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Economic Rationales for Regulating Behavioral Ads

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Advocates for regulating behaviorally targeted advertisements tend to focus on ethical and legal justifications for regulation. Meanwhile, the advertising technology industry has staunchly opposed regulation by drawing on economic arguments, contending that such regulation would be harmful to advertisers, consumers, publishers, and data intermediaries alike—ultimately undermining innovation and accessibility of free products across the Internet. In this Article, we analyze the theoretical and empirical economic literature on the costs and benefits of privacy regulation in the context of behavioral advertising in order to evaluate the strength of economic arguments for and against regulation. Our analysis suggests that recent enforcement actions against ad-technology firms and movements across the world for online privacy regulations may be justifiable not merely on ethical or moral grounds, but on economic grounds. We show that current economic arguments used by the ad industry to oppose privacy regulation are poorly substantiated, and therefore do not outweigh valid legal and ethical justifications for privacy regulation. Furthermore, there are valid theoretical and empirical economic justifications for regulating behavioral ads. Rather than resulting in a loss of welfare for consumers, regulation may produce a reduction of harms and a more balanced allocation of the costs and benefits of data

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accumulation. Still, future economic work must move from analyzing narrow micro-level effects to research designs that are both rigorous and encompassing, allowing for a fuller understanding of impacts across stakeholders to more effectively inform privacy regulation.

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Introduction

In the ongoing consumer-privacy debate surrounding behaviorally targeted advertising, economic rationales are often stacked against moral and ethical ones: Privacy advocates have largely adopted ethical justifications—such as the need to protect individual liberties,[1] mitigate various forms of discrimination,[2] and preserve decisional autonomy[3]—to argue in favor of regulation to curb data-intensive behaviorally targeted advertising.[4] In contrast, the ad-tech industry has often resisted and reshaped potential regulations through economic arguments.[5] These firms contend that regulation can be economically harmful to multiple stakeholders in the online data ecosystem — comprising advertisers, data intermediaries, publishers, and consumers. [6] Anti-regulatory arguments emphasize that curbing targeted advertising undermines innovation and competition in online marketplaces and limits access

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[1] *See, e.g.*, Danielle Keats Citron & Daniel J. Solove, *Privacy Harms*, 102 B.U. L. REV. 793 (2022); Samantha Lai & Brooke Tanner, *Examining the Intersection of Data Privacy and Civil Rights*, Brookings (July 18, 2022), https://www.brookings.edu/articles/examining-the-intersection-of-data-privacy-and-civil-rights/.

[2] *See, e.g.*, Citron and Solove, *supra* note 1; Amit Datta, Michael Carl Tschantz & Anupam Datta, Automated Experiments on Ad Privacy Settings: A Tale of Opacity, Choice, and Discrimination (Mar. 16, 2015), http://arxiv.org/abs/1408.6491. ; Fifth Amended Class and Collective Action Complaint ¶ 84, Bradley v. T-Mobile U.S., Inc., No. 17-cv-07232-BLF (N.D. Cal. Mar. 13, 2020), 2020 WL 1233924. *Cited in* Ifeoma Ajunwa, *Automated Governance*, 101 N.C. L. REV. 355 (2023).

[3] *See, e.g.*, Bennett Cyphers and Adam Schwartz, *Ban Online Behavioral Advertising*, Electronic Frontier Foundation (Mar. 21, 2022), https://www.eff.org/deeplinks/2022/03/ban-online-behavioral-advertising.

[4] *Id.*; *See, e.g.*, Fight for the Future, Data & Society, Surveillance Technology Oversight Project, Brown University Data Science Initiative, Shoshanna Zuboff, Andrew Selbst and Solon Barocas, and EPIC, *Comment Letters on Proposed Trade Regulation Rule on Commercial Surveillance and Data Security*, 87 Fed. Reg. 51273 (Aug. 22, 2022) (to be codified at 16 C.F.R. ch. I). https://www.regulations. gov/docket/FTC-2022-0053

[5] *See*, *e.g.*, Meta, ZoomInfo, Digital Advertising Alliance, Association of National Advertisers, and Interactive Advertising Bureau, *Comment Letters on Proposed Trade Regulation Rule on Commercial Surveillance and Data Security*, 87 Fed. Reg. 51273 (Aug. 22, 2022) (to be codified at 16 C.F.R. ch. I). https://www.regulations.gov/docket/FTC-2022-0053

[6] *Id.*; AdExchanger, *If A Consumer Asked You, "Why Is Tracking Good?" What Would You Say?*, AdExchanger (Oct. 28, 2011), https://www.adexchanger.com/online-advertising/why-is-tracking-good/.https://www.adexchanger*Id.*

to free and low-cost online products that targeted ads help monetize.[7]

But what can actually be concluded, based on economic findings, about the costs and benefits of regulating behaviorally targeted ads? In this Article, we critically review the theoretical and empirical literature on the economics of behaviorally targeted advertising, a form of advertising that is dependent on the mass accumulation and distribution of consumer data.[8] We aim to distill what current research actually reveals about the costs of regulation and, crucially, about the *allocation* of the costs and benefits of data collection. Are ethical arguments fundamentally at odds with economic arguments? To what extent do consumer data protection regulations reflect paternalistic solutions, potentially imposing undue costs that conflict with consumers' demonstrated preferences? Is there, in fact, an economic argument to be made in support of regulating behaviorally targeted ads?

Our findings challenge a key assumption at the core of the privacy debate: that economic arguments unequivocally support the ad-tech industry's anti-regulatory positions. We show that the economic analyses used to make anti-regulation arguments tend to be limited in scope and leave out key economic considerations; they focus primarily on the short-term costs of privacy regulations and the impacts of these regulations on specific stakeholders, rather than on long-term effects, effects on classes of stakeholders, and the allocation of benefits from data collection. Instead, some long-term analyses of existing privacy interventions show that online ecosystems adapt and continue to thrive over time under regulation. We also show that, while behavioral targeting has surely led to significant growth for data intermediaries, an in-depth analysis of the available literature raises doubts over whether these technologies have translated into comparable welfare increases for merchants, publishers, and consumers in the digital economy.

In Part I, we highlight the evolution of online advertising, and present the tensions between existing narratives surrounding the costs and benefits of behaviorally targeted ads: On one hand, the ad-tech industry offers a compelling argument of an economic win-win

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[7] AdExchanger, *supra* note 6.

[8] *See* definition in Sophie C. Boerman, Sanne Kruikemeier & Frederik J. Zuiderveen Borgesius, *Online Behavioral Advertising: A Literature Review and Research Agenda*, 46 J. Advert. 363, 364 (2017).

for all parties, while on the other hand, consumers,[9] publishers,[10] and merchants[11] alike have expressed disdain for the current state of online advertising and data collection.

In Part II, we focus on what the theoretical and empirical economic literatures on the economics of privacy and behavioral ads can reveal about these conflicting narratives. We find that, based on the theoretical literature, there are solid reasons to look at claims about economic benefits of online targeted advertising being shared by multiple stakeholders with suspicion — even without considering the individual and societal non-economic risks of data collection. We then turn to the existing empirical evidence on the allocation of benefits and implications of regulation for each stakeholder in the data economy: Merchants, publishers, consumers, and data intermediaries. While a significant portion of empirical studies have focused on the harm of regulation, we show the limitations in scope and generalizability of those studies. We also show that an encompassing view of the empirical literature unveils countervailing evidence, including evidence of harm from privacy loss and lack of long-term harm from privacy regulation. We also find a remarkable dearth of empirical evidence on the allocation of benefits from behavioral ads to stakeholders other than data intermediaries. Overall, there is limited empirical economic evidence to support the view that free data collection and processing is an economic win-win for all parties involved. A comprehensive

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[9] *See* Sara Atske, *Americans and Privacy: Concerned, Confused and Feeling Lack of Control Over Their Personal Information*, Pew Research Center: Internet, Science & Tech (Nov. 15, 2019), https://www.pewresearch.org/internet/2019/11/15/americans-and-privacy-concerned-confused-and-feeling-lack-of-control-over-their-personal-information/.

[10] As we discuss in Part I, news publishers in particular have faced dwindling revenues over the past several years. *See* generally: U.S. Census Bureau, *Breakdown of Revenue by Advertising Type: Newspapers Advertising Space - All Other Advertising for Newspaper Publishers, All Establishments, Employer Firms [RPCNOAEF51111ALLEST]*, FRED, Federal Reserve Bank of St. Louis (2021), https://fred.stlouisfed.org/series/RPCNOAEF51111ALLEST; Reid Wilson, *New Data Shows Newspaper Revenues down Sharply*, The Hill (June 9, 2022), https://thehill.com/homenews/state-watch/3517259-new-data-shows-newspaper-revenues-down-sharply/.

[11] *See* prominent examples of advertisers criticizing the state of online advertising: Marc Pritchard, *Procter & Gamble Chief Issues Powerful Media Transparency Rallying Cry*, (Jan. 29, 2017), https://www.campaignlive.co.uk/article/procter-gamble-chief-issues-powerful-media-transparency-rallying-cry/1422599?utm_source=website&utm_medium=social; Sarah Sluis, *How They Did It: ANA Report Details Widespread Agency Rebate Practices*, AdExchanger (June 7, 2016), https://www.adexchanger.com/agencies/ana-study-details-widespread-agency-rebate-practices/.

review of the existing theoretical and empirical literature offers a more nuanced perspective than the industry's anti-regulation narrative suggests.

In Part III, we synthesize these economic findings. We propose that allowing some large platforms to freely collect and process user data is unlikely to lead to economic equilibria which all stakeholders benefit; there are reasons to believe that the gains created by intensive data collection are not equitably distributed across stakeholders, and may even be detrimental for some of them. We suggest that recent enforcement actions against ad-technology firms and movements across the world for privacy regulations are not only justifiable on ethical or moral grounds, but also on economic ones. Rather than resulting in a loss of welfare for consumers, privacy regulation could instead result in a reduction of harms and in a more balanced allocation of the costs and benefits of data accumulation. We conclude by discussing the implications of these findings for future economic work and the evaluation of behavioral advertising regulation.

I. Conflicting Narratives of Behavioral Advertising

The first online banner ad is believed to be a 1994 advertisement for AT&T reading "Have you ever clicked your mouse right HERE? YOU WILL." 44% of viewers clicked it, costing AT&T $30,000.[12] Since then, digital advertising has ballooned into massive industry (estimated at $257.7 billion in 2023 for the United States alone)[13] which now dominates advertising in terms of revenue: about 67% of advertising revenue in the US comes from digital advertising, more than all forms of traditional advertising (e.g. TV, radio, print, and outdoor) combined.[14]

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[12] Jeremy Greenwood, Yueyuan Ma & Mehmet Yorukoglu, 'You Will:' A Macroeconomic Analysis of Digital Advertising (Mar. 2021), http://www.nber.org/papers/w28537; Adrienne LaFrance, *The First-Ever Banner Ad on the Web*, The Atlantic, Apr. 2017, https://www.theatlantic.com/technology/archive/2017/04/the-first-ever-banner-ad-on-the-web/523728/.

[13] Mintel, Digital Advertising - US - 2023 (2023), https://clients.mintel.com/report/digital-advertising-us-2023.

[14] GroupM, This Year Next Year: 2022 Global End of Year Forecast (2022); Research and Markets, *Global Digital Advertising and Marketing Market to Reach $786.2 Billion by 2026 at a CAGR of 13.9%*, GlobeNewswire (Sept. 28, 2022), https://www.globenewswire.com/en/news-release/2022/09/28/2524217/28124/en/Global-Digital-Advertising-and-Marketing-Market-to-Reach-786-2-Billion-by-2026-at-a-CAGR-of-13-9.html.

Digital advertising exhibits unique technical and economic features that separate it from traditional forms of advertising. Online ads have lower tracking, targeting, and measurement costs than traditional ads.[15] Data from millions of consumers can be collected and used to target individualized ads to them in an automated, low cost fashion.[16] Rather than attempt to determine the efficacy of an ad campaign after-the-fact, online advertisers can measure the return on their advertising spend by tracking the user from the point of seeing an ad to making a sale.[17] In addition, the vast majority of online advertising sales now occur through programmatic auctions on digital ad exchanges, in which advertisers make bids for impressions and a real-time auction is run before the highest-bidding ad is shown to the user.[18]

The structure of the advertising industry quickly evolved as a result of the unique characteristics of the digital ecosystem. Intermediaries soon formed with the promise of helping advertisers target more relevant audiences, whether through *contextual targeting*—placing display ads based on the context of which it appears, such as a relevant website—or *behavioral targeting*, in which individual consumers are served specific, personalized ads based on inferences made from data collected on their historical online activity.[19] The advertising economy now involves several stakeholders, including advertisers, publishers, and data

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[15] Avi Goldfarb & Catherine Tucker, *Digital Economics*, 57 J. Econ. Lit. 3 (2019); Daniel Susser & Vincent Grimaldi, *Measuring Automated Influence: Between Empirical Evidence and Ethical Values*, in *Proceedings of the 2021 AAAI/ACM Conference on AI, Ethics, and Society* 242 (2021), https://doi.org/10.1145/3461702.3462532.

[16] Avi Goldfarb, *What Is Different About Online Advertising?*, 44 Rev. Ind. Organ. 115 (2014); Goldfarb and Tucker, *supra* note 15.

[17] Goldfarb, *supra* note 16; Goldfarb and Tucker, *supra* note 15.

[18] PricewaterhouseCoopers & Interactive Advertising Bureau, *Internet Advertising Revenue Report: Full 2021 Results* (2022), https://www.iab.com/wp-content/uploads/2022/04/IAB_Internet_Advertising_Revenue_Report_Full_Year_2021.pdf.

