PERSONALIZED PRICING: ANTITRUST AND POLICY CONSIDERATIONS IN THE AGE OF PERSONALIZATION

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By Zach Y. Brown & Alexander MacKay

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By Ginger Zhe Jin, Liad Wagman & Mengyi Zhong

THE RISE OF SURVEILLANCE PRICING
By Rebecca Kirk Fair, Alvaro Ziadi & Juan Carvajal

PERSONALIZED PRICING: ANTITRUST AND POLICY CONSIDERATIONS IN THE AGE OF PERSONALIZATION
By Gabriela Antonie, J.P. Bruno, Mariella Gonzalez & Esperanza Johnson

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Personalized pricing, amplified by big data and artificial intelligence, marks a significant evolution from traditional pricing strategies, enabling firms to set granular and dynamic prices based on individual consumer data. While the term lacks a single established definition, it is a subject of increasing regulatory scrutiny. The Federal Trade Commission ("FTC") has described it as a form of "commercial surveillance" and, in July 2024, initiated a formal study into what it calls "surveillance pricing," ordering several firms to provide information on their use of consumer data and algorithms to target prices. The practice presents a complex duality. On one hand, it may offer pro-competitive benefits, such as increased market efficiency, tailored offerings for consumers, market expansion, and incentives for innovation. On the other hand, it may raise significant concerns articulated by academics and regulators. These include antitrust risks like targeted predatory pricing that could deter market entry, the creation of data-driven entry barriers, and potential for algorithmic collusion. Significant issues of fairness, transparency, and consumer consent are at the forefront, with fears that opaque algorithms could lead to discriminatory pricing and erode consumer trust. Despite some high-profile examples, evidence suggests that true, granular personalized pricing is not yet widespread, as firms strategically weigh potential profits against the risks of consumer backlash and regulatory action. The future of personalized pricing will likely be shaped by the interplay between technological advancement, business strategy, and evolving legal frameworks.

I. INTRODUCTION: THE EVOLVING LANDSCAPE OF PRICING STRATEGIES

The confluence of extensive digital data and advancements in artificial intelligence (AI) and machine learning ("ML") is significantly influencing pricing strategies. These technologies may empower firms to collect, process, and analyze vast amounts of consumer data, leading to more granular, dynamic, and individualized pricing than previously observed. This evolution, driven by the speed and scale of AI/ML data processing, signifies a qualitative shift from static, segment-based pricing to dynamic, highly individualized, and often automated mechanisms.[2] Historically, information and transaction costs constrained effective price discrimination. Big Data has potentially lowered these information costs, while AI/ML may further reduce the expense of data analysis and implementing sophisticated pricing rules.[3] This combination enables personalization and dynamism previously confined to theoretical models.

In this data-rich environment, pricing surveillance, price discrimination, and algorithmic pricing are distinct yet intertwined phenomena. Pricing surveillance provides data for personalized pricing, and algorithmic pricing executes these strategies.[4] Their synergy creates complex challenges for antitrust economics, as isolating each component may not adequately address concerns. The efficiency of data collection, algorithmic processing, and personalized pricing could amplify both pro-competitive benefits and anti-competitive risks.[5] This article will explore these implications within U.S. antitrust law, drawing on economic theory, enforcement trends, and technological developments.

II. DEFINING PERSONALIZED PRICING IN THE CURRENT DISCOURSE

"Personalized pricing" is a term that does not appear to have a universally established definition, and it is sometimes used interchangeably with other concepts, such as "algorithmic pricing."[6] Academic literature typically frames personalized pricing as a refined form of price discrimination, often described as a scenario where small, data-derived clusters of consumers receive tailored offers based on predicted willingness to pay.[7] The Organisation for Economic Co-operation and Development ("OECD") defines personalized pricing as "the practice of price discriminating final consumers based on their personal characteristics and conduct, resulting in each consumer being charged a price that is a function — but not necessarily equal — to his or her willingness to pay."[8]

The Federal Trade Commission ("FTC") has described personalized pricing as involving setting individualized prices for a product or service using consumer-specific data — such as location, demographics, credit history, or browsing behavior — processed via ML or AI.[9] The FTC has also characterized personalized pricing as part of a broader concern with what it terms "commercial surveillance," defined by the agency as "the business of collecting, analyzing, and profiting from information about people."[10] Per the FTC, "commercial surveillance" includes practices such as building consumer profiles, displaying targeted advertising, and selling consumer data.[11]

2 Federal Trade Commission, "Surveillance Pricing 6(b) Issue Spotlight," available at https://www.ftc.gov/system/files/ftc_gov/pdf/sp6b-issue-spotlight.pdf, accessed on May 26, 2025.

3 Federal Trade Commission, "Surveillance Pricing 6(b) Issue Spotlight," available at https://www.ftc.gov/system/files/ftc_gov/pdf/sp6b-issue-spotlight.pdf, accessed on May 26, 2025.

4 Federal Trade Commission, "Surveillance Pricing 6(b) Issue Spotlight," available at https://www.ftc.gov/system/files/ftc_gov/pdf/sp6b-issue-spotlight.pdf, accessed on May 26, 2025; Elizabeth Rholetter Purdy, "Price Discrimination," *EBSCO*, 2021, available at https://www.ebsco.com/research-starters/law/price-discrimination, accessed on May 26, 2025.

5 Organisation for Economic Co-operation and Development (OECD), "Personalised Pricing in the Digital Era," OECD Competition Committee Discussion Paper DAF/COMP/WD(2018)140, November 28, 2018, available at https://one.oecd.org/document/DAF/COMP/WD(2018)140/en/pdf; Andrew Rhodes & Jidong Zhou, "Personalized Pricing and Competition," *American Economic Review* 114.7 (2024): 2141-2170.

6 Kirti Gupta & Avigail Kifer, "Algorithms, Artificial Intelligence, and Antitrust," *The Antitrust Source*, February 2024, accessed on June 2, 2025; See also, Andrew Rhodes & Jidong Zhou, "Personalized Pricing and Competition," *American Economic Review* 114.7 (2024): 2141-2170.

