

# Why Google Dominates Advertising Markets

## *Competition Policy Should Lean on the Principles of Financial Market Regulation*

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\*Since leaving the industry, and authoring *The Antitrust Case Against Facebook*, I continue to research and write about the high-tech industry and competition, now as a fellow with Yale University's antitrust initiative, the Thurman Arnold Project. Separately, I have advised and consulted on antitrust matters, including for news publishers whose interests are in conflict with Google's. This Article is not squarely about antitrust, though it is about Google's conduct in advertising markets, and the idea for writing a piece like this first germinated in 2014. At that time, Wall Street was up in arms about a book called *FLASH BOYS* by Wall Street chronicler Michael Lewis about speed, data, and alleged manipulation in financial markets. The controversy put high speed trading in the news, giving many of us in advertising pause to appreciate the parallels between our market and trading in financial markets. Since then, I have noted how problems related to speed and data can distort competition in other electronic trading markets, how lawmakers have monitored these markets for conduct they frown upon in equities trading, but how advertising has largely remained off the same radar. This Article elaborates on these observations and curiosities. I am indebted to and thank the many journalists that painstakingly reported on industry conduct, the researchers and scholars whose work I cite, Fiona Scott Morton and Austin Frerick at the Thurman Arnold Project for academic support, as well as Tom Ferguson and the Institute for New Economic Thinking for helping to fund the research this project entailed. I remain deeply grateful to the many scholars that generously shared their feedback, comments, and insight, often on matters well outside of my area of expertise: Eric Budish, Kevin Haeberle, Scott Hemphill, Michael Kearns, Lina Khan, Jonathan Macey, Doug Melamed, John Morley, Gabriel Rauterberg, Thomas Philippon, Marc Rotenberg, Ashkan Soltani, and Chester Spatt, amongst others. I also warmly thank John Schwall and Rick Arney for helping me to better appreciate the parallels to financial markets, Zach Edwards for critical thinking and research assistance, Jennifer LaCrosse for careful edits and thoughtful suggestions, Chaaru Deb for excellent legal research assistance, and the editors at the *STANFORD TECHNOLOGY LAW REVIEW* for outstanding editorial support. The views and errors therein are my own.

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## ABSTRACT

*Approximately 86% of online display advertising space in the U.S. is bought and sold in real-time on electronic trading venues, which the industry calls “advertising exchanges.” With intermediaries that route buy and sell orders, the structure of the ad market is similar to the structure of electronically traded financial markets. In advertising, a single company, Alphabet (“Google”), simultaneously operates the leading trading venue, as well as the leading intermediaries that buyers and sellers go through to trade. At the same time, Google itself is one of the largest sellers of ad space globally. This Article explains how Google dominates advertising markets by engaging in conduct that lawmakers prohibit in other electronic trading markets: Google’s exchange shares superior trading information and speed with the Google-owned intermediaries, Google steers buy and sell orders to its exchange and websites (Search & YouTube), and Google abuses its access to inside information. In the market for electronically traded equities, we require exchanges to provide traders with fair access to data and speed, we identify and manage intermediary conflicts of interest, and we require trading disclosures to help police the market. Because ads now trade on electronic trading venues too, should we borrow these three competition principles to protect the integrity of advertising?*

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## I. INTRODUCTION

The business of advertising has changed drastically over the last two decades. In the past, advertising contracts were negotiated in person—think Mad Men-type advertising and publishing executives over two-martini lunches off Madison Avenue. Today, the largest category of advertising, online advertising, is rarely negotiated by people at all. Advances in technology allow ad space to be bought and sold electronically through centralized trading venues at high speeds, without people ever meeting face-to-face. When a user visits a website, the ad space on a page is instantly routed into one or more of these venues. There, the space is auctioned in real-time to the highest bidder. At the conclusion of these auctions, the advertisers' ads return and display to the user in time for the page to load and before the user has noticed anything has occurred. The user just sees ads targeted to them, say one for Barclays bank.

The rise of electronic ad trading, widely known today as “programmatic advertising,” paralleled the rise of electronic trading across various sectors of the economy. In 2005, the New York Stock Exchange merged with an electronic trading company, sunsetting the buying and selling of stock on its iconic trading floor on Wall Street.<sup>1</sup> Around this time, early advertising technology company Right Media launched the RMX “advertising exchange,” the first-ever electronic trading venue for ads.<sup>2</sup> Just like that, by “borrowing tactics from Wall Street,” advertising went from being a relationship business to a commodity business, with publishers and advertisers transacting with each other in an electronic spot market.<sup>3</sup>

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1. *NYSE Approves Merger with Electronic Trading Company*, N.Y. TIMES (Dec. 7, 2005), <https://perma.cc/QR3Y-KMX2>.

2. Adrienne Jeffries, *How to Succeed in Advertising (and Transform the Internet While You're at It)*, N.Y. MAG.: INTELLIGENCER (May 31, 2018), <https://perma.cc/W7CG-4LLA> (discussing the history of Right Media).

3. Stephanie Clifford, *Leftover Ad Space? Exchanges Handle the Remnants*, N.Y. TIMES (July 28, 2008), <https://perma.cc/UDC4-Q7LN>.

The efficiencies promised by this new way of trading caught on like wildfire. By late 2009, the RMX exchange, which Yahoo! acquired in 2007 for \$680 million, was processing 9 billion ad spaces daily.<sup>4</sup> Since then, the percentage of ads traded in this fashion has steadily increased. In 2021, it is estimated that 87.5% of all online display ad space in the United States—including that belonging to news publishers such as *The Washington Post* and *The Des Moines Register*—will trade programmatically.<sup>5</sup>

Since the advent of electronic ad trading, however, the market has become less competitive. At first, the biggest names in tech—including Microsoft, Yahoo!, AOL and Alphabet (“Google”)—competed vigorously with each other. These tech companies initially provided sellers (e.g., publishers like newspapers) and buyers (i.e., advertisers) with more choices when deciding which exchanges and other trading middlemen to use.<sup>6</sup> Today, a single company, Google, simultaneously operates the leading exchange and the leading middlemen (i.e., intermediaries) that publishers and advertisers must use to trade.<sup>7</sup>

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4. Yishay Mansour et al., Doubleclick Ad Exchange Auction 2, (2012) (unpublished manuscript), <https://perma.cc/T5L4-JS4Y> (noting Right Media average daily trades).

5. Lauren Fisher, *US Programmatic Ad Spending Forecast 2019*, EMARKETER (Apr. 25, 2019), <https://perma.cc/852B-PRUA> (estimating 87.5% of online display ads will trade programmatically in 2021). Note, websites can sell their ad space in open or private exchanges. Data from news publisher trade association Digital Content Next suggests that approximately 75% of the inventory of large and middle-tier U.S. publishers currently trades in open exchanges. One would imagine that the percentage increases if one includes small and local publishers across the heartland. See Jason Kint (@jason\_kint), TWITTER (May 12, 2020), <https://perma.cc/2NPY-SEZT>.

6. For competition in the exchange market in the late 2000s, see AdExchanger Staff, *infra* note 33 and further discussion in Part III.

7. The company formerly known as Google was renamed Alphabet Inc. in 2015, at which point Google became a subdivision of the parent organization. Indirect proof of market power in the form of market share information is notoriously difficult to construct with publicly available information. However, sev-

In addition to the market becoming more concentrated, it exhibits characteristics that would trigger concerns in other electronic trading markets: market growth is distorted, trading costs—between 30% to 50% of the trade—are high and non-transparent, and conflicts of interests abound.<sup>8</sup> For example, on top of operating the largest exchange, as well

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eral public reports on market shares support the proposition that Google operates the leading exchange, buy-side software, and sell-side software in the market today. *See* COMPETITION AND MKTS. AUTH., ONLINE PLATFORMS AND DIGITAL ADVERTISING: MARKET STUDY FINAL REPORT 20 (2019), <https://perma.cc/3GKR-YJ5J> [hereinafter CMA FINAL REPORT] (estimating that in the UK, Google has a 50-60% share of the advertising exchange market, 90+% share of the ad server sell-side software market, and 50-60% of the enterprise DSP buy-side software market); *Data Processing in the Online Advertising Sector, Opinion No. 18-A-03*, AUTORITÉ DE LA CONCURRENCE, at 86 ¶ 218 (Mar. 6, 2018), <https://perma.cc/X7ZQ-NM6U> [hereinafter AUTORITÉ DE LA CONCURRENCE] (finding that Google’s enterprise DSP buy-side software—previously called DoubleClick Bidding Manager or DBM but since renamed DV360—generates the most revenue and has significant growth and that Google “has held a leading position” in the ad serving sell-side software market since its acquisition of DoubleClick); Joe Mandese, *Google Discloses Results of “Exchange Bidding,” Boosts Publisher Yield >40%*, MEDIAPOST: DIGIT. NEWS DAILY (Feb. 16, 2018), <https://perma.cc/GN5X-N8ZZ> (stating that the DoubleClick ad server is “by far the dominant ad server used by advertisers, agencies and digital publishers”); Keach Hagey & Vivien Ngo, *How Google Edged Out Rivals and Built the World’s Dominant Ad Machine: A Visual Guide*, WALL ST. J. (Nov. 7, 2019), <https://perma.cc/DKC7-D5MA> (reporting that Google’s exchange, selling tools, and buying tools are the leading ones in the market and stating that “[m]ore than 90% of large publishers use the Google ad server, DoubleClick for Publishers, according to interviews with dozens of publishing and ad executives”); Allen Grunes, *Google’s Quiet Dominance Over the “Ad Tech” Industry*, FORBES (Feb. 26, 2015), <https://perma.cc/P84T-7GX3> (discussing the leading position of Google’s buying tools Google Ads and DoubleClick Bid Manager, which is now called DV360).

8. Several sources deal with the question of trading costs. *See* Alex Barker, *Half of Online Ad Spending Goes to Industry Middlemen*, FIN. TIMES (May 5, 2020), <https://perma.cc/Z3H4-JLBM>; Ross Benes, *Why Tech Firms Obtain Most of the Money in Programmatic Ad Buys*, EMARKETER (Apr. 16, 2018), <https://perma.cc/96RE-5HMA> (industry analysts from Warc estimating intermediaries collectively charge 55% of programmatic spend worldwide, based on data shared by advertising agency Magna Global).

as the largest intermediaries trading on its exchange, Google has another conflict of interest.<sup>9</sup> Google not only sells ad space belonging to third-party websites, it sells ad space appearing on its own sites, Google Search and YouTube. When a small business uses Google's intermediary tool, called Google Ads, to bid on and purchase ad space trading on exchanges, this tool steers that advertiser towards which ad space to buy.

The effects of this conflict of interest are predictable. In 2007, approximately 64% of Google advertising revenue went to Google properties, including Google Search and YouTube. The remaining portion went to non-Google properties, like *The Post* and *The Register*, that also sell their ad space through Google's intermediary tools and exchange.<sup>10</sup> Almost

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9. Note, according to some estimates, Google's buy-side intermediaries—the buying tools that small and large advertisers use to trade—account for the plurality if not the majority of buying volume on Google's exchange. See Kean Graham, *How to Increase Auction Pressure in Ad Exchange*, MONETIZEMORE (July 8, 2016), <https://perma.cc/BA8B-2YZV> (stating that Google Ads, formerly known as AdWords, is “currently the largest buyer of inventory on the [Google] Ad Exchange”); Hagey & Ngo, *supra* note 7 (stating that media company News Corp. did not switch from Google to a rival intermediary, because doing so would jeopardize 40% to 60% of the demand the publisher receives in Google's exchange from Google's proprietary demand, Google Ads).

10. In Google's annual 10-K SEC filings, Google breaks down its advertising revenue as going to “Google properties” or “web sites of Google Network members.” The term “Google Network members” refers to non-Google websites on which Google places advertising. In its 2017 10-K, Google explains that it generally accounts for third-party revenue on a gross basis: “For ads placed on Google Network Members' properties, we evaluate whether we are the principal (i.e., report revenues on a gross basis) or agent (i.e., report revenues on a net basis). Generally, we report advertising revenues for ads placed on Google Network Members' properties on a gross basis, that is, the amounts billed to our customers are recorded as revenues, and amounts paid to Google Network Members are recorded as cost of revenues. Where we are the principal, we control the advertising inventory before it is transferred to our customers. Our control is evidenced by our sole ability to monetize the advertising inventory before it is transferred to our customers, and is further supported by us being primarily re-

every year since 2004 this split has widened, in Google's favor.<sup>11</sup> By Q1 2020, the share going to Google properties had increased to 85%.<sup>12</sup> The

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sponsible to our customers and having a level of discretion in establishing pricing." In 2004, Google buying tools allocated approximately 50% of advertising revenue to Google's proprietary properties, such as Search, and the other 50% to non-Google websites selling their ads through Google's buying tools and advertising exchange. Google Inc., Annual Report (Form 10-K) (Mar. 30, 2005), <https://perma.cc/5A4Y-8EY4>. It was in 2006 that Google acquired YouTube. Andrew Ross Sorkin & Jeremy W. Peters, *Google to Acquire YouTube for \$1.65 Billion*, N.Y. TIMES (Oct. 9, 2006), <https://perma.cc/5TG8-8BVE>. In 2005, Google's share of advertising revenue increased to, approximately, 55%; 2006, 60%; 2007, 65%; 2008, 68%; 2009, 68%; 2010, 68%; 2011, 71%; 2012, 71%; 2013, 73%; 2014, 75%; 2015, 77%; 2016, 80%; 2017, 81%, 2018, 82%; 2019, 84%. Google Inc., Annual Report (Form 10-K) (Mar. 16, 2006), <https://perma.cc/Y272-BRAP>; Google Inc., Annual Report (Form 10-K) (Mar. 1, 2007), <https://perma.cc/H4ZJ-FL7B>; Google Inc., Annual Report (Form 10-K) (Feb. 15, 2008), <https://perma.cc/W6FU-AA2T>; Google Inc., Annual Report (Form 10-K) (Feb. 13, 2009), <https://perma.cc/5PZY-UZS5>; Google Inc., Annual Report (Form 10-K) (Feb. 12, 2010), <https://perma.cc/7B6E-REEV>; Google Inc., Annual Report (Form 10-K) (Feb. 12, 2011), <https://perma.cc/9ZKX-XPKL>; Google Inc., Annual Report (Form 10-K) (Apr. 23, 2012), <https://perma.cc/YS3R-TLE4>; Google Inc., Annual Report (Form 10-K) (Jan. 29, 2013), <https://perma.cc/3W45-M9R9>; Google Inc., Annual Report (Form 10-K) (Feb. 11, 2014), <https://perma.cc/79A2-6TCT>; Google Inc., Annual Report (Form 10-K) (Feb. 6, 2015), <https://perma.cc/7DJZ-FD8S>; Google Inc., Annual Report (Form 10-K) (Feb. 11, 2016) <https://perma.cc/EU2M-T6QC>; Alphabet Inc., Annual Report (Form 10-K) (Feb. 2, 2017), <https://perma.cc/4QKP-UUZJ>; Alphabet Inc., Annual Report (Form 10-K) (Feb. 5, 2018), <https://perma.cc/22HL-SSSP>; Alphabet Inc., Annual Report (Form 10-K) (Feb. 4, 2019), <https://perma.cc/ELZ2-AC93>; Alphabet Inc., Annual Report (Form 10-K) (Feb. 3, 2020), <https://perma.cc/RWE8-27PB>. For a visual graph of this split, see Appendix A.

11. Google Inc. (2005-2016), *supra* note 10; Alphabet Inc. (2017-2020), *supra* note 10.

12. See Alphabet Inc., Quarterly Report (Form 10-Q) (March 31, 2020), <https://perma.cc/7872-G8ZW>. In this filing, Google breaks down advertising revenue as revenue for "Google properties" and "Google Network Member Properties." Here, Google properties includes "Google Search & other properties and YouTube." *Id.* at 33. Google goes on to say that, "Google Search & other consists of revenues generated on Google search properties (including revenues from traffic generated by search distribution partners who use Google.com as their



lion's share of Google's \$134 billion in advertising revenue went to Google's own.

Problems of distorted growth then extend across the market. Over the last ten years, the online advertising market has enjoyed double-digit year-over-year growth.<sup>13</sup> However, the majority of advertising revenue and growth has gone to large firms like Google and Facebook that both sell their own ad space and simultaneously run an electronic marketplace.<sup>14</sup>

Transparency in the advertising market is also minimal. When small businesses use the Google Ads tool to bid on ad space belonging to third-party publishers from Google's exchange, Google does not disclose to them the price that the ad space actually cleared for and it appears Google

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default search in browsers, toolbars, etc.) and other Google owned and operated properties like Gmail, Google Maps, and Google Play; YouTube ads consists of revenues generated primarily on YouTube properties; and Google Network Members' properties consist of revenues generated primarily on Google Network Members' properties participating in AdMob, AdSense, and Google Ad Manager." *Id.*

13. PricewaterhouseCoopers, *Internet Advertising Revenue Report: 2019 First Six Months Results*, INTERACTIVE ADVERT. BUR. (Oct. 2019), <https://perma.cc/YX8X-72EC> (displaying year-over-year growth by quarter from 1996 through Q2 2019).

14. Lauren Fisher, *Digital Display Advertising 2019*, EMARKETER (Jan. 22, 2019), <https://perma.cc/4UVF-JGHX> (estimating that Google and Facebook will account for 52% of the display online advertising market in the U.S. in 2019); Michael Barthel, *5 Key Takeaways About the State of the News Media in 2018*, PEW RSCH. CTR. (July 23, 2019), <https://perma.cc/SJ25-45VC> (summarizing that digital ad revenue has grown exponentially but that the majority goes to Google and Facebook). Outside of Google, Facebook, and Amazon, some even estimate that the online advertising market is shrinking. See, e.g., Peter Kafka, *Google and Facebook Are Booming. Is the Rest of the Digital Ad Business Sinking?*, VOX (Nov. 2, 2016), <https://perma.cc/QAZ6-6V9K> (reflecting comments by industry analyst Brian Weiser and publisher trade association executive Jason Kint). Finally, for documentation on the auction marketplaces run by Facebook and Amazon, see Facebook Audience Network, *Solutions Overview*, <https://perma.cc/KYK5-HPUG> (last visited Sept. 29, 2020). See also Amazon Publisher Services, *Unified Ad Marketplace*, <https://perma.cc/82YF-AX7B> (last visited Sept. 29, 2020).

can arbitrage advertisers' bids across two Google-controlled marketplaces—a fact that may go unnoticed by these small mom-and-pop businesses due to the complexity of Google's terms.<sup>15</sup> In effect, the counterparty to these advertisers is often Google, though they may be under the illusion that Google is their agent. At the same time, Google does not disclose to the publishers on the other ends of these trades what their space ultimately sold for and how much Google keeps as its share.<sup>16</sup>

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15. Google explains how its auctions and pricing work across multiple, different documents. See Google Ads Help, *How the Google Ads Auction Works*, GOOGLE, <https://perma.cc/6NV9-43XK> (last visited Sept. 29, 2020); Google Ads Help, *How Google Ad Manager Works with Google Ads*, GOOGLE, <https://perma.cc/X6UQ-AN7S> (last visited Sept. 29, 2020); Google Ads Help, *About the Display Network Ad Auction*, GOOGLE, <https://perma.cc/8P3M-VPJ3> (last visited Sept. 29, 2020); Google Ads Help, *About the Google Display Network*, GOOGLE, <https://perma.cc/6582-YRSK> (last visited Sept. 29, 2020). When taken together, the terms appear to permit Google to process bids that advertisers submit via Google's buying tool for small advertisers called Google Ads through two different Google marketplaces (auctions). In other words, Google Ads hosts a first auction, then Google Ads acts as the "buyer" in Google's exchange, so that Google simultaneously acts on the buy-side and the sell-side. In a recent submission to the Australian competition authority, Google implicitly confirms this practice. See DANIEL S. BITTON & STEPHEN LEWIS, CLEARING UP MISCONCEPTIONS ABOUT GOOGLE'S AD TECH BUSINESS 48 (May 5, 2020), <https://perma.cc/WT2W-DD74>. At a 2019 conference for antitrust experts, Google chief economist Hal Varian confirmed that Google can act on both the buy-side and the sell-side at the same time and explained that Google uses a "formulaic apportionment" to price ads when Google participates on both sides of a transaction. Stigler Center, *2019 Antitrust and Competition Conference, Pt. 11: Fireside Chat*, YOUTUBE, at 1:01:13 (June 21, 2019), <https://perma.cc/K2RR-UTCT>. Finally, another point to consider is that arbitrage, hidden fees, and undisclosed kickbacks may be a pervasive problem in this electronic trading market. See Sarah Sluis, *Investigation: DSPs Charge Hidden Fees – And Many Can't Afford to Stop*, ADEXCHANGER (Jan. 10, 2018), <https://perma.cc/7GHG-KWDC>.

16. Websites that sell ads in Google's exchange can see buyers' clearing prices via the centralized market reports that Google shares back with sites. However, the buyers here are the intermediaries, such as Google Ads, not advertisers.

High trading costs in this market also affect consumers. As a general matter, if publishers like *The Post* and *The Register* make less money selling ads, they have less to re-invest into the business of investigative journalism and news. But the news business globally is already struggling. In the last decade and a half, this sector in the U.S. has shed 51% of newsroom jobs, paywalls and subscription prices have increased, and 20% of newspapers have closed.<sup>17</sup> This contraction has led some economists to urge lawmakers to think about democracy and “citizen welfare” when considering competition problems in advertising.<sup>18</sup>

Lawmakers, antitrust enforcers, and academics are concerned about distorted growth and high trading costs, which ultimately harm consumer welfare. As a result, they have been asking, why is competition not working better? In the U.S. and globally, governments are investigating whether Google has monopolized advertising markets or restrained competition by engaging in specific conduct that violates competition laws.<sup>19</sup>

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17. See generally Felix Simon & Lucas Graves, *Across Seven Countries, the Average Price for Paywalled News is About \$15.75/Month*, NIEMANLAB (May 8, 2019), <https://perma.cc/D8CF-CN46> (surveying rise of paywalls); Freddy Mayhew, *More Paywalls Going Up Online as News Publishers Face Shrinking Share of Ad Revenue and Try to Fight Back Against Ad-Blockers*, PRESSGAZETTE (May 15, 2018), <https://perma.cc/CHR2-SBJC>; Elizabeth Grieco, *U.S. Newspapers Have Shed Half of Their Newsroom Employees Since 2008*, PEW RSCH. CTR. (Apr. 20, 2020), <https://perma.cc/NN29-Z36V> (“The number of newspaper newsroom employees dropped by 51% between 2008 and 2019, from about 71,000 workers to 35,000.”); PENELOPE MUSE ABERNATHY, *THE EXPANDING NEWS DESERT* (UNC Ctr. for Innovation and Sustainability in Loc. Media ed., 2018) (finding total number of U.S. newspapers declined from 8,891 in 2004 to 7,112 in 2018).

18. STIGLER COMMITTEE ON DIGITAL PLATFORMS, FINAL REPORT (Stigler Ctr. for the Study of the Economy and the State ed., 2019) [hereinafter STIGLER COMMITTEE REPORT] (discussing how the news market in democratic societies shares features of a public good and how either concentration in news outlets or increased news prices harms “citizen welfare”).

19. See Tony Romm, *50 U.S. States and Territories Announce Broad Antitrust Investigation of Google*, WASH. POST (Sept. 9, 2019), <https://perma.cc/K8LA-NA2H>; Keach Hagey & Rob Copeland, *Justice Department Ramps Up Google Probe, With*

Do digital markets naturally tend to monopolize because of network effects?<sup>20</sup> Or has Google monopolized these markets by unlawfully excluding competition?<sup>21</sup> At the same time, economists and other scholars have

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*Heavy Focus on Ad Tools*, WALL ST. J. (Feb. 5, 2020), <https://perma.cc/CV82-T6K8> (reporting that the U.S. Justice Department's antitrust probe into Google is focusing heavily on Google's advertising products); Silvia Amaro, *EU Starts New Preliminary Probe into Google and Facebook's Use of Data*, CNBC (Dec. 2, 2019), <https://perma.cc/BL8S-8WFU>; Mark Sweney, *Google and Facebook Under Scrutiny over UK Ad Market Dominance*, GUARDIAN (July 3, 2019), <https://perma.cc/7EQR-X7FC>; Jamie Smyth, *Australia Probes Impact of Facebook and Google on Media*, FIN. TIMES (Dec. 3, 2017), <https://perma.cc/Z46B-PA6L>.

20. There has been push-back on the idea that network effects and economies of scale can explain market concentration in "big-tech" markets and a broader conversation about market concentration problems in the United States. See THOMAS PHILIPPON, *THE GREAT REVERSAL* 267 (Belknap Press of Harvard Univ. Press, 2019). *But see* STIGLER COMMITTEE REPORT, *supra* note 18 (discussing in broad terms tendency for digital platforms to concentrate markets due to network effects and other factors); Lina M. Khan, *The Separation of Platforms and Commerce*, 119 COLUM. L. REV. 973 (2019) (observing generally that digital platforms may tend to tip to monopolies and how network effects can act as a barrier to entry).