[19] Howard Beales, *The Value of Behavioral Targeting* (2010), https://www.ftc.gov/sites/default/files/documents/public_comments/privacy-roundtables-comment-project-no.p095416-544506-00117/544506-00117.pdf; J. M. Carrascosa et al., *I Always Feel Like Somebody's Watching Me. Measuring Online Behavioural Advertising*, arXiv.org (Nov. 19, 2014), https://arxiv.org/abs/1411.5281v3; Abhimanyu Panwar, Iosif-Viorel Onut & James Miller, *Towards Real Time Contextual Advertising*, *in* Web Information Systems Engineering – WISE 2014 445 (Boualem Benatallah et al. eds., 2014); Jun Yan et al., *How Much Can Behavioral Targeting Help Online Advertising?*, in *Proceedings of the 18th international conference on World Wide Web* 261 (2009), https://dl.acm.org/doi/10.1145/1526709.1526745.

intermediaries that collect and interpret users' online behavior and facilitate the buying and selling of ad space.[20]

In this Article, we focus on behavioral targeting, as opposed to contextual targeting. We highlight behavioral targeting because of its heavy reliance on the accumulation of user data[21] and the criticism it has accumulated from multiple observers and angles of analysis,[22] including a number of legal scholars.[23] Still, ad-tech firms present behavioral targeting as an economic win for all parties: Ad-tech firms argue that, through behavioral targeting, consumers are able to receive internet services and access platforms for free in exchange for seeing more relevant ads, merchants can cheaply and efficiently advertise to only the most relevant consumers, publishers are able to monetize their content, and intermediaries are able to extract revenue by improving the efficiency of the marketplace.[24]

Some studies do, in fact, find elements of truth to these claims.[25] And, regardless of the efficacy of behaviorally targeted

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[20] Veronica Marotta et al., *The Welfare Impact of Targeted Advertising Technologies*, 33 INF. SYST. RES. 131 (2022).

[21] Boerman, Kruikemeier, and Zuiderveen Borgesius, *supra* note 8.

[22] *See, e.g.,* criticism from consumers, policymakers, and advertisers, respectively: Brooke Auxier et al., *Americans and Privacy: Concerned, Confused and Feeling Lack of Control Over Their Personal Information*, Pew Research Center: Internet, Science & Tech (Nov. 15, 2019), https://www.pewresearch.org/internet/2019/11/15/americans-and-privacy-concerned-confused-and-feeling-lack-of-control-over-their-personal-information/; Anna Eshoo, *Eshoo, Schakowsky, Booker Introduce Bill to Ban Surveillance Advertising*, Congresswoman Anna G. Eshoo (Jan. 18, 2022), http://eshoo.house.gov/media/press-releases/eshoo-schakowsky-booker-introduce-bill-ban-surveillance-advertising; Pritchard, *supra* note 11; Shoshana Zuboff, THE AGE OF SURVEILLANCE CAPITALISM: THE FIGHT FOR A HUMAN FUTURE AT THE NEW FRONTIER OF POWER (2019).

[23] *See, e.g.*, Chris Jay Hoofnagle et al., *Behavioral Advertising: The Offer You Can't Refuse*, 6 HARV. L. & POL'Y REV. 273 (2012); Ryan Calo, *Digital Market Manipulation*, 82 GEO. WASH. L. REV. 995 (2013).

[24] *See, e.g.*, AdExchanger, *supra* note 6; Paul Bannister, *Does Behavioral Targeting Make Publishers More Money?*, AdExchanger (June 5, 2019), https://www.adexchanger.com/the-sell-sider/does-behavioral-targeting-make-publishers-more-money/; John Deighton & Leora Kornfeld, The Socioeconomic Impact of Internet Tracking (2020), https://www.iab.com/wp-content/uploads/2020/02/The-Socio-Economic-Impact-of-Internet-Tracking.pdf.

[25] *See, e.g.*, Beales, *supra* note 19; Ayman Farahat & Michael C. Bailey, *How Effective Is Targeted Advertising?*, in *Proceedings of the 21st international conference on World Wide Web 111* (2012), https://dl.acm.org/doi/10.1145/2187836.2187852; Justin Ho, *For Small Online Retailers, Digital Advertising Has Become More Expensive*, Marketplace (Feb. 16, 2023), https://www.marketplace.org/2023/02/16/digital-advertising-more-expensive-small-online-retailers/; Rick Karr, *Online Advertising Is More Expensive since Apple Changed Its Privacy Policies*, Marketplace (Oct. 25, 2021),

advertisements, it is evident that advertising, broadly defined, is at the core of the dominant business model that supports much of the free Internet as we know it today.[26]

Yet, despite behavioral advertising being presented as an economic win-win, various stakeholders within that ecosystem have expressed dissatisfaction with the current state of affairs. First, notwithstanding claims that consumers benefit from seeing more relevant ads,[27] consumers seem to be broadly dissatisfied with their returns from data collection and targeted advertising: About 40% of online users claim to use ad blockers (a proportion which has been increasing over the past several years),[28] and survey data indicates that consumers do not feel as though they are reaping the stated benefits of data collection: A 2019 Pew survey found that for 81% of Americans, the possible risks of corporate data collection outweighs its benefits, and 71% say they benefit "very little or none" from this data collection.[29] Merchants have criticized the lack of transparency of the online advertising ecosystem, the prevalence of ad fraud, and the real return on investment for targeted ads.[30] Publishers have accused intermediaries of siphoning off excessive and opaque fees: In one prominent case, the UK-based news outlet *The Guardian* sued Rubicon Project, an ad-tech firm, for not disclosing buyer fees (Rubicon Project claimed it disclosed these fees in its contract).[31] After an internal audit, The Guardian found that it was only receiving £0.30 for every pound spent on

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https://www.marketplace.org/2021/10/25/online-advertising-is-more-expensive-since-apple-changed-its-privacy-policies/; Deepak Ravichandran & Nitish Korula, Effect of Disabling Third-Party Cookies on Publisher Revenue (2019), https://services.google.com/fh/files/misc/disabling_third-party_cookies_publisher_revenue.pdf; *See infra* Part II.

[26] John Deighton & Peter Johnson, *The Value of Data: Consequences for Insight, Innovation & Efficiency in the U.S.* (2015), https://www.hbs.edu/faculty/Pages/item.aspx?num=48601.

[27] AdExchanger, *supra* note 6.

[28] Lara O'Reilly, *Ad Blocker Usage Is up 30% — and a Popular Method Publishers Use to Thwart It Isn't Working*, Business Insider (Jan. 31, 2017), https://www.businessinsider.com/pagefair-2017-ad-blocking-report-2017-1; Blockthrough, The Rise of Consent-Based Advertising: 2021 PageFair Adblock Report (2021), https://f.hubspotusercontent10.net/hubfs/4682915/Adblock%20Reports/2021%20PageFair%20Adblock%20Report.pdf.

[29] Auxier et al., *supra* note 22.

[30] Pritchard, *supra* note 11; Sluis, *supra* note 11.

[31] Lara O'Reilly, *The Guardian and Ad-Tech Vendor Rubicon Project Settle Legal Dispute*, Wall Street Journal, Oct. 12, 2018, https://www.wsj.com/articles/the-guardian-and-ad-tech-vendor-rubicon-project-settle-legal-dispute-1539348209.

programmatic advertising by merchants.[32] Opacity, fraud, and the extraction of excessive value from advertising dollars are particularly concerning for the numerous news publishers who have experienced decreasing revenues for the last decade.[33] News media, which has traditionally depended on advertising to generate revenue, has dwindled in recent years.[34] In the US, the number of newspapers has decreased by 25% since 2005, with an average of two newspapers shuttering each week. [35] In some notable cases, publishers have claimed that part of this loss comes from ad intermediaries extracting extra fees from the publishers' would-be ad revenue when selling ads to buyers.[36]

The extant economic literature has largely shied away from concerns raised by consumers, merchants, and publishers, with scholars opting instead to focus on how regulating behavioral ads might negatively impact advertising effectiveness.[37] Legal scholars have, in recent years, taken a different view, highlighting both economic as well as non-economic, qualitative harms of consumer data collection.[38] Legal scholarship has long considered the costs and benefits of consumer data collection, often similarly pitting these win-win economic arguments against civic privacy needs.[39] Scholars like Danielle Citron and Daniel Solove have taxonomized

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[32] David Kirkpatrick, *The Guardian Sues Rubicon Project over Buyer Fees*, Marketing Dive (Mar. 29, 2017), https://www.marketingdive.com/news/the-guardian-sues-rubicon-project-over-buyer-fees/439221/.

[33] U.S. Census Bureau, *supra* note 10.

[34] Wilson, *supra* note 10.

[35] Penny Abernathy, *The State of Local News 2022*, Local News Initiative (June 29, 2022), https://localnewsinitiative.northwestern.edu/research/state-of-local-news/report/.

[36] Accenture, Western Europe News Media Landscape Trends (2021), https://newsmediaanalysis.s3-ap-southeast-2.amazonaws.com/accenture_analysis_WesternEuropeNewsMedia.pdf; O'Reilly, *supra* note 31.

[37] *See generally* Alessandro Acquisti, *The Economics of Privacy at a Crossroads*, *in* The Economics of Privacy (2023), https://www.nber.org/books-and-chapters/economics-privacy/economics-privacy-crossroads.

[38] *See, e.g.*, Citron and Solove, *supra* note 1; Daniel J. Solove, *A Taxonomy of Privacy*, 154 U. PA. L. REV. 477 (2006); M. Calo, *The Boundaries of Privacy Harm*, 86 86 IND. L.J. 1131 2011 (2011), https://www.repository.law.indiana.edu/ilj/vol86/iss3/8.

[39] "The regulation of privacy, moreover, necessarily involves trade-offs between protection of privacy versus potentially increased burdens to consumers, or loss of free content (or both). Regulation to protect privacy could also affect innovation and create barriers to entry into the digital market. In short, given these uncertainties, a pure 'cost versus benefit' analysis of privacy regulation may become impossible." *In* Steven C. Bennett, *Regulating Online Behavioral Advertising*, 44 J. MARSHALL L. REV. 899, 945–947 (2010).

privacy harms in the legal sense, noting the variety of ways that data collection—as in online behavioral advertising—can lead to personal injury, for instance through discrimination, psychological distress, or reputational harms.[40] Much of this work helps courts to better concretize and evaluate these harms, which are often seen as difficult to measure or prove: As Citron and Solove describe, "courts often refuse to find economic harm," as economic privacy harms can be small, diffuse, and difficult to capture; they may involve missed opportunities or decision-making ability, rather than clear financial injury.[41] Moreover, as Andrew Selbst and Solon Barocas describe, "[t]raditional discrimination law tends to focus on allocative harms: who is hired for a job, gets a line of credit, or offered a lease," while new regulations can instead turn to focus on "quality of service" harms, which are less commonly invoked in current regulation regimes.[42] While these taxonomies often describe some economic harms to consumers from privacy violations, they still do not directly address the economic benefits that are claimed against these individual harms in the regulatory debate.

A separate but related thread of the law literature, most notably in work by scholars such as Lina Khan on structural separation in platforms, acknowledges that the current structure of the data economy involves a few large platform intermediaries that, while not explicitly violating antitrust law, still act anticompetitively (for instance, by serving both as a platform, and as a content or product creator for said platform).[43] These threads within the legal literature offer insights on how market structure may lead to anticompetitive and inefficient market outcomes that may not allocate any surplus value created fairly among all stakeholders. Others have argued that intermediaries are, in fact, explicitly violating antitrust law, leading to a number of high-profile legal and regulatory actions in recent years: most notably, the Department of Justice won their antitrust case against Google in April 2025, arguing that Google was illegally monopolizing the ad-tech industry by controlling the demand-side platform, the ad exchange, and the publisher ad server in the advertising supply chain — ultimately using its market position

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[40] *See e.g.,* Citron and Solove, *supra* note 4; Solove, *supra* note 38; Julie E. Cohen, *What Privacy Is For*, 126 HARV. L. REV. 1904 (2013); Paul Ohm, *Sensitive Information*, 88 S. CAL. L. REV. 1125 (2014).

[41] Citron and Solove, *supra* note 1 at 835.

[42] Selbst and Barocas, *supra* note 4 at 2.

[43] Lina M. Khan, *The Separation of Platforms and Commerce*, 119 COLUM. L. REV. 973 (2019); Lina M. Khan, *Amazon's Antitrust Paradox*, 126 YALE L.J. 710 (2017).

anticompetitively to preference its own ad-tech pools and set prices.[44]

The legal literature has thus brought forward a number of concerns regarding widespread consumer data collection and behavioral targeting, namely the kinds of personal injury that may arise, and the potential for anticompetitive behavior under current platform ecosystems and associated antitrust regimes. In what follows, we consider whether economic evidence and reasoning can in fact offer credence to these concerns.

II. Insights from Extant Economic Literature

Our analysis highlights discrepancies between the ad-industry claims and scholarly economic work on the benefits of behaviorally targeted advertising. We consider economic theory and a small but emerging body of empirical evidence to determine if existing literature can shed some light not only on the potential costs of regulating privacy, but also on how it may differentially affect the stakeholders in the online advertising ecosystem. Doing so allows us to vet the ad industry's claims on the benefits of online advertising, empowering both legal scholars and regulators to accurately apply economic arguments when formulating behavioral advertising regulation.

A. Economic Theory: Win-Win Vs. Rent Extraction Framings

Behavioral advertising can be thought of as a classic problem of information flow in a market: Extracting more information from users in the advertising market can theoretically lower search costs and allow for better matching between merchants and consumers.[45] As we discuss in this section, however, the increased flow of information is not always beneficial and welfare-increasing. Instead, existing theoretical framings demonstrate how intermediaries could exploit their position in the personal data market to extract value from merchants, publishers, and consumers.