7 Andrew Rhodes & Jidong Zhou, "Personalized Pricing and Competition," *American Economic Review* 114.7 (2024): 2141-2170.

8 Organisation for Economic Co-operation and Development (OECD), "Personalised Pricing in the Digital Era," OECD Competition Committee Discussion Paper DAF/COMP/WD(2018)140, November 28, 2018, available at https://one.oecd.org/document/DAF/COMP/WD(2018)140/en/pdf, accessed on January 10, 2025.

9 Federal Trade Commission, "FTC Issues Orders to Eight Companies Seeking Information on Surveillance Pricing," July 23, 2024, available at https://www.ftc.gov/news-events/news/press-releases/2024/07/ftc-issues-orders-eight-companies-seeking-information-surveillance-pricing, accessed on January 10, 2025.

10 Federal Trade Commission, "FTC Explores Rules Cracking Down on Commercial Surveillance and Lax Data Security Practices," August 11, 2022, available at https://www.ftc.gov/news-events/news/press-releases/2022/08/ftc-explores-rules-cracking-down-commercial-surveillance-lax-data-security-practices, accessed on January 10, 2025.

11 Federal Trade Commission, "FTC Explores Rules Cracking Down on Commercial Surveillance and Lax Data Security Practices," August 11, 2022, available at https://www.ftc.gov/news-events/news/press-releases/2022/08/ftc-explores-rules-cracking-down-commercial-surveillance-lax-data-security-practices, accessed on January 10, 2025

III. REGULATORY SCRUTINY: THE FTC'S EXAMINATION OF "SURVEILLANCE PRICING"

The FTC conducts studies under Section 6(b) of the Federal Trade Commission Act, which authorizes the agency to request information for research and policymaking purposes.[12] Although 6(b) study orders are technically non-enforcement tools, observers note they could influence subsequent enforcement strategies.[13]

In July 2024, the FTC issued a 6(b) study order to investigate the use of personal data and algorithmic tools in price targeting — a practice the FTC referred to as "surveillance pricing" or "personalized pricing."[14] The FTC's order appears to reflect growing regulatory scrutiny at the intersection of competition, data privacy, and consumer protection. The 2024 6(b) study order on personalized pricing requested information from eight firms described as offering pricing and targeting solutions:[15] Mastercard,[16] Revionics,[17] Bloomreach,[18] JPMorgan Chase,[19] Task Software,[20] PROS,[21] Accenture,[22] and McKinsey & Co.[23] The FTC indicated its interest in services and solutions that rely on consumer data, AI, and algorithmic tools to "categorize individuals and set a targeted price for a product or service."[24]

Recently, the FTC has also shown renewed attention to the Robinson-Patman Act in contexts that might touch upon differential pricing.[25] The Robinson-Patman Act prohibits certain forms of price discrimination that result in injury to competition, primarily focusing on

12 Federal Trade Commission, "A Brief Overview of the Federal Trade Commission's Investigative, Law Enforcement, and Rulemaking Authority," May 2021, available at https://www.ftc.gov/about-ftc/mission/enforcement-authority, accessed on January 10, 2025.

13 For instance, the FTC's investigation into pharmacy benefit managers (PBMs) led to a lawsuit alleging artificial inflation of insulin prices. Federal Trade Commission, "FTC Releases Interim Staff Report on Prescription Drug Middlemen," July 9, 2024, available at https://www.ftc.gov/news-events/news/press-releases/2024/07/ftc-releases-interim-staff-report-prescription-drug-middlemen, accessed on January 10, 2025; Federal Trade Commission, "FTC Sues Prescription Drug Middlemen for Artificially Inflating Insulin Drug Prices," September 20, 2024, available at https://www.ftc.gov/news-events/news/press-releases/2024/09/ftc-sues-prescription-drug-middlemen-artificially-inflating-insulin-drug-prices, accessed on January 10, 2025.

14 The terminology itself is contentious. Melissa Holyoak, "Concurring Statement of Commissioner Melissa Holyoak Regarding the Unnamed Matter to Issue Orders to File Special Reports," *Federal Trade Commission*, July 23, 2024, available at https://www.ftc.gov/system/files/ftc_gov/pdf/holyoak-concurring-statement-re-surveillance-pricing.pdf, accessed April 15, 2025; Andrew Ferguson, "Concurring Statement of Commissioner Andrew Ferguson Regarding Orders to File Special Reports on Surveillance Pricing," *Federal Trade Commission*, July 23, 2024, available at https://www.ftc.gov/system/files/ftc_gov/pdf/surveillance-pricing-6b-ferguson-concurrence.pdf, accessed April 15, 2025.

15 Federal Trade Commission, "Behind the FTC's Inquiry into Surveillance Pricing Practices," July 23, 2024, available at https://www.ftc.gov/policy/advocacy-research/tech-at-ftc/2024/07/behind-ftcs-inquiry-surveillance-pricing-practices, accessed on January 10, 2025.

16 Mastercard, "Advancing AI protection for the payments ecosystem," Brighterion AI, accessed January 13, 2025, https://b2b.mastercard.com/ai-and-security-solutions/brighterion-ai/; Mastercard, "Accelerating the digital economy with custom AI solutions," available at https://b2b.mastercard.com/ai-and-security-solutions/brighterion-ai/ai-express/, accessed on January 13, 2025.

17 Revionics, "AI Retail Pricing Software," available at https://revionics.com/solutions, accessed on January 12, 2025; Leah Nylen, "Mastercard, JPMorgan in FTC Study on 'Surveillance Pricing' (2)," *Bloomberg Law*, July 24, 2024, available at https://news.bloomberglaw.com/antitrust/mastercard-jpmorgan-get-ftc-inquiry-over-surveillance-pricing, accessed on January 13, 2025.