21. Competition laws in the U.S. and globally prohibit firms with market power from engaging in conduct that is exclusionary. In the U.S., Sections 1 and 2 of the Sherman Act prohibit exclusionary conduct. 15 U.S.C. §§ 1-2 (1890); *see generally* Herbert J. Hovenkamp, *The Antitrust Standard for Unlawful Exclusionary Conduct*, 1777 FAC. SCHOLARSHIP AT PENN L. 1 (June 2008) (defining exclusionary conduct as that "reasonably capable of creating, enlarging or prolonging monopoly power by impairing the opportunities of rivals," where such conduct either does "not benefit consumers at all," is "unnecessary for the particular consumer benefits claimed," or "produce[s] harms disproportionate to benefits"); *United States v. Microsoft Corp.*, 253 F.3d 34, 49-50 (D.C. Cir. 2001) (discussing single firm exclusionary conduct in technologically dynamic markets). In Europe, Article 102 of the Treaty on the Functioning of the European Union (TFEU) similarly prohibits firms from using their dominant position in a market to undermine competition. *See* Guidance on Article 102 Enforcement Priorities, 2008 O.J. (C 115) 89. In Australia, Section 46 of the Trade Practices Act of 1974 prohibits a company "in a position substantially to control a market" from leveraging that position to

been debating how to spur competition outside the scope of antitrust enforcement.<sup>22</sup> Some have advocated for the creation of a specialized digital competition authority, while others have argued more generally for structural separations.<sup>23</sup>

This Article studies the structure of online advertising markets, what drives competition, and how Google became dominant by engaging in conduct that lawmakers prohibit in other electronic trading markets. To “fix” competition in advertising, policymakers might lean on the toolbox

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exclude competition. Trade Practices Act 1974 (Cth) s 46 (Austl.). In China, Article 6 of China’s Anti-Monopoly Law prohibits dominant firms from leveraging their position to “eliminate or restrict competition.” Fàn Lǒngduàn Fǎ (反垄斷法) [Anti-Monopoly Law of China] (promulgated by the Standing Comm. Nat’l People’s Cong., Aug. 30, 2007, effective Aug. 1, 2008), art. 6.

22. STIGLER COMMITTEE REPORT, *supra* note 18 (proposing interoperability, stronger merger guidelines and antitrust enforcement, data remedies, and pro-consumer default rules, amongst others); STIGLER CTR., PROTECTING JOURNALISM IN THE AGE OF DIGITAL PLATFORMS (2019), <https://perma.cc/9LPT-AQB4> (proposing public funding of news operations, and a requirement that Google and other digital companies prioritize content according to criteria other than ad revenue, amongst other measures); CMA FINAL REPORT, *supra* note 7 (considering regulating dominant digital platforms with a code of conduct); Madhumita Murgia & Kate Beioley, *UK to Create Regulator to Police Big Tech Companies*, FIN. TIMES (Dec. 18, 2019), <https://perma.cc/DE8S-EXYM> (reporting that the UK in 2020 will move forward with establishing a new tech regulator for companies such as Google and Facebook); RICHARD KRAMER, CMA ONLINE PLATFORMS REVIEW: ARETE RESEARCH’S VIEW (2019), <https://perma.cc/2F7J-W4LM> (drawing parallels between permitted conduct in advertising markets and prohibited conduct in financial markets). See JASON FURMAN ET AL., UNLOCKING DIGITAL COMPETITION: REPORT OF THE DIGITAL COMPETITION EXPERT PANEL (2019); JACQUES CRÉMER ET AL., COMPETITION POLICY FOR THE DIGITAL ERA (Eur. Comm’n ed., 2019).

23. See generally *supra* note 19; Khan, *supra* note 20 (arguing that lawmakers should consider prohibiting dominant “digital platforms” from both running a market and participating in it and that structural separations would be more desirable than non-discrimination rules that would require case-by-case adjudication); Elizabeth Warren, *Here’s How We Can Break Up Big Tech*, MEDIUM (Mar. 8, 2019), <https://perma.cc/2SYT-T7TX> (proposing separating platforms and platform participants and/or fair and non-discriminatory rules of dealing).

that financial regulators have already developed to protect the integrity of a parallel real-time trading market, the securities market. That toolbox provides a framework for understanding and addressing competition problems in advertising.

Part II begins this conversation by identifying segments of the economy that have migrated to electronic trading, discussing the structure of these markets, and explaining how the structure of online advertising markets, in which Google is dominant, is similar. In markets with this structure, problems related to concentration and distorted growth can result when exchanges provide a subset of traders with information or speed advantages. Problems can also result when trading intermediaries route orders (i.e., liquidity) to an exchange in a discriminatory manner or abuse their access to third parties' sensitive nonpublic information. In the stock market, lawmakers safeguard competition by requiring exchanges to give all traders non-discriminatory access to the marketplace, by identifying and managing intermediary conflicts of interest, and by requiring trading disclosures to advance both principles. The integrity of the advertising market does not benefit from parallel competition safeguards.

Part III examines Google's extensive conflicts of interest and specific conduct in advertising. Part A first discusses how the story of Google's rise is in part a story of information and speed asymmetry: Google's exchange advantages the Google-owned intermediaries with better information about the ad space trading on Google's exchange and with speed advantages. When it comes to information asymmetries, Google often weds its practice of cutting off rivals' access to data in the noble language of furthering user privacy. But users' privacy is not protected from Google, only from trading rivals, and competition is stunted as a result. Part B then explains how Google routes buy and sell orders in a discriminatory manner, to both its exchange and web properties. Finally, Part C considers how Google distorts competition by using the sensitive non-public information belonging to third-party buyers and sellers—information it becomes privy to as an intermediary—to inform its own trading activity in the market.

Although Google’s conduct may appear novel and unprecedented, Part IV discusses in more depth how policymakers have dealt with parallel conduct in other electronic trading markets. As additional segments of the economy have migrated to real-time electronic trading, including small and emerging sectors like event tickets, airfare tickets, and cryptocurrencies, lawmakers have monitored for these common competition problems, and they have at times intervened with legislation or regulation when market participants have not sufficiently self-regulated their behavior. Because the advertising sector now trades on electronic exchanges too, we might similarly borrow from the principles of financial regulation—ensuring equal access to speed and information and managing intermediary conflicts of interest—in order to protect the integrity of advertising.

## II. ELECTRONIC TRADING MARKETS

### A. *Advertising Market Reflects the Structure of an Electronic Trading Market*

The rise of buying and selling ad space on electronic exchanges paralleled a shift to computerized trading systems across various sectors of the economy. For example, shares of issued stock trade on stock exchanges like the New York Stock Exchange (NYSE), which once reflected a hustle and bustle of traders on a physical exchange floor. Though television networks like CNBC still perpetuate this image, today, stocks, currencies, and other financial instruments trade on dozens of electronic trading venues at the same time and at lighting speed.<sup>24</sup> The NYSE is

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24. For a discussion of how equities trading happens on national public exchanges, off-exchange alternative trading systems, and internalization platforms, see Merritt Fox et al., *The New Stock Market: Sense and Nonsense*, 65 DUKE L.J. 191 (2015); Kevin S. Haeberle, *Discrimination Platforms*, 42 J. CORP. L. 809 (2017); MATTEO AQUILINA ET AL., QUANTIFYING THE HIGH-FREQUENCY TRADING “ARMS RACE”: A NEW METHODOLOGY AND ESTIMATES (Fin. Conduct Auth. ed.,

largely comprised of computer servers, interconnected by colored wiring in nondescript buildings off the New Jersey Turnpike.<sup>25</sup>

To buy and sell on these financial exchanges, investors used to go through a human middleman. But now brokers and other intermediaries are also computerized, connecting electronically to exchanges through application programming interfaces. An individual investor might use an online interface belonging to a broker like E\*Trade, while an institutional trader might use sophisticated algorithms to trade at high speeds in an automated fashion.

Outside of tradeable financial assets like equities, the tickets for sports, theater, and music events now trade on electronic marketplaces and “exchanges,” as do emerging cryptocurrencies like Bitcoin and Ether.<sup>26</sup> To buy and sell on these electronic trading venues, one can use an online interface or go through a “broker.” Here too, trading strategies can make use of computerized algorithms to buy and sell in an automated way at high speeds.

The biggest financial players have been helping to propel electronic trading to new sectors of the economy. For example, the parent company of the NYSE, Intercontinental Exchange, recently made a takeover bid for eBay (withdrawn), which, until not long ago, also owned the largest event ticket marketplace, StubHub.<sup>27</sup> Separately, large financial brokers,

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2020); SCOTT PATTERSON, *DARK POOLS: THE RISE OF THE MACHINE TRADERS AND THE RIGGING OF THE U.S. STOCK MARKET* (Crown Bus. ed., 2013).

25. Graham Bowley, *The New Speed of Money, Reshaping Markets*, N.Y. TIMES (Jan. 1, 2011), <https://perma.cc/4VEB-F987>.

26. Note, tickets trade in primary and secondary markets. *See generally* U.S. GOV'T ACCOUNTABILITY OFF., GAO-19-347, *EVENT TICKET SALES: MARKET CHARACTERISTICS AND CONSUMER PROTECTION ISSUES* (2018); ERIC T. SCHNEIDERMAN, *OBSTRUCTED VIEW: WHAT'S BLOCKING NEW YORKERS FROM GETTING TICKETS* (N.Y. State O.A.G. ed., 2016); BARBARA UNDERWOOD, *VIRTUAL MARKETS INTEGRITY INITIATIVE REPORT* (N.Y. State O.A.G. ed., 2018) (providing an overview of cryptocurrency trading).

27. Cara Lombardo & Corrie Driebusch, *NYSE Owner Intercontinental Exchange Makes Takeover Offer for EBay*, WALL ST. J. (Feb. 4, 2020), <https://perma.cc/79DL-SW38>.



including E\*Trade and TD Ameritrade, are launching cryptocurrency exchanges and trading desks.<sup>28</sup> NYSE rival, Nasdaq, has taken a different approach, licensing its underlying marketplace technology to jumpstart other sectors' migration to electronic trading.<sup>29</sup> One exchange built on the Nasdaq framework is NYIAX, the New York Interactive Advertising Exchange.<sup>30</sup>

But the biggest names in the advertising market are not NYSE or Nasdaq; they are Google and Facebook. These companies, amongst the largest market cap companies today, operate the nuts and bolts of what is likely the most sophisticated of all electronic trading markets: online advertising. Whereas the world's largest financial exchange, the NYSE, trades the shares of a few thousand companies and processes a few billion shares a day, Google's advertising exchange trades ad spaces targeted to billions of individual users and likely processes tens of billions of these targeted ad spaces daily.<sup>31</sup>

Just as individual investors go through an intermediary broker to trade on financial exchanges, publishers and advertisers must also go through a computerized middleman to trade on advertising exchanges. On the buy-side, advertisers use specialized software made either for small or large advertisers. Smaller advertisers, such as your local dry

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28. Elizabeth Dilts, *TD Ameritrade Invests in Cryptocurrency Exchange ErisX*, REUTERS (Oct. 3, 2018), <https://perma.cc/KPE7-RZEL>; Julie Verhage, *E\*Trade Is Close to Launching Cryptocurrency Trading*, BLOOMBERG (Apr. 26, 2019), <https://perma.cc/SE4K-H888>.

29. *Non-Traditional Exchanges & New Markets*, NASDAQ, <https://perma.cc/F4TN-N4DM> (last visited Sept. 29, 2020).

30. *Announcing NYIAX, the World's First Advertising Contract Exchange*, NASDAQ (Mar. 14, 2017), <https://perma.cc/8UZT-FDS7>.

31. Jeff Desjardins, *Here's the Difference Between the NASDAQ and NYSE*, BUS. INSIDER (July 11, 2017), <https://perma.cc/L6YQ-BF77>; *Markets Diary*, WALL ST. J.: MKTS., <https://perma.cc/F7SV-LTQC> (last visited Sept. 29, 2020) (reporting NYSE daily trading volume); Chiradeep BasuMallick, *What Is an Ad Exchange? Definition, Functioning, Types, and Examples*, TOOLBOX: MKTG. (May 18, 2020), <https://perma.cc/9AW7-SN9G> (estimating that advertising exchanges process approximately 70 billion ad "impressions" (i.e., ad spaces) daily).

cleaner, might use a simple, self-serve online buying tool, such as Google Ads, which Google has analogized to the “online broker” in the ad market.<sup>32</sup> Continuing this analogy, an early Google Ads competitor called itself “the eTrade to Google’s NYSE.”<sup>33</sup> In practical terms, the dry cleaner sets a budget and defines its bid parameters (e.g., bid ceiling) and Google Ads will bid on and buy ad space, including those trading on Google’s exchange, in an automated fashion on the dry cleaner’s behalf.<sup>34</sup> However, Google here can ultimately be the advertiser’s counterparty, not its agent.

Larger advertisers like Procter and Gamble use enterprise trading software that the industry calls demand side platforms (DSPs) and, again

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32. Comparisons between the advertising market and the financial market have frequently been made by advertising industry participants, including Google and others. For instance, Google compared Google Ads (then called AdWords) to an online broker: “Who participates in the Ad Exchange? Again, imagine the Ad Exchange as a stock exchange. Only the largest brokerage houses actually plug into, say, the NYSE. In the Ad Exchange world, those are: The large online publishers (sellers)—websites like portals, entertainment sites and news sites Ad networks and agency holding companies that operate networks (buyers)—companies that connect web sites with advertisers.” *The DoubleClick Ad Exchange*, GOOGLE, <https://perma.cc/5TTF-7PEK> (last visited Oct. 3, 2020); see also Mansour et al., *supra* note 4 (analogizing “like financial exchanges that only let licensed brokers trade, ad exchanges let ad networks trade on the exchange on behalf of individual advertisers.”).

33. AdExchanger Staff, *On DoubleClick Ad Exchange: More Digital Media Industry Reaction*, ADEXCHANGER (Sept. 22, 2009), <https://perma.cc/75GY-D87J> (comments of then-CEO of buying tool AdReady).

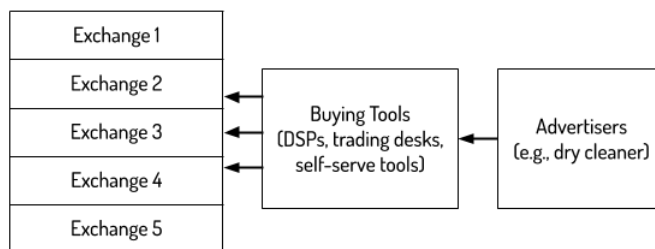
34. Note, historically, Google Ads only routed bids to Google’s exchange. This changed in 2016 when Google Ads started routing bids to non-Google exchanges. See *DoubleClick Ad Exchange*, DOUBLECLICK BY GOOGLE, <https://perma.cc/TZ6F-S55S> (last visited Oct. 3, 2020) (explaining that Google’s exchange is “the only exchange offering access to the full demand of Google AdWords”); Michel Van Luitelaar, *AdWords Remarketing Cross-Exchange*, UP ANALYTICS (Aug. 26, 2016), <https://perma.cc/34GY-WJ2P> (reflecting that Google Ads/AdWords started routing bids to non-Google exchanges in May of 2016); Google Ads Help, *About Cross-Exchange for Display Remarketing Campaigns*, GOOGLE, <https://perma.cc/NDP3-TDUE> (last visited Sept. 29, 2020).

borrowing from finance, “trading desks.”<sup>35</sup> Compared to the self-serve software used by smaller advertisers, these software tools provide more sophisticated bidding algorithms, offer a wider array of user targeting options, and typically require a higher monthly spending commitment.<sup>36</sup> For brevity, this Article refers to self-serve tools for small businesses, DSPs, and trading desks, collectively, as “buying tools.”

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35. See generally Michael Sweeney, *The Anatomy of a Demand-Side Platform (DSP)*, CLEARCODE, <https://perma.cc/K9EQ-XKBH>. Note, demand side platforms and trading desks also connect to the ad serving tool used by marketers. See generally Arvind Kesh, *What Is a Demand-Side Platform and How to Choose One*, ADBEAT, <https://perma.cc/K86U-J2UK>.

36. See generally Kesh, *supra* note 35 (summarizing that most DSPs require monthly spend commitments of \$5,000-\$10,000 U.S. dollars).

**Figure 1: The Buy-Side Intermediaries: Buying Tools\***

\*Advertisers must use buying tools to access the exchanges where ads are bought and sold.

The counterparts of advertisers in this market are those selling ad space, including publishers such as *The Post* and *The Register*. Sellers use a different type of computerized intermediary called an “ad server” to sell their inventory on exchanges.<sup>37</sup> At a simple level, the ad server is inventory management software, which keeps track of the number of ad spaces a publisher has available to sell and houses sensitive information about the publisher’s campaigns, advertisers, and pricing.<sup>38</sup> As a part of

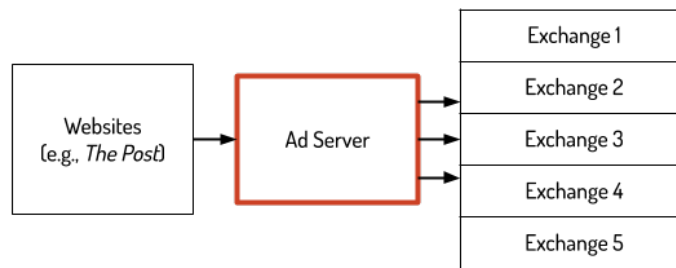
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37. It is worth noting that Google recently blurred the distinction between its ad server and exchange by both reclassifying its ad serving revenues in its shareholder reports and merging the two into a new single product renamed Google Ad Manager (GAM). Jonathan Bellack, *Introducing Google Ad Manager*, GOOGLE: AD MANAGER (June 27, 2018), <https://perma.cc/T3HN-YCZV> (announcing that Google has merged its ad server and exchange together and renamed them Google Ad Manager). However, from 2008 through 2018, Google’s ad server and exchange were marketed as separate, distinct, products. Additionally, in every 10K SEC filing from 2008 (the year Google acquired DoubleClick) through 2014, Google distinguished its “ad serving software” from its exchange and ad network. It was only in 2015 that Google reclassified its ad serving software revenues from “other” to “advertising revenues” and stopped referring to its ad server as a separate product. See Google Inc. (2008-2015), *supra* note 10.

38. *NetGravity Launches AdServer, the Premier Advertising Management System Software for World Wide Web Publishers*, NETGRAVITY (Jan. 31, 1996), <https://perma.cc/7B2W-JB4M> (announcing launch of first “adserver”); Julia

this role, the ad server also acts as a link between a publisher's inventory and real-time trading venues, routing ad space to exchanges in real-time as they become available for sale.<sup>39</sup> After a publisher sells its ad space, information about the order goes into the ad server. The ad server then tracks these orders and ensures each advertiser's ads are displayed (i.e., are *served*) in the right spot, at the right time, to the right users.

**Figure 2:** The Sell-Side Intermediary: Ad Server\*




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Brockhoff et al., *Google/DoubleClick: The First Test for the Commission's Non-Horizontal Merger Guidelines*, 2 COMPETITION POL'Y NEWSL. (Eur. Comm'n Competition), 2008, at 53 (explaining the core functions of an ad server); DoubleClick Inc. and Compaq Computer Corp., *Advertising Services Agreement*, FINDLAW (Jan. 18, 1999), <https://perma.cc/5T83-RGJ3> (detailing commercial terms of an old DoubleClick license).

39. Specifically, when a user loads a publisher's webpage, the user loads the ad server's "tag," which is commonly Google's since Google owns the leading ad server in the market. Historically, Google's ad server limited interconnection with non-Google exchanges. See *infra* Part III.B. When this was the case, Google's ad server redirected the user's browser to call non-Google exchanges directly. See *How RTB Ad Serving Works*, AD OPS INSIDER (Dec. 15, 2010), <https://perma.cc/S3TR-T84E> (discussing how it worked historically). This process changed in part when Google's ad server introduced a product enhancement called Open Bidding. With Open Bidding, it is Google's ad server (and not the user's browser) that makes direct calls to integrated exchanges. See Jonathan Bellack, *Improving Yield, Speed and Control with DoubleClick for Publishers First Look and Exchange Bidding*, GOOGLE AD MANAGER (Apr. 13, 2016), <https://perma.cc/LMU4-ENCQ>.

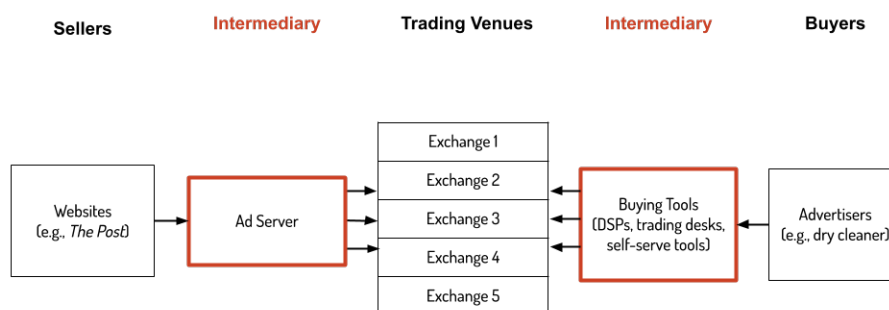
\*Websites must use an ad server to access the exchanges where ads are bought and sold.

The lifecycle of an ad trade flows through these three software components—the ad server, the exchanges, and the buying tools—and begins the moment a user visits a webpage.<sup>40</sup> The user’s visit triggers the publisher’s ad server to identify the user loading the page and to route the ad space on that page to one or more exchanges. The exchange then sends trading signals called “bid requests” to the buying tools that have a “seat” to bid, soliciting them to return a bid for that space without knowing what others are simultaneously returning as their bid.<sup>41</sup> Each exchange then holds an auction, picks a winning bid, and returns it to the ad server. The ad server can then maximize the publisher’s inventory yield by selecting the advertisement associated with the highest exchange bid and returning it to the user’s page all before it finishes loading.

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40. Websites might use another software called a supply side platform (SSP) between their ad server and exchanges. The SSP’s job is to route the site’s ads to exchanges in a way that maximizes yield. However, the ability today to route ad space to multiple exchanges synchronously largely renders SSPs obsolete, which is why the delineation between SSPs and exchanges has largely disappeared. See Maciej Zawadziński & Michal Wlosik, *What is a Supply-Side Platform (SSP) and How Does It Work?*, CLEARCODE (Oct. 18, 2018), <https://perma.cc/F5TG-UKVA> (explaining what an SSP is and does); Ryan Joe, *Defining SSPs, Ad Exchanges and Rubicon Project*, ADEXCHANGER (Feb. 7, 2014), <https://perma.cc/FQP2-JA8Q> (describing the disappearing delineation between SSPs and exchanges).

41. See generally Verizon Media, *Auction Mechanics 101*, VERIZON (Jan. 30, 2019), <https://perma.cc/53XX-CAQU> (explaining how advertising auctions work); *Authorized Buyers Real-Time Bidding Proto*, GOOGLE, <https://perma.cc/YKE6-N6DX> (explaining how Google shares advertisers’ bids post auction conclusion).

**Figure 3:** Electronic Ad Trading Altogether

### B. Common Competition Problems in Electronic Trading Markets

In the online advertising market, as well as in other electronic trading markets, access to information, speed, and the routing of buy and sell orders are the linchpin of a healthy, competitive market. Access to information about what is trading on an exchange is critical to those competing to buy on the same venue. In advertising, the bid requests that exchanges send to buying tools contain important information used to decide whether and how much to bid for an ad. This includes the size of the ad space for sale (e.g., 300x250 pixels), the page address (e.g., nytimes.com/HowToDoLaundry), and some information about the identity of the user.<sup>42</sup> Importantly, when these bid requests do not contain sufficient information about the identity of the user loading the page, which people in the industry have called the “skeleton key” of programmatic

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42. For a list of what Google includes in bid requests, see Google Developers, *Real-Time Bidding: Example Bid Request*, GOOGLE, <https://perma.cc/X4ND-77V9> (last visited Oct. 4, 2020). For an example of what another major exchange includes in bid requests, see Xandr Bidders, *Open RTB 2.0 Bid Request*, XANDR, <https://perma.cc/AW5X-ST22> (last visited Sept. 29, 2020), which explains bid requests and the fact that they contain “all the necessary information for a bidder to produce a bid price.”

advertising, the buying tools bidding on behalf of advertisers sit out of auctions or bid significantly less.<sup>43</sup>

Speed is critical to electronic trading, whether on advertising, stock, ticket, or cryptocurrency exchanges.<sup>44</sup> Online ad space trades in the milliseconds that it takes for users' pages to load and exchanges and buying tools communicate with each other at lightning speed. When an advertising exchange sends out bid requests, it sets the time each buying tool has to respond with a bid. Within this timeframe, which is usually between 100 to 160 milliseconds (one to two-tenths of a second), each tool races to unpack the data contained in the bid request, query additional user data (e.g., this particular user's spending habits), determine what price to bid, and return a bid back to the exchange before time is up.<sup>45</sup>

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43. Andrew Casale, *Identity: Programmatic's Skeleton Key*, VIMEO, at 5:40 (May 21, 2018), <https://perma.cc/E28F-EXQJ>.

44. See generally FirstPartner, *Digital Advertising: The Role of Cloud and Connectivity in Ad Trading and Delivery*, INTERXION (2020), <https://perma.cc/67ZR-QTUT> (explaining that "very fast response times" are "a precondition for competing" and "[t]rading and delivering ads at very high speed is a critical requirement, and depends on rapid interactions between partner companies"); Hasham, *How Network Latency Affects the RTB Process for AdTech*, DATAPATH (Apr. 21, 2016), <https://perma.cc/4W6Q-GUL2> (explaining that a "small improvement in latency can spell the difference between winning an auction and not being considered for the auction at all"); Tejaswini Tilak, *NEED FOR SPEED: Why the Online Ad Industry Is Converging on Equinix*, EQUINIX (Nov. 18, 2013), <https://perma.cc/G6GE-TV48>.