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[44] United States v. Google LLC, No. 1:23-cv-00108 (E.D. Va. 2025); U.S. Department of Justice, *Justice Department Sues Google for Monopolizing Digital Advertising Technologies*, (Jan. 24, 2023), https://www.justice.gov/opa/pr/justice-department-sues-google-monopolizing-digital-advertising-technologies.

[45] Avi Goldfarb & Verina F. Que, *The Economics of Digital Privacy*, 15 ANNU. REV. ECON. 267 (2023).

1. Early Theories of the Economics of Privacy

Since the 1970s, a growing body of theoretical work has attempted to understand the economic trade-offs of increasing information flows and transparency, versus limiting data collection and preserving privacy.[46] The theoretical economics of privacy literature has revealed that the axiomatic belief that less privacy protection necessarily leads to more efficient markets (and, by converse, privacy protection necessarily decreases welfare) is simplistic and inaccurate.[47]

An analysis of the foundational literature shows, in fact, that there exists a nuanced and non-monotonic relationship between privacy and economic welfare at both the individual and aggregate levels. In terms of individual consumer welfare, Hal Varian was among the first to propose a scenario in telemarketing in which sharing one's data could both benefit a consumer and harm them economically: The consumer may benefit, for instance, if the data being shared is their product preferences, but they may also suffer if the data shared is their maximum willingness to pay for the goods they prefer.[48]

Aggregate welfare effects, on the other hand, involve a more complex story. Some work argues that firms over-invest in data collection, because they do not internalize consumer privacy costs.[49]

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[46] *See, e.g.*, George A. Akerlof, *The Market for "Lemons": Quality Uncertainty and the Market Mechanism*, 84 Q. J. ECON. 488 (1970); Richard A. Posner, *The Economics of Privacy*, 71 AM. ECON. REV. 405 (1981); Richard A. Posner, *The Right of Privacy*, 12 GA. LAW REV. 393 (1977), https://heinonline.org/HOL/Page?handle=hein.journals/geolr12&id=409&div=&collection=; Richard A. Posner, *Economic Theory of Privacy*, 2 Regulation 19 (1978), https://heinonline.org/HOL/Page?handle=hein.journals/rcatorbg2&id=131&div=&collection=; Jack Hirshleifer, *Privacy: Its Origin, Function, and Future*, 9 J. Leg. Stud. 649 (1980), https://www.journals.uchicago.edu/doi/abs/10.1086/467659; George J. Stigler, *An Introduction to Privacy in Economics and Politics*, 9 J. LEG. STUD. 623 (1980), https://www.journals.uchicago.edu/doi/10.1086/467657.

[47] *See, e.g.* Acquisti, *supra* note 37; Alessandro Acquisti, Curtis Taylor & Liad Wagman, *The Economics of Privacy*, 54 J. ECON. LIT. 442 (2016). Legal scholarship has also touched upon the notion that privacy and markets are not at odds, *See, e.g.,* Ryan Calo, *Privacy and Markets: A Love Story*, 91 NOTRE DAME L. REV. 649 (2015).

[48] Hal R. Varian, *Economic Aspects of Personal Privacy*, *in* Cyber Policy and Economics in an Internet Age 127 (William H. Lehr & Lorenzo M. Pupillo eds., 2002), https://doi.org/10.1007/978-1-4757-3575-8_9.

[49] Jack Hirshleifer, *The Private and Social Value of Information and the Reward to Inventive Activity*, 61 AM. ECON. REV. 561 (1971); Goldfarb and Tucker, *supra* note 15.

Others note that limiting information flows can be more efficient even when there is no "taste" or consumer preference towards privacy, such as in the case of banning certain kinds of testing as a precursor for purchasing health insurance. Though testing would be ex-post efficient (in that insurance pricing would be fairly determined based on test results), a world where testing is banned and all consumers purchase insurance at a standard rate would result in greater aggregate welfare, since "the (socially wasteful) costs of testing would be avoided and because risk-averse individuals would bear less risk."[50]

In short, foundational theorizing about the economic impact of privacy is clear in one regard: privacy protection is not inherently welfare-decreasing. Rather, it can be welfare-decreasing, enhancing, or neutral, depending on context.

2. Theoretically Relevant Features of Online Advertising

In addition to the long-standing body of work on information flows, privacy, and efficiency in markets, more recent theoretical economic work specifically on online advertising and consumer tracking further reveals the nuanced relationship between privacy and welfare. Online advertising has particular features that make it a unique use case for questions of privacy and welfare: It has a high volume of exposure, as a result of low targeting costs; high market concentration of data intermediaries; highly precise targeting capabilities; and less costly and more accurate means of measuring advertising effectiveness.[51] Each of these dimensions affect consumer welfare in non-obvious ways, which we discuss in the remainder of this section.

a. High advertising exposure

All major economic and advertising schools of thought suggest that excessive advertising volume stymies consumer surplus and social welfare growth, especially when the increase in advertising intensity is not accompanied by a decrease in product prices.[52] The problem of excessive advertising volume is especially salient in online channels, which supplemented traditional advertising with

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[50] Benjamin E. Hermalin & Michael L. Katz, *Privacy, Property Rights and Efficiency: The Economics of Privacy as Secrecy*, 4 QUANT. MARK. ECON. 209, 212 (2006).

[51] Goldfarb, *supra* note 16.

[52] Avinash Dixit & Victor Norman, *Advertising and Welfare*, 9 BELL J. ECON. 1 (1978); Justin P. Johnson, *Targeted Advertising and Advertising Avoidance*, 44 RAND J. Econ. 128 (2013).

even more opportunities to reach customers. Social media, the proliferation of smartphones, and the Internet of Things have further expanded the capacity of advertising space, leading to virtually constant advertising exposure. Such overabundance is one of the main barriers of social welfare in traditional models of advertising. Advertisers, of course, enjoy uptakes in sales as a result of broader access to their target audiences.[53] On the other hand, advertisers also experience higher competition and entry barriers.[54] Greater competition can positively affect product quality[55] benefiting consumers, but the greater volume of ads can also lead to poorer user attention towards ads and a feeling of greater cognitive burden while using the web.[56]

b. Greater Market Concentration

As targeting technologies depend on troves of data from users collected across the internet, the market tends to be dominated by firms controlling the most data about users and/or serving as the default entry points to the internet. Multiple roles in the online advertising value chain — such as that of publishers, ad networks, and ad exchanges — are often consolidated and controlled by individual corporate entities, like Google or Meta.[57] Multi-sided

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[53] Sha Yang & Anindya Ghose, *Analyzing the Relationship Between Organic and Sponsored Search Advertising: Positive, Negative, or Zero Interdependence?*, 29 Mark. Sci. 602 (2010); Navdeep S. Sahni, Effect of Temporal Spacing between Advertising Exposures: Evidence from Online Field Experiments (June 1, 2015), https://papers.ssrn.com/abstract=2380375.

[54] *See generally* Dorothea Braithwaite, *The Economic Effects of Advertisement*, 38 ECON. J. 16 (1928); Joe S. Bain, *A Note on Pricing in Monopoly and Oligopoly*, 39 Am. Econ. Rev. 448 (1949); William S. Comanor & Thomas A. Wilson, *Advertising Market Structure and Performance*, 49 Rev. Econ. Stat. 423 (1967); William S. Comanor & Thomas A. Wilson, Advertising and Market Power (1974); Daniel Shapiro & R. S. Khemani, *The Determinants of Entry and Exit Reconsidered*, 5 INT. J. IND. ORGAN. 15 (1987).

[55] Neil Hopper Borden, The Economic Effects of Advertising (1942); Phillip Nelson, *Advertising as Information*, 82 J. Polit. Econ. 729 (1974); John E. Kwoka, *Advertising and the Price and Quality of Optometric Services*, 74 Am. Econ. Rev. 211 (1984); Paul Milgrom & John Roberts, *Price and Advertising Signals of Product Quality*, 94 J. Polit. Econ. 796 (1986).

[56] *See generally* Moira Burke et al., *High-Cost Banner Blindness: Ads Increase Perceived Workload, Hinder Visual Search, and Are Forgotten*, 12 ACM Trans. Comput.-Hum. Interact. 423 (2005); Daniel G. Goldstein, R. Preston McAfee & Siddharth Suri, *The Cost of Annoying Ads*, in *Proceedings of the 22nd international conference on World Wide Web 459* (2013), https://doi.org/10.1145/2488388.2488429.

[57] Consolidation as well as current and/or possible anticompetitive behaviors are described generally in Khan, *supra* note 43; Jan Wolfe, *Big Tech Braces for Wave of Antitrust Rulings in 2024*, Wall Street Journal, Jan. 1, 2024,

network externalities and economy of scale generate high concentration of market power,[58] which may be a perturbing signal of potential distortion of the market equilibrium in favor of monopolistic stakeholders under a secure protection of legal departments, especially in the case of further relentless upholding of their interests without an appropriate attention to the more disaggregated and unprotected parties, among which consumers are often pushed to the very background. Moreover, the current structure of the advertising ecosystem raises an antitrust issue: For instance, Avi Goldfarb argues that monopolies in online advertising especially affect small or niche businesses, which have little chance to reach the long tail of customers without online advertising.[59] These concerns surrounding the *structure* and consolidation of power in the market, rather than sheer outcomes for consumers, echo those ideas brought forth by legal scholars like Lina Khan, as discussed previously.[60]

c. Enhanced Targeting Precision and Measurement of Outcomes

Behavioral advertising's most critiqued feature is likely its highly precise customer targeting and measurement. Augmented personalization capacity allows better and faster matching of buyers' needs and sellers' offers.[61] Furthermore, improving measurement of outcomes like click-through rates and conversions can allow fine-grained tracking of online ad delivery and how consumers respond to them.

While targeting may reduce search costs and improve the matching between consumer preferences and products, search costs are just one element in a consumer utility function;[62] how increased targeting would affect consumer welfare more broadly is far more complex. For instance, in some models, targeting benefits consumers when they have to make a voluntary decision to share

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https://www.wsj.com/tech/big-tech-braces-for-wave-of-antitrust-rulings-in-2024-860f0149.

[58] Ken Heyer, Carl Shapiro & Jeffrey Wilder, *The Year in Review: Economics at the Antitrust Division, 2008-2009*, 35 REV. IND. ORGAN. 349 (2009).

[59] Goldfarb, *supra* note 16 at 124.

[60] *See generally*, Khan, *supra* note 43; Khan, *supra* note 43.

[61] Dirk Bergemann & Alessandro Bonatti, *Targeting in Advertising Markets: Implications for Offline versus Online Media*, 42 RAND J. ECON. 417 (2011); Sherwin Rosen, *Advertising, Information, and Product Differentiation*, Issues Advert. 161 (1978).

[62] Eduardo Schnadower Mustri, Idris Adjerid & Alessandro Acquisti, *Behavioral Advertising and Consumer Welfare: An Empirical Investigation* (Mar. 23, 2023), https://papers.ssrn.com/abstract=4398428.

their personal information (and thus only consumers who expect to benefit from data sharing would engage in such disclosures).[63] However, other models have highlighted the incentives that may lead merchants or advertising platforms to target consumers with less preferred options in order to increase their own profits.[64] For instance, Wilfred Amaldoss and Chuan He have shown how targeted ads may lead to lower or higher prices depending on the distribution of consumer valuations.[65]

3. Diverging Predictions: A Tale of Two Frames

A possible explanation for the diverging predictions presented above is that, when it comes to online advertising and behavioral advertising in particular, contrasting effects and dynamics coexist. In prior sections, we have referred to the ad-tech industry's view that behavioral advertising is a win-win for various stakeholders, often emphasized in academic marketing literature critical of privacy regulations. The left side of Figure 1 (Frame 1), from Acquisti,[66] illustrates this idea, depicting online advertising as a two-sided platform market where data intermediaries like Google and Meta act as matchmakers. They facilitate connections between consumers and merchants, reducing search costs and increasing efficiency. In this frame, the focus is on market efficiency, which corresponds to optimally matching consumers and merchants, leading to minimizing wasted resources and greater economic utility for all parties involved.

However, Figure 1's right side (Frame 2) presents an alternative view, focusing on competition and intermediaries' ability to extract surplus from both sides of the market. With consumers having limited budgets and attention, publishers and merchants aggressively compete for their engagement. In this frame, it is the intermediaries (which, unlike the aggressively competing merchants and publishers, are ultimately oligopolies) that accrue most of the economic surplus produced by the collection and analysis of consumer data.

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[63] Jianqing Chen & Jan Stallaert, *An Economic Analysis of Online Advertising Using Behavioral Targeting*, 38 MIS Q. 429 (2014).

[64] Andrei Hagiu & Bruno Jullien, *Why Do Intermediaries Divert Search?*, 42 RAND J. Econ. 337 (2011); Alessandro Acquisti, *Inducing Customers to Try New Goods*, 44 Rev. Ind. Organ. 131 (2014); Kaifu Zhang & Zsolt Katona, *Contextual Advertising*, 31 Mark. Sci. 980 (2012).

[65] Wilfred Amaldoss & Chuan He, *Product Variety, Informative Advertising, and Price Competition*, 47 J. MARK. RES. 146 (2010).

[66] Acquisti, *supra* note 37.

The two frames focus on distinct features of the online advertising ecosystem, but are not necessarily in contradiction with each other. Frame 1 captures the effect of data intermediaries and consumer tracking in terms of search cost reduction. In so doing, it focuses on the increased efficiency that online targeting may produce at the local level — that of individual transactions and ad-impressions. Frame 2 instead captures how intermediaries' control over data affects competition. In so doing, the second frame focuses on the global dynamics, or what happens in terms of aggregate competition for impressions, consumer attention, and consumer budget. Both frames are theoretically valid, yet lead to very different conclusions about the allocation of benefits from consumer data collection.