18 Bloomreach, "AI-Powered Ecommerce Personalization," https://www.bloomreach.com/en, accessed on January 13, 2025.

19 JPMorgan Chase & Co., "Machine Learning Center Of Excellence," J.P. Morgan, available at https://www.jpmorgan.com/technology/applied-ai-and-ml/machine-learning, accessed on January 13, 2025.

20 Task, "Our Story," available at https://tasksoftware.com/au/about-us/our-story, accessed on January 13, 2025.

21 PROS, "PROS.com," available at https://pros.com/, accessed on January 13, 2025.

22 Accenture, "What we do," available at https://www.accenture.com/us-en/services, accessed on June 2, 2025; Nicole Fallon, "What is AI Price Optimization?" *US Chamber of Commerce*, May 6, 2024, available at https://www.uschamber.com/co/run/finance/ai-price-optimization, accessed on May 29, 2025 ("There are numerous AI-powered pricing tools to help businesses get started with price optimization, including Amazon Web Services, IntelligenceNode, Pricefx, Sniffie.io, and Accenture's Solutions.AI for Pricing.").

23 McKinsey & Company, "McKinsey Digital," available at https://www.mckinsey.com/capabilities/mckinsey-digital/how-we-help-clients, accessed on January 13, 2025.

24 Federal Trade Commission, "P246202 Surveillance Pricing 6(b) Study: Research Summaries (Redacted)," January 2025, https://www.ftc.gov/system/files/ftc_gov/pdf/p246202_surveillancepricing6bstudy_researchsummaries_redacted.pdf, accessed on April 21, 2025. See also Federal Trade Commission, "Order to File a Special Report, #P246202," July 19, 2024,https://www.ftc.gov/system/files/ftc_gov/pdf/sp6b_order_surv_pricing.pdf, accessed January 13, 2025.

25 Federal Trade Commission, "FTC Sues Southern Glazer's for Illegal Price Discrimination," December 2024, available at https://www.ftc.gov/news-events/news/press-releases/2024/12/ftc-sues-southern-glazers-illegal-price-discrimination, accessed on April 15, 2025.

differences in prices charged to competing purchasers (typically businesses).[26] Its applicability to algorithmic personalized pricing for end consumers may be complex and less direct, though some FTC actions suggest a potential exploration of its relevance in modern digital markets.[27] Commentators have noted that the primary focus of the Robinson-Patman Act is on discrimination between *competing buyers*, which might make its application to individualized prices for *end consumers* challenging, unless such pricing can be shown to harm competition at some level of the market.[28]

IV. HISTORICAL ANALOGUES AND TECHNOLOGICAL EVOLUTION: PERSPECTIVES ON WHAT MAY BE DIFFERENT

The concept of personalized pricing has many historical analogues and has been reportedly used extensively in different contexts. For example, car dealerships,[29] insurers,[30] and airlines have long priced products based on observable or inferred customer characteristics.[31] In the auto industry, one academic study found that African American and Hispanic car buyers paid approximately two percent more for cars at a car dealership than white buyers for identical cars, which the authors attributed mainly to differences in factors such as income and education rather than statistical discrimination. The authors further found that such racial gaps in prices paid were not present among online car shoppers, where such racial and other personal characteristics were considered unobservable at the time of the study.[32] Similarly, academic research has found that, even before the era of widespread ML and AI, businesses across sectors, such as supermarkets, airlines, and credit cards, compiled extensive databases of individual consumer transactions to study purchasing behavior and make personalized offers.[33]

Given this historical context, a key question is what makes the current environment of personalized pricing potentially different. The literature has raised several aspects that are currently perceived by some as different from historical standards:

1. **The Increasing Role of Algorithms in Pricing:** Historically, pricing products based on customer characteristics, while personalized, often relied on static, rule-based systems and, reportedly, heavily on human intuition rather than algorithmic models.[34] It is suggested that modern algorithmic pricing software has evolved from static, rule-based systems to dynamic, learning-based models capable of adjusting prices in response to shifting conditions and individualized traits. It is perceived by some that modern personalized pricing can leverage vast data sets and automated systems to estimate consumer demand and willingness-to-pay in real-time.[35]

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26 Maureen Ohlhausen et. al, "Shot, Chaser: FTC Sues Alcohol Supplier Under Controversial Pricing Law, Dissenting Commissioner Offers Detailed Defense," *Wilson Sonsini*, December 18, 2024, available at https://www.wsgr.com/en/insights/shot-chaser-ftc-sues-alcohol-supplier-under-controversial-pricing-law-dissenting-commissioner-offers-detailed-defense.html.

27 Federal Trade Commission, "FTC Sues Southern Glazer's for Illegal Price Discrimination," December 2024, available at accessed April 15, 2025, https://www.ftc.gov/news-events/news/press-releases/2024/12/ftc-sues-southern-glazers-illegal-price-discrimination, accessed on April 15, 2025; Kevin Hahm, Nicole R. Johnson, "Where Might Antitrust Enforcement be Heading Under Trump?," *The National Law Review*, available at https://natlawreview.com/article/ftc-antitrust-enforcement-under-second-trump-administration, accessed on May 26, 2025.

28 Coby Wittman, "The Return of the Robinson-Patman Act? The Economics of Secondary-Line Price Discrimination and Considerations for RPA Compliance," *ABA Antitrust Law Section*, April 8, 2025, available at https://www.americanbar.org/groups/antitrust_law/resources/newsletters/return-robinson-patman-compliance/, accessed on June 2, 2025.

29 Ian Ayres & Peter Siegelman, "Race and Gender Discrimination in Bargaining for a New Car," *The American Economic Review* 85, no. 3 (1995): 304-21; Fiona M. Scott Morton, Florian Zettelmeyer & Jorge Silva-Risso, "Consumer Information and Discrimination: Does the Internet Affect the Pricing of New Cars to Women and Minorities?" *Quantitative Marketing and Economics* 1, no. 1 (2003): 65-92.

30 Ben Handel, Igal Hendel & Michael D. Whinston, "Equilibria in Health Exchanges: Adverse Selection versus Reclassification Risk," *Econometrica* 83, no. 4 (2015): 1261-1313; Alma Cohen & Liran Einav, "Estimating Risk Preferences from Deductible Choice," *American Economic Review* 97, no. 3 (2007): 745-88.

