the past.\textsuperscript{330} Indeed, the Chicago School of antitrust analysis brought the consumer welfare standard into antitrust precisely for that purpose.\textsuperscript{331} The Chicago School believed that prevailing antitrust rules punished firms that dominated markets for the legitimate purpose of controlling the resources necessary to produce the best

\begin{footnotesize}
\textsuperscript{327} See 15 U.S.C. § 2 (2018) (“Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations, shall be deemed guilty of a felony . . . .”).
\textsuperscript{328} See supra text accompanying note 45. For a discussion of the evolution of the monopolization requirement as a set of interpretations of Section 2, see Hovenkamp, supra note 1, at 291–92.
\textsuperscript{329} See supra text accompanying note 45.
\textsuperscript{331} See George L. Priest, Bork’s Strategy and the Influence of the Chicago School on Modern Antitrust Law, 57 J.L. & Econ. S1, S10–11 (2014).
\end{footnotesize}
quality products at the lowest cost. The courts ultimately used the consumer welfare standard as the sole justification for altering the antitrust laws to tolerate salutary dominance, despite the lack of any other basis in statute or caselaw for doing so. The courts reversed longstanding prohibitions on exclusive dealing and tying arrangements, for example, replacing those prohibitions with case-by-case review for harm to consumers. And the courts stopped condemning mergers in concentrated industries out of hand. The courts made those and other changes without express authorization from Congress, or the aid of precedent, but simply because they concluded that antitrust’s mission is to protect consumers—the consumer welfare standard—and they believed that these changes to the law would be good for consumers. There is no reason for which the consumer welfare standard should only be used to restrict the ambit of antitrust rules, sparing some conduct for the sake of, expanding consumer welfare, but should never be used to expand the ambit of antitrust rules, by extending them to condemn new categories of conduct, such as personalized pricing.

CONCLUSION

The information age promises to make personalized pricing a reality, at

332 In the decades preceding the triumph of the Chicago School in the 1970s, the courts had tended to pursue the promotion of competition regardless of the effect of competition on consumers. See N. Pac. Ry. Co. v. United States, 356 U.S. 1, 4 (1958) (“The Sherman Act was designed to be a comprehensive charter of economic liberty aimed at preserving free and unfettered competition as the rule of trade. It rests on the premise that the unrestrained interaction of competitive forces will yield the best allocation of our economic resources, the lowest prices, the highest quality and the greatest material progress, while at the same time providing an environment conducive to the preservation of our democratic political and social institutions. But even were that premise open to question, the policy unequivocally laid down by the Act is competition.”); Brown Shoe Co. v. United States, 370 U.S. 294, 344 (1962) (“Congress appreciated that occasional higher costs and prices might result from the maintenance of fragmented industries and markets. It resolved these competing considerations in favor of decentralization. We must give effect to that decision.”). For an example of the Chicago School rejoinder, see Robert H. Bork, Legislative Intent and the Policy of the Sherman Act, 9 J.L. & ECON. 7, 12 (1966) (“Congress was very concerned that the law should not interfere with business efficiency. This concern, which was repeatedly stressed, was so strong that it led Congress to agree that monopoly itself was lawful if it was gained and maintained only by superior efficiency. Thus the desire to protect small firms from annihilation by monopoly-minded rivals did not extend an inch beyond the bounds of the consumer-welfare rationale.”).


335 See id. at 29–31.

336 For the full list of rule changes, see id. at 27–36. For the unprecedented nature of the changes, see Woodcock, supra note 330, at 1755–63. The changes were so sudden, and ungrounded in existing law, that the Supreme Court never ratified the changes in the merger context, and indeed still has not done so through to the present day. See GAVIL ET AL., supra note 22, at 452–55.

337 See Woodcock, supra note 330, at 1762–63.
least approximately. As the only regulatory regime having the general mission of protecting consumer welfare in the economic sense, antitrust can block the emergence of this consumer-surplus-reducing practice. One approach would be for antitrust to recognize that anticompetitive conduct lies at the heart of much personalized pricing. 338 For no firm can personalize prices unless the firm can stop low-price buyers from reselling the product to high-price buyers. To personalize prices, then, firms generally must impose restraints on arbitrage, and those restraints are anticompetitive. They undermine resale competition in the market to buy the firm’s own product.

The refusal of a firm to sell units of its product for resale is not protected by the general right of firms to choose their clients. In recent decades, the courts have recognized that the right to refuse to deal does not protect the termination of a prior profitable course of dealing with a competitor. The refusal of a price-personalizing firm to deal with a low-price buyer seeking to buy additional units for resale is precisely the sort of termination of a prior profitable course of dealing that the courts remain willing to condemn.

Even when the courts are willing to condemn a refusal to deal, such as the refusal to sell to resellers that underpins personalized pricing, the courts hesitate to provide a remedy because they worry about the administrability of judicially-compelled dealings between competitors. But condemning restraints on arbitrage does not implicate this concern, because courts have available an alternative remedy to forced dealing that is more effective at alleviating the harm of restrictions on arbitrage. That alternative remedy is directly to order firms not to personalize prices. Such an order would preserve for a firm the discretion to decide whether or not to sell to any particular buyer, as well as the discretion of the firm to decide the absolute prices to charge for its product, so long as the prices are not personalized on a unit basis. Thus the courts could avoid compelling firms to deal with any particular buyer, and avoid the problem of setting absolute price levels, while still forcing offenders to desist from personalizing prices.

Antitrust condemnation of restraints on arbitrage are unlikely, however, to preclude all personalized pricing, because some firms may be able to escape competition from resellers out of luck, rather than by taking steps to prevent arbitrage. Antitrust can fully eliminate personalized pricing only by recognizing the act of personalizing prices itself as an independent violation of Section 2 of the Sherman Act. The courts have broad authority to take that step under antitrust’s consumer welfare standard, because personalized pricing always harms consumers.

338 For other approaches, see Woodcock, supra note 7, at 1400–16.