45. Google Ad Manager, *Bring More Bids to the Auction with Open Bidding*, GOOGLE, <https://perma.cc/YPH2-KPAL> (last visited Sept. 29, 2020) (sharing new Google ad server Open Bidding timeouts of 160 milliseconds); *BidResponse Object*, OPENX (Oct. 9, 2017), <https://perma.cc/37ME-6S9E> (discussing OpenX exchange timeouts of 125 milliseconds and how the exchange reduces the number of bid requests sent to bidders with frequent timeouts); PubMatic Technical Documentation, *OpenRTB 2.1 API Performance*, PUBMATIC, <https://perma.cc/36BA-42PK> (last visited Sept. 29, 2020) ("PubMatic's performance requires that the total latency should be within 130 milliseconds - 30 ms for connection establishment and 100 ms for bid response. If either of these independent thresholds are exceeded (connection and bid response time) during the transaction the bid is considered a 'timeout.'").



After the set time, the exchange closes the auction, excludes the bids that arrived too late, and chooses a winner.

Across any of these electronically traded markets, an exchange can distort competition between the different buyers competing in its marketplace by giving some an information or speed advantage. In advertising, an exchange might give some buying tools (bidders) superior information about the ad space (e.g., the user's identity) or let some colocate. Colocation, which is also central to equities trading, broadly refers to the practice of placing trading computers and exchange computers close together to reduce the time it takes for signals to travel between the two.<sup>46</sup> By collocating with an ad exchange, a bidder can receive and respond to bid requests faster than the bidders that are not colocated, allowing it to be included more often in exchanges that subject their auctions to strict time constraints.

Just as exchanges can distort competition between bidders, the trading intermediaries can distort competition between exchanges by the way that they route buy and sell orders to exchanges. When ad space on a site becomes available for sale, the ad server—like the broker in financial markets—determines whether to route that space only into Exchange A, or Exchange A, B, and C, on equal terms, and whether to do so at the same time. Similarly, when an advertiser uses a buying tool to bid on and buy ad space from exchanges, this intermediary determines whether to route the advertiser's bids only into Exchange A, or Exchange A, B, and C, on equal terms. A company that operates an intermediary, especially one that has significant market share and enjoys barriers to entry, can distort competition in the exchange market by, for example, preferentially routing buy and sell orders to a particular trading venue.

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46. Geoffrey Rogow, *Colocation: The Root of All High-Frequency Trading Evil?*, WALL ST. J. (Sept. 20, 2012), <https://perma.cc/QM7B-HSA3> (defining colocation); Google Ad Manager Help, *How Google Ads and Display & Video 360 Work with Ad Exchange*, GOOGLE, <https://perma.cc/MWY3-JLP5> (last visited Sept. 26, 2020) (discussing speed and other advantages of colocation).

Also critical to competition is the way that trading intermediaries handle the material nonpublic information belonging to third party buyers and sellers. Problems often arise when companies trade on behalf of third parties, but also trade on behalf of themselves. For example, in financial markets, a broker might receive a Carl Icahn sell order for 10 million shares of Tesla. The broker can best serve Icahn's interests by keeping information about his trading activity confidential, or alternatively, the broker can use that information to advance its own interests. For instance, its proprietary trading division might use information about Icahn's trade to get rid of its Tesla shares before information about Icahn's trade becomes public and the price of those shares drops. To be discussed more in Part III, information use problems also arise in advertising markets when a company both handles trading activity for third parties but also buys and sells in the market for its own financial interests.

*C. The Competition Principles We Apply in the Equities Trading Market*

In the U.S. and globally, lawmakers manage these common electronic trading issues in the stock market through the application of a handful of broad principles.<sup>47</sup> While financial market regulation may sound intimidating, the basic principles are straightforward. One guiding principle is that exchanges must provide traders with fair access to the marketplace, including access to the *data* transmitted by exchanges as well as the *speed* at which data signals travel from exchanges to traders.<sup>48</sup> When exchanges

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47. U.S. Congress started regulating the stock market in 1934 to prohibit unfair trading practices and "insure the maintenance of fair and honest markets." Securities Exchange Act of 1934, 15 U.S.C. § 78b.

48. In the U.S., stock exchanges must obtain approval for their trading rules from the SEC, who in turn must ensure "fair competition among brokers and dealers." 15 U.S.C. § 78k-1(a)(1)(C)(ii). Specific fair access rules are articulated in federal statutes. For example, Rule 610(a) and Rule 603(a)(2) of SEC Regulation NMS, prohibit the regulated National Market System (NMS) exchanges, including the NYSE and Nasdaq, from restricting efficient exchange access; these

permit colocation, terms must be transparent, pricing non-discriminatory, and the length of fiber-optic cord connecting the exchange engine to the trader servers the same length.<sup>49</sup> Even an extra foot of cabling in a colocation facility can systemically disadvantage some traders due to latency.

Competition is also protected through the identification and management of intermediary conflicts of interest.<sup>50</sup> One principle applied here is

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rules also require exchanges to distribute information with respect to quotations or transactions in a manner “fair and reasonable” or “not unreasonably discriminatory.” See *respectively* 17 C.F.R. § 242.610(a) (2020) (prohibiting restrictions on “efficient access”); 17 C.F.R. § 242.603(a)(2) (2020). The SEC has interpreted these fair access rules to prohibit an exchange from sending data to some traders before the exchange sends the same data to consolidated feeds. See, e.g., N.Y. Stock Exch. LLC, Release No. 67857 SEC, 2 (Sept. 14, 2012). While the non-NMS exchanges—the Alternative Trading Systems (ATSS)—are generally not subject to fair access rules, some are subject to the fair access standards of Regulation ATS. 17 C.F.R. § 242.301 (2020). In the European Union, access to regulated markets (RMs) and multilateral trading facilities must be transparent and non-discriminatory. Other jurisdictions globally also require trading venues to provide traders with fair access. See *generally* INT’L ORG. OF SECURITIES COMM’NS [IOSCO], REGULATORY ISSUES RAISED BY CHANGES IN MARKET STRUCTURES CONSULTATION REPORT 9 (2013) [hereinafter IOSCO MARKET STRUCTURE CONSULTATION REPORT].

49. Exchange colocation procedures need to be submitted to and approved by the SEC. For transparency around exchange colocation services, see, e.g., *NYSE Price List 2020*, N.Y.S.E. 28-39 (2020), <https://perma.cc/T2XU-HFDF>; MORGAN HAUSEL, *THE BAD SIDE OF A GOOD IDEA* (Collaborative Fund ed., 2016), <https://perma.cc/AX7A-M6V6> (“NYSE measured the distance to the furthest cabinet, which is where people put their servers. It was 185 yards. So they gave every [high-frequency trader] a cable of 185 yards.”)

50. See *generally* Resolution on IOSCO Objectives and Principles of Securities Regulation and Methodology for Assessing Implementation of the IOSCO Objectives and Principles of Securities Regulation, Presidents Comm. of the Int’l Org. of Securities Comm’ns [IOSCO] (May 2017), <https://perma.cc/UG65-KS23> (summarizing that one key role of the securities regulator, or an industry self-regulatory organization, is to avoid, eliminate, disclose, or otherwise manage conflicts of interest); Carlo V. di Florio, *Conflicts of Interest and Risk Governance*, S.E.C. (Oct. 22, 2012), <https://perma.cc/L3RW-NY9W> (providing an overview of

a structural one: a company that runs an exchange like the NYSE cannot also operate a division involved in trading.<sup>51</sup> However, when companies *are* permitted to participate in the market in more ways than one, conflicts of interest and disclosure rules kick in. For example, intermediary broker dealers can have conflicts: they trade in the market on behalf of third parties (the broker designation), as well as on behalf of themselves as a proprietary trader (the dealer designation), and they can even run a specialized trading venue called an Alternative Trading System (ATS).<sup>52</sup> But these multi-service firms must manage their conflicts of interest and cannot simply route their customers' buy and sell orders (order flow) to the firm's electronic trading venue.<sup>53</sup>

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the importance of conflicts of interest management to securities regulation and the interplay between the existence of conflicts and increased market risk); Christoph Kumpan & Patrick C. Leyens, *Conflicts of Interest of Financial Intermediaries - Towards a Global Common Core in Conflicts of Interest Regulation*, 4 EUR. CO. AND FIN. L. REV. 72 (2008) (defining a conflict of interest as arising when "a person who has a duty to act in another party's interest has to decide how to act in the interest of that party and another interest interferes with his ability to decide according to his duty.").

51. Conversations with securities professionals indicate that the SEC enforces this structural separation through its power to reject public exchange applications.

52. Prop. Regulation of NMS Stock Alternative Trading Systems, 80 Fed. Reg. 80,998 (Dec. 28, 2015) (codified at 17 CFR § 240.3a1-1(a)) (stating that broker dealers operate ATSs).

53. It is the Best Execution Rule, grounded in common law principles of agency, industry self-regulation, and federal securities law, that prohibits de-facto preferencing or internalization and requires broker dealers to use reasonable diligence in determining where to route client orders. The rule's application in equities, however, is not uncontroversial and has application challenges (e.g., When does speed of execution trump best price? Is it unrealistic to apply such a rule to individual trades?). See Jonathan Macey & Maureen O'Hara, *The Law and Economics of Best Execution*, 6 J. OF FIN. INTERMEDIATION 188, 188-223 (1997). See also Paul G. Mahoney & Gabriel V. Rauterberg, *The Regulation of Trading Markets: A Survey and Evaluation*, in SECURITIES MARKET ISSUES FOR THE 21ST CENTURY, 221, 221-81 (Merritt B. Fox et al. ed., 2018).

Competition in the stock market—heavily shaped by access to data and information—also benefits from rules that regulate who may use what information when trading. For example, we require financial intermediaries (i.e., brokers and investment advisors) to act in the best interest of their customers, which forcibly vests property rights in customers’ information in customers themselves.<sup>54</sup> Brokers, therefore, cannot use information about their customers’ trading activity to trade in the market for their own financial gain.<sup>55</sup> This prohibition is further enforced through

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54. Regulation Best Interest under the Securities Exchange Act of 1934 requires broker dealers to act in the “best interest” of their customers and not place their own interest ahead of retail investors when advising on securities or investment strategy. This code of conduct requires broker dealers to mitigate or eliminate certain some conflicts of interest and disclose others. It also requires broker dealers to exercise reasonable diligence, care and skill when advising retail clients. Sec. Exch. Act of 1934, 17 CFR § 240.151-1(a)(2) (2019). Investment advisors, on the other hand, owe their customers a fiduciary duty, under the Investment Advisors Act of 1940, 17 CFR § 275 (1940). The SEC has interpreted this duty to permit investment advisors to sometimes merely disclose some types of conflicts to institutional clients; to retail customers, investment advisors may instead have to mitigate or eliminate conflicts entirely, especially complex ones. The fiduciary standard for investment advisors also includes an ongoing duty to monitor customer accounts. As background, per the Dodd-Frank Act, Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, § 929-Z, 124 Stat. 1376, 1871 (2010) (codified at 15 U.S.C. § 78o), the SEC was to “harmonize” the duties of broker dealers and investment advisors. When promulgating a “best interest” rule, as opposed to a parallel fiduciary rule, seven states, the District of Columbia, and others, filed suit, challenging the short falling of the “best interest” rule. Keith Blackman et al., *Second Circuit Upholds Regulation BI*, NAT’L L. REV. (July 3, 2020), <https://perma.cc/B8CY-D4TV>.

55. If a broker uses information about a customer’s trading activity to place and execute trades in advance of the customer’s, it is called trading ahead or front running, and is prohibited under common law principles of agency (which the law constructs regardless of contractual intentions), industry self-regulation, and federal securities law. See *Opper v. Hancock Sec. Corp.*, 250 F. Supp. 668, 676 (S.D.N.Y. 1966) (holding front running to be illegal under principles of agency and federal law), *aff’d*, 367 F.2d 157 (2d Cir. 1966); FINRA Rule 5270, FINRA Rules, FIN. INDUS. REG. AUTH., <https://perma.cc/5WPC-LMEF>; NORMAN S. POSER,

Congressionally mandated ethical walls—internal corporate policies and physical barriers that brokers must implement to prevent the flow of sensitive information from one business division (e.g., the broker division) to another (e.g., the dealer division).<sup>56</sup>

On top of this, rules against insider trading further restrict certain parties from trading upon particular types of information advantages. The classic example prohibits corporate “insiders” from trading in the market using material nonpublic information.<sup>57</sup> However, insider trading

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BROKER-DEALER LAW AND REGULATION 16-5 (4th ed. 2007) (discussing broker dealer duties).

56. In 1988, Congress passed the Insider Trading and Securities Fraud Enforcement Act of 1988, which increased penalties for insider trading and securities fraud and required registered brokers and dealers to enforce written policies and procedures to prevent the misuse of material nonpublic information. *See* Insider Trading and Securities Fraud Enforcement Act of 1988, H.R. 5133, 100th Cong. (1998). In 1990, the SEC clarified and outlined minimum requirements for broker dealers. Section 204 of the Investment Advisers Act contains a similar requirement for investment advisers. *See* 15 U.S.C. § 78o(g) (2018); DIVISION OF MARKET REGULATION U.S. SEC. AND EXCH. COMM’N, BROKER-DEALER POLICIES AND PROCEDURES DESIGNED TO SEGMENT THE FLOW AND PREVENT THE MISUSE OF MATERIAL NONPUBLIC INFORMATION (U.S. Sec. and Exch. Comm’n ed., 1990); 15 U.S.C. § 80b-4a; RALPH C. FERRARA, DONNA NAGY & HERBERT THOMAS, FERRARA ON INSIDER TRADING & THE WALL 9-7-9-12 (2017).

57. Before the SEC took an active role in defining, expanding, and regulating “insider trading,” information use when trading was primarily governed by state common law of fraud. The majority rule there rejected any fiduciary relationship between corporate insiders and shareholders, which would have triggered a duty to disclose material nonpublic information to shareholders before trading or to withhold from trading. At the helm of the SEC, Chairman William Cary sought to reign in how certain parties with access to nonpublic information, including corporate insiders and exchange floor members, could take advantage of such information access. JOEL SELIGMAN, THE TRANSFORMATION OF WALL STREET: A HISTORY OF THE SECURITIES AND EXCHANGE COMMISSION AND MODERN CORPORATE FINANCE 344-45 (3rd ed. 1977). It was during Cary’s tenure that the SEC began to use Section 10(b) of the 1934 Securities Exchange Act to prosecute trading on the basis of certain information advantages. Though insider trading doctrine developed over the years as requiring a breach of a fiduciary duty, some

rules also apply to “temporary insiders,” to prohibit those that become privy to sensitive information through an unrelated business relationship from trading on the same information.<sup>58</sup> These rules can promote economic efficiency by properly allocating property rights to information and by ferreting out trading activity thought to be grossly unfair.<sup>59</sup> In one of the seminal insider trading cases at the U.S. Supreme Court, *United States v. O’Hagan*, Justice Ginsburg relied on such rationale: unerodable information advantages that derive from misappropriated information can discourage people from participating in the markets in the first place.<sup>60</sup>

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scholars have argued that such fiduciary duties were “fictions” manufactured to prohibit trading based on information advantages deemed unfair. See, e.g., Donna Nagy, *Insider Trading and the Gradual Demise of Fiduciary Principles*, 94 IOWA L. REV. 1315 (2009) (discussing the “Supreme Court’s Fiduciary Fictions”).

58. The development of insider trading rules stem from Rule 10b-5 of Section 10(b) of the Securities Exchange Act (1934) that makes it unlawful “(a) to employ any device, scheme, or artifice to defraud, (b) to make any untrue statement of a material fact or to omit to state a material fact necessary in order to make the statements made, in the light of the circumstances under which they were made, not misleading, or (3) to engage in any act, or course of business which operates or would operate as a fraud or deceit upon any person, in connection with the purchase or sale of any security.” 17 CFR § 240.10b-5 (1951). Per the misappropriation theory of insider trading, Rule 10b-5 “bars trading on the basis of information that the wrongdoer converted to his own use in violation of some fiduciary, contractual, or similar obligation to the owner or rightful possessor of the information.” Barbara Aldave, *Misappropriation: A General Theory of Liability for Trading on Nonpublic Information*, 13 HOFSTRA L. REV. 101, 122-23 (1984).

59. Jonathan R. Macey, *From Fairness to Contract: The New Direction of the Rules Against Insider Trading*, 13 HOFSTRA L. REV. 1, 55 (1984) (summarizing the various motivations behind insider trading jurisprudence and arguing that a main motivation is the proper allocation of property rights in information).

60. *United States v. O’Hagan*, 521 U.S. 642 (1997) (citing Victor Brudney, *Insiders, Outsiders, and Informational Advantages Under the Federal Securities Laws*, 93 HARV. L. REV. 322, 356 (1979)) (additionally discussing why it is not socially useful to permit those that become in possession of relevant information in the course of rendering another service to trade on the acquired information advantages for their personal benefit).

Collectively, these principles—those prohibiting intermediaries from using certain information advantages when trading, those prohibiting intermediaries from preferentially routing order flow, and those requiring exchanges to provide traders with fair access to information and speed—help to protect competition in the electronically traded equities market. Online advertising, despite also trading on electronic trading venues at high speeds and facing the same competition issues, benefits from no parallel code of conduct.

### III. GOOGLE DOMINATES ONLINE ADVERTISING MARKETS BY ENGAGING IN CONDUCT LAWMAKERS PROHIBIT IN OTHER ELECTRONIC TRADING MARKETS

Historically, Google was late to enter the programmatic advertising market, and, when it launched an exchange in the fall of 2009, it faced a lot of competition.<sup>61</sup> Right Media's RMX exchange launched four years earlier and was processing billions of individual ad spaces daily.<sup>62</sup> Microsoft and top Silicon Valley venture funds Sequoia Capital and Draper

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61. In the late 2000s, the advertising exchange market was competitive. *See generally* AdExchanger Staff, *supra* note 33 (stating that the exchange market "is one area where Google is playing catch up with Yahoo and their RMX"); Case No COMP/M.4731 – Google/DoubleClick, Regulation (EC) No 139/2004 Merger Procedure, Comm'n of the European Communities Decision (Nov. 3, 2008) (discussing competition in the exchange and network markets between Google, Yahoo!, Microsoft, AOL/Time Warner, and others); Harry Gold, *Pros and Cons of Ad Exchanges*, CLICKZ (July 24, 2007), <https://perma.cc/M4GZ-JUTF> (further discussing exchange competition from Yahoo!, ContextWeb, AdBrite, and others).

62. Michael Arrington, *Panama Not Enough to Battle Google: Yahoo Acquires RightMedia*, TECHCRUNCH (Apr. 30, 2007), <https://perma.cc/9USU-XFSQ>; AdExchanger Staff, *supra* note 33 (clarifying that Right Media's exchange did not permit real-time bidding on individual impressions at the time). *See also* Clifford, *supra* note 3 (stating that in 2008, Right Media "handle[d] about six billion transactions a day"). *See also*, Yishay Mansour et al., *supra* note 4.



Fisher Jurvetson had their horses in the race as well with three other exchanges: AdECN, AdBrite and ADSDAQ, respectively.<sup>63</sup> Some eight exchanges crowded the market, competing against each other on price, auction mechanics, liquidity and inventory quality.<sup>64</sup> The same was true about Google's entry into the enterprise buying tool market. In 2009, Google owned Google Ads (then called AdWords), but Google had not yet launched an enterprise buying tool (DSP), and plenty of firms competed in that market segment.<sup>65</sup>

Despite "playing catch up," by around 2013, Google's exchange overtook the competition to become the largest trading venue for ad space globally.<sup>66</sup> Shortly afterwards, Google's enterprise buying tool called Dis-

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63. AdExchanger Staff, *Ad Exchange AdECN Acquired By Microsoft*, ADEXCHANGER (July 27, 2007), <https://perma.cc/9LC7-A6RH>; Kristen Nicole, *ContextWeb Launches ADSDAQ for Ad Trading*, MASHABLE (May 1, 2007), <https://perma.cc/74VB-PKE5>; *adBrite*, CRUNCHBASE (2020), <https://perma.cc/8G6K-WGGB>; Danny Schultz, *ContextWeb's ADSDAQ Exchange Reaches Record Size and Scope*, GOTHAM VENTURES (Nov. 21, 2008), <https://perma.cc/G7VV-DSGT>.

64. See generally AdExchanger Staff, *supra* note 33.

65. AdExchanger Staff, *The AppNexus Reveal: We're A Demand-Side Platform Says Pres Rubenstein*, ADEXCHANGER (Nov. 12, 2009) <https://perma.cc/Z92C-53X7> (discussing competition in this market segment from x+1, MediaMath, Invite Media, CPM Advisors, Adchemy, Fox Audience Network, DataXu, Turn, AdBuyer.com, and TriggIt). A 2011 market research report found the top DSPs in the market to be those belonging to AppNexus, Turn, MediaMath, and DataXu. Jason Del Ray, *MediaMath in AdAge "MediaMath Declared Winner, but Who's the Largest DSP in the Land?"*, MEDIAMATH (Dec. 14, 2011), <https://perma.cc/MCX4-ED8S> (showing AppNexus was the leading DSP processing 26 billion impressions monthly whereas Invite Media processed an estimated 10 billion monthly).

66. The first reference to the dominance of Google's exchange can be found in the year 2013. John McDermott, *Google's Display Advertising Dominance Raises Concerns*, DIGIDAY (Dec. 2, 2014), <https://perma.cc/Z7D3-KRLR> (noting that "Google is the operator of the largest ad exchange, AdX, while also operating a leading DSP, namely, DBM" (quoting Amir Efrati, *FTC Begins Probe of Google's Display-Ad Business*, WALL ST. J. (May 24, 2013)).

play & Video 360 (“DV360”), an outgrowth of Google’s acquisition of Invite Media, also eclipsed the competition to become the most used in the market.<sup>67</sup> By 2015, the early exchanges that had initially beat Google to the punch sold at a discount price or closed their doors.<sup>68</sup> The market shares of the DSPs that once led that market segment declined in parallel.<sup>69</sup> Google, with the language of tech likely obscuring parallels between ad trading and electronic trading in other markets, rose in the West by breaching the principles that regulators in the East had crafted over the years to help safeguard competition in a market with a parallel structure.

A. *Google Has Information and Speed Advantages*

1. *Google Acquires Leading Ad Server DoubleClick*

One reason why Google’s exchange and buying tools expediently surpassed their competitors comes down to an information advantage they have when buying and selling ads, which traces its origin to the ad server software company called DoubleClick that Google acquired in

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67. Google acquired one of the first DSPs, Invite Media, in 2010, which Google re-launched into the market in 2012 as “DoubleClick Bid Manager” (now called DV360). Peter Kafka, *Google’s Final Price Tag for Invite Media: \$81 Million*, ALL THINGS D (June 9, 2010), <https://perma.cc/PP5S-AE9J>.

68. See Zachary Rodgers, *Microsoft Retires AdECN, Migrates to AppNexus RTB Engine*, CLICKZ (Mar. 30, 2011), <https://perma.cc/9R6A-5ZEL>; Anthony Ha, *Ad Exchange adBrite to Shut Down on Feb. 1*, TECHCRUNCH (Jan. 28, 2013), <https://perma.cc/2JQD-JRGN>; Jeff Fraser, *Yahoo Ad Exchange Closes Its Doors to Publishers*, MKTG. MAG (Jan. 13, 2015), <https://perma.cc/X3C5-RQQK>. The ADSDAQ exchange became ContextWeb, before PulsePoint acquired it. Today, PulsePoint appears to be focusing on the healthcare segment and operates header bidding technology (see *infra* Part III.B) but does not appear to be operating an exchange.

69. Today, Google’s tool DV360 is the leading one in the market. See generally CMA FINAL REPORT, *supra* note 7; AUTORITÉ DE LA CONCURRENCE, *supra* note 7 (finding that Google’s enterprise buying tool DV360 generates the most revenue and has significant growth).

2007.<sup>70</sup> DoubleClick—founded in 1996 and listed on the Nasdaq just two years later—was the leading ad server globally and claimed about 57% of the market in the U.S.<sup>71</sup> A long list of news publishers, including *Sports Illustrated*, *AOL Online*, and *The Wall Street Journal*, used DoubleClick to migrate their business from print to digital and to automate the process of targeting and selling ads.<sup>72</sup>

As an intermediary in this market, DoubleClick was privy to critical information about publishers' readers, which publishers use when selling their ad space on real-time electronic exchanges. One of the most important pieces of information in this category is the identity of users associated with publishers' ad space. To identify publishers' online readers, the ad server assigns users a "cookie" to track users by random, unique identifiers ("user IDs").<sup>73</sup> As long as users' internet browsers permit

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70. Press Release, Google Inc., Google to Acquire DoubleClick (Apr. 13, 2007), <https://perma.cc/JZ58-LLT9>.

71. Information on DoubleClick publisher ad server market shares in 2008 is readily available. See Abbey Klaassen, *Google Leads in Ad-serving Share*, ADAGE (Dec. 18, 2008) (estimating Google's ad server market share, including DoubleClick and AdSense, totaled 57%); Brockhoff et al., *supra* note 38 (summarizing that the European Commission conducted an investigation into the ad server market and found that DoubleClick was the leading publisher ad server used by publishers in the European Economic Area, followed by the ad servers belonging to 24/7 Real Media/OpenAdStream and AdTech/AOL); Statement of Federal Trade Commission Concerning Google/DoubleClick, No. 071-0170 (F.T.C. Dec. 11, 2007), <https://perma.cc/636J-EF2B> ("DoubleClick is the leading firm in the third party ad serving markets. It faces competition from several significant competitors in the United States, such as 24/7 Real Media, aQuantive, and ValueClick."). Additionally, many smaller publishers also did (and still do) use Google's AdSense product to perform ad serving functions rather than licensing a standalone ad server such as Google's DoubleClick product.

72. See *What Customers are Saying About DART for Publishers*, DOUBLECLICK (Sept. 1, 2006), <https://perma.cc/6FW9-Z2LB>; Louise Story & Miguel Helft, *Google Buys DoubleClick for \$3.1 Billion*, N.Y. TIMES (Apr. 14, 2007), <https://perma.cc/UCJ7-X49Y>.