31 Joanna Stavins, "Price Discrimination in the Airline Market: The Effect of Market Concentration," *Review of Economics and Statistics* 83, no. 1 (2001): 200-202.

32 Scott Morton, Zettelmeyer & Silva-Risso, "Consumer Information and Discrimination," 65-92.

33 Alessandro Acquisti & Hal R. Varian, "Conditioning Prices on Purchase History," *Marketing Science* 24, no. 3 (2005): 367-81 (see p. 367 for examples).

34 Emilio Calvano et al., "Artificial Intelligence, Algorithmic Pricing, and Collusion," *American Economic Review* 110, no. 10 (2020): 3267-97; Qiuyu Lu & Noriaki Matsushima, "Personalized Pricing When Consumers Can Purchase Multiple Items," *The Journal of Industrial Economics* 72, no. 4(2024): 1507-24.

35 Gupta & Kifer, "Algorithms, Artificial Intelligence, and Antitrust." See also European Commission, Directorate-General for Justice and Consumers, *Consumer Market Study on Online Market Segmentation through Personalised Pricing/Offers in the European Union* (Luxembourg: Publications Office of the European Union, 2018), 43, https://www.econbiz.de/Record/consumer-market-study-online-market-segmentation-personalised-pricing-offers-european-union-request-specific-services-2016-implementation-framework/10011925365.

2. **Perceived Lack of Transparency in Pricing Algorithms:** In the current environment, consumers may not know what information pricing algorithms use. Academic research studying Uber, which uses algorithmic pricing to set prices for its services, has raised concerns that consumers may be unable to discern which data or behaviors are used in setting prices, including whether and how much personal information is used.[36]
3. **Clarity of Customer Consent:** Some argue that personalized pricing that happens unbeknownst to consumers differs from other forms of price discrimination in which the consumer is aware of the dynamic pricing.[37] For example, when consumers "opt in" to having a monitoring device installed in their car to reduce insurance premiums, there is arguably a clearer basis for consent, and an understanding that these devices track driving behaviors like speed, braking, acceleration, time of use, and mileage, in exchange for the possibility of lower insurance premiums.[38]

V. ECONOMIC AND ANTITRUST DISCUSSION: POTENTIAL IMPLICATIONS VOICED IN LITERATURE AND POLICY CIRCLES

At its core, the economics literature often discusses personalized pricing as a form of price discrimination, and some sources note the practice is "increasingly gaining prevalence" in recent years due to "advances in information technology" such as data algorithms.[39] The FTC 6(b) study order highlights the potential role of AI and ML in processing consumer data to predict purchasing behavior and willingness to pay.[40] These technologies, it is suggested, might enable dynamic pricing models to adjust prices in real-time based on individual consumer profiles.

Some potential concerns regarding personalized pricing that have been discussed by the FTC and in the literature include:

- **Potential for Entry Deterrence and Targeted Predatory Pricing:** Cheng & Nowag (2023) discuss a theoretical scenario where a dominant firm could use its granular customer data to identify marginal customers who might be most likely to switch to a competitor or new entrant. The theory suggests it could then offer highly targeted, below-cost prices only to this specific segment, potentially minimizing its own losses while inflicting maximum damage on the competitor. Traditional predatory pricing is often considered risky and costly because price cuts typically may need to be applied more broadly. The paper argues that algorithmic personalization could change this calculus, potentially making predation less costly to initiate and easier to recoup losses from, as inframarginal customers might continue to be charged higher prices. Such practices may thus deter market entry because there may be fewer customers available to the new entrants.[41]
- **Concerns about Data-Based Barriers to Entry:** For data to be an effective deterrent to competition, some argue "it has to be inimitable, rare, valuable, and non-substitutable."[42] It has been posited that, under these circumstances, access to data can lead to a feedback loop: more users imply more data, which can lead to more targeted pricing and better customer experience, which loops back into acquiring more users, implying that data has economies of scale.[43] This feedback loop, some suggest, could allow larger firms to extract more value from data than smaller firms, which could lead to a few firms dominating the entire market. The big firm could then use a data set to greatly expand customer reach, optimize many operations, or improve or innovate many products.[44] However, empirical examples (e.g. Airbnb, Tinder) are cited by some to suggest that superior products can still overcome incumbency in well-established industries. Airbnb entered a highly competitive travel industry and, as noted by Lambrecht and Tucker (2015), quickly became a relevant player "because of its superior value proposition." Tinder entered the online dating

36 Ryan Calo & Alex Rosenblat, "The Taking Economy: Uber, Information, and Power," *Columbia Law Review* 117 (2017): 1623-90.

37 Alessandro Acquisti, Curtis Taylor & Liad Wagman, "The Economics of Privacy," *Journal of Economic Literature* 54, no. 2 (2016): 442-92.

38 Yizhou Jin & Shoshana Vasserman, "Buying Data from Consumers: The Impact of Monitoring Programs in U.S. Auto Insurance," NBER Working Paper No. w29096, July 2021.

39 Dennis W. Carlton & Jeffrey M. Perloff, *Modern Industrial Organization*, 4th ed. (Boston: Pearson Addison Wesley, 2005), 314; (Note: Original text cites 2015 edition, Essex, UK: Pearson. Verify edition and publisher details for accuracy.) Lu & Matsushima, "Personalized Pricing When Consumers Can Purchase Multiple Items," 1507-24.

40 Federal Trade Commission, "Behind the FTC's Inquiry into Surveillance Pricing Practices."

41 Thomas K. Cheng & Julian Nowag, "Algorithmic Predation and Exclusion," *University of Pennsylvania Journal of Business Law* 25 (2023): 41-101.