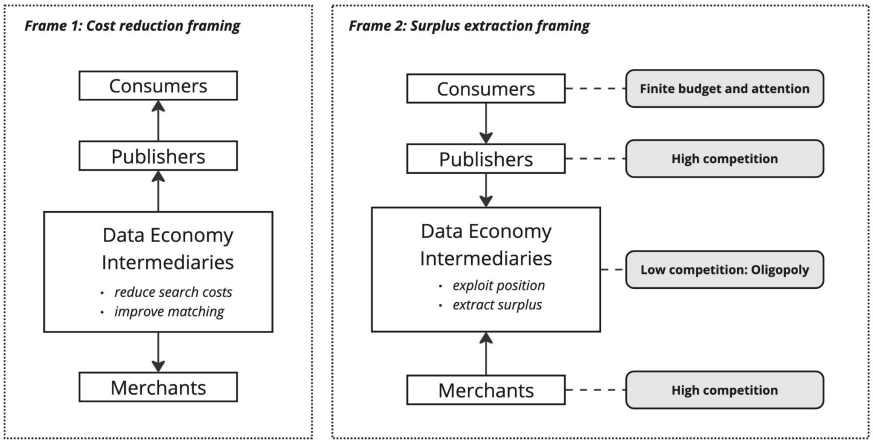

Figure 1. Two theoretically valid framings of the allocation of benefits of online advertising, from Acquisti.[67] *Arrows indicate how value is either created (frame 1) or extracted (frame 2).*

Consider, for instance, what the two frames captured in Figure 1 tell us about the nuanced impact of behavioral advertising on advertisers (the merchants that produce products and buy ads to sell them) and publishers (the platforms and media companies that display the ads). Under frame 1, advertisers benefit from behavioral targeting because they can allocate their scarce advertising budget to the "right" consumers — those more likely to be interested in their products. Under Frame 2's alternative perspective, however, merchants have to compete more fiercely to reach interested consumers because of behavioral advertising. Before behavioral advertising, merchants may have focused on specific outlets to target consumers with specific interests, only having to compete for

[67] *Id.*

consumer attention against other businesses in related industries. For instance, a merchant producing golf-related merchandise may have tried to reach interested consumers by advertising on golf magazines; there, it would have competed for consumer attention with other merchants interested in targeting that same type of consumer. Online tracking, however, enables targeting consumers across platforms based on multiple and multi-dimensional consumer preferences, making golf-related merchants compete against a far wider array of businesses, such as those who may be selling sports cars, Italian shoes, or cooking classes — all other things that one particular golf-loving consumer may also be interested in. This heightened competition can drive up the price that advertisers need to pay to reach consumers. Despite the proliferation of content distribution channels increasing available ad spaces, and despite the increased matching accuracy that behavioral advertising can provide, competition among advertisers can still intensify.

A similar double-edged dynamic arises for publishers. While behavioral targeting can increase impressions (or views) on ads, making these ads more valuable and, for publishers, more profitable, it also diminishes publishers' control over the matching of consumers and advertisers: That is, with behaviorally targeted ads, publishers no longer choose the specific outlets where they want to target customers. For instance, the merchant producing golfing merchandise (to expand on the prior example) may try to reach interested consumers by advertising specifically on golf magazines. However, third-party tracking allows advertisers to target ads based on user preferences across multiple platforms: The golf-loving consumers are no longer only targeted on golf-related magazines, but can now also be targeted on TikTok, YouTube, The New York Times, podcasts, and so forth.

This change constitutes a shift in power: The power to match advertisers and consumers shifts away from publishers (e.g. a golf magazine) to a data intermediary (e.g. Google). This shift also impacts publishers' ability to extract surplus from advertising transactions, further contributing to declining revenues despite more precise consumer targeting techniques. In short, under Frame 2, online tracking and targeting have increased competition for both publishers and merchants, enabling a few dominant oligopolies to emerge as intermediaries. Thus, under Frame 2, these intermediaries potentially extract more surplus from advertising transactions, benefiting the most from the data economy.

In a nutshell, Figure 1 captures the complex and nuanced predictions that theoretical economic work can make about the impact that behavioral advertising can have on different

stakeholders. Under Frame 1, all stakeholders benefit thanks to increased matching efficiency and reduction in search costs at the individual ad impression level. Under Frame 2, oligopoly data intermediaries benefit by extracting surplus from consumer data, whereas intense competition within advertising merchants and within publishers reduces their profits across ad impressions.

As noted, both frames may be simultaneously capturing some of the dynamics happening today in the online data ecosystem—for instance in how the ad-tech industry portrays the advertising economy as a win-win for all stakeholders,[68] in contrast to how antitrust scholars (and the recent decision in the Google ad-tech antitrust case brought by the DOJ)[69] have described it as a welfare-extracting oligopoly. [70] While the ad-tech industry borrows economic arguments that predominantly highlight one frame (Frame 1), economic theory pointing to Frame 2 provides reinforcement for the concerns raised by these antitrust scholars problematizing the consolidation of power by platform intermediaries.

4. Regulatory Mechanisms Supported by Economic Theory

Before analyzing the findings of empirical contributions, it is worthwhile to highlight what theoretical research says about regulations to control the type and intensity of digital advertising.

In terms of advertising intensity, theoretical research suggests that non-regulated advertising may push overall volume beyond the socially optimal level,[71] hurting both the advertisers' revenues and customer surplus. However, draconian bans on advertising are predicted to increase product prices[72] (which is also supported by empirical evidence).[73] Theoretical models also predict increases in search and transportation costs due to advertising bans.[74] In terms of advertising accuracy, while anti-tracking or obfuscation solutions

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[68] AdExchanger, *supra* note 6. Meta, ZoomInfo, Digital Advertising Alliance, Association of National Advertisers, and Interactive Advertising Bureau, *supra* note 8.

[69] United States v. Google LLC, No. 1:23-cv-00108 (E.D. Va. 2025).

[70] Khan, *supra* note 43; AdExchanger, *supra* note 6.

[71] Lola Esteban, Agustín Gil & José M. Hernández, *Informative Advertising and Optimal Targeting in a Monopoly*, 49 J. Ind. Econ. 161 (2001).

[72] Milgrom and Roberts, *supra* note 55.

[73] John R. Schroeter, Scott L. Smith & Steven R. Cox, *Advertising and Competition in Routine Legal Service Markets: An Empirical Investigation*, 36 J. Ind. Econ. 49 (1987); Jeffrey Milyo & Joel Waldfogel, *The Effect of Price Advertising on Prices: Evidence in the Wake of 44 Liquormart*, 89 Am. Econ. Rev. 1081 (1999).

[74] Helmut Bester & Emmanuel Petrakis, *Price Competition and Advertising in Oligopoly*, 39 Eur. Econ. Rev. 1075 (1995).

help preserve user privacy, they may result in irrelevant or mistargeted ads. This, in turn, decreases the effectiveness of ads, weakens the matching between buyers and sellers, and may ultimately degrade user experience. Instead, models predict that caps on the number of ad impressions per user have a greater potential in increasing consumer surplus and net welfare.[75]

Different approaches have been proposed in the literature in order to cap ad impressions. Firms can engage in self-regulatory practices, whether through technological means or through their privacy policies (e.g. letting consumers opt-out from receiving certain types of advertising messages). Other solutions beyond the blanket banning of online advertising — an impractical and hazardous solution — include setting non-intrusive advertising and intensity requirements and standardizing enforcement of these rules.[76] Others suggest limiting tracking instead of completely blocking advertising,[77] and allowing users more of a say in the advertising that they see: Allowing users to skip an ad or rate it as irrelevant or annoying can be an opportunity for the ad industry, rather than a threat; receiving this consumer feedback can improve targeting accuracy, reduce annoyance, and calibrate the ad quality standards to be more optimal to consumers' tolerance levels. Users benefit through more relevant ads with less tracking and the industry benefits through greater accuracy, without overinvesting in tracking or triggering consumer backlash.

These capping techniques that lower advertising supply (i.e. create fewer online ad slots) and increase advertising quality are likely to increase advertising prices, ensuring a stable revenue stream for publishers and advertising agencies, and reducing users' exhaustion towards advertising — further promoting ad effectiveness. Well-designed and successfully implemented regulatory solutions may decrease the proliferation of ad-blocking, preserving the ad industry's and publishers' revenue streams, while also satisfying advertisers' goals and improving consumers' online experience.

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[75] Simon P. Anderson & André de Palma, *Information Congestion: Open Access in a Two-Sided Market*, THEMA Work. Pap. (2007), https://ideas.repec.org//p/ema/worpap/2007-10.html; Simon P. Anderson & André de Palma, *Shouting to Be Heard in Advertising*, 59 Manag. Sci. 1545 (2013).

[76] Paul Ohm, *The Illusory Benefits of Behavioral Advertising* (2013).

[77] Vincent Toubiana et al., Adnostic: Privacy Preserving Targeted Advertising (2010), https://papers.ssrn.com/abstract=2567076; Matthew Fredrikson & Benjamin Livshits, *RePriv: Re-Imagining Content Personalization and In-Browser Privacy*, *in* 2011 IEEE Symposium on Security and Privacy 131 (2011), https://ieeexplore.ieee.org/document/5958026.

Alternatively, some scholars see the solution in the deployment of new business models, whereas publishers' revenues do not heavily depend on advertising but rather on monthly fees or additional paid services (e.g., paywalls, freemium models, donation-based models, in-app purchases, etc.).[78] A number of innovative proposals are emerging; among the most recent and remarkable is a proposition to use spare computing power on users' computers to mine cryptocurrency as a revenue stream.[79] However, the revenue generated by these models may not be enough to substitute a share of revenue currently generated by advertising, at least in the short term.[80] Public awareness about the intangible price that users pay with their data may facilitate the expansion and success of paid services, and eventually improve the quality of websites' content and services.

The regulatory approaches we highlight here focus on designing mechanisms for *directly* regulating and limiting online behavioral advertising. Yet much of the broader discourse around online privacy has focused on more indirect regulation, such as calls to "break up big tech."[81] As Figure 1 demonstrates, a key difference between the two frames (and the associated outcomes for consumers, merchants, and publishers) is in whether the data intermediaries act as oligopolistic surplus extractors, or whether they exist within a competitive marketplace. Antitrust law, as some scholars have noted, can be a useful tool for ensuring that data intermediaries exist in a competitive ecosystem conducive to the equitable distribution of value to different stakeholders.

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[78] Katherine Strandburg, *Free Fall: The Online Market's Consumer Preference Disconnect*, 2013 U. CHI. LEGAL F. (2015), https://chicagounbound.uchicago.edu/uclf/vol2013/iss1/5; Ceren Budak et al., *Understanding Emerging Threats to Online Advertising*, in *Proceedings of the 2016 ACM Conference on Economics and Computation 561* (2016), https://doi.org/10.1145/2940716.2940787.

[79] Jon Brodkin, *Salon to Ad Blockers: Can We Use Your Browser to Mine Cryptocurrency?*, Ars Technica, Feb. 2018, https://arstechnica.com/information-technology/2018/02/salon-to-ad-blockers-can-we-use-your-browser-to-mine-cryptocurrency/.

[80] Simon P. Anderson & Joshua S. Gans, *Platform Siphoning: Ad-Avoidance and Media Content*, 3 Am. Econ. J. Microecon. 1 (2011).

[81] Josh Hawley, *Sen. Hawley: Break up Big Tech to Reclaim American Freedom*, New York Post (Apr. 30, 2025), https://nypost.com/2025/04/30/opinion/sen-hawley-break-up-big-tech-to-reclaim-american-freedom/; *Break Up Big Tech | Elizabeth Warren*, (Dec. 9, 2019), https://2020.elizabethwarren.com/toolkit/break-up-big-tech.

B. Empirical Evidence of Costs and Benefits to Each Stakeholder

Our above review of theoretical models shows that the impact of behavioral targeting on various stakeholders in the online advertising ecosystem is complex and nuanced, with diverging predictions possible. To complement the theoretical picture, we turn to a review of recent empirical evidence, some of which focuses on tracking interventions such as the European Union's General Data Protection Regulation (GDPR) or Apple's App Tracking Transparency (ATT) framework.[82] These analyses leverage these interventions to evaluate how different stakeholders are affected by more protective privacy regimes. In this Section, we consider the empirical economic literature for each stakeholder in the online advertising economy: Data intermediaries, merchants, publishers, and consumers. The arguments presented here are summarized in Table 1.

[82] Notably, the Apple ATT framework is not a governmental regulation, but a form of industry self-regulation. As we demonstrate in the following section, economic works often analyze self-regulatory interventions to better understand the impact of limiting behavioral targeting more generally.

Table 1. Industry claims about behavioral advertising vs. empirical evidence, presented in Part B.