73. For a more thorough explanation of how cookies work, see AdSense Help, *DoubleClick Cookies*, GOOGLE (Mar. 1, 2017), <https://perma.cc/J5MT-MGFD>.

tracking through cookies by default, these IDs become a proxy for users' identity online.<sup>74</sup> Because DoubleClick was the number-one ad server in the market, it had cooked the most online users and was the leader in online identity information.<sup>75</sup>

Tracking users with identifiers is of high value to advertisers who buy ad space for myriad reasons. At a basic level, user IDs are used to recognize users, remember information about their prior visits, and more effectively target ads.<sup>76</sup> For example, if John visits *The New York Times* on Monday and reads the article "How to Do Laundry," *The Times'* ad server can assign John an ID, such as 1Q2W3E.<sup>77</sup> When John returns on Friday, the ad server recognizes John as user 1Q2W3E who read about laundry earlier in the week. The ad server can use that information to show John

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74. The way that user tracking works for mobile applications is different than the way it works for advertising on desktop or mobile web. For ads that display inside of mobile applications, the mobile device operating system (such as Apple or Android) assigns a user's device an advertising ID, and this ID is signaled to exchanges along with information about specific ads for sale. See MOBILE IDENTITY WORKING GROUP, MOBILE IDENTITY GUIDE FOR MARKETERS: A BEST PRACTICES PRIMER FOR MOBILE & CROSS-DEVICE MARKETING (IAB ed., 2017); Authorized Buyers Help, *Target Mobile Apps with IDFA or AAID*, GOOGLE, <https://perma.cc/6CK6-D63K> ("[B]id requests from Android devices pass the AAID [Android Advertising ID], . . . [a] device-specific, unique, resettable ID for advertising . . ."); Google AdMob Advantage, *Discover the AdMob Advantage*, GOOGLE, <https://perma.cc/7M4S-V233> (last visited Nov. 16, 2020) (explaining how the mobile app advertising vendor AdMob shares users' identities with exchanges).

75. We can infer that DoubleClick had IDs for the most users online because DoubleClick had partnerships with the most websites permitting DoubleClick to track websites' users using cookies. See Balachander Krishnamurthy & Craig Wills, *Privacy Diffusion on the Web: A Longitudinal Perspective*, INT'L WORLD WIDE WEB CONF. COMM. (Apr. 2009), <https://perma.cc/SGS3-Y5TM> (study of 1200 sites showing doubleclick.net as the number one tracker between 2005-2008).

76. STEVE JONES, ENCYCLOPEDIA OF NEW MEDIA: AN ESSENTIAL REFERENCE TO COMMUNICATION AND TECHNOLOGY 95-96 (2003).

77. Jolie Kerr, *How to Do Laundry*, N.Y. TIMES, <https://perma.cc/76PH-CVH8> (last visited Nov. 16, 2020).

an ad for detergent even though he might be reading an article about the weather. Access to the ID also permits advertisers bidding through exchanges to access information they already have about John or query more information about him from a third-party data vendor.<sup>78</sup> While John's page is still loading, it might query its internal customer records, or connect with a provider of audience data, to learn that John has sensitive skin and to refine its decisioning and targeting algorithms to show the ad for unscented detergent instead.<sup>79</sup>

At the time of the Google-DoubleClick merger, the Federal Trade Commission (FTC) and others had faith that Google would not leverage its control of publishers' primary ad server to distort competition in the electronic trading market. The FTC rejected prescient concerns about data and competition raised by public interest groups and FTC Commissioner Pamela Jones Harbour (dissented), stating that the evidence showed that "it was unlikely that Google could manipulate DoubleClick's third-party ad serving products in a way that would competitively disadvantage Google's competitors in the ad intermediation market."<sup>80</sup> In covering the

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78. Advertisers commonly query data from data management platforms (DMPs), which are specialized software companies that warehouse, analyze, and process data. For more on this, see Maciej Zawadziński, *What is a Data Management Platform (DMP) and How Does It Work?*, LINKEDIN (Sept. 1, 2015), <https://perma.cc/W7J8-M49T>.

79. Knowing the IDs of users is also used for non-targeting purposes. For example, advertisers do not want to inundate users with the same ad, and knowing the user's ID allows them to limit how many times they show the same ad to the same user. This feature of online advertising called "frequency capping" has been around since the early 2000s. Additionally, knowing the IDs of users viewing ads allows advertisers to measure the effectiveness of a campaign, since they allow advertisers to track whether a user took a subsequent action, such as clicking on an ad, signing up for a service, or purchasing a product. JONES, *supra* note 76.

80. Complaint and Request for Injunction, Request for Investigation and for Other Relief at 9-10, *In the Matter of Google, Inc. and DoubleClick, Inc.*, (F.T.C. April 20, 2007) (urging the FTC to open an investigation into Google's

merger for the wider public, *The New York Times* was equally optimistic. It acknowledged that Google's DoubleClick division would have conflicts of interest with Google's "Nasdaq-like exchange," but suggested that publishers and advertisers would "jump ship" if Google failed to properly manage its conflicts.<sup>81</sup>

Google's representations to government bodies furthered the belief that Google would properly manage its conflicts of interest, including when it came to data. To Congress, Google's general counsel assured that DoubleClick "data is owned by the customers, publishers and advertisers, and DoubleClick or Google cannot do anything with it."<sup>82</sup> Indeed,

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proposed acquisition of DoubleClick and to halt the merger absent assurances that Google will not merge DoubleClick datasets with Google datasets and engage in other data conduct that could hurt consumers); Second Filing of Supplemental Materials in Support of Pending Complaint and Request for Injunction, Request for Investigation and for Other Relief at 4, In the Matter of Google, Inc. and DoubleClick, Inc., (F.T.C. Sept. 17, 2007) (asking the FTC to condition the merger on Google and DoubleClick "maintaining separate databases of user information"); Pamela Jones Harbour, Dissenting Statement in Google/DoubleClick F.T.C. File No. 071-0170 (F.T.C. 2007), <https://perma.cc/Q57H-3YT8> (specifically warning that if Google and DoubleClick are permitted to merge without conditions, the firm may merge data between Google and DoubleClick, to negatively harm both consumer privacy and competition; also stating that the merger "has the potential to profoundly alter the 21st century Internet-based economy – in ways we can imagine, and in ways we cannot"); *Federal Trade Commission Closes Google/DoubleClick Investigation*, FED. TRADE COMM'N (Dec. 20, 2007), <https://perma.cc/B5JD-QVNC> [hereafter *FTC Closes Investigation*] (additionally stating that the FTC would "closely watch these markets and, should Google engage in unlawful tying or other anticompetitive conduct, the Commission intends to act quickly").

81. Story & Helft, *supra* note 72 ("The sale also raises questions about how Google will manage its existing business and that of the new DoubleClick unit while avoiding conflicts of interest. If DoubleClick's existing clients start to feel that Google is using DoubleClick's relationships to further its own ad network, some Web publishers or advertisers might jump ship.").

82. *An Examination of the Google-DoubleClick Merger and the Online Advertising Industry: What Are the Risks for Competition and Privacy?: Hearing Before the Subcommittee on Antitrust, Competition Policy and Consumer Rights, 110th Cong. (2007)*, <https://perma.cc/39UD-MKDZ> [hereinafter *The Google-DoubleClick Merger*].

with ownership of such data contractually vested in the buyers and sellers in this market, to do anything with that data would be, by definition, a misappropriation.

However, the FTC's confidence was misplaced. DoubleClick and Google were already under fire for how they handled information and, in an electronically traded equities market, regulators must proactively manage conflicts of interest in order to ensure a company will not misuse inside information. When financial intermediaries are allowed to have conflicts, ethical walls and fiduciary (or best interest) duties restrict them from using their customers' information for their own financial gain. There was also a problem with jumping ship. As inventory management software integrated into back-end billing systems, it was a jump that some compare to changing engines mid-flight.<sup>83</sup>

Thus, in a 4-1 vote, the FTC approved the merger without conditions. However, the concerns raised by the public interest groups and FTC Commissioner Harbour would come to fruition. Google's conflicts of interest would get the better of it. When it officially launched its exchange in 2009, Google began to restrict publishers' and advertisers' ability to access their DoubleClick data and to reserve for its own trading divisions an "essential" information advantage.<sup>84</sup>

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83. Ratko Vidakovic, *The Beginner's Guide to Header Bidding*, ADPROFS (Mar. 21, 2019), <https://perma.cc/98WQ-G42C> ("As a publisher, replacing your primary ad server is not a trivial task. Think of it like doing a mid-flight engine swap on an airplane. Except that it's your revenue engine. It's hard to imagine many publishers wanting to take such a risk."); Tim Cross, *Why Don't More Publishers Switch Ad Servers?* VIDEO AD NEWS (June 6, 2019), <https://perma.cc/9MD7-GU27>.

84. AdSense Help states the following: "Cookie ID in each DoubleClick cookie is essential to these applications. For example, DoubleClick uses cookie IDs to keep a log of which ads show to which browsers. When it's time to serve an ad to a browser, DoubleClick can use the browser's cookie ID to check which DoubleClick ads have already been delivered to that particular browser. That's how DoubleClick avoids showing ads the user has already seen. In the same way, cookie IDs allow DoubleClick to log conversions related to ad requests—such as when a user views a DoubleClick ad and later uses the same browser to visit the advertiser's website and make a purchase." AdSense Help, *supra* note 73.

2. *DoubleClick Ad Server Starts to Play Favorites When Sharing User Identity*

Competition in the exchange market, one step removed from the ad server that routes to exchanges, depends on the ability to recognize users associated with ad space for sale.<sup>85</sup> Without access to user IDs, the demand for ad space wanes and their clearing prices on exchanges drop dramatically as a result. Recent pricing and bid data from various exchanges illustrate the point. For example, a 2018 Google study reports that the prices for ad space trading on Google's exchange drop by 50+% when advertisers cannot identify users associated with ad space for sale.<sup>86</sup> Relatedly, Index Exchange has shared that the number of bids for ad space on Mozilla Firefox pages dropped by 38% after the internet browser started blocking cookies.<sup>87</sup> That is, without knowing the identity of the user, advertisers often sit out of ad auctions altogether. Although some

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85. See generally AdSense Help, *supra* note 73; Ronan Shields, *Inside the IAB Tech Lab's New Consumer Privacy Proposals*, ADWEEK (Sept. 19, 2019), <https://perma.cc/3PP2-LS47> (discussing how access to user IDs inside bid requests is what permits firms to conduct basic programmatic advertising processes).

86. Deepak Ravichandran & Nitish Korula, *Effect of Disabling Third-Party Cookies on Publisher Revenue*, GOOGLE (Aug. 27, 2019), <https://perma.cc/79K4-RLHJ> ("We disabled access to cookies for a small fraction of randomly selected users (the treatment group). We observed that for the top 500 global publishers, average revenue in the treatment group decreased by 52%, with a median per-publisher decline of 64%."). See also Garrett Johnson et al., *Consumer Privacy Choice in Online Advertising: Who Opt Out and at What Cost to Industry?* (Simon Business School, Working Paper No. FR 17-19, 2019) ("We estimate that opt-out consumers fetch 52% lower prices on the exchange than the counterfactual prices they would fetch with tracking cookies.").

87. Mike O'Sullivan, *The Impact of Mozilla Firefox: The Change Is Now*, INDEX EXCHANGE (Oct. 30, 2019), <https://perma.cc/W5J3-GT9V>; Ross Benes, *Publishers Are Already Feeling Pain from Apple's Move Against Ad Tracking*, DIGIDAY (Oct. 15, 2017), <https://perma.cc/4XAZ-S8NE> (reporting one publisher receives 15% less bids for Safari impressions).



advertisers do bid on this type of cookie-less ad space, data from the Rubicon exchange shows that the clearing prices on Safari pages drop by 60% overall.<sup>88</sup>

To maximize competition for ad space in auctions, and in turn their clearing prices, all parties bidding on inventory need to recognize users associated with the ad space for sale. Publishers could facilitate this outcome by sharing their ad server user IDs with all bidders in a non-discriminatory manner. After all, ownership of DoubleClick data rested in publishers and advertisers, and Google could not do anything with it.

But ownership rights in the ad trading market are malleable: they vest from negotiating power and contract rights. When Google launched an exchange into a crowded market in 2009 and its ad server developed a conflict, the ad server started to restrict publishers' and advertisers' ability to access the ad server user IDs.<sup>89</sup> In fact, Google restricted how any party other than Google could access them. It did this by hashing the

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88. Tom Dotan, *Apple's Ad-Targeting Crackdown Shakes Up Ad Market*, INFORMATION (Dec. 9, 2019), <https://perma.cc/69YT-QU38> (Rubicon Project CEO Michael Barrett explaining that “[t]he allure of a Safari user in an auction has plummeted” and “[t]here’s no easy ability to ID a user”). See also Yoel Minkoff, *Safari Privacy Features Disrupt Ad Market*, SEEKING ALPHA (Dec. 10, 2019), <https://perma.cc/AYQ9-HJ6N>.

89. See AdExchanger Staff, *AdExchanger.com Q&A with Google DoubleClick Ad Exchange's Mohan and Spencer* [hereinafter *AdExchanger Q&A*], ADEXCHANGER (Sept. 21, 2009), <https://perma.cc/J3WN-YGPV>. Before Google's acquisition of DoubleClick, DoubleClick faced no conflict of interest, which may explain why DoubleClick's policy towards sharing user IDs was more neutral back then. Note, prior to 2003, DoubleClick had a division that licensed ad management software and another that acted as a sales broker for publishers who were part of the “DoubleClick Network.” However, this changed in 2002 when DoubleClick divested its ad network division to focus on licensing ad serving software. See DoubleClick Inc., Registration Statement (Form S-1) (Nov. 18, 1998), <https://perma.cc/P3M7-322W> (discussing both lines of business activity at the time of the DoubleClick IPO); DoubleClick Inc., Annual Report (Form 10-K), <https://perma.cc/ZX55-R9R9> (discussing divestiture in 2002 through a series of transactions).

user IDs, which is a process of scrambling characters based on a mathematical formula.<sup>90</sup> If John's ID was 1Q2W3E, Google would share a different ID with the Iowa news publisher *The Register* (e.g., 0P9O8I) than it would share with the advertiser (e.g., MM99NN), thereby preventing both entities from realizing that the person in question was in fact the same user.

The change did not go unnoticed. Industry publication AdExchanger interviewed senior Google product manager Scott Spencer about the change, asking whether the new approach “break[s] the universal cookie model that helps create efficiencies for advertisers and, ultimately, more frictionless advertising for the user . . . .”<sup>91</sup> Without delving into specifics, Spencer replied that a concern for user privacy motivated the change.

At the same time that Google's ad server started to restrict access to these IDs for privacy reasons, Google permitted its own exchange and buying tools to access them by default. First it was Google's buying tool for small businesses—Google Ads, which was then called AdWords.<sup>92</sup>

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90. Specifically, they are hashed differently for each publisher, advertiser, and intermediary. See *AdExchanger Q&A*, *supra* note 89 (discussing Google's decision to start hashing IDs); Google Developers, *Cookie Matching*, GOOGLE (Jan. 5, 2014), <https://perma.cc/A7WF-SAL7> (“For buyers, Google identifies users using a buyer-specific Google User ID which is an encrypted version of the doubleclick.net cookie, derived from but not equal to that cookie.”); Google Ad Manager Help, *Data Transfer Fields*, GOOGLE (2020), <https://perma.cc/U62K-V5EX> (“The DoubleClick cookie ID associated with the user, encrypted.”). One needs a “key” to unscramble the user id, but Google does not provide keys for that purpose. Campaign Manager Help, *User ID Encryption*, GOOGLE (2020), <https://perma.cc/GCE2-TGWE> (“You will never be able to decrypt user IDs, and Google will not disclose the encryption method. No encryption keys will ever be provided to any Campaign Manager customer or any third-party partner.”).

91. *AdExchanger Q&A*, *supra* note 89.

92. Note, the buying tool is called AdWords, but the product for publishers is called AdSense. *Privacy Policy*, GOOGLE (Mar. 11, 2009), <https://perma.cc/VQ8C-ZB79> (“Google uses the DoubleClick advertising cookie on AdSense partner sites . . . .”); AdSense Help, *AdSense Program Policies*, GOOGLE (July 8, 2016), <https://perma.cc/9FGA-3S4Q> (“Google uses the DoubleClick

Then it was Google's exchange. When Google launched an exchange in the fall of 2009, the exchange recognized website visitors by their DoubleClick IDs.<sup>93</sup> Finally, it was Google's DSP, the enterprise buying tool. When Google launched its DSP, DoubleClick Bid Manager (now called DV360), in 2012, this software recognized users by their DoubleClick IDs as well.<sup>94</sup>

The change to hashing user IDs for everyone other than Google reserved an information advantage for Google when it came to selling websites' ad inventory. Specifically, Google's exchange benefits from better recognizing online users, which allows it to better facilitate trades between websites and buyers, compared to rival exchanges.<sup>95</sup> An advertiser

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cookie on publisher websites displaying AdSense for content ads."); News from Google, *Google Expands Advertising Monetization Program for Websites*, GOOGLE (June 18, 2003), <https://perma.cc/YR2Y-HYFL> (announcing and explaining the AdSense product).

93. *AdExchanger Q&A*, *supra* note 89.

94. Payam Shodjai, *Getting Real with DoubleClick Bid Manager*, DOUBLECLICK ADVERTISER BLOG (Oct. 24, 2012), <https://perma.cc/S9N6-TZ3W> (announcing the launch of Google's DSP DoubleClick Bid Manager and the sunset of Invite Media and that user id lists in advertisers' ad server are available in DoubleClick Bid Manager "without any data loss, leading to better reach and performance for remarketing campaigns"); Jason Miller, *Constantly Innovating: the DoubleClick Digital Marketing Platform*, DOUBLECLICK ADVERTISER BLOG (Sept. 19, 2012), <https://perma.cc/N8L6-NTRE> (explaining that buyers can easily target the list of users that saw their Google Search ads through Google's DSP since the integration between the two products does not require advertisers to install new site tags); Google Developers, *Cookie Matching*, GOOGLE, <https://perma.cc/WL6Q-GYPD> (last visited Nov. 16, 2020) ("For itself, Google identifies users with cookies that belong to the doubleclick.net domain under which Google serves ads.").

95. For example, suppose John was assigned a DoubleClick ID of 1Q2W3E but had not been assigned a Right Media RMX or Google Ad Exchange ID. If neither the Right Media nor the Google exchange could recognize John by an ID, each might have sold an initial ad targeted to John for a low \$1 CPM price, which stands for cost per one thousand impressions and is one common advertising pricing model. After the acquisition, Google's exchange could access John's DoubleClick ID by default, which allowed it to sell the initial same ad targeted to

that is a client of the DoubleClick ad server has to go *through* Google's exchange in order to efficiently buy more ads targeted to the same users because only Google tracks users by the same ID.<sup>96</sup> On the ground, this worked to lock-in clients of the DoubleClick ad server to Google's exchange and buying tools, fueling Google's reputation in the industry as a "walled garden."<sup>97</sup>

3. *Google-Owned Intermediaries Have an Information Advantage on Google's Exchange*

Google's asymmetric approach to sharing websites' DoubleClick user IDs also distorts competition between the buying tools competing to purchase ad space from Google's exchange (e.g., DV360 and Google Ads versus rival buying tools). This helps explain how Google eventually leveraged its dominance in the ad server market, then the exchange market, into dominance in the buying tool market too, to the detriment of advertisers. Google's exchange shares users' DoubleClick IDs with the Google-

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John for a higher price than could Right Media's exchange RMX. Google's exchange benefits from piggybacking off the Google DoubleClick ad server IDs in other ways too. *See infra* note 103.

96. The ability to share IDs facilitates better interoperability between Google and non-Google tools. For example, an advertiser using the DoubleClick ad server might have shared a list of user IDs directly with a publisher or non-Google intermediary to target more ads to the same users. This old advertising contract between DoubleClick and Compaq Computer from 1999 corroborates the understanding that before Google's acquisition of DoubleClick, DoubleClick permitted its customers more discretion over how to use their DoubleClick ad serving software data. DoubleClick Inc. and Compaq Computer Corp., *supra* note 38 (stating that "Compaq has the sole and exclusive right to use all data derived by its use of the DART [ad serving software] Service, for any purpose related to Compaq's business with Advertisers").

97. *See generally* John McDermott, *Welcome to the 'Walled Garden' Era of Ad Tech*, DIGIDAY (Feb. 12, 2015), <https://perma.cc/8N99-WRZ3>.

owned buying tools.<sup>98</sup> However, when sending bid requests to non-Google intermediaries, Google's exchange shares a different ID value.<sup>99</sup>

The information asymmetry, flowing from Google's number-one exchange to the buying tools that have a seat to bid, distorts competition between bidders. To identify users associated with ad space for sale on Google's exchange, the non-Google intermediaries have to use cookies to assign users a new set of proprietary IDs and must synchronize their IDs with Google's hashed ones through a process called cookie syncing.<sup>100</sup> The problem is that the cookie syncing process is inherently inefficient.<sup>101</sup> In addition to increasing page latency for users, the new IDs belonging to the non-Google intermediaries will not always match with Google's hashed IDs, resulting in advertisers sometimes not knowing the identity of users associated with ad space trading on Google's exchange. Industry

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98. Google Developers, *supra* note 90.

99. AdExchanger Staff, *supra* note 90; Google Developers, *supra* note 90; Google Ad Manager Help, *supra* note 90; Campaign Manager Help, *supra* note 90.

100. To give a simple example, if Google's exchange sends a bid request indicating there is an ad available for user 0P9O8I, the non-Google buying tool will initially not know who that is because it tracks the user by a different ID (e.g., BB88VV). To solve this problem, Google's exchange and the non-Google buying tool swap their proprietary IDs for the same user through "cookie syncing." After a cookie sync has occurred successfully, the trader will know bid requests for user 0P9O8I correspond to user BB88VV in its own records. See Google Developers, *supra* note 90; Ronan Shields, *The Trade Desk Rolls Out Its Unified ID to Take on the Walled Gardens*, ADWEEK (Oct. 24, 2018), <https://perma.cc/C6XW-DAYR>; Maciej Zawadziński, *What Is a Cookie Syncing and How Does it Work?*, CLEARCODE BLOG (Dec. 14, 2015), <https://perma.cc/AWA4-BRK8>; *Infrastructure Options for RTB Bidders (Part 4)*, GOOGLE CLOUD, <https://perma.cc/LHE5-C97E> (last visited Nov. 16, 2020) (explaining cookie syncing and that syncing can also happen outside of bid requests).

101. Cookie syncing also has negative consumer welfare effects, including consumer privacy implications and slower page loads. See Shields, *supra* note 100.

insiders call these “blind” spots<sup>102</sup> and quantify the attrition as “loss rates.”<sup>103</sup> When blind, advertisers bid less or not at all.

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102. See generally *SSP to DSP Cookie Syncing Explained*, AD OPS INSIDER (May 1, 2011), <https://perma.cc/7KY2-QZEQ>; Ben Kneen, *What Exactly Is “Data Loss” and “Cookie Loss” in AdTech?*, QUORA (June 22, 2015), <https://perma.cc/P4NY-7AA7> (explaining loss rates); Chris O’Hara, *The Match Game: Match Rates Are the New Click-Through Rates*, AD EXCHANGER (Nov. 30, 2015), <https://perma.cc/T3WB-879X> (explaining that match rates of 60% are “overall pretty good” and of 70% are “excellent”).

103. Loss rates can occur because of technical glitches during the synchronization process, because users block or delete cookies, or because companies may not have enough time during page loads to sync with other companies involved in the trade. For instance, when users delete their cookies and the associated user IDs assigned to them, exchanges and buying tools race to assign those users new cookies and new IDs. Since so many consumers use Google Search and Gmail, and so many websites use Google’s ad server product, the company that can do this fastest is often Google. Because Google is the fastest, this can mean that Google’s exchange and buying tools can re-identify users the fastest too. On the other hand, competitors have to re-assign users new cookies and synchronize new IDs with Google’s, resulting in higher loss rates. *The Most Popular Email Providers in the U.S.A.*, SHUTTLECLOUD (Aug. 11, 2016), <https://perma.cc/HET2-DGGK> (stating that Google’s Gmail service has 130+ million U.S. users and has 53% share of the U.S. email market). Moreover, Google’s buying tools may also have a leg-up when it comes to user identity because of Google’s ability to avoid third-party cookie blocking (by ad blockers and internet browsers). Some ad blockers and browsers do not block Google Analytics first party cookies, enabling Google to get around the blocking by sharing data between the non-blocked Google Analytics cookies and its advertising divisions. *Which Ad Blockers Are Blocking Google Analytics?*, ANALYTICAL 42 (Aug. 10, 2016), <https://perma.cc/YVV2-D2MF> (discussing how ad blockers do not block Google Analytics cookies); Google Developers, *Google Analytics Cookie Usage on Websites*, GOOGLE ANALYTICS, <https://perma.cc/JGT4-5SDU> (last visited Sept. 28, 2020); Google Support, *About Remarketing Audiences in Analytics*, GOOGLE, <https://perma.cc/4MR3-CESG> (last visited Sept. 28, 2020) (both discussing how Google shares data from Google Analytics with Google advertising divisions); Parker Robben, *Here Are Your Options for Google Ads Tracking with Apple’s ITP 2.0*, METRIC THEORY (Sept. 18, 2018), <https://perma.cc/LGX4-YE9M> (explaining the linking of data pools between first-party cookies from Google Analytics and Google Ads and Google Tag Manager).