42 Anja Lambrecht & Catherine Tucker, "Can Big Data Protect a Firm from Competition?" (CPI Chronicle, January 2017).

43 Maryam Farboodi & Laura Veldkamp, "A Growth Model of the Data Economy," NBER Working Paper No. w28427, February 2021.

44 Maryam Farboodi & Laura Veldkamp, "Data and Markets," *Annual Review of Economics* 15 (2023):23-40; Farboodi & Veldkamp, "A Growth Model of the Data Economy."

market in 2012, and its success, according to the same authors, is not due to "big data but because it offers a better solution for its market."[45]

- **Fairness Considerations:** The FTC has expressed concern that personalized pricing could lead to discriminatory practices, where certain groups may systematically face higher prices based on their data profiles.[46] This, it is argued, could exacerbate existing inequalities and undermine consumer trust.[47] Some literature suggests that a lack of consumer trust may occur in retaliation for online commerce generally, and not only the firms undertaking personalized pricing.[48]
- **Issues of Consumer Awareness and Transparency:** Many consumers may be unaware that their personal data is being used to determine pricing, potentially leading to a lack of informed consent. The perceived opacity of these pricing strategies could make it difficult for consumers to understand or challenge the prices they are offered. Moreover, some researchers, such as Acemoglu et al. (2022), argue that even opting out may not prevent personalized pricing, as firms might infer traits based on group-level data, suggesting firms may not need an individual's specific data to provide personalized pricing if they can rely on the data of other similar users.[49]

On the other hand, the literature has highlighted ways in which personalized pricing could potentially promote competition or enhance efficiency:

- **Potential for Increased Efficiency:** Personalized pricing could allow firms to better match prices with consumer demand, potentially leading to a more efficient resource allocation, according to some economic theories. It has been suggested that AI-powered pricing algorithms can reflect and adjust to real-time market conditions, possibly avoiding shortages or oversupply.[50] For example, a ride-share app using location and demand data to adjust prices (surge pricing) is often cited as a way to help allocate drivers efficiently where demand is the highest.[51] Another example relates to dynamic pricing in airline tickets, which some argue can ensure business travelers can get seats while expanding budget-friendly offerings to leisure travelers.[52]
- **Possibility of More Tailored Offerings for Consumers:** It is posited that companies can use data to customize prices, promotions, or bundles, which might benefit consumers who are more price-sensitive. This could expand market access to consumers who would not buy at a uniform price. For example, a student who observes a lower subscription rate for a streaming service based on their demographics or past behavior. Some argue that more tailored offerings benefit consumers because they could involve savings at a reduced search cost relative to less targeted promotions.[53]
- **Potential for Increased Competitive Pressure on Firms:** Personalized pricing, it is theorized, could force firms to be more responsive to consumer behavior and competitors' moves, as each might be better at targeting customers of other firms at competitive prices.[54] Thus, some argue personalized pricing can intensify competition. If many firms have access to similar data, they might compete aggressively on price and service. In theory, this could keep margins lean and benefit consumers as competing firms might increasingly lower the prices offered to specific individuals.
- **Potential for Higher Innovation Incentives:** Some suggest the ability to gather and act on user data may reward innovation in analytics and pricing algorithms. It may push firms to invest more in technology and personalization, potentially improving overall market

45 Lambrecht & Tucker, "Can Big Data Protect a Firm from Competition?"

46 Federal Trade Commission, "Surveillance Pricing 6(b) Issue Spotlight."

47 OECD, "Personalised Pricing in the Digital Era," 2018.

48 OECD, "Personalised Pricing in the Digital Era," 2018.

49 Daron Acemoglu, Ali Makhdoumi, Azarakhsh Malekian & Asu Ozdaglar, "Too Much Data: Prices and Inefficiencies in Data Markets," *American Economic Journal: Microeconomics* 14, no. 4 (2022): 218-56.

50 Gupta & Kifer, "Algorithms, Artificial Intelligence, and Antitrust"; Andrew Odlyzko, "Privacy, Economics, and Price Discrimination on the Internet," in *ICEP'03: Proceedings of the 5th International Conference on Electronic Commerce* (New York: ACM Press, 2003), 355-66; Gupta & Kifer, "Algorithms, Artificial Intelligence, and Antitrust"; Buchholz et al., "Personalized Pricing and the Value of Time: Evidence from Auctioned Cab Rides," *Econometrica* 93, no. 3 (2025): 929-58.

51 Juan Camilo Castillo, "Who Benefits from Surge Pricing?", November 8, 2024, *Econometrica* (forthcoming).

52 Gupta & Kifer, "Algorithms, Artificial Intelligence, and Antitrust." See also Ambarish Chandra & Mara Lederman, "Revisiting the Relationship Between Competition and Price Discrimination," *American Economic Journal: Microeconomics* 10, no. 2 (2018): 190-224; Kevin Williams, "The Welfare Effects of Dynamic Pricing: Evidence from Airline Markets,» *Econometrica* 90, no. 2 (2022): 831-58; Gaurab Aryal et al., "Price Discrimination in International Airline Markets," *Review of Economic Studies* 91, no. 2 (2024): 641-89.

53 Pratap Chandra Mandal, "Marketing Information and Marketing Intelligence: Linkages With Customer Relationship Management," *International Journal of Business Strategy and Automation* 3, no. 1 (2022); Buchholz et al., "Personalized Pricing and the Value of Time: Evidence from Auctioned Cab Rides"; Brian Wallheimer, "Are You Ready For Personalized Pricing?" *Chicago Booth Review*, February 26, 2018, available at https://www.chicagobooth.edu/review/are-you-ready-personalized-pricing, accessed on June 3, 2025.

54 OECD, "Personalised Pricing in the Digital Era," 2018.

offerings. It has also been argued that personalized pricing may incentivize firms to invest in product innovation because as demand increases due to innovation, price personalization might allow firms to recover more of their investment.[55]

- **Possibility of Market Expansion:** It is theorized that, using data, firms might discover underserved niches or latent demand and serve those segments with tailored pricing strategies.[56] For example, a software company might offer a heavily discounted "lite" version of its product to students or users in developing countries who might not otherwise purchase it, thereby potentially expanding its user base and offering opportunities for upselling later. Similarly, streaming services might identify clusters of users with niche content preferences and offer specialized, lower-priced bundles, possibly attracting viewers who wouldn't subscribe to a broader, more expensive package. This ability to finely tune offerings could, in theory, unlock new revenue streams and bring more consumers into the market.