Stakeholder	Ad-Tech Claims	Empirical Economic Literature
Data Intermediaries	Reduce search costs and improve matching for all other stakeholders Benefit and distribute value to other stakeholders	**Support:** Evidence of reduction in search costs **Limitation:** Dearth of empirical economic studies on how benefits are allocated to intermediaries vs. other stakeholders
Merchants	Experience increased click-through rates and improved purchase intention, increasing their revenues	**Support:** Some evidence of increased click-through, conversion, and retention rates **Limitation:** Studies tend to capture local, redistributive effects across merchants, not general, aggregate producer surplus effects
Publishers	Experience increased revenues due to better matching	**Support:** Evidence of increase in per-impression revenues **Limitation:** Mixed evidence on extent of that increase. Also, studies do not capture aggregate-level perspective of increased competition among publishers
Consumers	Experience increased quantity and types of goods available Can access more free and low-cost products and services	**Support:** Evidence of reduction in consumer search costs **Limitation:** Some evidence of consumer welfare decreasing effects in terms of prices, product quality, and online fraud

1. Data Intermediaries

Although few academic works have specifically and explicitly focused on measuring the benefits to data intermediaries, the evidence is clear that data intermediaries have benefitted enormously from the accumulation and use of consumer data. About 78% of Google's and 97% of Facebook's revenues come from advertising, and the two companies effectively operate in an online advertising oligopoly: Industry data suggests Meta, Google, and Amazon capture more than 65% of all digital ad revenues.[83] Meta and Alphabet — Google's parent company — both have an operating profit margin of roughly 25%, compared to the advertising industry average of roughly 11%.[84]

The rise of behavioral advertising has also led to the proliferation of data brokers, which profit off of the collection, consolidation, and analysis of consumer data.[85] Some claim the data broker industry is worth at least $200 billion,[86] while a report from the Interactive Advertising Bureau estimated that firms in five categories of data intermediaries—ad and marketing tech, customer relationship management, measurement and analytics, and "data and

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[83] Alphabet Inc., *Alphabet Announces Third Quarter 2022 Results* (2022), https://perma.cc/6AFQ-LG3Y; Meta, Meta Earnings Presentation Q3 2022 (2022), https://perma.cc/P8HM-HLG5; Sara Lebow, *Google, Facebook, and Amazon to Account for 64% of US Digital Ad Spending This Year*, Insider Intelligence (Nov. 3, 2021), https://www.insiderintelligence.com/content/google-facebook-amazon-account-over-70-of-us-digital-ad-spending; Ronan Shields, *Here Are the 2022 Global Media Rankings by Ad Spend: Google, Facebook Remain Dominant -- Alibaba, ByteDance in the Mix*, Digiday (Dec. 13, 2022), https://digiday.com/media/the-rundown-here-are-the-2022-global-media-rankings-by-ad-spend-google-facebook-remain-dominate-alibaba-bytedance-in-the-mix/.

[84] Alphabet Inc., *Alphabet Announces Fourth Quarter and Fiscal Year 2022 Results*, Alphabet Investor Relations (Feb. 2, 2023), https://abc.xyz/investor/static/pdf/2022Q4_alphabet_earnings_release.pdf?cache=9de1a6b; Meta Platforms, Inc., *Meta Reports Fourth Quarter and Full Year 2022 Results*, Meta Investor Relations (Feb. 1, 2023), https://s21.q4cdn.com/399680738/files/doc_financials/2022/q4/Meta-12.31.2022-Exhibit-99.1-FINAL.pdf; Aswath Damodaran, *Margins by Sector (US)*, (2023), https://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/margin.html.

[85] Steven Melendez & Alex Pasternack, *Here Are the Data Brokers Quietly Buying and Selling Your Personal Information*, Fast Company, Mar. 2, 2019, https://www.fastcompany.com/90310803/here-are-the-data-brokers-quietly-buying-and-selling-your-personal-information.

[86] David A. Hoffman, *Opinion | Intel Executive: Rein In Data Brokers*, The New York Times, July 15, 2019, https://www.nytimes.com/2019/07/15/opinion/intel-data-brokers.html.

ad agencies"—generated $37.9 billion in revenue in 2019.[87] The report predicts that ending third-party web tracking would lower aggregate revenues for these intermediaries by between $7.5-10 billion each year.[88]

Data intermediaries clearly benefit from the increased data collection associated with behavioral targeting: As Judge Leonie M. Brinkema described in her decision on the DOJ's ad-tech antitrust case against Google, the company used their position in the market as a data intermediary to effectively force publishers to use their ad exchange (See Figure 2).[89] The DOJ complaint noted, "[a]s a result of its illegal monopoly, and by its own estimates, Google pockets on average more than 30% of the advertising dollars that flow through its digital advertising technology products; for some transactions and for certain publishers and advertisers, it takes far more."[90] Moreover, data intermediaries often lobby legislators regarding online privacy regulation: A 2021 analysis from The Markup found that 25 companies registered as data brokers in Vermont and California with publicly available lobbying data spent a total of $29 million on federal lobbying in 2020, though this figure encapsulates lobbying on other kinds of legislation as well, such as credit reporting, banking, and cybersecurity.[91] Meta and Alphabet (two of the biggest federal lobbying spenders in the U.S., having spent a total of $32.3 million on federal lobbying in 2022) lobbied on bills such as the American Data Privacy and Protection Act, which proposed providing all consumers with the right to opt out of targeted advertising and would ban targeted ads for children altogether.[92]

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[87] Deighton and Kornfeld, *supra* note 24 at 32.
[88] *Id.* at 33.
[89] United States v. Google LLC, No. 1:23-cv-00108 (E.D. Va. 2025).
[90] U.S. Department of Justice, *supra* note 44.
[91] Alfred Ng & Maddy Varner, *The Little-Known Data Broker Industry Is Spending Big Bucks Lobbying Congress*, The Markup, Apr. 2021, https://themarkup.org/privacy/2021/04/01/the-little-known-data-broker-industry-is-spending-big-bucks-lobbying-congress.
[92] Open Secrets, *Alphabet Inc Lobbying Profile*, OpenSecrets (2023), https://www.opensecrets.org/federal-lobbying/clients/summary?cycle=2022&id=d000067823; Open Secrets, *Meta Lobbying Profile*, OpenSecrets (2023), https://www.opensecrets.org/federal-lobbying/clients/summary?cycle=2022&id=D000033563&name=Meta; Frank Rep. Pallone, *American Data Privacy and Protection Act*, (2022), http://www.congress.gov/.

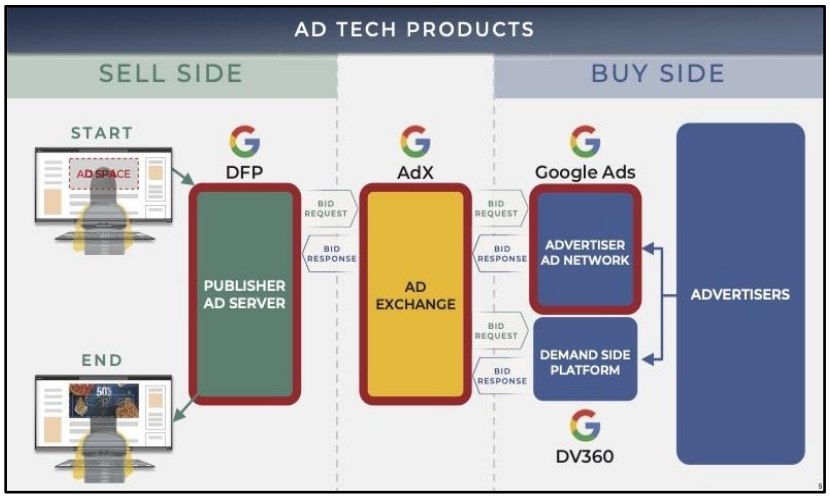

Figure 2. Slide presented by DOJ lawyers in United States v. Google LLC, demonstrating how Google controls both the sell side and buy side in the advertising marketplace.[93]

And yet, while this evidence may hint to the importance of the data economy for the economic success of data intermediaries, it does not replace the need for rigorous empirical research on how intermediaries benefit from behavioral advertising. Without independent, empirical research on these intermediaries, these firms may be able to control much of the narrative and regulatory agenda around online privacy.

2. Merchants

Most literature on behavioral advertising focuses on its effectiveness for merchants. At first glance, the literature in this area suggests that behavioral targeting is highly effective, as behavioral advertising is often associated with an increase in click-through rates for merchants,[94] while others show higher rates of conversion and purchasing probability. For instance, after European Union regulations limited the use of behavioral user data with advertising outside of the EU, Goldfarb and Tucker found that the data-limited EU advertisements were 65% less effective at changing whether consumers said that they intended to purchase a product. [95] (Importantly, some other reports note no significant differences in actual click-through rates and conversions after removing cookies,

[93] Antitrust Division U.S. Department of Justice, *Plaintiffs' Demonstrative D*, (2024), https://www.justice.gov/atr/media/1366836/dl.
[94] Beales, *supra* note 19.
[95] Avi Goldfarb & Catherine Tucker, *Privacy Regulation and Online Advertising*, 57 Manag. Sci. 57 (2010).

as in a study from the Dutch public broadcaster Ster.[96]) And yet, as we argue, the ad-industry narratives surrounding the findings of these studies belie the reality of how uncertain the relative effectiveness of these ads actually are. Even if scholars and policymakers were to adopt the ad-industry interpretations of these studies, we show how it is still possible that merchants are not significantly benefitting from behaviorally targeted advertisements.

Many interpretations of empirical findings conclude that behavioral advertising is extremely beneficial for merchants, but measuring the effectiveness of behavioral advertising is fraught in and of itself. Observational methods for measuring the causal effects of advertising in general can produce outcomes that differ from comparable experimental methods.[97] Experimental methods have limited generalizability, and ad exposure in observational settings can depend on a variety of factors. In targeted advertising, estimating counterfactual outcomes is especially difficult as supposedly comparable, untreated units may have been left out of the targeted ad group purposely.[98] That is, despite being similar to the targeted user, the non-targeted user in the supposed counterfactual may have some feature that led them to not be targeted in the first place. Conversely, some advertisers may intend to target certain groups, but measuring whether the individual actually consumed the ad is still unknown, as other advertisers may have bid higher for the same impression, or the consumer may have scrolled or clicked past the ad without looking at it.[99]

It is ultimately difficult to disentangle actual from apparent effects: For instance, Goldberg, Johnson, and Shriver analyze the impact of GDPR on 1,084 online firms and report that the regulation led to a decline of 11.1% in *recorded* page views and a 13.3% drop in *recorded* revenues.[100] The authors also note that while these "results suggest that the GDPR has changed recorded online outcomes, they do not disentangle the role of data recording from real economic harms." If these results are quoted without the

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[96] Ster Reclame, *A Future Without Advertising Cookies?* (2021), https://www.ster.nl/media/lfhlgmke/ster_a-future-without-advertising-cookies.pdf.

[97] Brett R. Gordon et al., *A Comparison of Approaches to Advertising Measurement: Evidence from Big Field Experiments at Facebook*, 38 Mark. Sci. 193 (2019).

[98] Garrett Johnson, *Inferno: A Guide to Field Experiments in Online Display Advertising* (July 18, 2022), https://papers.ssrn.com/abstract=3581396.

[99] *See Id.*

[100] Samuel G. Goldberg, Garrett A. Johnson & Scott K. Shriver, *Regulating Privacy Online: An Economic Evaluation of the GDPR*, 16 Am. Econ. J. Econ. Policy 325 (2024), https://www.aeaweb.org/articles?id=10.1257/pol.20210309.

clarifying statement, they can lead those unfamiliar with the work to believe the impact of the regulation is bigger and less ambiguous than it truly is.

Because measuring the causal impact of behavioral targeting is inherently challenging, the extant empirical literature tends to be highly contextual and dependent on the type of consumer, ad, and behavioral data. In a study focused on retargeting —a behavioral advertising strategy in which a consumer is shown an ad for a product they have previously shown interest in—Lambrecht and Tucker found that retargeting using pictures of specific products that consumers browsed was less effective than retargeting using generic brand-based ads, but that these effects changed depending on the type of consumer.[101] Consumers who had changed their preferences benefitted from the product-specific targeting, as did consumers who had based their preferences in specific product information.[102] Other work similarly finds different effectiveness based on the type of ad (such as retargeted ads or pre-roll video ads),[103] the type of behavioral data used, and the subsequent perceived intrusiveness of the ad.[104] Counterintuitively, ads tend to perform worse when the data used is more personalized,[105] and ad effectiveness can be dependent on whether users perceive that they have control of the data used in advertising.[106] Consumers thus have some expressed preferences for privacy and against the use of their highly personal data in advertising.

At times, studies analyzing very specific outcomes of privacy interventions can be easily misconstrued in the public debate. For example, in a working paper on how Apple's ATT framework impacted a subset of advertisers, Aridor, Che, Hollenbeck et al. note advertisers with a higher dependence on Facebook ads experienced a "37% reduction in click-through rates" after ATT.[107] The authors are thorough in their estimations, and clearly specify that their result

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[101] Anja Lambrecht & Catherine Tucker, *When Does Retargeting Work? Information Specificity in Online Advertising*, 50 J. Mark. Res. 561 (2013).
[102] *Id.*
[103] Anindya Ghose & Vilma Todri, *Towards a Digital Attribution Model: Measuring the Impact of Display Advertising on Online Consumer Behavior* (Aug. 1, 2015), http://papers.ssrn.com/abstract=2638741.
[104] Jenny van Doorn & Janny C. Hoekstra, *Customization of Online Advertising: The Role of Intrusiveness*, 24 Mark. Lett. 339 (2013).
[105] *Id.*
[106] Catherine Tucker, *Social Networks, Personalized Advertising, and Privacy Controls*, 51 J. Mark. Res. 546 (2014).
[107] Guy Aridor et al., *Evaluating the Impact of Privacy Regulation on E-Commerce Firms: Evidence from Apple's App Tracking Transparency* (Apr. 28, 2025), https://papers.ssrn.com/abstract=4698374.

applies to "some firms" that are smaller in size and over reliant on Meta for advertising, and that their estimated revenue losses represent "forgone growth rather than absolute revenue declines."[108] They also carefully estimate how other firms can effectively substitute Meta advertising for advertising in other platforms and don't experience revenue losses as a result of ATT.