The Google-owned buying tools do not suffer from this information asymmetry. DV360 (enterprise) and Google Ads (small business) more frequently recognize the identity of users associated with ad space on Google's exchange, which means they more frequently make informed decisions about the value of inventory for sale and return informed bids on behalf of advertisers. This information advantage, reserved by Google for Google, is something that Google markets to advertisers and publishers as a synergy for using Google all the way through the trade: Google's intermediary on the sell-side (i.e., ad server), Google's exchange, and Google's intermediary on the buy-side (i.e., the buying tools).<sup>104</sup>

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104. See Google Ad Manager Help, *supra* note 46 (explaining that advertisers "minimize" losses related to "cookie matching" and "there is a higher likelihood they'll find impressions that meet their targeting criteria" when they use DV360 or Google Ads); Shields, *supra* note 100 (explaining generally that advertisers spend disproportionately with Google because it is comparatively easier to target audiences). Note, Google also explains to publishers that they should benefit from greater "auction pressure" because of the information advantages between Google's exchange and Google's buying tools. Google Ad Manager Help, *supra* note 46. However, the expected higher bid prices for publishers may be tempered by new "Unified Pricing Rules" that Google introduced in April 2019. These rules now prohibit publishers from routing their ads through Google's exchange at prices higher than they route them through competing exchanges. For further discussion on Google price parity restrictions and their effect on competition see *infra* Part III.B and Groth, *infra* note 183. Consequently, although Google states the information advantages of Google buying tools should garner higher bids for publishers, Google's Unified Price Rules (which are a condition of using Google's ad server) can make sure that ads are sold at the lowest price across the market. Jason Bigler, *An Update on First Price Auctions for Google Ad Manager*, GOOGLE BLOG (May 10, 2019), <https://perma.cc/F8JG-WVNA> (stating that publisher price floor will hereinafter "be applied to all partners equally, and cannot be set for individual buying platforms"); Google Ad Manager Help, *Unified Pricing Rules*, GOOGLE SUPPORT (Sept. 28, 2020) <https://perma.cc/A2YS-7WN6> (discussing beta rules); Jessica Davies, "It's a Shakedown": Everything You Need to Know about Google's "Unified Pricing" Product Changes, DIGIDAY (Apr. 25, 2019), <https://perma.cc/U6A2-C6VU> (stating that publishers had historically set higher floor prices for Google's exchange); Sarah Sluis, *Publishers Lash Out Against Google*

#### 4. *Consumer Privacy Offered as Reason for Information Asymmetry*

Google's excuse for sharing information in an asymmetric fashion is consumer "privacy," but its reasoning does not hold water. Supposedly, Google does not want firms to combine consumer data records together.<sup>105</sup> By sharing John's data with Company A as belonging to user 1Q2W3E and sharing John's data with Company B as belonging to user 0P9O8I, Company A and B cannot join their respective information about John together, to create a more comprehensive profile of his internet activity. However, this is precisely what Google does. By migrating its exchange and buying tools to the same DoubleClick cookie, and by merging consumer data sets between Google business divisions, Google creates deeper and deeper profiles of consumers' internet activity.

Furthermore, Google contract terms already prohibit companies from combining their Google data records.<sup>106</sup> As a result, scrambling IDs has

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over "Unified Pricing" Changes, ADEXCHANGER (Apr. 18, 2019), <https://perma.cc/Z3Z7-AA3Z> (discussing reception of Google's Unified Pricing changes).

105. In 2009, Google did not explain what it meant by consumer privacy. However, online advertising industry executives have shared that Google has stated concern about companies combining consumer data records. Google shares this reasoning in a recent submission to the U.K. competition commission. See *AdExchanger Q&A*, *supra* note 89; CMA FINAL REPORT, *supra* note 7 at 409 (discussing how Google does not share granular consumer information because "[i]mposing consistent transaction IDs raises potential privacy concerns" by allowing advertisers to join user data). Further challenging Google's rationale is the fact that companies can obtain user consent for this practice and the fact that companies can combine these types of data records together after-the-fact through various database matching and merging techniques. Google has also raised concern about companies possibly using consistent user IDs to merge users' internet activity with users' real identity. However, Google itself engages in precisely this practice. See CMA FINAL REPORT, *supra* note 7 at 409 (discussing how Google states consistent IDs could permit "individual users to be identified"); Julia Angwin, *Google Has Quietly Dropped Ban on Personally Identifiable Web Tracking*, PROPUBLICA (Oct. 21, 2016), <https://perma.cc/QN9L-2MHB>.

106. *Authorized Buyers Program Guidelines*, GOOGLE,



the added effect of interfering with competition. An advertiser that uses Google's DoubleClick ad server now has a harder time using a non-Google buying tool because the two tools operate on different user IDs.

The privacy imperative has turned out to be Google's Trojan Horse in extracting synergies from DoubleClick. Since 2009, Google has continued to restrict competitors' access to trading data in various ways for privacy reasons, without imposing a parallel limitation on Google's use of the same information.<sup>107</sup> For example, in 2018, Google stopped allowing

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<https://perma.cc/BL9Y-3Z9H> (last visited Sept. 28, 2020) (stating that buyers that do not win a specific impression are prohibited from using data associated with that impression to create user lists, profile users, or associating said data with third-party data; also prohibiting buyers that do win specific impressions from retaining impression data outside of Location at a for any use other than for forecasting inventory through Google's exchange). Additionally, other exchanges do not necessarily approach privacy in this way. See, e.g., AdExchanger Staff, *supra* note 90 (comparing Right Media exchange's practice of storing advertisers ID in the RMX cookie with Google's exchange practice of sharing unique hashed user IDs); *Outgoing Bid Request to Bidders*, XANDR, <https://perma.cc/5VWW-7B9L> (last visited Sept. 28, 2020) (discussing how the Xandr exchange shares a unique 64-bit ID for a specific user if the seller permits the sharing of user IDs and that IDs remain stable until the user clears his or her cookies); *List of Supported OpenRTB Bid Request Fields*, INDEX EXCH., <https://perma.cc/KT5F-PWAD> (last visited Nov. 17, 2020) (stating the Index Exchange IX shares with buying tools a "IX static identifier for this user"); David Simerly & Catherine Racette, *OpenRTB 2.3 Bid Request Objects and Parameters*, PUBMATIC (Oct. 26, 2020), <https://perma.cc/HSU3-PHH7> ("Exchange-specific ID for the user. At least one of ID or buyeruid is recommended.").

107. See, e.g., James Hercher, *How We Got Here: A Look Back at the Privacy Changes That Reshaped Google*, ADEXCHANGER (Oct. 7, 2019 12:36 AM), <https://perma.cc/MJQ6-V4ES>; Eric Berry, *How Will Google's Move to Restrict Third-Party Cookies Affect Publishers?*, ADEXCHANGER (Apr. 5, 2019), <https://perma.cc/MMG8-Z9QN>. Conversely, Google has decreased consumers' privacy with respect to Google itself over the years. For example, Google today owns and operates the most widely distributed online trackers. These trackers are also particularly invasive, due to a privacy change Google made in 2016 that permits Google to combine data obtained from its DoubleClick trackers with in-

advertisers to access the encrypted user IDs from campaign reports, which advertisers need to access in order to hire non-Google campaign measurement firms.<sup>108</sup> Google stated that the change was made to protect user privacy and alluded to Europe's new General Data Protection Regulation (GDPR) privacy legislation, though no provision of GDPR appears to require Google to take this approach.<sup>109</sup> Meanwhile, advertisers, provided they stay within Google's Walled Garden and use Google's new Ads Data Hub product, can still access these IDs.<sup>110</sup>

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formation it knows about consumers' real identity, in order to conduct non-anonymized surveillance of consumers. Steven Englehardt & Arvind Narayanan, *Online Tracking: A 1-Million-Site Measurement and Analysis*, PRINCETON WEB CENSUS, <https://perma.cc/Y2LE-QQR6> (last visited Sept. 28, 2020) (empirical study of 1 million sites showing that the top five third-party domains distributed on websites online and twelve of the top twenty are owned by Google; stating the top five are google-analytics.com, gstatic.com, doubleclick.net, google.com, and fonts.googleapis.com); Angwin, *supra* note 105.

108. Alison Weissbrot, *4 Ways the Death of the Cookie in Chrome Could Affect Marketers*, ADEXCHANGER (Jan. 17, 2020), <https://perma.cc/NWM7-DB8F>.

109. See also *Understanding the Digital Advertising Ecosystem and the Impact of Data Privacy and Competition Policy: Hearing Before the S. Comm. on the Judiciary*, 116th Cong. (2019) (questions for the record from Senator Lindsey O. Graham to Mr. Brian O'Kelley) (Brian O'Kelley, former CTO of the first advertising exchange at Right Media and later founder of AppNexus, stating: "In effect, GDPR [EU privacy regulation] gave Google to take anti-competitive actions on the basis of privacy that made it almost impossible for competitors to operate").

110. Google still shares the IDs with Ads Data Hub, a product of Google Cloud, which means advertisers need to use Data Hub to run these calculations. Weissbrot, *supra* note 108; Seb Joseph, *Advertisers See Google's New DoubleClick ID Rules Cementing Its Dominance*, DIGIDAY (Oct. 5, 2018), <https://perma.cc/C5KX-WP28>; George Slefo, *Google's Removal of DoubleClick ID Presents Litany of Issues for Brands, Agencies*, ADAGE (May 8, 2018), <https://perma.cc/QA7P-7CND>. "Some have noted that Google's Ads Data Hub, Google's DMP-like offering, will retain use of the DID – presenting it with a nearly incomparable advantage. Some agencies have already gone on the record questioning this change and what it means for their clients – noting that it's nearly impossible for a marketer to live in a world completely independent from the Google stack given their dominance in the DSP, ad server and site analytics world and questioning what this will mean

Further complicating matters, in January of 2020, Google's internet browser Chrome (61% market share) announced that it would block the technology of third-party cookies altogether within two years.<sup>111</sup> Competing exchanges and buying tools will soon no longer be able to use cookies to assign users IDs for the purpose of buying and selling ads.<sup>112</sup> It is not clear how the market will adjust to these changes. At the same time, there is concern that the changes will disproportionately impact rivals because Google has alternative ways of deducing users' identity.<sup>113</sup>

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for choice in the marketplace." Sonja Kristiansen, *Ending DoubleClick's ID Export*, MEDIUM: LIFT LETTERS (May 6, 2018), <https://perma.cc/646P-DC7G>. Additionally, in 2019, Google removed descriptive information about the pages that ad space will appear on (e.g., "health") from bid requests under the guise of privacy concerns. Here, Google's stated concern made little sense to people in the industry because Google's exchange still shares the user's page URL (e.g., [webmd.com/hiv-aids](http://webmd.com/hiv-aids)), which is much more intrusive on a user's privacy. Chetna Bindra, *Additional Steps to Further Safeguard User Privacy*, GOOGLE BLOG (Nov. 14, 2019), <https://perma.cc/SZ4N-Y3G7>; Lara O'Reilly, *Ad Tech Industry Questions Intentions Behind Google's Latest Privacy Moves*, DIGIDAY (Nov. 19, 2019), <https://perma.cc/M8S9-8AZQ>.

111. Justin Schuh, *Building a More Private Web: A Path Towards Making Third Party Cookies Obsolete*, CHROMIUM BLOG (Jan. 14, 2020), <https://perma.cc/TR97-8L34> (announcing Chrome changes); *Desktop Browser Market Share in United States of America*, STATCOUNTER (Jan. 2020), <https://perma.cc/6QTM-KNAN> (estimating Google has 61% market share in the U.S.).

112. See Berry, *supra* note 107; John McCarthy & Andrew Blustein, *As Google Chrome Crumbles the Third-Party Cookie, What's next for Adtech?*, DRUM (Jan. 15, 2020), <https://perma.cc/TN67-T9FD>; Maciej Zawadziński & Michael Sweeney, *Google Chrome to Kill Off Third-Party Cookies: What It Means for AdTech*, CLEARCODE, <https://perma.cc/FYA8-DA5Q> (last visited Sept. 28, 2020); Ari Paparo, *Google, You Finally Really Did It*, ADEXCHANGER (Jan. 14, 2020), <https://perma.cc/EZ7R-SCU9>; Weissbrot, *supra* note 108.

113. See Seb Joseph, *Winners, Losers and Fallout from Google's Plan to Drop Cookies*, DIGIDAY (Jan. 16, 2020), <https://perma.cc/67WG-6RZV> ("Unsurprisingly, Google stands to profit the most from the death of the third-party cookie. In the absence of third-party cookies' use with Chrome, the alternative for advertisers is to use Google's first-party data within its own tools."). "For example, exchange bidding could pass a hashed ID of the Google cookie to its partners and similarly

For instance, Google Chrome started to track consumers' web activity directly at the browser level, obviating Google's need to rely on cookies at all for identity information.<sup>114</sup>

More recently, Google's exchange has relied on California privacy legislation, the California Consumer Privacy Act ("CCPA"), to starve rival exchanges of liquidity and exclude non-Google buying tools from auctions altogether. If a California consumer visits a website, and selects the "Do Not Sell My Information" link as mandated by CCPA, Google's ad server does not permit non-Google exchanges and buying tools to bid for publishers' ad space at all.<sup>115</sup> Google's approach contrasts with that of

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make the same available on a server-to-server basis for various pixel calls. To the extent that Google is the only platform that makes this available, it would have the added benefit of effectively forcing everyone (except Amazon) into exchange bidding if they want user data, and thus into Google's single auction." Berry, *supra* note 107; McCarthy & Blustein, *supra* note 112 ("Google is building a moat. It doesn't need third-party cookies to track people. It has code live on virtually every single website and app."); Weissbrot, *supra* note 108 (joint statement issued by industry trade groups the ANA and the 4A's stating "Google's decision to block third-party cookies ... would threaten to substantially disrupt much of the infrastructure of today's internet without providing any viable alternative, and it may choke off the economic oxygen from advertising that startups and emerging companies need to survive.").

114. Specifically, Google currently always and automatically logs users of Chrome into the browser itself when users log into a Google service like Gmail or YouTube. If a user then attempts to log out of Chrome, Google automatically also logs them out of the Google service, thereby prohibiting users from using a Google service while not simultaneously being logged into the Chrome browser. On top of this, Google steers users towards syncing their Chrome user data with other Google user data and granting Google permission to use this data for the purpose of selling Google advertising, including "to personalize Search, ads, and other Google services." Screenshot of Google Chrome Terms (2020) (on file with author); see also Matthew Green, *Why I'm Done with Chrome*, CRYPTOGRAPHY ENG'G (Sept. 23, 2018), <https://perma.cc/ES7H-24DR> (discussing how Chrome steers users to give Google permission over their browsing history data and how this is deceptive and a "dark pattern").

115. Google Ad Manager Help, *Integration with IAB CCPA Framework Technical Specifications*, GOOGLE SUPPORT, <https://perma.cc/Q9WU-M3AQ> (last visited

the industry trade group—the Internet Advertising Bureau (IAB)—and rival exchanges.<sup>116</sup> Other exchanges instead send the same bid requests to all bidders, signaling that a user associated with ad space has exercised an opt-out under CCPA.

The approach taken by the IAB and rival exchanges mirrors the broader competition approach that lawmakers take in the equities market. Stock exchanges must provide all traders with access to relevant trading information. Then, firms must comply with industry-specific privacy rules to safeguard consumer data transmitted during trading.

5. *Google-Owned Intermediaries Have a Speed Advantage on Google's Exchange*

When financial markets migrated to electronic trading, non-discriminatory access to exchanges—specifically, access to data and trading speed—became critical to competition. The financial traders who had their computers located physically closer to exchange servers noticed that they could access relevant trading information first and place orders faster than the traders whose computers were located further away. This led to a speed “arms race.”<sup>117</sup> In the early 2000s, some traders moved their computers closer to the new computerized exchanges in New York City's Financial District to increase trading speeds, before collocation in the same room with exchanges became the trend.<sup>118</sup> Despite the decentralized

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Sept. 28, 2020) (“When restricted data processing is enabled, Google does not call out to third parties via RTB and the signal would not be propagated further to other vendors”).

116. IAB PRIVACY, IAB CCPA COMPLIANCE FRAMEWORK FOR PUBLISHERS & TECHNOLOGY COMPANIES: VERSION 1.0 (2019); *Bid Request to Bidders*, *supra* note 106.

117. Aaron Lucchetti, *Firms Seek Edge Through Speed as Computer Trading Expands*, WALL ST. J. (Dec. 15, 2006), <https://perma.cc/8EVV-8GWS> (quote of Tradebot Systems principle David Cummings).

118. *Id.* (sharing that trading firm Tradebot Systems Inc. moved their computers from Kansas City to New Jersey and New York to colocate with exchanges

nature of the Internet, having servers in closer proximity with each other yields faster response times.

Though trading speed emerged as critical to competition in the early 2000s, it was not until Michael Lewis released a book called *FLASH BOYS* in 2014 that a wider audience began to appreciate the implications of speed and latency with electronic trading.<sup>119</sup> Lewis, a renowned chronicler of Wall Street culture, broke down how speed shaped competition on stock exchanges and how traders were going to greater and greater lengths to acquire incremental speed advantages. In an illustration of how ridiculous the race for speed had become, Lewis recounted how one enterprising group spent hundreds of millions of dollars drilling through the Allegheny Mountains of Pennsylvania to lay straighter wires between the Chicago and New York exchanges to shave off three milliseconds when trading between the two. Being able to trade a few milliseconds faster gives traders an edge.

There are speed parallels in advertising markets. Speed shapes competition between buying tools on ad exchanges.<sup>120</sup> Ads trade in milliseconds and exchanges limit the amount of time that those intermediaries have to return bids. If a trading desk, DSP, or other buying tool is too slow, an exchange will exclude it from the instant auction. Similarly, if a buying tool is slow too often, an exchange might “throttle” it.<sup>121</sup> Meaning,

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in 2002 and that from 2002 to 2006, about 40 small trading firms and large brokerages moved their computers closer to exchanges); Michael J. McGowan, *The Rise of Computerized High Frequency Trading: Use and Controversy*, DUKE L. & TECH. REV. 24 (2010).

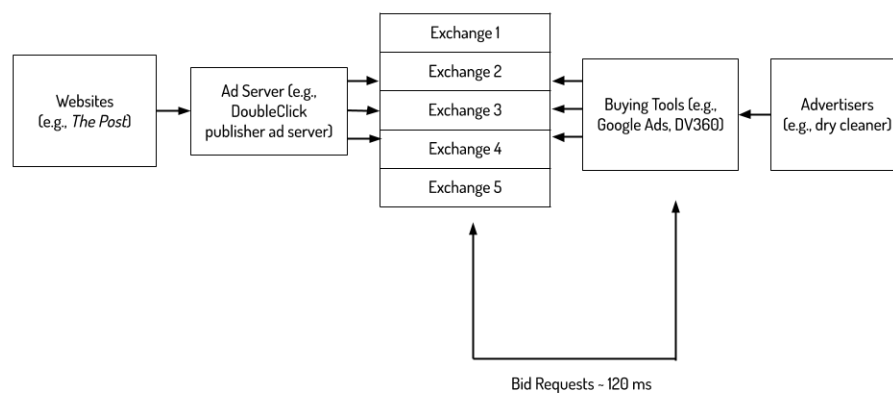
119. MICHAEL LEWIS, *FLASH BOYS: A WALL STREET REVOLT* (W. W. Norton & Company 2014).

120. See generally *supra* notes 44-45.

121. Specifically, the exchange will send the buying tool fewer bid requests, allowing it to participate in only some ad auctions until it improves trading speeds. See e.g., *Latency Restrictions and Peering*, GOOGLE DEVELOPERS, <https://perma.cc/C62T-UKAP> (last visited Sept. 28, 2020) (“We require that 85 percent of responses be received within the deadline from the perspective of the trading location and will throttle bidders that cannot consistently achieve this.”).

the exchange will exclude it from a percentage of future auctions. Because the buying tools encounter varying levels of traffic and delay when conveying their bids back to exchanges (network latency), they need to leave enough time to account for such traffic.<sup>122</sup> Thus, as a general matter, bidders that receive bid requests and respond to them fastest have advantages over those that are slower.

**Figure 4:** Time Restrictions in Bid Requests



Like the trading firms on Wall Street that benefit from speed advantages, the Google-owned intermediaries DV360 and Google Ads also have speed advantages. Google explains to current and prospective customers that when DV360 and Google Ads compete against the non-Google buying tools for the ad space trading in Google's exchange, they have a speed advantage from colocation.<sup>123</sup> By collocating DV360 and Google Ads with Google's exchange, the bids submitted by DV360 and Google Ads can be excluded less often than the bids submitted from bidders that are not colocated.<sup>124</sup>

122. Hasham, *supra* note 44 (discussing network congestion, Google recommended buffers, and recommended buffers of 20 milliseconds).

123. Google Ad Manager Help, *supra* note 46.

124. *Id.*

In fact, colocation may just reduce the frequency of exclusion for the Google-owned intermediaries from 1-in-4 to zero. According to a post by Google, DV360 and Google Ads have “no network latency or timeout issues,” meaning that Google’s exchange “always receive bids” from advertisers that use them.<sup>125</sup> Conversely, in Google’s experience, “latency issues can prevent advertisers from successfully submitting a bid on up to 25% of bid requests.”<sup>126</sup> That is, one out of every four bids submitted to an exchange by a non-colocated buying tool may be disregarded simply because of speed.

Colocation also provides intermediaries like DV360 and Google Ads with another distinct benefit. Because they must allocate less time to network travel—the time it takes for the bid request to travel from Google’s exchange to a non-colocated bidder and back—DV360 and Google Ads have more time to query additional data about the user to better determine the value of ad space for sale.<sup>127</sup> That is useful because online advertisers aim to target particular consumers, drive web traffic, or sell more widgets, all of which require *time* to query data, crunch data, and pick an advertisement that has the highest likelihood of persuading a user to take a particular action. *Time* permits DV360 and Google Ads to bid smarter.

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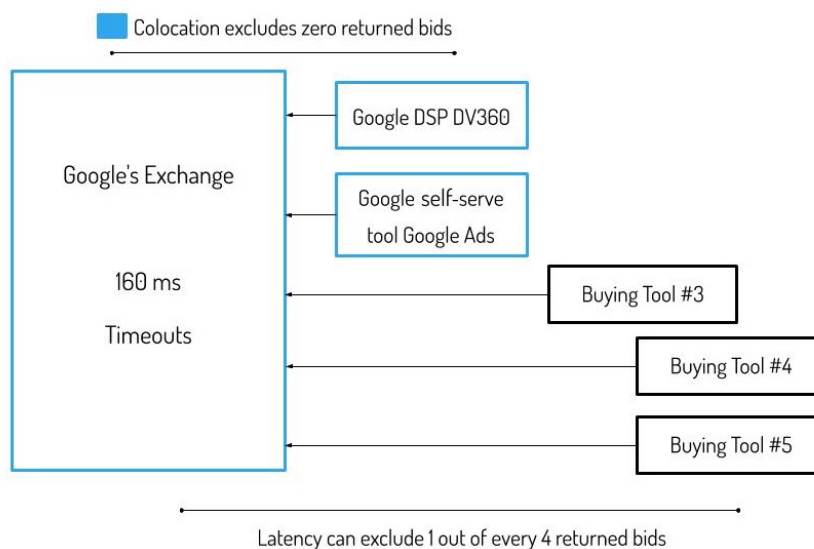
125. *Id.*

126. *Id.*

127. See generally Vasavi Pandey, *5 Questions to Ask When Considering Server Side Header Bidding*, INDEX EXCH. (Mar. 1, 2017), <https://perma.cc/LP4E-SWMK>.



**Figure 5:** Google Colocation & Unequal Access to Speed Excludes Bids from Slower Traders



Today, the Google-owned intermediaries are the number-one buying tools in the market for both small and large advertisers and it is unclear to what extent this is due to speed advantages on Google's number-one exchange. In financial markets, the traders that send and receive signals to and from financial exchanges fastest and have systemic advantages over others trading on the same venue.<sup>128</sup> Systemic speed advantages also

128. See generally AQUILINA ET AL., *supra* note 24 (providing an overview of the role of speed and data in the securities market); McGowan, *supra* note 118 (discussing the shift to computerized trading and the role that superior speed and data plays with high-frequency trading); Liz Moyer & Emily Lambert, *The New Masters of Wall Street*, FORBES (Sept. 2, 2009), <https://perma.cc/HVV5-QZBW> (discussing generally how slower traders were excluded from competing against faster ones); Gregory Meyer et al., *How High-Frequency Trading Hit a Speed Bump*, FIN. TIMES (Jan. 1, 2019), <https://perma.cc/2BGZ-26XT> (discussing ongoing competition around speed and data); Thierry Foucault et al., *Equilibrium High Frequency Trading*, Int'l Conf. Of the French Fin. Ass'n (Sept. 2011),

translated to market power. The firms in the early 2000s that first made speed their strategy—Citadel, Virtu Financial, Getco and Tradebot—emerged as the eventual market leaders.<sup>129</sup>

Even if speed advantages can explain the market power of Google intermediaries DV360 and Google Ads, Google does offer some form of colocation to competitors. Since 2013, Google has let competitors colocate through Google's proprietary computer infrastructure services division Google Cloud.<sup>130</sup> In addition to Cloud colocation, Google has partnerships with non-Google data centers that guarantee round trip network

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<https://perma.cc/8ZTN-92DD> (studying how differential access to market data and speed forecloses competition between traders). *But see* Robert Litzenberger et al., *The Impacts of Automation and High Frequency Trading on Market Quality*, 4 ANNUAL REV. FIN. ECON. 58-59 (Oct. 2012) (arguing that discriminatory access to speed forecloses competition between high frequency traders but not retail investors, who compete instead on different fundamentals).