VI. EVIDENCE ON THE EXTENT OF PERSONALIZED PRICING: AN AREA OF ONGOING OBSERVATION

Some high-profile examples of attempts at personalized pricing in past years have been reported, in some cases leading to public backlash:

- **Amazon's 2000 Reported DVD Pricing Experiment:** As discussed by Townley et al. (2017),[57] Amazon reportedly tested how consumers would react to personalized pricing for DVDs. The experiment was followed by consumer backlash, and media reports at the time indicated the company apologized, claimed that test prices were not based on customers' demographics, and refunded thousands of customers.[58]
- **Staples' 2012 Reported Location-Based Price Adjustments:** In 2012, Staples was reported to have adjusted prices for online shoppers based on their geographic location, specifically by offering lower prices to users who lived closer to rival stores such as Office Depot and OfficeMax. This practice was highlighted in the media as one of the first widely publicized examples of location-based dynamic pricing by a major online retailer.[59]
- **Orbitz's 2012 Reported Differentiated Options Based on Device:** The online travel agency Orbitz reportedly found that willingness to pay may vary by the device a consumer uses. Media reports at the time indicated Orbitz showed people who used Mac computers "different, and sometimes costlier, travel options" than users of other machines. It was reported that Orbitz stated it did not show the same hotel room at different prices but rather that its algorithm might have presented different or higher-ranked (and often pricier) options to Mac users, potentially based on an inference that Mac users might have a higher propensity to book more expensive hotels.[60]
- **Reported Hotel Booking Site Discrepancies:** An investigative reporter found that consumers in the Bay Area were, in their investigation, consistently offered higher rates for the same hotel room than consumers from cities such as Kansas City or Phoenix.[61]

The FTC's 6(b) research summaries discuss evidence suggesting that companies are engaging in what it terms surveillance pricing. Specifically, the FTC found, based on documents produced by six major firms subject to its 6(b) study order, which notably do not include retailers,[62] the use of products or services — termed "Targeted Pricing Solutions" and "User Segmentation Solutions" — that incorporate consumer data like location, purchase and return history, customer service interactions, browsing behavior, and demographics to set or personalize prices.

55 OECD, "Personalised Pricing in the Digital Era," 2018.

56 Brian Wallheimer, "Are You Ready For Personalized Pricing?" 2018; Buchholz et al., "Personalized Pricing and the Value of Time: Evidence from Auctioned Cab Rides."

57 Christopher Townley, Eric Morrison & Karen Yeung, "Big Data and Personalized Price Discrimination in EU Competition Law," *Yearbook of European Law*, 2017.

58 Reuters, "Amazon Apologizes to Customers for Price Test," CNN, September 28, 2000, http://www.cnn.com/2000/TECH/computing/09/28/amazon.reut/; "Amazon Apologizes for DVD Pricing Flap," ABC News, September 28, 2000, https://abcnews.go.com/Technology/story?id=119399&page=1. See also Executive Office of the President, *Big Data: Seizing Opportunities, Preserving Values* (Washington, DC: The White House, May 2014), https://obamawhitehouse.archives.gov/sites/default/files/docs/big_data_privacy_report_may_1_2014.pdf. (Note: Original link was to a v2 of a differential pricing report; this is the main Big Data report from that period).

59 Jennifer Valentino-DeVries, Jeremy Singer-Vine & Ashkan Soltani, "Websites Vary Prices, Deals Based on Users' Information," *The Wall Street Journal*, December 24, 2012, https://www.wsj.com/articles/SB10001424127887323777204578189391813881534.

60 Dana Mattioli, "On Orbitz, Mac Users Steered to Pricier Hotels," *The Wall Street Journal*, May 23, 2012, (original URL was: www.wsj.com/articles/SB10001424052702304458604577488822667325882). See also Rafi Mohammed, "How Retailers Use Personalized Prices to Test What You're Willing to Pay," *Harvard Business Review*, October 20, 2017, https://hbr.org/2017/10/how-retailers-use-personalized-prices-to-test-what-youre-willing-to-pay.

61 Keith A. Spencer, "Hotel Booking Sites Caught Overcharging Travelers from Bay Area," *SFGate*, February 3, 2025, https://www.sfgate.com/travel/article/hotel-booking-sites-overcharge-bay-area-travelers-20025145.php.

62 This refers to Mastercard, Revionics, Bloomreach, PROS, Accenture, and McKinsey & Co.

The FTC reported finding that these tools are marketed and used to categorize consumers and set individualized or group-based prices, suggesting active engagement in surveillance pricing, according to the FTC's interpretation of the documents.[63]

Separately, coupons and loyalty programs may offer a more commonly accepted form of price discrimination. The FTC identified "consumer segmentation and profiling tools" as one type of product offered by the intermediary firms subject to the 6(b) study order. The FTC discussed that these products can be used as "targets for ads, promotions, and coupons based on what a company has learned about a consumer." Further, the FTC mentioned that some characteristics (e.g. data on coupon usage, identifying coupon-inclined customers) can be used as inputs to determine the likelihood of spending on certain products and target customers perceived as loyal customers.[64] Academic literature notes that coupons and loyalty programs generally segment consumers based on price sensitivity without necessarily resorting to extensive over-personalization.[65] Some retailers like Kroger integrate coupons into apps and websites, which may enhance their targeting capabilities while, it is argued by some, maintaining consumer goodwill. A 2017 article discussed how in the first quarter of 2017, Kroger made more than 6 million personalized offers to its Plus Card members.[66] Similarly, a 2022 CNN article discusses how Amazon uses click-on coupons to target consumers who may only purchase items on sale, and incentivize consumers who are looking for a specific item that happens to be on sale.[67]