While the authors are careful and clear in outlining the boundaries of their results, readers may easily misread the practical significance of the findings. For example, in a decision regarding advertising practices on iOS devices, the French competition regulator *Autorité de la concurrence* cited the Aridor et al. study as evidence of the detrimental consequences of ATT. The decision notes that "companies most dependent on Meta to promote their product saw their revenue fall by 39.4%, in particular because of a drop in new customer acquisitions, the ultimate effect depending on the advertiser's ability to switch to another advertising platform such as Google."[109] While the statement is factually correct, it tells us little about the significance and implications of this effect. Before concluding that the ATT is causing significant harm, it would be necessary to know how many companies are "most dependent on Meta to promote their product" and how representative they are of sellers as a whole. More importantly, to understand the effect of this change in consumers, one would need to know whether the merchants that experienced losses were high-quality or low-quality vendors, and if their prices were above or below similar-quality merchants. For example, if the vendors experiencing losses are those exploiting hyper-targeting on social media to sell low-quality, high-priced products,[110] then what seems like a loss for small merchants may in fact be correcting a market inefficiency created by behavioral targeting. Additionally, it would be important to consider if and how affected merchants can adapt to more restrictive privacy regimes. Restricting the ability of online advertisers to indiscriminately collect and use personal information may reduce their effectiveness in the short term, but that doesn't imply that they will be unable to adapt and develop effective advertising techniques that don't

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[108] *Id.* at 25.

[109] Autorité de la concurrence, *Decision 25-D-02 of March 31, 2025 Regarding Practices Implemented in the Sector for Mobile Application Advertising on iOS Devices*, 109 (2025), https://www.autoritedelaconcurrence.fr/en/decision/regarding-practices-implemented-sector-mobile-application-advertising-ios-devices.

[110] Julia Angwin, *Opinion | If It's Advertised to You Online, You Probably Shouldn't Buy It. Here's Why.*, The New York Times, Apr. 6, 2023, https://www.nytimes.com/2023/04/06/opinion/online-advertising-privacy-data-surveillance-consumer-quality.html.

infringe on their users' privacy, or that they cannot be substituted by other forms of advertising, such as contextually targeted advertising.

Other studies argue that the effectiveness of behavioral advertising may be more generally overstated, and that incremental clicks do not translate into actual sales. Instead, behavioral advertising can target consumers who are already likely to make a purchase. In a randomized field experiment, Frick, Belo and Telang found that consumers who were already likely to purchase the product were those for whom ads already worked best.[111] Moreover, the amount that intermediaries extract from merchants to serve these ads outweighs the benefit of targeting: Frick, Belo and Telang found that the ad platform contributed 4.35% of the profit generated by the ad, yet charged the merchant about 8.12% of the profit.[112]

But even if we were to take the narrow ad-industry interpretation of these studies at face value, ignoring the above critiques, it is still possible that merchants are not better off in a world with unregulated behavioral advertising. Merchants may be playing a kind of Prisoner's Dilemma game, where all merchants may be better off not spending on targeted ads, but the optimal equilibrium is for them to spend on these ads; by spending on these ads they are able to capture the attention of customers who may otherwise go to their competitors. While there is little empirical work done on these dynamics with behavioral targeting, there is some research on this phenomenon as it relates to search advertising, where brands are incentivized to chip away at their competitors' traffic from search terms.[113] Similar Prisoner's Dilemma games can occur in other platform-mediated markets as well: An analysis of the adoption of reservation platform OpenTable in New York City suggested that restaurants could be driven to join the platform even when they cannot derive any gains from it.[114] When this happens, the platform becomes an additional cost for restaurants that pass down its cost to consumers.[115]

It is possible, then, that behaviorally targeted advertising is not necessarily increasing productivity or growing the economic pie, but

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[111] Thomas Frick, Rodrigo Belo & Rahul Telang, *Incentive Misalignments in Programmatic Advertising: Evidence from a Randomized Field Experiment* (Feb. 21, 2022), https://papers.ssrn.com/abstract=4039560.
[112] *Id.*
[113] Tom Blake, Chris Nosko & Steven Tadelis, *Consumer Heterogeneity and Paid Search Effectiveness: A Large Scale Field Experiment* (May 2014), http://www.nber.org/papers/w20171.
[114] Cristobal Cheyre & Alessandro Acquisti, *Online Intermediation in Legacy Industries: Evidence from the Adoption of Restaurant Reservation Platforms* (Feb. 9, 2024), https://papers.ssrn.com/abstract=4721874.
[115] *Id.*

rather cutting the pie differently; consumer spending activated by behaviorally targeted advertising is perhaps being reallocated among stakeholders — with a larger slice allocated to intermediaries — rather than simply growing for all. Ultimately, the empirical evidence behind the oft-discussed negative consequences for merchants is incomplete, and cannot be definitively used to override privacy concerns in the debate surrounding regulation of behavioral advertising.

3. Publishers

Various pieces of evidence suggest that publishers do benefit from targeted advertising: One observational study found that users who opted out of behavioral advertising provided 52% less revenue to publishers than similar ads for users who allowed behavioral targeting, which the authors estimated resulted in publishers losing nearly $9 in ad spending per customer.[116] Similarly, Google tested the change in publisher revenue when disabling access to cookies for a randomly selected group of consumers, finding that average revenue decreased by 52% and median per-publisher revenue declined by 64% when cookies were disabled.[117] While the results of this test suggest a marked difference, the test is an incomplete representation of what happens when cookies are disabled. In Google's experiment they compared payments in Google's platform when cookies were or weren't allowed. It does not consider that publishers, if offered significant lower payments from Google when cookies are not available, can sell their advertising inventory in other ad-exchanges, or through direct deals with advertising agencies.

In fact, other works using different methodologies note that while cookies might offer some value to publishers, the real economic value might be overstated. A study of 42 million ad impressions across 100 publishers found a 24% decrease in the mean net price paid to publishers without tracking when controlling for differences in users, advertisers, and publishers.[118] Another observational study, using advertising transaction data from a large media company, found that using cookies may lead to as little as 4%

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[116] Garrett Johnson, Scott Shriver & Shaoyin Du, *Consumer Privacy Choice in Online Advertising: Who Opts Out and at What Cost to Industry?*, 39 Mark. Sci. 33 (2020).

[117] Ravichandran and Korula, *supra* note 25.

[118] Rene Laub, Klaus Miller & Bernd Skiera, *The Economic Value of User Tracking for Publishers* (Oct. 18, 2022), https://papers.ssrn.com/abstract=4251233.

increase in publishers revenues.[119] And Wang, Jiang, and Yang similarly find that while GDPR only led to early "modest decreases in ad performance" for some publishers, and "the GDPR's impacts can be alleviated by relevant webpage context."[120]

More importantly, while empirical studies suggest that there is at least some value allocated to publishers in behavioral tracking, the empirical picture painted is incomplete because it focuses on the first frame of the figure we presented in Section 2.[121] The empirical studies we have cited so far, which focus on the per-impression economic value of tracking, should be supplemented with an understanding of the broader, across-impressions effect of targeted advertising. As captured by Frame 2 of Figure 1, targeting is a two-sided platform problem, with high competition on both sides. Traditional publishers now compete with an ever-increasing array of new publishers and media for consumer attention (e.g. local news now competes with Facebook, YouTube, and TikTok), and advertisers compete with a seemingly infinite array of other merchants for consumers. The data intermediaries in the middle, which exist in an oligopoly, can extract value from the heightened competition on both sides.[122]

The variety of different findings of the impact of behavioral advertising on publishers indicates a key gap in the literature: While observational and experimental research designs can compare advertisers who use behavioral targeting and those who do not in our current world, these extant studies cannot tell us *what the advertising market would look like in a world without behavioral targeting.* What would outcomes look like in a world where behavioral data collection and use is banned? Existing studies that only capture a local decrease in targeting are thus showing how ad investment moves from vectors where less targeting is available, to vectors where more targeting is available, rather than the true effect of targeting on the ecosystem as a whole.

4. Consumers

Proponents of behavioral targeting argue that targeting leads to both direct and indirect benefits for consumers: Consumers benefit

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[119] Veronica Marotta, *Online Tracking and Publishers' Revenues: An Empirical Analysis* (2019), https://weis2019.econinfosec.org/wp-content/uploads/sites/6/2019/05/WEIS_2019_paper_38.pdf.

[120] Pengyuan Wang, Li Jiang & Jian Yang, *The Early Impact of GDPR Compliance on Display Advertising: The Case of an Ad Publisher*, 61 J. Mark. Res. 70 (2024).

[121] Acquisti, *supra* note 37.

[122] *Id.*

directly from more relevant ads and indirectly from receiving free or inexpensive online goods monetized by the advertising economy.[123]

What evidence exists is, again, highly context-dependent, highlighting only a piece of the broader implications of tracking for consumers. Economic evidence often focuses on outcomes like competition and market exit as a proxy for consumer welfare: In an observational study of Google Play Store apps before and after the implementation of GDPR, Janßen and colleagues find that the addition rate of new apps fell by 47.2%, with the rate of successful apps (those achieving a certain number of total installations) dropping at a similar rate.[124] Another study of children's games on the Google Play Store before and after the implementation of a Google rule limiting behavioral tracking for children's apps found that games affected by the ban were less likely to receive feature updates and were more likely to be dropped from the Play Store altogether, negatively affecting competition in the Android app marketplace.[125] A similar natural experiment analyzed video updates for YouTube channels before and after the FTC required YouTube to stop behavioral tracking for channels that had "Made for Kids" (MFK) content.[126] MFK channels posted fewer videos, and many channels with a mix of MFK and non-MFK content began posting less MFK content: 42% of these mixed-content channels moved to a completely non-MFK content model.[127]

On initial glance, these studies indicate that limiting behavioral targeting and data collection are homogenizing online products and limiting competition. But deeper inspection reveals a more nuanced view of how behavioral targeting affects consumer welfare. For instance, one study of the Apple App Store found that when Apple implemented their "App Tracking Transparency" framework (allowing users to ask apps not to track their activity across other apps and websites), the number of apps in the App Store initially

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[123] AdExchanger, *supra* note 6; *Meta, ZoomInfo, Digital Advertising Alliance, Association of National Advertisers, and Interactive Advertising Bureau*, *supra* note 5.

[124] Rebecca Janßen et al., GDPR and the Lost Generation of Innovative Apps (May 2022), https://www.nber.org/papers/w30028.

[125] Tobias Kircher & Jens Foerderer, *Ban Targeted Advertising in Apps? An Empirical Investigation of the Consequences for App Development* (Aug. 8, 2022), https://papers.ssrn.com/abstract=4184066.

[126] Garrett Johnson et al., *COPPAcalypse? The Youtube Settlement's Impact on Kids Content* (Apr. 26, 2023), https://papers.ssrn.com/abstract=4430334.

[127] *Id.*

dropped;[128] this initial drop, however, was followed by an increase in the number of apps, which ultimately recovered to above pre-ATT levels.[129] Focusing only on the short-term, direct effects of privacy interventions, as many studies do, can create the impression that their effects are negative and profound, overlooking the ecosystem's ability to adapt to different data handling regimes.

These studies are useful for understanding local effects of targeted advertising bans. Yet the interpretations of these experiments often belie the tangible impacts of regulating behavioral ads for consumer welfare more broadly. If behavioral targeting limits the creation and maintenance of certain online products, which products are the ones that win, and which are the ones that lose? Areas like Android apps and children's online content, in particular, tend to be rife with low-quality advertisements.[130] The social benefit of advertising to children in the first place is questionable, as increased exposure to advertising is associated with worsened health outcomes (including, among other things, greater use of tobacco, drugs, and alcohol).[131] Is it possible that many online markets are oversaturated with poorer quality products that are easiest to monetize, and that regulation can help to improve consumer welfare by improving product quality standards, as well as consumer privacy?

Moreover, it is important to note that while some studies suggest significant negative effects of privacy intervention on consumers, it is necessary to critically examine the practical significance of their results. In their study of the effect of GDPR on Google Apps, Janßen and colleagues report that the regulation led to the exit of a third of all apps available in the Google ecosystem.[132] However, the authors note that apps that exited often had not been updated for a long period of time, and had amassed few users, which the authors attribute to developers choosing "to forgo costly compliance upgrades," rather than to low quality.[133] Thus, as impressive as the rate of exit sounds, its practical significance is questionable — and may in fact be a *positive* outcome for the oversaturated children's

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[128] Cristobal Cheyre et al., *Did Apple's App Tracking Transparency Framework Harm the App Ecosystem?* (July 1, 2024), https://papers.ssrn.com/abstract=4453463.
[129] *Id.*
[130] Marisa Meyer et al., *Advertising in Young Children's Apps: A Content Analysis*, 40 J. Dev. Behav. Pediatr. 32 (2019).
[131] Jenny Radesky et al., *Digital Advertising to Children*, 146 Pediatrics e20201681 (2020).
[132] Janßen et al., *supra* note 124.
[133] *Id.* at 21.

app market. Other studies have identified very small, albeit statistically significant, effects of privacy regulations. In a study of the impact of Apple's ATT on app monetization strategies, Kesler argues that the new framework brings back paid apps and reinforces the trend towards increasing the number of in-app purchases.[134] However, the economic significance of the measured change is negligible, as it corresponds to a 0.071% increase in paid apps, and a 0.1% increase in apps containing in-app payments. Crucially, these findings risk being easily miscommunicated and misconstrued in the media to overstate the true significance of behavioral data collection on outcomes for publishers; yet upon closer scrutiny the economic significance of behavioral data collection is minimal at best.

While these studies suggest that recent privacy interventions have a negligible impact on the provision of ad-supported online products, is there evidence that these interventions have translated to *gains* for consumers? Some emerging evidence indicates they may have.

One study of complaints to the CFPB, FTC Identity Theft database, and FTC-organized Consumer Sentinel Network found that Apple Ad-Tracking Transparency "substantially reduced fraud complaints" from consumers, signifying a potential decrease in fraud due to the ATT.[135] Not only can these regulatory measures reduce consumer fraud, they can also lead to design choices that empower consumers to reject tracking on their own terms. A study of over 900 news websites in the EU and US found that government intervention led to a decline in the use of privacy dialog boxes that nudged users to accept tracking.[136]

Some recent empirical work attempts to better understand the relationship between behavioral tracking and the quality of both ads and online content. One online experiment found that products from targeted ads tended to be from lower quality vendors and have higher prices compared to those discovered through organic search (though the difference in price may offset search costs of organic search).[137] The authors note however that there are also tradeoffs for merchants: products that performed better in search tended to be

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[134] Reinhold Kesler, *The Impact of Apple's App Tracking Transparency on App Monetization* (Aug. 8, 2023), https://papers.ssrn.com/abstract=4090786.