129. Michael Mackenzie, *US: High Frequency Trading Dominates the Debate*, FIN. TIMES (Oct. 20, 2009), <https://perma.cc/3TUR-9M8E> (reflecting that high-frequency traders using speed strategies accounted for approximately 70% of U.S. equity trading volume in 2009, up from 30% a few years prior); Concept Release on Equity Market Structure, 75 Fed. Reg. 3594, 3606 (proposed Jan. 21, 2010) (to be codified at 17 C.F.R. pt. 42) (“Estimates of HFT volume in the equity markets vary widely, though they typically are 50% of total volume or higher.”); Meyer, et. al., *supra* note 128 (providing the same estimate, attributed to the Tabb Group, and discussing how Virtu Financial leveraged speed early-on to become the largest proprietary trading firm in the U.S.); Jonathan Spicer & Herbert Lash, *Who's Afraid of High-Frequency Trading*, REUTERS (Dec. 2, 2009), <https://perma.cc/MRT2-8A5Y> (reporting that trading firms Tradebot and Getco that were amongst the first to adopt speed as their strategy regularly accounted for 20% of the trading volume in the U.S. stock market); Kim Janssen, *Citadel Trader Testimony Reveals Little of World That Helped Mint Ken Griffin*, CHI. TRIB. (Oct. 28, 2015), <https://perma.cc/W5AR-2734> (discussing how Citadel is a major firm in the high-frequency trading space).

130. *Open Bidder (Beta)*, GOOGLE DEVELOPERS (May 19, 2013), <https://perma.cc/DE5G-9ER3>; Noam Wolf, *Google I/O 2013 - Introducing Open Bidder: Leverage Cloud Platform to Reinvent Display Advertising*, YOUTUBE (May 19, 2013), <https://perma.cc/XB2N-2GTV>. *Google Compute Engine - Cloud Platform*, GOOGLE (Aug. 5, 2013), <https://perma.cc/22VR-QDAY>.

travel with Google within 5 milliseconds.<sup>131</sup> It is not clear whether 5 milliseconds of latency make or break a rival's ability to bid for ad space trading in Google's exchange.

At least when it comes to Google Cloud colocation, it appears that few firms have taken Google up on its offer. One exception is advertising exchange OpenX, which publicly announced a five-year, \$110 million colocation agreement with Google in January 2019.<sup>132</sup> In discussing the OpenX deal, Google reiterated the competitive benefits of colocation: "[colocation] reduced overall latency, especially when sending requests to Google ... It increases the speed that bids come into the OpenX Exchange from potential buyers, driving increased revenue potential by allowing publishers to see greater demand for their audiences before an auction closes."<sup>133</sup> Despite Google's arguments for collocating, few other companies have chosen to follow in OpenX's footsteps.

It is possible that rivals do not colocate with Google in Cloud because Google charges high colocation rents or rivals are not comfortable collocating on Google territory. In financial markets, colocation practices are tightly regulated: procedures and prices have to be approved by the Securities and Exchange Commission (SEC) and the length of cord in colocation facilities has to be exactly the same to ensure non-discriminatory access. In advertising, the common practice is for ad exchanges and buying tools to control for some of these neutrality concerns by meeting on

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131. See Choosing Colocation Facility Locations, GOOGLE CLOUD, <https://perma.cc/KPN7-6N38> (last visited Sept. 28, 2020).

132. George Slefo, *Google Cloud, Looking to Invade Amazon's Turf, Inks Deal with OpenX*, ADAGE (Jan. 24, 2019), <https://perma.cc/57ZL-TD7Q> ("It's the first time that Google Cloud has struck a deal with a well-known, or large exchange, according to both companies."); Andrew Blustein, *OpenX Bets Future Is Serverless in Move to Google Cloud Platform*, DRUM (Jan. 24, 2019), <https://perma.cc/TK7Y-SB3Q> ("You have to operate at speed, efficiency, closeness to the publisher and the demand-side of Google, and if you don't . . . you aren't going to be able to compete in the adtech space.").

133. *OpenX: Powering the Future of Advertising with Google Cloud*, GOOGLE CLOUD <https://perma.cc/84RY-FPPF> (last visited Sept. 28, 2020).

independent ground. For instance, AT&T XNDR hosts its exchange with intermediaries in independent data centers, including at Equinix—the same data center that often acts as a neutral arbiter of colocation for stock exchanges, including the NYSE, Nasdaq, the Chicago Board Options Exchange, BATS, and trading firms.<sup>134</sup> Google, unlike Equinix, has conflicts of interest. Google Cloud’s job is to nullify speed advantages between competitors, but Google also operates buying tool intermediaries that benefit from speed advantages over those customers.

When it comes to speed and competition, one problem is that a lack of transparency makes it difficult for market participants to understand the true extent that speed favors Google and excludes others. Does colocation really reduce Google Ads’ exclusion from Google’s exchange from 1-in-4 to zero? While Google’s exchange shares centralized auction reports back with publishers, those reports do not include information about the bids that Google’s exchange excludes due to latency.<sup>135</sup> In other

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134. *Datacenters*, XANDR CLOUD SERVICES, <https://perma.cc/QWT3-7WAK> (last visited Sept. 28, 2020); Matthew Leising & Annie Massa, *Inside the Nondescript Building Where Trillions Trade Each Day*, BLOOMBERG (Apr. 13, 2016), <https://perma.cc/QT9J-F896> (discussing colocation in the securities market). Other major ad exchanges, including those belonging to Index, OpenX, and Pubmatic, take the same approach. *OpenX Selects Zayo for Data Center Expansion*, ZAYO (Mar. 15, 2016), <https://perma.cc/XU54-RVV7>; Vasavi Pandey, *Tour IX’s Amsterdam & Frankfurt Data Centers*, INDEX EXCH. (July 2, 2018), <https://perma.cc/L7AJ-CVY9>; *Digital Realty SFR1*, INFLECT (2020), <https://perma.cc/J3QV-9AVS> (last visited Sept. 28, 2020).

135. See *Bids Data in Ad Manager Data Transfer (Beta)*, GOOGLE AD MANAGER HELP (2020), <https://perma.cc/R6DN-ZJHV> (making no mention of reporting on bids due to latency); Jason Bigler, *Rolling Out First Price Auctions to Google Ad Manager Partners*, GOOGLE <https://perma.cc/QL6V-LHXN> (last visited Sept. 26, 2020) (stating that new beta market trading files include data from “bids submitted to your auctions”) (emphasis added). The Google Ad Manager reports on “metrics” and “dimensions” do not include data about bids excluded due to latency or timeouts. See *Ad Manager Report Metrics*, GOOGLE AD MANAGER HELP, <https://perma.cc/Q7FQ-2FWN> (last visited Sept. 26, 2020); Google Ad Manager Help, *Ad Manager Report Dimensions*, GOOGLE (2020),

words, if Google's exchange hosts a 100 millisecond auction for an ad, and reports that a Google-owned intermediary won the auction at a price of a \$2 CPM—which stands for cost per one thousand ad spaces (“impressions”)—a publisher would not know if Google's exchange excluded a higher \$3 CPM bid received just 2 milliseconds late.

In financial markets, specific investigations and enforcement actions have been critical to discovering speed problems, enforcing fair access rules, and protecting competition. For example, in 2012, the NYSE settled charges levied by the SEC for giving some trading firms access to the market single digit milliseconds to multiple seconds before others.<sup>136</sup> Following FLASH BOYS' release in 2014, the FBI, the SEC, and the securities enforcement division of the Office of the New York Attorney General (NYAG) opened investigations into whether other exchanges were in violation of existing fair access rules.<sup>137</sup> The second-largest public exchange, BATS, soon settled charges brought against them for providing some traders with superior access.<sup>138</sup> In advertising, a lack of transparency by

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V6DT. The following NetworkBackfillBids report states it includes bids categorized as “Other,” but does not mention latency; the prior documentation suggests that “Other” would exclude bids due to latency. *See also Ad Manager Data Transfer Reports*, GOOGLE AD MANAGER HELP, <https://perma.cc/8QSV-YBQF> (last visited Sept. 28, 2020) (describing the various market trading reports Google offers). The NetworkBackfillBids report contains data about Google's market trading activity and pulls from winning bids, bids excluded because they were lower than the auction “Floor,” bids that were “Outbid,” and bids excluded due to “Other,” or those Google calls “lost for another reason, such as URL filtering.” Google Ad Manager Help, *Bids Data in Ad Manager Data Transfer (Beta)*, GOOGLE, <https://perma.cc/2HN6-AVY4> (last visited Dec. 2, 2020).

136. N.Y. Stock Exch. LLC, *supra* note 48.

137. *See generally* Michael Lewis, *Michael Lewis Reflects on His Book Flash Boys, a Year After It Shook Wall Street to Its Core*, VANITY FAIR (Mar. 12, 2015), <https://perma.cc/U92W-DKLL> (summarizing onset of regulatory scrutiny after the release of FLASH BOYS).

138. N.Y. Stock Exch. LLC, *supra* note 48 (two exchanges owned by BATS Global settle their charges for not adequately disclosing how their order types worked and for giving information about order types to some traders but not

trading intermediaries, combined with a lack of regulatory oversight, may permit speed exclusion problems to go under the radar.

Finally, it is important to note how unequal trading speeds can negatively affect the efficiency of the trading market, in addition to leading to market concentration. Unequal access to speed can operate to line the pockets of the middlemen. The following hypothetical provides one example of how this could happen. When Google's exchange excludes rival intermediaries for being too slow, the Google-owned intermediary Google Ads would have been able to acquire publishers' ad space for lower prices. But it is not clear whether the small mom-and-pop advertisers using Google Ads benefitted from such lower prices. Instead, the setup could have permitted Google as the intermediary to engage in a wider arbitrage—keeping a larger difference between the price it sells an ad to a Google Ads advertiser and the price the ad space actually clears for on Google's exchange.<sup>139</sup> Like in finance, the mechanics of highly-sophisticated electronic trading markets and their accompanying speed

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others); *In re Ubs Sec. LLC Respondent*, SEC Admin. Release No. 9697, 2015 WL 179551 (Jan. 15, 2015), <https://perma.cc/7KXP-EMJ5> (UBS settles its charges for violating Regulation NMS by allowing some traders to place orders in small increments, which allowed some orders to jump ahead of others).

139. Though not completely on point, there is one case in which an intermediary in the event ticket market sequenced buyers through two consecutive marketplaces that it owned and was thereafter charged with violating Section 5 of the FTC Act. LiveNation, the company that owns the Ticketmaster marketplace, also operates a second marketplace called TicketsNow. In the late 2000s, Ticketmaster automatically re-directed consumers looking to purchase tickets on Ticketmaster to the TicketsNow marketplace. TicketsNow listed the same tickets at higher mark-ups, which permitted the parent company to obtain higher commissions on these trades. The FTC brought charges against Ticketmaster and TicketsNow for steering consumers from one marketplace to another, alleging that this conduct was deceptive and unfair and constituted a violation of Section 5 of the FTC Act. The two companies settled and agreed to pay consumers the difference between what they paid to purchase the tickets in the TicketsNow marketplace and what they would have paid in the Ticketmaster marketplace.

aces may just wash over the heads of the least sophisticated market participants.

*B. Discriminatory Routing of Orders and More Speed Races*

*1. Routing Orders to Google's Exchange and Owned Properties*

While exchanges can distort competition between intermediaries by sharing data and speed in an asymmetric fashion, the intermediaries can distort competition by routing buy and sell orders in a discriminatory manner. In the equities trading market, we temper competition and welfare problems associated with this conduct by identifying and managing intermediary conflicts of interest. Your broker cannot steer you to purchase stock in which they have an underlying financial interest. Neither can the broker steer you to purchase shares of stock from the broker's exchange if the same shares trade on a rival's exchange for lower prices.

Google takes advantage of the lack of conflicts of interest oversight in advertising markets to distort competition in similar ways. For example, when this author opened a Google Ads account, Google Ads required the author to start a Google Search campaign in order to complete the account setup process.<sup>140</sup> In other words, Google Ads does not merely steer

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*See Ticketmaster and TicketsNow Settle FTC Charges of Deceptive Sales Tactics, Refunds for Springsteen Concertgoers Provided; FTC Warns Other Ticket Resellers, FED. TRADE COMM'N (Feb. 18, 2010), <https://perma.cc/LM9R-947W>. Separately, in the foreign exchange market, which is not subject to the rules and regulations that apply to the equities market, the DOJ and SEC brought civil charges against the asset manager State Street for defrauding investors by charging hidden mark-ups and not properly disclosing how its electronic platform for trading U.S. Treasuries worked. See David Lynch, *State Street Agrees \$35m Fraud Settlement with SEC*, FIN. TIMES (Sept. 7, 2017), <https://perma.cc/Q8QR-4Z5K>.*

140. How Google Ads Requires Advertisers to Purchase Search Ads (2020) (on file with author). Additionally, according to a recent Wall Street Journal investigation, Google Search also steers users to YouTube videos. Sam Schechner et al., *Searching for Video? Google Pushes YouTube Over Rivals*, WALL ST. J. (July 14, 2020), <https://perma.cc/P59U-RQCR>.

advertisers to Google Search, it sometimes requires them to purchase Google Search ads before they can bid on display space belonging to publishers such as *The Seattle Times*.

Exacerbating steering and tying conduct is the fact that many advertisers must use a Google-owned buy-side intermediary to purchase Search or YouTube ad space, properties many advertisers cannot forgo. Since 2015, advertisers that want to purchase YouTube ads must use DV360 or Google Ads because Google withholds YouTube ad space from rival buying tools.<sup>141</sup> It is less clear whether and to what extent Google withholds Search inventory from rivals. In January 2012, the Federal Trade Commission found that Google restricted third-party tools from selling Google Search ads and that such restrictions were anticompetitive.<sup>142</sup> But the FTC ultimately declined to file suit, and Google loosened

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141. Jeff Fraser, *Google Cuts out Third-Party DSPs from YouTube Inventory*, *MARKETING* (Aug. 7, 2015), <https://perma.cc/N6JD-SPYT> (explaining how Google withdrew YouTube inventory from third-party buying tools).

142. Staff report from the competition bureau stated the following: “Staff has investigated whether Google has employed anticompetitive contractual restrictions on the automated cross-management of advertising campaigns. Google’s main rival (Microsoft) has alleged that Google is denying Microsoft critical scale by employing these restrictions, and thus impairing Microsoft’s ability to compete effectively in the markets for general search and search advertising. We conclude that these restrictions should be condemned under Section 2 because they limit the ability of advertisers to make use of their own data, and as such, have reduced innovation and increased transactions costs among advertisers and third-party businesses, and also degraded the quality of Google’s rivals in search and search advertising.” *The FTC Report on Google’s Business Practices*, *WALL ST. J.* (Mar. 24, 2015). David Drummond, *The Federal Trade Commission Closes Its Antitrust Review*, *GOOGLE* (Jan. 3, 2013), <https://perma.cc/XUJ5-B9W4> (explaining how Google would start permitting third-party tools that connect to the AdWords API to “mix and copy campaign ad data,” as advertisers are permitted to do when they use AdWords directly); Greg Sterling, *From Praise to Outrage: Reactions to Google’s Antitrust Settlement*, *SEARCH ENGINE LAND* (Jan. 4, 2013), <https://perma.cc/SMU8-5K2V> (summarizing how Google’s changes helped third-party tools like Marin Software and Kenshoo better sell Google Search ads). Separately, for Google’s share of the US search market, see *Search Engine Market Share*



its restrictions. The competition agency in the U.K. recently re-investigated the matter.<sup>143</sup>

On top of pressuring advertisers to use Google's buy-side tools, Google pressures advertisers to use just one tool at a time (i.e., to single home).<sup>144</sup> Because Google scrambles DoubleClick IDs for everyone but Google, advertisers that use more than one buying tool at a time risk inadvertently bidding against themselves in exchanges. Buying Tool 1 might bid on user 12345, while Buying Tool 2 might try to outbid the first for user 09876, without the two knowing that user 12345 and 09876 are in fact the same person. By using two tools at once, advertisers can drive their acquisition prices up. As a result, advertisers have pressure to single home, and if they want to purchase advertising on YouTube, they should single home using DV360 or Google Ads.

According to Google, conflicts of interest should lead to efficiencies rather than distortions in the market: "the combination of Google's search business and its vertical ad tech integration should give it incentives to

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*in 2020*, OBERLO (2020), <https://perma.cc/27VF-7DXY> (stating that Google has an 88+% share of U.S. search queries and a 92+% share of worldwide search queries).

143. The competition agency in the UK, Competition Markets Authority, is investigating non-Google buying tools' access to Search inventory. The CMA FINAL REPORT stated that: "Transaction costs faced by advertisers in using multiple search engines appear likely to benefit Google and create a barrier to entry for smaller rivals. Most of the larger advertisers we contacted did not suggest there was a difficulty in multi-homing across multiple search engines and used tools such as SA360, or those provided by third parties such as Marin and Kenshoo, to do so. However, a minority of the larger advertisers who responded to our questionnaire choose to single-home as Google had a sufficiently large market share and reach to meet all their needs. Based on evidence from the qualitative research set out in Appendix N, many smaller advertisers choose to single-home, using the simple interface provided by Google Ads and benefiting from its broad reach." CMA FINAL REPORT, *supra* note 7, at 227.

144. For a discussion of the risks of bidding against oneself when targeting individual users in advertising auctions, see Jaysen Gillespie, [RESEARCH] *Why You Should Only Use One Retargeter*, CRITEO (July 1, 2019), <https://perma.cc/FWK6-PSZC>; Brian O'Kelley, *DSP User: In What Situations Am I Bidding Against Myself?*, QUORA, <https://perma.cc/2CRT-4J7F>.

balance the interests of all ecosystem participants . . . .”<sup>145</sup> However, the data tell a different story.<sup>146</sup> Google’s public filings generally show how the split in the allocation of advertising revenues between Google and non-Google properties has widened almost every year since 2004.<sup>147</sup> In 2007, the share going to Google properties increased to 64%, in 2008 to 68%, eventually to 71% (2011), then 75% (2014), 77% (2015), 80% (2016), 81% (2017), and 82% (2018). It increased again in 2019 with just 16% of the \$134 billion dollars that advertisers spent through Google going to the 2+ million non-Google properties, like *The Post*, *The Register*, *Le Monde*, or *The Times of India*, that also sell their ad space through Google’s exchange and buying tools.<sup>148</sup> Early 2020 data suggest this squeeze will continue. In the midst of a global pandemic, Q1 2020 data reveals the share going to news publishers has further declined to 15%.<sup>149</sup>

Google Search in particular accounts for 73% of Google advertising revenues, though it is not clear why.<sup>150</sup> One cannot definitively attribute revenue growth to usage growth because Google stopped reporting Search usage and query growth.<sup>151</sup> Some external estimates even suggest

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145. Bitton & Lewis, *supra* note 15, at 12 (“Google’s presence across the buy and sell-side of ad tech also gives it incentives to promote efficiency traditionally associated with vertical integration, including the reduction of double marginalization . . .”).

146. The fact that these types of competition problems arise again-and-again in electronic trading markets also pushes back on that vertical integration hypothesis. A similar issue came up in the market for electronically traded airfares. When the airline-owned electronic marketplaces for airfares engaged in a similar pattern of withholding then steering behavior in the 1970s, lawmakers intervened to put a stop to it. *See infra* note 209.

147. Google Inc. (2005-2016) and Alphabet Inc. (2017-2020), *supra* note 10.

148. *See* Alphabet Inc. (Feb. 4, 2019), *supra* note 10; *About Targeting for Display Network Campaigns*, GOOGLE ADS HELP, <https://perma.cc/U24D-PRRW>.

149. Alphabet Inc. (Feb. 3, 2020), *supra* note 10.

150. Bitton & Lewis, *supra* note 15, at 10; Alphabet Inc. (Feb. 4, 2019), *supra* note 10, at 29.

151. *See* Danny Sullivan, *Google Now Handles at Least 2 Trillion Searches per Year*, SEARCH ENGINE LAND (May 24, 2016), <https://perma.cc/LT4T-HCTQ>.

growth post-2012 was stagnant or slow.<sup>152</sup> To shareholders, Google has been generally attributing revenue increases to “interrelated factors,” including “growth in advertiser activity.”<sup>153</sup> But as this author’s experience with Google Ads shows, Google has the ability to generate advertiser activity through steering and tying. It is impossible to know whether Google also quietly steers demand by the way that it allocates the use of data when making ad-matching decisions.<sup>154</sup>

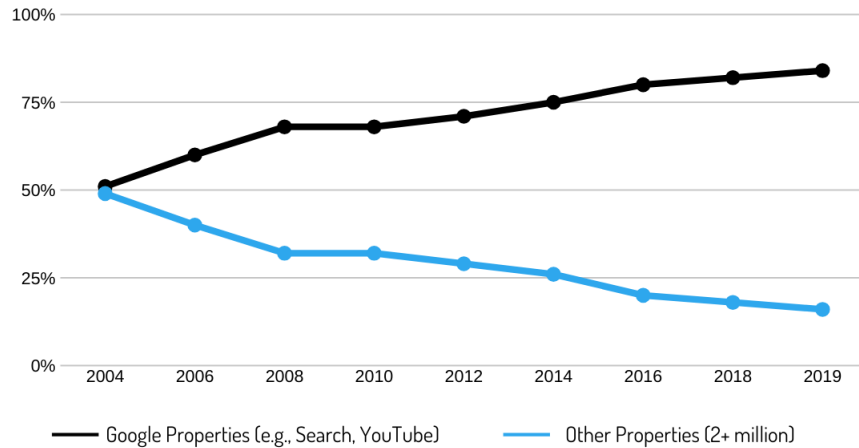
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152. See Danny Sullivan, *Google Still Doing at Least 1 Trillion Searches per Year*, SEARCH ENGINE LAND (Jan. 16, 2015), <https://perma.cc/9URP-VU7B> (summarizing that Google was issuing the same daily search number of 3 billion in 2015 that it disclosed in 2012, that comScore numbers showed a 5% gain from 12/2012 to 12/2014, and that the analysis by journalist Charles Arthur suggests low search usage from mobile devices).

153. Alphabet Inc. (2019), *supra* note 10, at 30 (attributing revenue increases to “interrelated factors including increases in search queries resulting from ongoing growth in user adoption and usage, primarily on mobile devices, continued growth in advertiser activity, and improvements we have made in ad formats and delivery”).

154. Google charges advertisers by user conversion (i.e., when a user takes a specific action). Thus, when Google knows that a user is a conversion target, it can distort competition between sellers by displaying an ad to that user when they are on a Google property, as opposed to a third-party property. In financial markets, trading intermediaries owe fiduciary or best interest duties to customers, which requires them to allocate trading decisions in a fair and equitable manner. For example, intermediaries cannot engage in “trade allocation,” the allocation of favorable trades to certain accounts and less favorable trades to other accounts.

**Figure 6:** Share of Google Ad Revenues Going to Google vs. Non-Google Properties 2004-2019<sup>155</sup>



In addition to steering advertisers to Google properties, Google's trading intermediaries steer buyers and sellers to execute orders on Google's exchange. Until 2016, on the buy-side, Google Ads *only* routed advertisers' bids to Google's exchange.<sup>156</sup> Meaning, if the local dry cleaner used Google Ads to bid on ad space belonging to *The Register*, Google Ads did not route the dry cleaner's bids to competing exchanges belonging to AppNexus, Index, and Pubmatic, where *The Register* inventory may have been trading for lower prices. According to a claim by the CEO of rival exchange AppNexus, Google's enterprise buying tool DV360 engaged in similar conduct.<sup>157</sup> Today, though both DV360 and Google Ads

155. See Google Inc. (2005-2016) and Alphabet Inc. (2017-2020), *supra* note 10. Note: Google acquired YouTube during Q4 of 2006. "Google Properties" also includes properties such as Gmail. See *supra* notes 10-12.

156. *DoubleClick Ad Exchange*, *supra* note 34.

157. Sarah Sluis, *AppNexus CEO Brian O'Kelley on Waging a Price War*, ADEXCHANGER (Nov. 9, 2017), <https://perma.cc/8KHY-MGX6> (then-CEO of

technically route orders to non-Google exchanges, they would still disproportionately route orders to Google's because of the speed and information advantages discussed in Part III.A.<sup>158</sup>

Google's ad server, the dominant intermediary on the sell-side, also steers orders to Google's exchange. From 2010 through 2018, the ad server restricted websites from transacting with advertisers through non-Google trading venues in two ways.<sup>159</sup> First, Google prohibited websites from routing their ad space to multiple venues at the same time,<sup>160</sup> the

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Google rival exchange AppNexus stating that "Google is quietly allocating demand toward AdX, but without making any rationale to the buyer as to why. It's bad for the buyer. It's bad for the publisher").

158. GOOGLE, ONLINE PLATFORMS AND DIGITAL ADVERTISING COMMENTS ON THE MARKET STUDY INTERIM REPORT 11 (2020), <https://perma.cc/CL3R-ZL4M> (Google claiming that it is "wrong" to think that Google Ads and DV360 prefer Google's exchange). *But see* Google Ad Manager Help, *supra* note 46 (explaining that publishers benefit from greater "auction pressure" and higher demand for their inventory in Google's exchange when advertisers use DV360 and Google Ads because of user ID and speed reasons).

159. For a thorough explanation on how Google's ad server restricted competition in the exchange market, see Damien Geradin & Dimitrios Katsifis, *An EU Competition Law Analysis of Online Display Advertising in the Programmatic Age*, 15 EUR. COMPETITION J. 55 (2019).