However, the precise current extent of true first-degree personalized pricing appears challenging to quantify, with some analyses suggesting that "examples remain fairly limited."[68] In 2018, the OECD also noted that existing evidence of personalized pricing was "still relatively limited," and there were "no documented cases of the special case of perfect price discrimination, which remains a theoretical hypothesis."[69] It has been observed that only a few academic studies about personalized pricing have been published,[70] and some empirical literature documents that personalized pricing is more observable in sectors like tourism and hospitality, particularly in hotels and airfare, where prices are naturally dynamic and consumer behavior is perhaps more opaque.[71] For example, a study conducted in France found evidence of personalized pricing depending on the time of the day and browser history.[72] Also, in the case of Germany, a 2016 study showed that personalized pricing in the tourism sector appeared to be based on characteristics of consumers.[73] In contrast, some empirical literature finds that the retail sector exhibits fewer consistent signs of personalized pricing, possibly due to factors such as competitive environment, reputational risks, implementation complexity, and legal uncertainty.[74] It has been reported that even large, digitally enabled firms such as Amazon have, at times, committed to

63 Federal Trade Commission, "FTC Issues Orders to Eight Companies Seeking Information on Surveillance Pricing;" Federal Trade Commission, "P246202 Surveillance Pricing 6(b) Study: Research Summaries (Redacted)," January 2025, https://www.ftc.gov/system/files/ftc_gov/pdf/p246202_surveillancepricing6bstudy_researchsummaries_redacted.pdf, accessed on April 21, 2025.

64 Federal Trade Commission, "P246202 Surveillance Pricing 6(b) Study: Research Summaries (Redacted)," January 2025, https://www.ftc.gov/system/files/ftc_gov/pdf/p246202_surveillancepricing6bstudy_researchsummaries_redacted.pdf, accessed on April 21, 2025

65 Chakravarthi Narasimhan, "A Price Discrimination Theory of Coupons," *Marketing Science* 3, no. 2 (Spring 1984): 128–47.

66 Rhett Power, "Is Couponing Making A Comeback In Online Shopping?" *Forbes*, December 8, 2024, https://www.forbes.com/sites/rhettpower/2024/12/08/is-couponing-making-a-comeback-in-online-shopping/; Sandy Skrovan, "Kroger's Analytics and Personalized Pricing Keep It a Step Ahead of Its Competitors," *Grocery Dive*, July 10, 2017, https://www.grocerydive.com/news/grocery--krogers-analytics-and-personalized-pricing-keep-it-a-step-ahead-of-its-comp/534926/.

67 Nathaniel Meyersohn, "Why Amazon Makes You Click a Box to Redeem Coupons," CNN, March 26, 2022, https://www.cnn.com/2022/03/26/business/amazon-coupons-shopping-psychology/index.html.

68 Jean-Pierre Dubé and Sanjog Misra, "Personalized Pricing and Consumer Welfare," *Journal of Political Economy* 131.1 (2023): 131-189; Executive Office of the President, Council of Economic Advisers, *Big Data and Differential Pricing* (Washington, DC: The White House, February 2015), https://obamawhitehouse.archives.gov/sites/default/files/whitehouse_files/docs/Big_Data_Report_Nonembargo_v2.pdf.

69 OECD, *Personalised Pricing in the Digital Era - Executive Summary of the Discussion*, OECD Competition Committee, DAF/COMP/M(2018)2/ANN10/FINAL, accessed on May 30, 2025, https://one.oecd.org/document/DAF/COMP/M(2018)2/ANN10/FINAL/en/pdf.

70 European Commission, *Consumer Market Study on Online Market Segmentation*, 43.

71 European Commission, *Consumer Market Study on Online Market Segmentation*. See also Aniko Hannak et al., "Measuring Price Discrimination and Steering on E-commerce Web Sites," in *Proceedings of the 2014 Conference on Internet Measurement Conference (IMC '14)* (New York: ACM, 2014), 305-18; Gaurab Aryal, Charles Murry & Jonathan W. Williams. "Price discrimination in international airline markets." *Review of Economic Studies* 91.2 (2024): 641-689.

72 European Commission, "Consumer market study on online market segmentation through personalised pricing/offers in the European Union," June 2018, available at https://www.econbiz.de/Record/consumer-market-study-online-market-segmentation-personalised-pricing-offers-european-union-request-specific-services-2016-implementation-framework/10011925365, accessed on January 10, 2025, p. 45-46. European Commission, *Consumer Market Study on Online Market Segmentation*, 45-46.

73 European Commission, *Consumer Market Study on Online Market Segmentation*, 45-46.

74 Alberto Cavallo, "Are Online and Offline Prices Similar? Evidence from Large Multi-Channel Retailers," *American Economic Review* 107, no. 1 (January 2017): 283-303; Kimia Heidary and Helen Phut, "All is (not) fair in personalized pricing: antecedents and outcomes of consumer fairness perceptions," *Journal of Revenue and Pricing Management,* December 16, 2024.

an explicit, non-discriminatory pricing policy with respect to certain types of customer characteristics, though their overall pricing systems are acknowledged to be dynamic.[75] Such empirical findings may be consistent with some theoretical predictions.

It has also been noted that while personalized pricing, in its most granular form, may not be widespread, firms are reportedly using online and offline pricing practices that fall into related categories: (i) conducting A/B tests that randomly assign customers to one of two possible pricing conditions, (ii) showing different products to customers in distinct demographic groups (not necessarily based on information at the individual-level), and (iii) targeting ads and tailoring prices for a set of products."[76]

VII. THE POTENTIAL INFLUENCE OF MARKET CHARACTERISTICS AND STRATEGIC CHOICES BY FIRMS

Generally, theoretical economic models discuss how the successful implementation of price discrimination may require the firm to possess some degree of market power, the ability to segment its customers effectively, and mechanisms to prevent or limit arbitrage.[77] In particular, the overall impact of personalized pricing on consumer surplus and firm profits may depend on several factors, including the underlying market structure (e.g. monopoly versus oligopolistic competition), the degree of market coverage (i.e. whether all or only a fraction of potential consumers are served), and the granularity and accuracy of the data used for personalization.