[135] Bo Bian et al., *Consumer Surveillance and Financial Fraud* (Sept. 2023), https://www.nber.org/papers/w31692.

[136] Logan Warberg et al., *Trends in Privacy Dialog Design after the GDPR: The Impact of Industry and Government Actions*, in *Proceedings of the 22nd Workshop on Privacy in the Electronic Society 107* (2023), https://dl.acm.org/doi/10.1145/3603216.3624963.

[137] Schnadower Mustri, Adjerid, and Acquisti, *supra* note 62.

from better-known competitors, meaning targeted ads may be helpful for lesser-known vendors who would not perform as well as their competitors in search.[138] In a field experiment on users' valuation of ad-blockers, Lin and colleagues found that users who newly installed ad-blockers led to fewer purchase regrets, while those who uninstalled their ad-blockers experienced more dissatisfaction with recent purchases.[139] Another longitudinal study of news and media sites in the EU and US after the implementation of GDPR found that, after an initial drop in tracking for EU websites relative to US websites, there was no significant impact of GDPR on the creation of new EU content and online social media engagement with this content.[140]

In short, the current empirical economic evidence on how behavioral tracking affects consumer welfare is—much like that of other stakeholders—mixed and highly contextual. Studies used to oppose behavioral targeting regulation tend to focus on competition and innovation, though these outcomes are only part of the puzzle. What the current literature in this area lacks is a clear evaluation of consumer welfare outcomes in terms of marginal costs versus marginal benefits: If behavioral targeting is enabling access to free online goods and services, then how much have these free services improved over time, in both quality and quantity? On the other hand, how much has personal data collection increased, and how have profits for data companies changed?

As described above, while some economic works aim to quantify these qualitative and experiential changes, the majority of economic literature on consumers tends to focus solely on the impacts of behavioral advertising on online innovation and the accessibility of free and low-cost online resources. But just as legal scholars have taxonomized and enumerated various qualitative, ethical harms that emerge as a result of behavioral data collection,[141] economic works must measure the marginal cost vs. marginal benefit empirically in order to understand whether more personal data collection in behavioral targeting causally leads to better consumer outcomes.

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[138] *Id.*

[139] Fengyang Lin, Cristobal Cheyre & Alessandro Acquisti, The Welfare Effects of Ad Blocking (Sept. 30, 2023), https://papers.ssrn.com/abstract=4635884.

[140] Vincent Lefrere et al., *Does Privacy Regulation Harm Content Providers? A Longitudinal Analysis of the Impact of the GDPR*, Manag. Sci. (2025), https://pubsonline.informs.org/doi/abs/10.1287/mnsc.2022.03186.

[141] Citron and Solove, *supra* note 1; Solove, *supra* note 38; Calo, *supra* note 38.

5. Synthesizing Streams of Research

Overall, our analysis of the extant empirical literature on behavioral advertising reveals a focus on how privacy regulation may negatively affect direct-effect outcomes for specific stakeholders in the short-term (when those effects may merely reflect the reallocation of advertising budgets between platforms rather than lasting aggregate effects for classes of stakeholders), sidestepping countervailing evidence we cited above —such as studies showing lack of discernible long-term harm for content providers from regulations such as GDPR and Apple's ATT, or correlations between behavioral ads and higher-priced, lower-quality vendors.[142] A shift towards studying longer-term, broader, economy-wide impacts is needed to further help policymakers formulate measures that reduce harm and more equitably distribute power among all stakeholders in the data economy, including consumers.[143]

III. Evaluating Economic Rationales For and Against Behavioral Ad Regulation

In the preceding sections, we have shown that there are compelling economic rationales — both theoretical and empirical — for approaching the advertising industry's economic claims about behavioral targeting and their subsequent anti-regulatory efforts with skepticism. Our review of the literature reveals gaps in the economic work, as well as ambivalent (if not altogether conflicting)

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[142] *See* Jean-Pierre Dubé et al., *The Intended and Unintended Consequences of Privacy Regulation for Consumer Marketing* (2024), https://www.msi.org/wp-content/uploads/2024/05/MSI_PRIVACY-PAPER-V3.pdf.

[143] Regarding consumer and the research on their privacy behavior, *see id.*; Alessandro Acquisti, Laura Brandimarte & George Loewenstein, *Secrets and Likes: The Drive for Privacy and the Difficulty of Achieving It in the Digital Age* (Sept. 7, 2020), https://papers.ssrn.com/abstract=3688497. Dubé et al., *supra* note 142, frame lessons from the behavioral privacy literature as paternalistic: Consumers *should* care more about privacy. In our view, the relevant literature reaches a different conclusion. Acquisti et al. (2020) highlight how both field and lab studies provide evidence for both privacy-seeking and disclosure-seeking behaviors, and that survey data consistently reflects high levels of concern, anxiety, and a widespread desire for stronger privacy protections. The key insight from this body of work is not that consumers fail to care, but rather that they face significant structural obstacles in acting on their preferences. These obstacles include manipulative choice architectures and economic frictions that make it difficult—or costly—for individuals to make privacy-preserving decisions in digital environments.

evidence regarding the purported gains created by the behavioral advertising ecosystem. Notably, there are gaps in the economic understanding of how those gains are distributed across stakeholders. The theoretical literature does not provide a definitive answer on whether behavioral advertising benefits all stakeholders, or whether ad-tech intermediaries may instead be extracting most of the benefits created by the collection of consumer data and its use in targeting ads. Looking at what the empirical literature reveals about how different stakeholders have fared in this ecosystem provides little clarity on the question of *allocation*. If the benefits of collecting and using data for online advertising are not as widely distributed across stakeholders as the ad-tech industry suggests (and, considering that some stakeholders may even suffer economic harms) then it is not clear that the privacy costs imposed by these technologies are justified on economic grounds.

The rest of this Part summarizes how the empirical and theoretical literature speaks to arguments for regulating behavioral ads. Understanding the economic bases of these common claims can thus empower legal scholars, lawmakers, and regulators alike to draw on economic rationales—as well as the more commonly deployed ethical justifications—for regulating behavioral ads.

A. The benefits and costs of behaviorally targeted advertising are unevenly distributed across stakeholders

We have scrutinized, from a purely economic perspective (that is, with a focus on market efficiency, and ignoring the other critical dimensions of privacy that have less to do with economics) the claim that online targeted advertising is a win-win for all stakeholders involved. This claim is commonly used to justify the widespread collection of personal data online, and oppose data protection and data-use regulations. While many privacy scholars have been critical of this claim, the ad industry has tended to focus primarily on the economic gains created by behavioral targeting, such as better matching between buyers and sellers (intending to reduce search costs and increase consumer satisfaction), and support to the provision of free content.[144]

From a theoretical perspective, it is evident that behaviorally targeted advertising could be an economic win-win for all stakeholders involved, or could evolve into a structure where the data intermediaries are in a position to extract rents from other

[144] Acquisti, *supra* note 37.

stakeholders. In Frame 1 of Figure 1, the data intermediaries and targeting technology firms act as a matchmaker that uses the information it collects to reduce search costs. That is, consumers receive more relevant ads, and advertisers more easily find the consumers they want to target. In the alternative framing (Frame 2), the data intermediaries exploit their position to increase competition between all possible advertisers, allocating impressions to the most profitable advertiser from the platform's perspective, which may not necessarily be the one that will maximize consumer surplus or the advertisers' profits.

As we discuss above, these two framings are closely related to prominent legal critiques of how U.S. antitrust law approaches platform intermediaries; [145] while it is *possible* that data intermediaries are fairly distributing the gains from their favorable market position, it is equally possible that they are reaping the value created by behavioral targeting, without allocating this value across the whole ecosystem. To determine which of these regimes more closely resembles how the behaviorally targeted advertising ecosystem operates should be a priority for empirical scholarship, policy, and legal analysis — especially as governments have recently brought and successfully litigated high-profile antitrust cases against intermediaries like Google.

While empirical contributions in this area provide evidence on the effectiveness of targeted advertising relative to non-targeted advertising in specific contexts, they reveal little about the overall impact of the targeting ecosystem on the welfare of different stakeholders. For example, targeted advertising seems better than non-targeted online advertising in terms of click-through-rate and conversion-rate for merchants;[146] and yet this fact says little about whether merchants, in the aggregate, are benefiting from the targeting tools, or whether, once most merchants use similar tools, those gains turn into a zero-sum game. Similarly, some works do show that publishers seem to receive higher revenues for targeted relative to non-targeted impressions; but such works focus on per-impression analyses.[147] That is, valuable and sophisticated as they are, these works are constrained by experimental and empirical barriers, and thus focus on the local, transaction-level of ad impressions. These works are not designed to, and thus cannot tell us much, about the global effects that the rise of third-party intermediaries has had on online publishers. For instance, would

[145] Khan, *supra* note 43; Khan, *supra* note 43.
[146] Beales, *supra* note 19.
[147] Johnson, Shriver, and Du, *supra* note 116; Ravichandran and Korula, *supra* note 25; Laub, Miller, and Skiera, *supra* note 118.

publishers be better or worse off in a counterfactual regime where fewer data and less targeting were available? Conceivably, publishers with valuable audiences and information about their readers could benefit in such a regime, as they could monetize their enabling role in reaching those audiences. If there is one pattern that does seem unequivocal, however, it is that advertising technology firms that derive almost all of their revenues from advertising have flourished in the current regime of unchecked data collection.

Yet questions still remain surrounding the economic costs of online advertising. Public opinion surveys consistently highlight the dislike of consumers towards online data collection and targeted advertising.[148] Additionally, the many regulatory efforts ongoing in different countries,[149] and the initiatives of large technology firms to appease consumers' concerns[150] are clear signs of ubiquitous concerns among the public regarding widespread online data collection. However, articulating and quantifying the specific risks and harms of data collection is difficult—from both economic *and* legal perspectives. Even in notable examples of massive data breaches, such as the Cambridge Analytica scandal, it is hard to determine who was harmed by the data breach and the extent of those harms: The Cambridge Analytica case was settled in 2022 for $725 million, which looks like a staggering amount but corresponds to only a few dollars per user that was impacted.[151] This highlights a key difficulty in identifying and measuring the potential harms of the online targeting ecosystem: The harms, at an individual scale in a given moment in time may be very small and diffuse, but when

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[148] Auxier et al., *supra* note 22; Ross Benes, *Do People Actually Want Personalized Ads?*, Insider Intelligence, Mar. 4, 2019, https://www.insiderintelligence.com/content/do-people-actually-want-personalized-ads; Jorge Uceda, *(Study) Boomers Enjoy Targeted Ads, Even If "Phones Listen,"* Data Hub (Jan. 5, 2023), https://www.sortlist.com/datahub/reports/is-my-phone-listening-to-me-for-ads/; Russell Heimlich, *Internet Users Don't like Targeted Ads*, Pew Research Center, https://www.pewresearch.org/short-reads/2012/03/13/internet-users-dont-like-targeted-ads/ (last visited Feb. 29, 2024).

[149] *See, e.g.*, General Data Protection Regulation, Regulation (EU) 2016/679, 2016 O.J. (L 119) 1; California Consumer Privacy Act of 2018, Cal. Civ. Code §§ 1798.100 et seq. (West 2022); Lei Geral de Proteção de Dados (LGPD), Brazil Law No. 13,709, Aug. 14, 2018.

[150] Michel Protti, *Investing In Privacy*, Meta (Jan. 25, 2024), https://about.fb.com/news/2024/01/investing-in-privacy/.

[151] Nate Raymond & Nate Raymond, *Facebook Parent Meta to Settle Cambridge Analytica Scandal Case for $725 Million*, Reuters, Dec. 23, 2022, https://www.reuters.com/legal/facebook-parent-meta-pay-725-mln-settle-lawsuit-relating-cambridge-analytica-2022-12-23/.

aggregated across all internet users, and long periods of time, can add up to large societal costs.[152]

Some contributions in the theoretical and empirical literature directly address potential harms of behavioral advertising. In theoretical contributions the possibility that behavioral targeting leads to harm is explicitly addressed: There are several ways in which targeting, rather than increasing efficiency and providing all stakeholders with economic gains, can be leveraged to extract rents through price discrimination or steering. Empirical evidence is far more scant, with few contributions exploring the potential negative effects of advertising on consumers. While difficult to measure, empirical literature should attempt to quantify and measure the potential gains and harms of behavioral advertising for consumers, perhaps beyond the *legal* conception of economic privacy harms—that is, financial injury that may occur after a privacy violation has occurred,[153] as opposed to economic surplus that has not been efficiently allocated to different stakeholders. While this is almost impossible to achieve from purely observational data, new field experiments offer a promising avenue to answer these questions. To be able to determine if behavioral advertising in fact benefits all stakeholders involved, the economic literature should not only focus on the unintended consequences of privacy regulation, but should also expand its reach to understand the factors that influence the allocation of the gains created by behavioral targeting. While this has been addressed in some theoretical contributions, empirical work in this area is limited.

B. Recent privacy regulations and self-regulatory efforts have not meaningfully harmed the provision of free products and services

A common claim to oppose efforts to regulate data collection and data use for behaviorally targeted advertising has been that, even if the practice has some social costs, it has fueled innovation and helped provide free products and services that are highly valued by consumers.[154] This claim is difficult to vet, as it implies balancing the benefits brought up by free ad-supported products and services with the potential negative societal impacts of behaviorally targeted advertising — like heightened discrimination or limiting democratic values. However, as privacy regulations have been

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[152] Citron and Solove, *supra* note 4 at 794.
[153] *Id.* at 834–835.
[154] Meta, ZoomInfo, Digital Advertising Alliance, Association of National Advertisers, and Interactive Advertising Bureau, *supra* note 5.

enacted[155] and technology firms have started experimenting with technologies to provide greater privacy to its users,[156] it is possible to examine if they have affected the entry or the subsistence of ad-supported businesses.