160. The process of routing advertising impressions to exchanges in sequence was also called "waterfalling" or "daisy-chaining." In the online advertising market's early days, before the invention of real-time impression-by-impression bidding through exchanges, it was rational for the ad server to provide publishers with sequential routing because publishers sold their ad space to advertisers and through ad networks for fixed CPM prices. However, once the market structure migrated to real-time impression-by-impression bidding in the late 2000s, sequential routing stopped being rational and started to operate as a restriction on exchange competition. A rough parallel today might be if a financial intermediary prohibited financial exchange competition based on a legacy practice designed in the days of floor-based trading. *See* Gavin Dunway, *What Is the Waterfall?*, ADMONSTERS (Feb. 23, 2017), <https://perma.cc/Q8BR-2M9V> (further discussing history of waterfalling); Bitton & Lewis, *supra* note 15, at 13 (further explaining how waterfalling has its origins in the early 2000s and was used by

way that shares of stock, airline tickets, and sports tickets trade in multiple marketplaces at once.<sup>161</sup> Pitting ad exchanges against each other would let the demand in each exchange naturally drive prices up. In advertising, however, websites had to go through their ad server, which was most commonly Google's (90+% market share).<sup>162</sup> Google's ad server let publishers route their inventory to one exchange at a time, in sequential order—requiring a site like *The Register* to route ad space first into Exchange A, then to Exchange B, only if Exchange A passed on the opportunity.

A second way that Google's ad server restricted competition between exchanges was by incentivizing websites to route their ad space to Google's marketplace first: if a site did, the server permitted a limited

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publishers selling inventory for fixed prices); George Slefo, *Google's Exchange Bidding Makes Its Debut: Here's What You Need to Know*, ADAGE (Apr. 4, 2018), <https://perma.cc/E5HH-N6NZ> (reporting on Google's official launch of "Exchange Bidding," which permitted publishers to route their ads from their Google ad server to multiple exchanges at the same time).

161. Stocks trade on public exchanges, such as the NYSE and Nasdaq, and on 30+ Alternative Trading Systems (ATSs).

162. Complaint at 42, *Devaney v. Google*, No. 5:20-cv-04130 (N.D. Cal. June 22, 2020); Keach Hagey & Vivien Ngo, *How Google Edged Out Rivals and Built the World's Dominant Ad Machine: A Visual Guide*, WALL ST. J. (Nov. 7, 2019).

form of exchange competition (that highly favored Google) in return.<sup>163</sup> Most publishers did exactly that to maximize yield on their inventory.<sup>164</sup>

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163. Specifically, if publishers routed their ad space to Google's exchange through a feature Google called "Dynamic Allocation," Google's ad server permitted Google's exchange—and only Google's exchange—to compete against the "floor prices" that publishers statically set for rival exchanges. To be clear, those floor prices were required by the ad server to be manually set by publishers. Publishers commonly set those values to equal what an exchange historically cleared ad space for on average. Static floor prices post-2010 made little sense, since exchanges could return a live informed bid for particular impressions if Google's ad server permitted them to do so. Such was Google's ad server's official setup from 2010 through 2018, though the market migrated to real-time impression-by-impression bidding in the late 2000s. The subject of Google's ad server's continuance of this Dynamic Allocation conduct post-2010 is a point of particular contention. In a recent filing to the Australian competition regulator, Google defended its conduct on the basis that it was DoubleClick, not Google, that introduced Dynamic Allocation before Google's acquisition of the company in 2008. It pointed to the fact that a page on DoubleClick's website from 2007 discusses Dynamic Allocation in conjunction with a DoubleClick exchange. However, the public record shows that DoubleClick at the time had neither officially launched an exchange nor put to practice this Dynamic Allocation conduct. The competitive effects of any dynamic allocation conduct in 2007 would also have been substantively different, since plans for a DoubleClick exchange did not include real-time impression-by-impression bidding. Additionally, a former DoubleClick employee shared with me (uncorroborated) that DoubleClick had developed plans for an exchange to spur acquisition interests and that such interests did follow *The New York Times'* coverage of DoubleClick's exchange plans. Telephone Interview with former DoubleClick employee (Feb. 14, 2020). Based on this person's account, DoubleClick specifically pitched the sale of the DoubleClick ad server as something that a firm in the intermediary trading market could leverage and claimed that Google executive Neal Mohan had a spreadsheet that specifically modeled rent extractions through such leveraging during merger negotiations. Note: that narrative may counter the FTC's assessment of the merger and its conclusion that Google would not be able to leverage the DoubleClick ad server to preference itself in the ad trading intermediation market. See *Maximizing Advertising Revenues for Online Publishers*, GOOGLE (2010), <https://perma.cc/3VE9-YWPF> (original announcement describing how Google's ad server let Google's exchange compete in real-time against other exchanges' static prices); Google Ad Manager Help, *Dynamic Allocation*, GOOGLE (2020),

Discriminatory routing of order flow from the sell-side and buy-side to Google's exchange jumpstarted Google's entry into the exchange market. Google entered a crowded market in 2009, and by 2013, Google's exchange was trading the most volume. Rival exchanges, starved of liquidity, fell quietly in parallel.

But this practice and resulting competition problem is neither new nor novel. Operating parallel to Google's timeframe, in the equities market, the broker dealer Barclays started preferentially routing its clients' stock orders into Barclays' recently launched "dark pool" — a trading venue where parties can trade with each other anonymously.<sup>165</sup> By 2013,

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<https://perma.cc/929B-GDRA> (further explaining how this tactic worked and continues to work in limited form); Michalis Pachilakis et al., *No More Chasing Waterfalls: A Measurement Study of the Header Bidding Ad-Ecosystem*, ASS'N COMPUTING MACHINERY (2017), <https://perma.cc/RSZ4-M4BC> (summarizing that Google's exchange historically competed against other exchanges' "average price of [] past purchases"); Sarah Sluis, *The Rise of "Header Bidding" and the End of the Publisher Waterfall*, ADEXCHANGER (June 18, 2015), <https://perma.cc/MPY6-6X9F> (further explaining how Google's ad server preferentially routed advertising inventory to Google's exchange); Bitton & Lewis, *supra* note 15, at 15-16, 25 (defending Dynamic Allocation preferencing conduct as something invented by DoubleClick and not Google); Louise Story, *DoubleClick to Set Up an Exchange for Buying and Selling Digital Ads*, N.Y. TIMES (Apr. 4, 2007), <https://perma.cc/2LBZ-5PQY> (reporting on DoubleClick's plans to launch an exchange); *FTC Closes Investigation*, *supra* note 80; *supra* Part III.A.1. Additionally, in 2015, Google's ad server let Google's exchange access and sell additional high-value website advertising inventory and did not grant non-Google exchanges access to the same. John McDermott, *Google Sweetens Deal for Publishers with Dynamic Price Floors*, DIGIDAY (Mar. 5, 2015), <https://perma.cc/8PKK-CE7L> (reporting that, according to a Google customer support page, Google's ad server routes publishers' direct-sold impressions only to Google's ad exchange).

164. Barry Levine, *MarTech Landscape: What Is Header Bidding — and Why Should Publishers Care?*, MARTECH TODAY (Dec. 21, 2015), <https://perma.cc/NQC3-NAFF> ("Many of the site publishers utilizing Google's DFP ad server employ a setting that allows its Ad Exchange (AdX) to outbid any of the winning waterfall bidders by even a penny per CPM, because AdX gets the last bid. This is supposed to maximize yield, but it also puts AdX in a privileged position.").

165. Amended Complaint, *New York v. Barclay Inc.*, No. 451391/2014



Barclays' specialized trading venue became one of the top two in the U.S. In the equities market, however, we protect the market from these types of competition problems by prohibiting this type of steering conduct. The investment bank eventually paid \$70 million dollars in fines to settle charges brought by the NYAG and the SEC.<sup>166</sup>

In addition to distorting competition in the exchange market, it is important to note how routing order flow to Google's exchange may have also resulted in welfare problems. For example, by blocking a publisher from routing its ad space to exchanges simultaneously, Google's ad server could sell the publisher's space to, for example, the Google-owned intermediary Google Ads for a high bid of a \$10 CPM, even though demand from advertisers in rival exchanges might have otherwise pushed this clearing price up.<sup>167</sup> In other words, by excluding competition, a publisher like *The Post* might have made less advertising revenue than it otherwise would have. Did these lower clearing prices benefit the advertisers buying through Google Ads? Again, the answer to this question remains unclear. Because Google arbitrages between two Google-controlled marketplaces, lower prices may have instead permitted Google as the intermediary to retain a wider spread.<sup>168</sup>

## 2. Market Creates Invention to Circumvent Routing Restrictions

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(N.Y.S. 2d 2015), [hereinafter *Barclay Inc.*] (discussing Barclays' preferential order routing practices, market share, and alleging Barclay made material misrepresentations to customers about how it operated its dark pool).

166. *Barclays, Credit Suisse Charged with Dark Pool Violations*, U.S. SECURITIES AND EXCHANGE COMMISSION (Jan. 31, 2016), <https://perma.cc/54KJ-LWWD> (announcing settlement of NYAG and SEC claims against Barclays).

167. Note that bids from non-Google intermediaries could be excluded from participating in Google's exchange due to latency reasons discussed in Part III.A.

168. See *supra* note 15.

*and Set Own Speeds*

Of all Google's steering and discriminatory routing conduct, the one that drew the most ire in the industry was Google's ad server not letting publishers simultaneously route their ad space to more than one exchange at once. When exchanges like the NYSE reflected a huddle of traders on a street "curb" or trading floor, it was a physical feat to trade on more than one exchange at a time. That was also why the NYSE was a natural monopoly for over a century. But the advent of electronic communications broke down these walls and ushered in a watershed of electronic exchange competition. Shares of Microsoft stock now trade on dozens of electronic trading venues at the same time, pitting exchanges against each other to fight for market share and drive down trading costs. Why couldn't ads?

At the tail end of 2014, publishers started to use a technological hack to get around Google routing restrictions and push the advertising market to function more like other sophisticated electronic trading markets.<sup>169</sup> The invention, commonly called "header bidding," required websites to insert a piece of JavaScript code into the *header* section of their webpages. As soon as a user visited a page, the JavaScript would route the website's ad space to multiple exchanges simultaneously, before

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169. The industry has copiously covered header bidding and how this workaround was designed to circumvent Google restrictions specifically. See *Header Bidding: Holistic Ad Serving Is Here*, AD OPS INSIDER (June 1, 2015), <https://perma.cc/WR2F-WHCN>; Sluis, *supra* note 163; Ross Benes, 'An Ad Tech Urban Legend': An Oral History of How Header Bidding Became Digital Advertising's Hottest Buzzword, DIGIDAY (June 16, 2017), <https://perma.cc/97F8-F3ZJ/>; Michal Wlosik, *Client-Side vs. Server-Side Header Bidding: Pros and Cons*, CLEARCODE (Apr. 17, 2019), <https://perma.cc/6N8Q-NJJZ> (stating that header bidding "originally emerged as a novel solution to remedy the inefficiency, and Google's preference, of its own ad exchange (AdX), during the waterfall ad-buying process . . ."); Sarah Sluis, *The Year Header Bidding Went Mainstream*, ADEXCHANGER (Dec. 27, 2016), <https://perma.cc/E6AW-QNGZ/> ("After all, the priority that Google gave its Ad Exchange service kicked off the whole header bidding trend.").

Google's ad server had time to kick in and prevent them from doing so.<sup>170</sup> The invention permitted a site like *The Post* to start routing its inventory to a dozen exchanges at once, instead of routing them to Google's exchange first, something *The Post* now does.<sup>171</sup>

The original version of header bidding (called "client-side") also provided buyers and sellers with advantages when it came to speed. Specifically, it let publishers set the time that exchanges have to respond with their winning bids, which publishers started lengthening to account for more bids from slower traders.<sup>172</sup> Setting speeds several seconds long would cause users to load pages without ads or cause users to leave the page while impatiently waiting for pages to load. But giving exchanges *incrementally* more time—a fraction of a second that users might not notice—excluded fewer bidders from auctions and resulted in more and higher bids returned.<sup>173</sup>

Typically, publishers set these exchange timeouts to 500-1000 milliseconds (one-half to one second), but the default for the leading header

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170. See Vidakovic, *supra* note 83; Pachilakis et al., *supra* note 163.

171. # ADS.TXT FILE FOR WASHINGTONPOST.COM, <https://perma.cc/46UY-23SL> (last visited Nov. 17, 2020) (an initiative from the Interactive Advertising Bureau Technology Laboratory listing the companies authorized to sell *The Washington Post* inventory).

172. With client-side header bidding, websites use a "wrapper" to set a "universal timeout," which is the time limit within which all exchanges competing for ads must submit a bid. See, e.g., *Basic Prebid.js Example*, PREBID (2020), <https://perma.cc/59DN-RMSR>.

173. See, e.g., Lynne Johnson, *Publishers Should Experiment with Timeouts to Bring in Higher Bids*, ADMONSTERS (Sept. 26, 2019), <https://perma.cc/M4YP-FLDR>; *Index Exchange Introduces Adaptive Timeout, Incorporating Machine Learning into Header Bidding*, GLOBENEWSWIRE (May 20, 2019), <https://perma.cc/2HB3-NLX4> (explaining the correlation between auction speed and revenue: "By adaptively modifying the timeout, the feature ensures the maximum number of bids make it to the publisher, thereby increasing revenue, while improving user experience in each unique condition . . ."); *How to Optimize Header Bidding Setup*, PREBID, <https://perma.cc/NG7G-HWKC> ("Working with 10 bids (orange) makes incrementally more money as the ad server waits longer. But the 5 bids revenue plateaued.").

bidding vendor PreBid is set to 3000 milliseconds (three seconds).<sup>174</sup> One report based on data from 300+ publishers recommended publishers set their timeouts to at least 1157 milliseconds, finding publishers routinely exclude higher bids from slightly slower traders when they set stricter timeouts.<sup>175</sup> In a roundabout way, this setup empowered sellers of ad space to neutralize any speed advantage that Google Ads and DV360 had in Google's exchange due to colocation.

The client-side header bidding invention also increased trading transparency, permitting market participants to better understand how speed and competition go hand-in-hand. Publishers could now monitor how many milliseconds it took exchanges to return bids.<sup>176</sup> If a publisher set its timeouts at 800 milliseconds, and saw that this timeout excludes higher bids from exchanges that arrived at 820 milliseconds, the publisher might re-set its timeouts to 820 milliseconds to increase competition for its ad space and drive prices up.

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174. *Publisher API Reference*, PREBID (2020), <https://perma.cc/P23L-2824>. Though 3,000 milliseconds (three seconds) was a long time for users, a study of 35,000 websites showed that this amount of time in fact captured 90% of bids returned on average. Note: an observed overall timeout is different than the exchange timeout set by the publisher. Pachilakis et al., *supra* note 163 (showing that 600 milliseconds was an observed median timeout and 3,000 milliseconds was a common timeout that captured 90% of bid responses). Ultimately, publishers tested different millisecond settings, weighing their interests in readership and revenue to find an optimal balance for their own business. *See generally* Johnson, *supra* note 173; *Prebid.js FAQ*, PREBID (2020), <https://perma.cc/9AYE-BR5E> (summarizing that publishers should adjust speeds to fill inventory “at the highest CPMs without adding too much latency in the process”).

175. Johnson, *supra* note 173; *MonetizeMore Publisher Metrics August 2019*, MONETIZEMORE (2019), <https://perma.cc/V49A-2FAA>.

176. Vidakovic, *supra* note 83 (showing a screenshot of this transparency); *see also* Appendix B.

Google initially argued that header bidding disadvantaged websites because it was too slow.<sup>177</sup> But the advantages that the invention provided—transparency, control over latency restrictions, and the ability to route inventory to multiple exchanges simultaneously—led publishers to rapidly adopt it. In 2015, within months of its debut, header bidding was already the hot topic at industry conferences.<sup>178</sup> By 2016, approximately 70% of major U.S. publishers adopted it.<sup>179</sup> By early 2018, 80% of news publishers were on board.<sup>180</sup>

The effects of unleashed competition reverberated quickly through the industry. More competition from exchanges and slower bidders

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177. Levine, *supra* note 164 (discussing an AppNexus executive's rebuttal that header bidding decreased latency since 78% of header bidding transactions concluded within 200 milliseconds, whereas only 12% of sequential auctions did).

178. *Id.* ("Next to ad blocking, header bidding is one of the hottest topics among digital advertisers and website publishers."). This market development was widely viewed in the industry as presenting a viable mechanism to challenging Google's hold in the exchange and buying tool markets, as well as Google's ability to possibly extract wide intermediary spreads. See generally Ciaran O'Kane, *Why 2016 Was the Beginning of the End of the Current Ad Tech Cycle*, EXCHANGEWIRE (Dec. 23, 2016), <https://perma.cc/GPX7-EM6G> ("Header bidding was the ultimate assault on the ad server. It caught Google completely off guard. Its money pit – dynamic allocation – was being challenged through its own tech."); Sluis, *supra* note 169 (where an industry executive notes how fast Google took note of and responded to header bidding).

179. See generally Sluis, *supra* note 169; Wlosik, *supra* note 169 (discussing why header bidding became the new industry standard); *Header Bidding Gains Momentum, Drives Up Publisher Ad Revenue*, BUS. INSIDER (May 3, 2016), <https://perma.cc/YFF2-KBVJ> (executive with AppNexus sharing that nearly 70% of top publishers in the U.S. adopted header bidding); A. Guttmann, *Share of Publishers Doing Header Bidding in the United States as of November 2017*, STATISTA (Oct. 1, 2017), <https://perma.cc/J5HY-8QDL> (showing 71.6% of publishers in the study in the U.S. adopted header bidding); *U.S. Websites that Use Header Bidding, by Category, Sep 2017-May 2018*, EMARKETER (2017), <https://perma.cc/KF2V-ZH8H> (showing that as of May 2018, 81% of news publishers in the US were using header bidding).

180. *U.S. Websites that Use Header Bidding, supra* note 179.

caused publishers' ad revenue to soar overnight, often by 40-70%.<sup>181</sup> Ad prices on one entertainment and news media publisher increased by 50%.<sup>182</sup> Another publisher reported a daily revenue increase of 40% within the first day of routing to multiple exchanges and an increase of 100% in the longer-term.<sup>183</sup> Other sites echoed revenue increases of over 100%.<sup>184</sup> What this all meant was that by suppressing competition from non-Google exchanges, Google had cost publishers real revenue, sometimes significant sums. This was no small development for publishers large and small reeling from the demise of print advertising and migrating to sophisticated electronic trading.

3. *Google AMP Speed Protocol Restricts Trading Through Non-Google Venues*

With stock trading, speed races have shifted from physical proximity, colocation, and re-wiring cables in a straight line, to the installation of

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181. Levine, *supra* note 164 (executives from Index and PubMatic exchanges noting adoption of header bidding resulted in a 30-50% lift in CPM prices); Ricardo Bilton, *With Header Bidding, Publishers Are Boosting CPMs by as much as 50 Percent*, DIGIDAY (Nov. 12, 2015), <https://perma.cc/SZZ9-5TBM>.

182. PubMatic Staff, *How PubMatic's Header Bidding Technology Helped an Entertainment and News Media Company Increase CPMs By 50%*, PUBMATIC (Apr. 28, 2016), <https://perma.cc/343S-4JQ9> (stating that the adoption of header bidding caused entertainment and news publisher CPMs to increase on average by 50% and caused a daily revenue increase of 9-16X on Pubmatic's exchange).

183. Alex Groth, *Header Bidding Is a Game Changer for Smaller Publishers*, ADMONSTERS (Nov. 3, 2016), <https://perma.cc/J5F9-PMUJ> (noting that publisher and ad network Gladly states average daily revenue increased by 40% after the first day of routing to multiple exchanges at the same time and that average revenue in the long-term increased 100%).

184. *PulsePoint Enables Publishers to Bypass Waterfall Inefficiencies with Header Bidding; Average CPM Increases 147%*, BUS. WIRE (Apr. 21, 2016), <https://perma.cc/NU6A-QC5X> (announcing that the adoption of header bidding caused PulsePoint publisher CPMs to increase 147% on average).

new transatlantic cables and cross-country microwave networks.<sup>185</sup> In advertising, when Google could no longer preferentially route ad space to its own exchange, the tug-of-war pivoted increasingly to speed. Just as publishers and advertisers were adopting header bidding at a rapid pace to work around Google's restrictions related to routing, speed, and transparency, Google introduced a software development framework called Accelerated Mobile Pages (AMP).<sup>186</sup> At a simple level, AMP is a framework that websites can use to create fast-loading mobile web pages. In part by limiting the types of programming codes that can be used on a page, AMP pages load faster than they otherwise would.<sup>187</sup> However,

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185. For an overview, see AQUILINA ET AL., *supra* note 24.

186. Google announced the AMP Project on October 7, 2015 and first launched it early 2016. Though AMP is open source (meaning, it is developed as a public collaboration), it is widely viewed as a Google initiative because Google employees spearheaded its development. As a result, the news media frequently refers to AMP simply as "Google's AMP." See, e.g., Sarah Sluis, *Google's Accelerated Mobile Pages Aim to Speed Content and Ad Load Times*, ADEXCHANGER (Oct. 7, 2015), <https://perma.cc/HD8K-ZA79>; Mark Scott, *Google's Mobile Web Dominance Raises Competition Eyebrows*, POLITICO (June 1, 2018), <https://perma.cc/TF7S-QFYG>; Danny Crichton, *Answering Its Critics, Google Loosens Reins on AMP Project*, TECHCRUNCH (Sept. 18, 2018), <https://perma.cc/VLF7-RRMT>; *A Letter About Google AMP*, AMPLETTER.ORG (Jan. 9, 2018), <https://perma.cc/5XN5-3B5R>; Frederic Lardinois, *Google's AMP Project Expands Beyond News*, TECHCRUNCH (Aug. 2, 2016), <https://perma.cc/VLF7-RRMT>; Julia Greenberg, *Google's AMP Will Make the Mobile Internet Faster Early Next Year*, WIRED (Dec. 9, 2015), <https://perma.cc/4GMV-TR7Z>; Scott Gilberston, *How Google's AMP Project Speeds Up the Web—By Sandblasting HTML*, ARS TECHNICA (Nov. 3, 2015), <https://perma.cc/E8EE-FRGH>.

187. The speed at which web pages load is important for consumers and publishers and there are different ways that consumers and publishers can get pages to load faster. For instance, consumers might pay their internet service provider more for quicker download speeds or publishers can follow best practices in web design to optimize page load speeds. AMP pages load fast because they limit the use of JavaScript, only permit asynchronous JavaScript execution, and are cached. For further discussion of AMP and its restrictions, see *How AMP Works*, AMP.DEV (2020), <https://perma.cc/XBN7-4UU3>; *How AMP Pages Are Cached*, AMP.DEV (2020), <https://perma.cc/SAE8-9JKQ>.

there are caveats to Google's approach to speed with AMP. The AMP framework restricts the use of JavaScript, which is precisely the code that websites needed to use to make the client-side header bidding invention work.<sup>188</sup>

Google framed AMP as something that maximizes consumer welfare: faster loading pages are better for consumers. But the question of whether faster-and-faster page speeds maximize consumer welfare is more complicated. If John is reading a news site and a page loads too slow, he might quickly switch to another site in the hopes of finding a similar article that loads faster.<sup>189</sup> The sites that keep up with John's preference for speed

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188. Later, RTC wrappers were developed to permit publishers to route their ad space through header bidding. However, because these RTC wrappers impose tight restrictions on the number of entities that publishers can route to (a max of five vendor calls overall), only permit one vendor cookie-sync, and impose strict trading timeouts (of 1000 ms), the industry has continued to speak of AMP as being simply incompatible with client-side header bidding, which was founded on publishers being able to control both these things. See *AMP Real Time Config*, GITHUB (2020), <https://perma.cc/39PA-LQYK>; *Monetizing Your AMP Page with Ads*, AMP.DEV (2020), <https://perma.cc/4J9K-CEGP> ("In non-AMP pages (traditional HTML), if you want to display ads on your page, you'd include a snippet of JavaScript to serve ads from your ad network. For performance and security reasons, you cannot include third-party JavaScript in AMP pages. So, to display ads in AMP, you need to add the custom amp-ad component to your AMP page."); Geradin & Katsifis, *supra* note 158 (discussing AMP's incompatibility with traditional client-side header bidding). More recently, AMP has loosened restrictions around the use of JavaScript but remains incompatible with client-side header bidding in its original form. *amp-script: AMP [heart] JS*, AMP.DEV (2020), <https://perma.cc/FT93-UFS6>; *Amp-Script*, AMP.DEV (Aug. 21, 2019), <https://perma.cc/7RLC-NQSP> (acknowledging that the availability of JavaScript was "one of the most important requests from developers using AMP").

189. According to Google, pages that take longer than three seconds to load lose 53% of mobile visits. However, it is unclear whether this statistic excludes bot traffic. David Kirkpatrick, *Google: 53% of Mobile Users Abandon Sites That Take Over 3 Seconds to Load*, MARKETING DIVE (2020), <https://perma.cc/BSL5-6LMA>. But see Jake D. Brutlag et al., *User Preference and Search Engine Latency*, Joint Statistical Meeting Proceedings (2008) (demonstrating that user preference for faster search engines kicks in at or after the three second latency mark).



will have more ad space to sell, which is how page speed also correlates with publisher welfare.<sup>190</sup>

However, publishers also face trade-offs when it comes to speed that ultimately impact consumer welfare. When AMP first launched, AMP pages loaded so fast, they sometimes loaded for users before sites could return ads at all.<sup>191</sup> AMP pages were also incompatible with JavaScript, the code that publishers relied on to route their ad space to multiple exchanges with header bidding. If publishers make less revenue selling ad space, they have less to re-invest into the content that consumers want to consume. Thus, at a certain point, fast-loading pages come back to hurt consumer welfare.