For instance, in competitive oligopolistic settings with high market coverage or a high number of firms, some economic models suggest personalized pricing might intensify competition as firms vie for individual consumers, potentially leading to lower prices and benefiting consumers at the expense of firm profits.[78] This idea generalizes the insight from Thisse & Vives (1988) that personalized pricing can, under certain conditions, intensify competition.[79] Dubé & Misra (2022), in a study of a monopoly price setting that did not consider competitive reactions, found that, despite an overall decrease in total consumer surplus in their model, over 60 percent of consumers actually benefited from personalization, receiving lower prices than they would under an optimal uniform pricing strategy. In their validation experiment, nearly 70 percent of consumers in the personalized pricing group were offered a price lower than the optimal uniform price.[80]

Moreover, while technology provides the means for personalized pricing, its adoption is not merely a matter of technological determinism, as some commentators suggest. It likely represents a strategic choice by firms, who must weigh potential profit gains against significant risks. These risks, as highlighted in some discussions, might include adverse consumer reactions, as personalized pricing is often perceived as unfair, potential damage to brand reputation, and the increasing likelihood of regulatory scrutiny and intervention.[81] Therefore, the prevalence of personalized pricing may reflect not only what is technically feasible but also what firms deem strategically prudent within specific market contexts and evolving regulatory landscapes. This calculation, it is argued, might explain why some firms could opt for less overt or obfuscated forms of personalization, such as personalized discounts or product recommendations that steer consumers towards differently priced options.

The reported lack of widespread evidence of overt personalized pricing might suggest that firms are slowly adopting these strategies, possibly due to fears that consumers will respond negatively, and also perhaps because methods for personalized pricing are still in development, as suggested in a 2015 White House report.[82] Understanding these potential economic drivers and the digital context is important for comprehending why firms might pursue this strategy and why it has become a prominent issue of discussion today.

75 Daisuke Wakabayashi, "Does Anyone Know What Paper Towels Should Cost?" *New York Times*, February 26, 2022, https://www.nytimes.com/2022/02/26/technology/amazon-price-swings-shopping.html, accessed on June 6, 2025. .

76 Executive Office of the President, *Big Data and Differential Pricing*, 2015.

77 This is a general economic principle. For examples of discussions, see: Benjamin Klein, *Price Discrimination* (University of Virginia Department of Economics, 2008), https://economics.virginia.edu/sites/economics.as.virginia.edu/files/2025-04/pricedisc080808_0.pdf; Federal Trade Commission, "Surveillance Pricing 6(b) Issue Spotlight"; Numberanalytics, "Quick Guide to the Math & Econ of Price Discrimination," Numberanalytics Blog, https://www.numberanalytics.com/blog/quick-guide-math-econ-price-discrimination, accessed on May 30, 2025; "Antitrust Issues in Pricing Algorithms Debated," *China Social Sciences Net*, October 11, 2024, http://english.cssn.cn/skw_focus/202410/t20241011_5790219.shtml.

78 Andrew Rhodes & Jidong Zhou, "Personalized Pricing and Competition," *American Economic Review* 114.7 (2024): 2141-2170

79 Jacques-François Thisse & Xavier Vives, "On the Strategic Choice of Spatial Price Policy," *American Economic Review* 78, no. 1 (March 1988): 122-37.

80 Jean-Pierre Dubé and Sanjog Misra, "Personalized Pricing and Consumer Welfare."

81 See, e.g. Andrew Rhodes & Jidong Zhou, "Personalized Pricing and Competition," *American Economic Review* 114.7 (2024): 2141-2170; Kimia Heidary & Helen Phut, "All is (not) fair in personalized pricing: antecedents and outcomes of consumer fairness perceptions," *Journal of Revenue and Pricing Management*, December 16, 2024.

82 Executive Office of the President, *Big Data and Differential Pricing*, 2015.

VIII. CONCLUDING OBSERVATIONS

Personalized pricing, potentially amplified by Big Data and AI/ML, appears to represent a significant evolution from traditional pricing models. It raises the prospect, in theory, of near-perfect price discrimination, potentially enabling firms to tailor prices to individual or micro-segmented consumer willingness to pay with considerable granularity and dynamism. This evolution, as discussed in various academic articles, carries the potential for both pro-competitive benefit and anticompetitive concerns.

On one hand, suggested pro-competitive benefits such as increased market efficiency, more tailored consumer offerings, intensified competitive pressure under certain conditions, incentives for innovation, and market expansion by serving previously unreached customer segments.

However, these advancements are accompanied by significant concerns articulated by regulators and academics. The capacity for granular surveillance and algorithmic price setting has led to discussions about antitrust risks, including the potential for sophisticated predatory pricing, the erection of data-driven entry barriers, and concerns about algorithmic collusion. Fairness and transparency are also highlighted as major issues, with potential risks of discriminatory outcomes that some fear could exacerbate societal inequalities and erode consumer trust. The perceived opacity of many algorithms and the reported ambiguity of consumer consent further complicate the landscape, according to these discussions.

Regulatory bodies like the FTC are actively scrutinizing these personalized pricing practices, as evidenced by 6(b) studies and renewed attention to leveraging existing laws like the Robinson-Patman Act in certain contexts. While available evidence suggests that true first-degree personalized pricing may not yet be ubiquitous, it is reported that firms are increasingly employing sophisticated data analytics for user segmentation, targeted advertising, and dynamic adjustments that may approach individualized treatment.

The trajectory of personalized pricing will likely depend on a complex interplay of technological advancement, strategic business decisions (weighing potential profits against reputational and regulatory risks), consumer responses, and the evolution of legal and ethical frameworks. As these practices mature, a nuanced understanding of their potential economic impacts and a vigilant approach to their potential anti-competitive and societal harms, as discussed by various stakeholders, will be essential for any efforts to foster innovation while seeking to protect consumers and competitive market structures.