A first aspect to note from a theoretical perspective is that it is not evident that behaviorally targeted advertising will always act as an enabler of innovation. If ad-tech acts as an oligopoly that is well positioned to extract rents from advertisers and consumers, it is difficult to argue that it will be an engine for the development of ad-supported products and services. As we noted earlier, recent regulations[157] and private initiatives[158] have created opportunities to empirically examine how restricting the access to data for the purpose of targeting advertising affects innovation in the ecosystems supported by it. In the case of GDPR, some studies have noted that in the short term after GDPR, there were fewer investments in new technology firms[159] and a large number of apps exited the Google Play Store.[160] Over the long term, despite early claims of the potential of the GDPR to cause wide-spread negative effects on ad-supported businesses,[161] the consequences have been minor. While many studies have looked at the consequences of the GDPR,[162] the setting is not ideal to study how restructuring behavioral advertising may affect innovation in ad-supported ecosystems due to its broad reach and inconsistent enforcement. Instead, the implementation of Apple's Tracking Transparency (ATT) framework provides a better setting as it only applies to Apple devices (and not to other devices) and its implementation was consistent across Apple devices.[163] Studies that have considered the impact on the provision of ad-

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[155] *See, e.g.,* General Data Protection Regulation, *supra* note 130.

[156] *See, e.g.,* Apple, *If an App Asks to Track Your Activity*, Apple Support (Feb. 27, 2024), https://support.apple.com/en-us/102420; Brian Quinn, *Meta's Ad-Free Tier Tests User Hunger for Data Privacy*, AdWeek (Dec. 21, 2023), https://www.adweek.com/social-marketing/meta-ad-free-fee-consumer-hunger-data-privacy/.

[157] *See, e.g.,* General Data Protection Regulation, *supra* note 130.

[158] *See, e.g.,* Apple, *supra* note 156.

[159] Jian Jia, Ginger Zhe Jin & Liad Wagman, *The Short-Run Effects of the General Data Protection Regulation on Technology Venture Investment*, 40 Mark. Sci. 661 (2021).

[160] Janßen et al., *supra* note 124.

[161] *Id.*; Jia, Jin, and Wagman, *supra* note 159.

[162] Janßen et al., *supra* note 124; Lefrere et al., *supra* note 140; Garrett Johnson, Scott Shriver & Samuel Goldberg, *Privacy & Market Concentration: Intended & Unintended Consequences of the GDPR* (Nov. 14, 2022), https://papers.ssrn.com/abstract=3477686.

[163] *User privacy and data use.* Apple Developer Documentation, https://developer.apple.com/app-store/user-privacy-and-data-use/

supported apps in the Apple ecosystem have found little evidence of negative consequences.[164] For the most part app developers have adapted to the new framework and have continued to create apps for Apple devices.[165]

Research on the consequences of privacy regulations and industry self-regulatory initiatives thus highlight that just because many current apps and services are monetized by behaviorally targeted ads does not mean that this kind of targeting is the optimal solution, nor is it the world that policymakers should strive to create. Rather, ad-supported ecosystems have adapted and can continue to adapt to more privacy protecting regimes, continuing to produce products and services that are of quality to consumers.

C. There is mounting empirical evidence suggesting that limiting tracking and behavioral targeting can benefit consumers

Instead of simply scrutinizing the economic arguments usually deployed to oppose regulating behavioral ads, we also examine whether there is economic evidence suggesting that privacy regulations can *reduce* online tracking and lead to benefits to consumers. The economic literature has only recently considered this research direction, and the early works suggest that limiting the tracking and targeting of behavioral data can in fact *benefit* consumers.

First, it is important to consider to what extent government regulations and industry initiatives actually are effective at limiting tracking. In its early implementation, GDPR was often criticized as being costly and ineffective, as websites often circumvented the regulation through the use of dark patterns[166] or by exploiting ambiguities in the regulation to continue their tracking and targeting practices.[167] However, some studies that took a longitudinal perspective find that as enforcement actions and industry compliance initiatives have started emerging over time, websites are

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[164] Cheyre et al., *supra* note 128.

[165] *Id.*

[166] Than Htut Soe et al., *Circumvention by Design - Dark Patterns in Cookie Consent for Online News Outlets*, in *Proceedings of the 11th Nordic Conference on Human-Computer Interaction: Shaping Experiences, Shaping Society* 1 (2020), https://doi.org/10.1145/3419249.3420132; Midas Nouwens et al., *Dark Patterns after the GDPR: Scraping Consent Pop-Ups and Demonstrating Their Influence*, in *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems* 1 (2020), https://doi.org/10.1145/3313831.3376321.

[167] Lin Kyi et al., *Investigating Deceptive Design in GDPR's Legitimate Interest*, in *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* 1 (2023), https://dl.acm.org/doi/10.1145/3544548.3580637.

providing more transparent consent choices to users and making it simpler to reject tracking.

Industry initiatives have also been criticized: Apple's ATT framework has been characterized as a strategic maneuver by Apple to assert greater control over their ecosystem and limit competition in the advertising market.[168] Despite these critiques, however, we have identified multiple analyses portraying positive effects of ATT on privacy, finding that the rule has been effective in reducing the collection of cross-app tracking identifiers,[169] enhancing data privacy through its opt-in tracking authorizations,[170] and lowering levels of tracking.[171]

Secondly, do reductions in online tracking and targeting actually translate into benefits for consumers? Recent literature suggests as much, showing that reducing exposure to behavioral targeting and to advertising exposure in general can be welfare-enhancing for consumers. As mentioned above, a recent field experiment shows that products shown to participants in behavioral ads are more relevant than randomly picked products, but they are also associated with lower quality and higher prices.[172] Another field experiment shows that limiting consumer exposure to online advertising leads to fewer purchase regrets and higher satisfaction with recent online purchases.[173] Beyond online purchases, limiting tracking can reduce fraud: After the implementation of Apple ATT,

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[168] Emily Woodward, *Data Friction and Infrastructural Platform Power: An Analysis of Apple's iOS 14 Privacy Updates* (Univ. of Tex. at Austin, Apr. 21, 2023), https://hdl.handle.net/2152/121438; Thomas Hoppner & Philipp Westerhoff, *Privacy by Default, Abuse by Design: EU Competition Concerns About Apple's New App Tracking Policy* (May 26, 2021), https://papers.ssrn.com/abstract=3853981; D. Daniel Sokol & Feng Zhu, *Harming Competition and Consumers under the Guise of Protecting Privacy: An Analysis of Apple's iOS 14 Policy Updates Essay*, 107 CORNELL L. REV. ONLINE 94 (2021).

[169] Konrad Kollnig et al., *Are iPhones Really Better for Privacy? A Comparative Study of iOS and Android Apps*, 2022 Proc. Priv. Enhancing Technol. 6 (2022).

[170] Anzo DeGiulio, Hanoom Lee & Eleanor Birrell, *"Ask App Not to Track": The Effect of Opt-In Tracking Authorization on Mobile Privacy*, in *Emerging Technologies for Authorization and Authentication* 152 (Andrea Saracino & Paolo Mori eds., 2021).

[171] Konrad Kollnig et al., *Goodbye Tracking? Impact of iOS App Tracking Transparency and Privacy Labels*, in *Proceedings of the 2022 ACM Conference on Fairness, Accountability, and Transparency* 508 (2022), https://doi.org/10.1145/3531146.3533116.

[172] Schnadower Mustri, Adjerid, and Acquisti, *supra* note 62.

[173] Lin, Cheyre, and Acquisti, *supra* note 139.

there was a significant reduction in fraud complaints in geographical areas with higher penetration of iOS devices vs other areas.[174]

IV. A Path for Future Economic Research

In a prescient article from 1980 on the economics of privacy, Jack Hirshleifer wondered whether his fellow economists, who had just then discovered the territory of privacy, were perhaps mistaking "a peninsula for the mainland, foothills for a grand sierra," in their reductionist approach to privacy that sacrificed richness for methodological rigor.[175] In our view, Hirshleifer was proven right: The economics of privacy has grown, but most of the many non-economic ramifications of privacy loss—as well as many of its economic ramifications other than those most direct and short-term—remain outside the scope of much contemporary literature. But even *within* the current body of empirical and theoretical literature, we have shown that a more nuanced and balanced picture emerges, challenging the industry's prevailing narrative that economic evidence uniformly opposes regulation. In this Article, we have focused on surfacing those nuances and demonstrating that the existing evidence base can, in fact, support a case in favor of privacy regulation. We contend that the debate surrounding regulating behavioral ads is far more nuanced than simply pitting anti-regulatory economic arguments against civic- and ethics-based justifications for regulation. That is, privacy and market efficiency are not at odds, but in fact can be closely linked.[176]

Both theoretical and empirical economic work indicates that the benefits of behaviorally targeted advertising—and the harms of regulating it—are overstated given the state of the economic literature. In fact, the literature provides oft-overlooked evidence that regulating behavioral advertising may be welfare-enhancing if it prevents overinvestment in wasteful advertising and protects consumers from harms resulting from the over-collection or misuse of their personal data. Extant economic research is at best ambivalent about the benefits and welfare distribution arising from behavioral advertising. The anti-regulatory economic arguments that ad-tech stakeholders readily deploy should therefore not be weighed so heavily against the robust and well-studied legal and philosophical ones. At minimum, they should not be taken at face value.

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[174] Bian et al., *supra* note 135.
[175] Hirshleifer, *supra* note 46 at 649.
[176] *See generally* Ryan Calo, *Privacy and Markets: A Love Story*, 91 NOTRE DAME L. REV. 649 (2015).

Yet one lingering issue remains: Given the paucity of rigorous, global-scale empirical economic research on behavioral advertising, how should future studies be structured to meaningfully inform regulatory debates? A core challenge lies in obtaining ecologically valid data that allows for credible causal inference. While some studies have leveraged observational data—either scraped independently or sourced from data brokers—these designs often fall short in the absence of a clearly exogenous shock that changes how advertising is targeted or delivered. Notable exceptions include quasi-experiments leveraging events such as GDPR or Apple's ATT, which have provided insights into the impact of privacy interventions on website visits and revenues,[177] as well as the availability of ad-supported content.[178] However, such policy shocks are rare, and externally sourced data may be hard to collect and interpret without platform-level access. Other studies have used platform-provided data to evaluate the effects of external events, offering more granular insight into underlying mechanisms.[179] Yet these datasets often limit external validity, as they reflect outcomes conditioned on a single platform's implementation choices.

To address these limitations, future empirical work should aim to combine data across multiple platforms and regulatory contexts to examine how divergent interpretations and implementations of privacy rules shape economic outcomes. Such comparative designs would provide a more comprehensive understanding of how platform incentives, regulatory structures, and market dynamics interact. Crucially, randomized controlled trials (RCTs)—either conducted in collaboration with platforms or independently—are emerging as the most promising path forward. Collaborative experiments have already yielded valuable insights into issues such as consumers' valuation of advertising[180] or the effects of political advertising.[181]

However, valuable as they are, collaboration with platforms is often constrained by their strategic interests. To ensure the rigor and independence of these studies, they should be conducted under a pre-registered analysis plan, and the dissemination of their results must not be conditioned on the platform's approval. In contrast,

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[177] Goldberg, Johnson, and Shriver, *supra* note 100.
[178] Lefrere et al., *supra* note 140; Cheyre et al., *supra* note 128.
[179] Aridor et al., *supra* note 103.
[180] Erik Brynjolfsson et al., *The Consumer Welfare Effects of Online Ads: Evidence from a 9-Year Experiment* (Aug. 1, 2024), https://papers.ssrn.com/abstract=4929525.
[181] *2020 Election Research - Meta Research*, Meta Research, https://research.facebook.com/2020-election-research/ (last visited Aug. 5, 2025).

platform-independent field experiments offer an avenue for researchers to test the effects of behavioral targeting and data use at a broader scale. Examples include Alcott et al.'s 2020 study on the welfare effects of social media,[182] the 2023 Farronato et al. study on the effects of self-preferencing in online markets,[183] and a working paper on a long-term field experiment to evaluate the impacts of online tracking and behavioral targeting on user outcomes.[184]

Ultimately, what should regulators do in the absence of macro-level empirical studies that credibly establish how behaviorally targeted advertising affects all stakeholders? Discarding well-founded legal and philosophical justifications for regulation in favor of poorly substantiated claims from the ad-tech industry would be misguided. Instead, as in other domains where there is potential for consumer harm and economic inefficiencies, regulators should incentivize greater transparency from ad-tech firms to enable independent evaluations of how the ecosystem distributes benefits and harms. Until such evidence exists, regulators should feel empowered to pursue regulation on both ethical and economic grounds—particularly given the growing evidence that behavioral targeting may harm consumers and competition, and that privacy protections can be implemented without undermining innovation or the provision of ad-supported content.

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[182] Hunt Allcott et al., *The Welfare Effects of Social Media*, 110 Am. Econ. Rev. 629 (2020).

[183] Chiara Farronato, Andrey Fradkin & Alexander MacKay, *Self-Preferencing at Amazon: Evidence from Search Rankings*, 113 AEA Pap. Proc. 239 (2023).

[184] Cristobal Cheyre et al., *An Experimental Infrastructure to Investigate the Impact of Online Tracking, Targeting, and Advertising on Consumer Behavior and Consumer Welfare*, Work. Pap. (2024), https://ideas.repec.org//p/net/wpaper/2410.html.