Nevertheless, Google started to condition premium treatment on Google Search—a market where Google has 88% market share in the U.S.—on publishers' migration to AMP. For example, to have news articles displayed at the top of Google Search results, in the "News Carousel" that features news articles in a visual and swipe-able format, websites generally have to use AMP.<sup>192</sup> Google Search also includes a lightning

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190. Consumers now use their phones more than their computers and publishers receive approximately 60% of their traffic from mobile use. Mason Walker, *Americans Favor Mobile Devices Over Desktops and Laptops for Getting News*, PEW RSCH. CTR. (Nov. 19, 2019), <https://perma.cc/67NV-4LB3> (Pew Research survey showing roughly 6 in 10 US adults access news from a mobile device); Sluis, *supra* note 186 ("The Washington Post, for one, said its audience is 60% mobile, roughly average for most publishers."); BRIGHTEDGE 2018 MID-YEAR MOBILE RESEARCH ROUNDUP, BRIGHTEDGE RSCH. (2020), <https://perma.cc/TPR8-SKV5> ("62% of traffic in a large sample coming from mobile and tablet search.")

191. Garrett Sloane, *Publishers Find Google's Amp Speeds Up Pages, But Ads Are Still Slow*, DIGIDAY (Apr. 21, 2016), <https://perma.cc/WEU4-PK25>; see also Sarah Sluis, *With Ads in Place, Google Takes Training Wheels Off of AMP*, ADEXCHANGER (Feb. 18, 2016), <https://perma.cc/DY36-MWJG> ("Faster-loading pages may lead to a rise in page views. But AMP doesn't support more complex, higher-paying ads, like interstitials, which could dampen yield.")

192. *Search Engine Market Share United States of America*, *supra* note 111; Barry Schwartz, *Google Reserves News Carousel for AMP Pages Only*, SEARCH

bolt icon next to AMP pages in the search results, signaling to users that those pages load fast.<sup>193</sup> To participate in the News Carousel, or have a lightning bolt, a publisher has to use AMP and forgo the implementation of header bidding using JavaScript.

With these developments, the advertising technology companies like PreBid and Rubicon Project that developed the original header bidding inventions started to build a modified version that complied with Google AMP JavaScript restrictions and improved on the original version's latency challenges.<sup>194</sup> To speed things up and work around AMP JavaScript constraints, these vendors moved auctions back to third-party *servers*, which is commonly called "server-side" header bidding.

It was around this time, in April of 2016, that Google's ad server relented and started letting some publishers route their ad space to multiple exchanges at the same time.<sup>195</sup> Google encouraged publishers to start

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ENGINE ROUNDTABLE (Mar. 2, 2016), <https://perma.cc/CM5G-KBMB> (reporting that Google announced that News Carousel is only open to publishers using AMP); Google Developers, *Structured Data: Article*, GOOGLE, (Feb. 7, 2020), <https://perma.cc/62LS-SLBP> (stating Google has since opened up the News Carousel to non-AMP pages but only when other pages in the News Carousel are not AMP pages); Greg Sterling, *Google Adding More News Content to 'Top Stories' in Search Results*, SEARCH ENGINE LAND (Dec. 11, 2019), <https://perma.cc/QH8X-XUNS> (noting that all top pages in the News Carousel "appear to be AMP formatted"). *But see Evaluating Page Experience for a Better Web*, OFF. GOOGLE WEBMASTER CENT. BLOG (2020), <https://perma.cc/6WGT-9QV3> (announcing that Google will soon no longer require a site to use AMP to be included at the top of Google Search mobile stories).

193. Lucia Moses, *The Guardian Is Getting 60 Percent of Its Google Mobile Traffic from AMP*, DIGIDAY (Mar. 8, 2017), <https://perma.cc/2Vfy-5CY6> (stating that users increasingly recognized that the lightning bolt meant that pages would load instantly).

194. *See generally Server Side Header Bidding Explained*, AD OPS INSIDER (Jan. 25, 2017), <https://perma.cc/S99F-R4EQ>; Sarah Sluis, *Header Bidding Goes Server-Side: 6 Things You Should Know*, ADEXCHANGER (Jan. 11, 2017), <https://perma.cc/73BS-GFB7>.

195. Google piloted the capability on April 13, 2016, beta launched it on

routing their ad space to exchanges synchronously directly from their Google ad server. Implicitly acknowledging how its legacy routing restrictions had harmed market participants, Google now encouraged publishers to route their space to multiple exchanges to augment advertising revenues by as much as 40%.<sup>196</sup>

However, the server-side versions of header bidding re-introduce information and speed asymmetries between bidders, which can dampen competition. Specifically, they impose tighter latency restrictions and re-

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June 8, 2017, and officially launched it on April 4, 2018. Google initially called the feature Exchange Bidding but renamed it in August 2019 to Open Bidding. See Jonathan Bellack, *Improving Yield, Speed and Control with DoubleClick for Publishers First Look and Exchange Bidding*, GOOGLE (Apr. 13, 2016), <https://perma.cc/LMU4-ENCQ>; Sam Cox, *Announcing Exchange Bidding Open Beta*, GOOGLE AD MANAGER BLOG (June 8, 2017), <https://perma.cc/NE43-E723>; Ronan Shields, *Google Announces Full Rollout of Exchange Bidding to Counter Header Bidding Rise*, DRUM (Apr. 4, 2018), <https://perma.cc/G7NW-7FZZ>; Authorized Buyers Help, *Publisher Inventory Transitioning to a Unified First-price Auction*, GOOGLE (2020), <https://perma.cc/2LRT-R2B3> (announcing renaming to Open Bidding).

196. Shields, *supra* note 195 (“The rollout has taken place a little under a year since Google first launched Exchange Bidding in open beta (after an earlier 12 month private pilot scheme) with the online behemoth claiming that trials had seen earlier participants bolster programmatic revenues by as much as 40%.”); Minda Smiley, *OpenX Says Google’s Exchange Bidding Has Led to 48% Revenue Lift for Publishers*, DRUM (Feb. 15, 2018), <https://perma.cc/LRM9-NJAM>; see also Jessica Davies, *Why El Pais Owner Prisa Is Shifting from Header Bidding to Server-side Bidding in 9 Markets*, DIGIDAY (Sept. 22, 2017), <https://perma.cc/P52D-34HW> (Spanish publisher Prisa shares that “Google’s server-side option, exchange bidding in dynamic allocation . . . has seen decent yield lifts compared to what Google’s ad exchange is generating”). From an antitrust perspective, given Google’s own evidence of empirical price increases, it is difficult to estimate how Google might justify its historical conduct by pointing to the conduct’s beneficial effects. For the burden that antitrust defendants face under such scenarios, see C. Scott Hemphill, *Less Restrictive Alternatives in Antitrust Law*, 116 COLUM. L. REV. 927 (2016).

sult in higher cookie syncing loss rates, resulting in more bidders not being able to identify users loading pages.<sup>197</sup> Meaning, more bidders may bid less for ad space and be excluded altogether due to latency.

Today, when publishers route their inventory to non-Google exchanges *from* their Google ad server, these problems persist. When it comes to speed, Google's ad server gives exchanges a 160 millisecond timeout, which some people in the industry have noted is too little time for non-Google exchanges to conclude their own auctions and return a bid to Google's server.<sup>198</sup> Increased information asymmetry between Google and non-Google bidders exacerbates this problem. The non-Google intermediaries can deduce the identity of users associated with ad space even less often than they could before, further depressing their ability to compete against DV360 and Google Ads on equal footing.<sup>199</sup>

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197. See Lynne Johnson, *Client-Side vs. Server-Side? It's a Draw*, ADMONSTERS (July 23, 2019), <https://perma.cc/89KA-STR7> (reporting on server-side header bidding's approach to speed and challenges with cookie matching). Server-side auctions are also not transparent, because auctions occur inside of a company's servers, rather than within users' browsers.

198. Kean Graham, *Google's Plans May Not Eliminate Header Bidding*, ADEXCHANGER (July 1, 2016), <https://perma.cc/9AB2-U3JM> (where an executive of an advertising consultancy notes that "DoubleClick Ad Exchange will also have a major advantage because of tiny timeouts for third-party ad networks, making it more difficult for them to submit winning bids in time"). *But see* Google Ad Manager, *supra* note 45 (stating that 160 millisecond timeouts in Google's server-to-server solution decreases bid exclusion).

199. With client-side header bidding, an exchange (such as Index's exchange) retrieves the ID of the user loading a page by reading the user's ID contained in the exchange's cookies on the user's browser. With Google's multiple-exchange bidding approach, competing exchanges cannot directly access the user IDs contained on users' browsers, and must conduct an additional cookie-sync with Google, which increases loss rates. As the firm intermediating this process, Google does not face the same disadvantage. See generally APPNEXUS, HEADER BIDDING: THE NEXT EVOLUTION 10 (2017), <https://perma.cc/9H9T-PEXU> ("The reason [server-side header bidding] lowers cookie match rates is that in client-side header bidding, the header makes ad calls from the browser, where cookies are stored, directly to programmatic demand partners. But in [server-

Google's approach to multiple-exchange bidding restricts competition between non-Google exchanges and buying tools in more brazen ways too. For example, when publishers choose to route their ad space from their Google ad server to multiple exchanges at the same time, Google's ad server requires them to route their space through Google's trading venue and charges an additional intermediary fee for transacting through a non-Google exchange, which is an additional 5-10% of the winning buyer's bid.<sup>200</sup> The fee would be on top of the 10-20% fee that market

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side], the auction takes place away from the browser inside a third-party server, and relies on user syncing between the third-party server and the various demand partners. As a result, it's tougher for advertisers and publishers to sync on user identity."). In addition, if the page the user is loading is a Google AMP page, Google may be able to obtain additional information advantages about the user and the content. *See Scott, supra* note 186 ("Other publishers gripe that AMP gives Google access to coveted user data because almost all of AMP traffic currently runs through the company's own servers.").

200. To be clear, Google's ad server permits publishers to not do business with Google's exchange if they forgo routing their space to multiple exchanges at the same time through Open Bidding. *See Google Ad Manager, supra* note 45 ("With Open Bidding, you can invite trusted third-party exchanges to compete together in real-time alongside Ad Exchange in Dynamic Allocation."); Google Ad Manager Help, *Create and Manage Yield Groups*, GOOGLE (2020), <https://perma.cc/7Q7Z-K3LN> ("Yield groups always include Ad Exchange, and you can also add third-party exchanges and ad networks."); Sarah Sluis, *3 Auctions Rule Digital Advertising. Here's a Guide to Navigating Them*, ADEXCHANGER (Nov. 20, 2019), <https://perma.cc/H3HW-AYWV> ("Google open bidding charges the highest fee, a 5% fee for display and outstream inventory and a 10% fee for video and app. That charge is on top of the exchange fee. So an exchange would take its cut from the buyer's bid, then Google would take its fee."); George Slefo, *Google's Answer to Header Bidding Runs into Headwinds*, ADAGE (July 13, 2017), <https://perma.cc/9MN8-KUPL> (confirming the same). In other words, if a buyer and seller go through Google's ad server to route and clear ad space in the Index exchange, they must pay a fee to Index (e.g., 7% of \$1,000) and an additional fee to Google for using Index and not Google's exchange (e.g., an additional 10%, which would further reduce the publisher's share to \$837). When websites use client-side header bidding to route their ad space to non-Google exchanges, publishers and advertisers have no such additional intermediary fee to absorb. *See*

participants already pay to exchanges.<sup>201</sup> By raising rivals' costs, Google dissuades buyers and sellers from routing trades through non-Google venues.<sup>202</sup> In addition, Google's ad server depresses competition through a price parity rule called "Unified Pricing" that it introduced in 2019.<sup>203</sup> With Unified Pricing, Google's ad server started to prohibit publishers from routing their ad space to different intermediary buying tools and

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Sluis, *3 Auctions Rule*, *supra* note 200 (confirming that the client-side header bidding vendor "Prebid doesn't charge fees because it's an open-source solution.").

201. Sarah Sluis, *Explainer: More on the Widespread Fee Practice Behind the Guardian's Lawsuit vs. Rubicon Project*, ADEXCHANGER (Mar. 30, 2017), <https://perma.cc/5TFE-5L6A> (stating that exchanges usually charge publishers 10-20% of ads' clearing prices); Sluis, *supra* note 200 (noting that exchanges take their cut from the buyer's bid); Sarah Sluis, *Rubicon Got Rid of Its Buy-Side Fees – But Who Else Is Charging Them?*, ADEXCHANGER (Nov. 8, 2017), <https://perma.cc/C7YF-37AB> (reporting that, according to a Google spokesperson, publishers pay Google's exchange a transparent revenue share that varies); Shailin Dhar, *Ad-Tech Tax – What Bracket Are You In?*, MEDIUM (Apr. 7, 2016), <https://perma.cc/LWF9-J8ED> (explaining generally how ad fees work).

202. From an antitrust perspective, this can be thought of as a mechanism to raise rivals' costs. For a discussion of this conduct and consideration under antitrust law, see Steven C. Salop & David T. Scheffman, *Raising Rivals' Costs*, 73 AM. ECON. REV. 267 (1983).

203. Sarah Sluis, *Google Switches to First-Price Auction*, ADEXCHANGER (Mar. 6, 2019), <https://perma.cc/8PT9-VDY7> (discussing Google plans to launch a unified pricing tool); Sluis, *supra* note 104 (discussing the beta launch of unified pricing restrictions). There are additional ways that Google's ad server restrictions competition. For example, Google's ad server shares superior information about publishers' auctions and pricing with competing exchanges that integrate through Google's ad server's Open Bidding feature. Google easily could pass the same information to header bidding auction vendors through an API, for example, but chooses not to. Google markets this information advantage as a reason to forgo header bidding and integrate through Open Bidding. Bigler, *supra* note 135 ("For Authorized Buyers and Open Bidders (formerly known as Exchange Bidding buyers), we'll provide additional information post-auction to help inform your bidding strategies. Buyers will receive the minimum bid price to win after the auction closes. This feedback will help you understand when to bid higher to win valuable inventory.").

through different exchanges at different price floors.<sup>204</sup> The change bans publishers from routing their ad space to, for example, Google Ads, at a price floor of a \$10 CPM, while routing the same space to The Trade Desk at a price floor of a \$9 CPM.

Historically, many publishers set higher price floors for Google Ads because of the information advantages that Google reserves for Google Ads, which were discussed in Part III.A. “Many set Google AdWords at a higher floor price, since its demand often bids very low due to its superior data,” explained industry publication AdExchanger.<sup>205</sup> Setting lower price floors for the non-Google intermediaries was how publishers could manufacture competition from bidders with information disadvantages.

Publishers’ practice of setting higher price floors for the party with information advantages—Google—was rational and output enhancing. For example, in discussing insider trading and information advantages, the late professor and legal scholar Victor Brudney explained: “A rational buyer (or seller) in a market, who knows that the person with whom he is dealing has material information about the value of the product being exchanged which he could not lawfully acquire, will either refrain from dealing with that transactor or demand a risk premium.”<sup>206</sup> In other

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204. Specifically, publishers can set price floors by advertiser and brand, but not by “buyer,” which means not by buying tool such as Google DV360 or Google Ads. This effectively operates as a price restraint on exchanges too. See Google Ad Manager Help, *supra* note 104 (“Advertiser- and brand-specific floor prices can be configured in unified pricing rules. However, per-buyer floor prices are not available.”). Interestingly, Google justifies Unified Pricing rules by arguing that unified price floors serve publisher interests. See Bitton & Lewis, *supra* note 15, at 21.

205. Sluis, *supra* note 104 (“First, publishers often set different floor prices for different platforms. Many set Google AdWords at a higher floor price, since its demand often bids very low due to its superior data. Under the new rules, publishers can’t set rules at a platform level, which Google calls the ‘buyer’ level.”).

206. See Brudney, *supra* note 60, at 356 (“If the market is thought to be systematically populated with such transactors some investors will refrain from

words, if parties cannot demand rational risk premiums when dealing with counterparties with information advantages, they can refrain from dealing altogether. Google's Unified Pricing rules prohibit sellers from asking for such risk premiums and, in the short term, let DV360 and Google Ads buy ad space at the lower floors publishers historically set for rivals, or alternatively, exclude rival bidders through the higher price floors publishers historically set for Google.

From an antitrust and competition policy perspective, Google's approach with Unified Pricing is against the grain of the trend. More and more, these types of price parity provisions have been challenged from a policy and antitrust perspective.<sup>207</sup> E-commerce retailer Amazon dropped similar provisions after they came under scrutiny in the U.S. and

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dealing altogether, and others will incur costs to avoid dealing with such transactors or corruptly to overcome their unerodable informational advantages. None of those responses is socially useful. All raise the cost of capital. And some are simply unlawful attempts to obtain information corruptly from those who are forbidden from disclosing it.”).

207. See Jonathan Baker & Fiona Scott Morton, *Antitrust Enforcement Against Platform MFNs*, 127 *YALE L. J.* 2176 (2018); Andre Boik & Kenneth S. Corts, *The Effects of Platform Most-Favored-Nation Clauses on Competition and Entry*, 59 *J.L. & ECON.* 105 (2016); Ariel Ezrachi, *The Competitive Effects of Parity Clauses on Online Commerce*, 11 *EUR. COMPETITION J.* 488 (2016); Letter from Sen. Richard Blumenthal to Assistant Att’y Gen. Makan Delrahim (Dec. 19, 2018), <https://perma.cc/NY2C-4PBR> (urging the Department of Justice to investigate the anticompetitive effects of the price parity provisions in Amazon’s contracts with third parties); Joe Palazzolo, *Apple Ruling Heaps Doubt on ‘MFN’ Clauses*, *WALL ST. J.* (July 14, 2013), <https://perma.cc/4U9Y-LZVA>.



globally.<sup>208</sup> The Department of Justice (DOJ) and U.S. courts also disfavored similar price restrictions imposed by the electronic marketplaces for airfare tickets.<sup>209</sup>

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208. Amazon, the largest e-commerce retailer in the U.S. and globally, nixed its price parity clauses after increased scrutiny by scholars and others. See Catherine Shu, *Amazon Reportedly Nixes Its Price Parity Requirement for Third-Party Sellers in the U.S.*, TECHCRUNCH (Mar. 11, 2019), <https://perma.cc/PWE9-SHFX> (reporting that Amazon is dropping its price parity provisions with third-party sellers); *Amazon to Alter Pricing Policy for Traders*, BBC NEWS (Aug. 29, 2013), <https://perma.cc/F3XK-74GZ> (reporting that Amazon dropped similar price parity provisions in Europe after investigations by the Office of Fair Trading in the UK and the Federal Cartel Office in Germany).

209. The DOJ and DOT thought such clauses restricted competition between marketplaces, acted as a barrier for new entrants, resulted in effects similar to tying, and ultimately harmed the airlines and consumers. See Computer Reservations Systems (CRS) Regulations, Statements of General Policy, 67 Fed. Reg. 69365 (Nov. 15, 2002) (codified at 14 C.F.R. 255) (“We based our prohibition of the enforcement of the systems’ parity clauses on findings that those contract provisions had the harmful effects of tying provisions—they limited competition between the systems, and they increased the prices paid by the systems’ customers.”); Computer Reservations Systems (CRS) Regulations 69 Fed. Reg. 999 (January 7, 2004) (codified at 14 C.F.R. 255) [hereinafter, “CRS Regulations”] (Section E discussing the history and reasoning behind the most-favored-nation clauses prohibition); *Am. Airlines, Inc. v. Travelport Ltd.*, No. 4:11-CV-244-Y, 2011 U.S. Dist. LEXIS 166373 (N.D. Tex. Nov. 21, 2011) (summarizing how regulation historically and until 2004 prohibited the airfare marketplaces from imposing MFN provisions in their contracts and how the DOT and DOJ were concerned the provisions foreclosed competition between distribution channels). When the DOT issued its final deregulation order, it warned that “clauses requiring participating airlines to provide all fares as a condition to participation may similarly constitute unfair methods of competition because they unreasonably limit each airline’s ability to choose how to market its services.” CRS Regulations. The Second Circuit recently considered a similar restraint by a leading airfare marketplace in *U.S. Airways v. Sabre*. *U.S. Airways v. Sabre Holdings*, 938 F.3d 43 (2d Cir. 2019). In that case, U.S. Airways challenged the fact that Sabre, the leading GDS in the U.S. with 50% market share, had a provision in its contract (called “No Discounts”) that prohibited the airline from routing lower priced tickets into com-

Google's approach is also in direct conflict with the policy approach that lawmakers take with electronic trading in the equities market. There, intermediaries (e.g., brokers) must act in their customers' best interest.<sup>210</sup> Brokers cannot preferentially route order flow to their owned and operated exchange unless doing so best serves the client's interest (e.g. best price).<sup>211</sup> Because Google's trading intermediaries could negotiate out of the duties they owe to publishers and advertisers and no equivalent trading rule exists, Google can adopt a price parity rule that ultimately harms buyers and sellers.

#### 4. *Google Search "Speed Update" Further Restricts Trading Through Non-Google Venues*

Google soon gave publishers a second reason to adopt AMP and forgo header bidding. In 2018, Google Search released a "Speed Update" and started to rank mobile pages according to how fast they load.<sup>212</sup> Specifically, Search started to push pages that were "slow" down in users'

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peting marketplaces. Another provision called "No Better Benefits" required airlines to provide all available inventory to Sabre's GDS. The district court ruled that Sabre's restrictions were illegal vertical restraints that violated Section 1 of the Sherman Act. However, the Second Circuit reversed and remanded the case in light of the Supreme Court's recent holding in *Ohio v. Amex*, 138 S. Ct. 2274, (2018), which rendered the district court's jury instructions around market definition erroneous.

210. See discussion in *supra* note 54.

211. *Id.*

212. Zhiheng Wang & Doantam Phan, *Using Page Speed in Mobile Search Ranking*, GOOGLE WEBMASTER CENTRAL BLOG (Jan. 17, 2018), <https://perma.cc/F972-ZDJV> (announcing full roll-out of "Speed Update"); Addy Osmani & Ilya Grigorik, *Speed Is Now a Landing Page Factor for Google Search and Ads*, GOOGLE (Sept. 23, 2019), <https://perma.cc/7AQT-QJ6H>. Note, Google started using speed as a ranking factor for desktop pages in 2010, but "relevance" for those pages remained the "primary" ranking signal. Additionally, on May 28, 2020, Google announced upcoming changes to how it ranks Search pages. With these changes, Google will start to consider a page's "Core Web Vitals," which

search results. Rather than providing websites with an objective speed requirement or tools to determine speed compliance,<sup>213</sup> Google steered websites to a speed compliant solution: “if you're looking for a fast-by-default framework for your pages, take a look at AMP.”<sup>214</sup> Publishers that did not want to lose their Google Search traffic—which for news publishers can account for 40-50% of incoming traffic—had to comply with this Speed Update.<sup>215</sup>

For its part, Google maintains that it does not have an AMP requirement, only a speed requirement.<sup>216</sup> But many publishers have complained

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includes speed and other factors, and, will no longer require a site to use AMP to be included at the top of Google Search mobile stories. Sowmya Subramanian, *Evaluating Page Experience for a Better Web*, WEBMASTER CENTRAL BLOG (May 28, 2020), <https://perma.cc/XMF5-ATFH>.

213. See Osmani & Grigorik, *supra* note 212; Wang & Phan, *supra* note 212 (where Google acknowledges “there is no tool that directly indicates whether a page is affected by this new ranking factor”). Although Google does not provide a direct tool for publishers to determine speed compliance, Google does offer tools such as the Lighthouse Report, the Speed Scorecard and Impact Calculator, the Chrome User Experience Report, and PageSpeed Insights tool to generally advise about speed performance. See Mark McGonigle, *Slow Down and Think About Google's Speed Update*, DRUM (July 30, 2018), <https://perma.cc/YU89-6KJM>. See also *A Letter about Google AMP*, *supra* note 186 (where more than 600 signees pen an open letter to Google urging the company to adopt a neutral, objective speed criterion).

214. Osmani & Grigorik, *supra* note 212.

215. Lucia Moses, *How Google Is Using Its Search Clout to Steer Publishers to Use AMP*, DIGIDAY (Feb. 15, 2018), <https://perma.cc/67MB-EJWL> (stating that Google makes up about 40% of Chartbeat publishers' referral traffic); Kelsey Arndt, *Publishers, This Is Where Your Traffic Is Going to Come from in 2019*, WHAT'S NEW IN PUBLISHING (Feb. 12, 2019), <https://perma.cc/3PFS-4MXE> (stating that Parse.ly powered sites received over 50% of their external traffic from Google Search in 2018). For a discussion on the correlation between publisher AMP use and traffic loss, see Scott, *supra* note 186.

216. *Understand How Amp Looks in Search Results*, GOOGLE SEARCH (July 14, 2020), <https://perma.cc/4GAL-6FTR> (“While AMP itself isn't a ranking factor, speed is a ranking factor for Google Search. Google Search applies the same standard to all pages, regardless of the technology used to build the page.”).

that the only way to comply with the Speed Update is by using AMP, leading many to effectively equate the Speed Update with an AMP requirement, despite Google's claims to the contrary.<sup>217</sup> Overall, AMP guarantees publishers higher positions in Google Search, so they feel compelled to use it given the correlation between the number of visitors that Search directs to their website and the quantity of ad space they have to sell.<sup>218</sup> Reflecting on this catch-22, industry publication *Digiday* noted: "[i]n theory, adoption of AMP is voluntary. In reality, publishers that do not want to see their search traffic evaporate have little choice."<sup>219</sup>

Google's particular approach with AMP and speed may explain why AMP pages would indeed load fastest for Google. In addition to limiting the deployment of JavaScript code on webpages, Google stores AMP pages on Google's servers.<sup>220</sup> In other words, AMP pages are *colocated*

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217. Over a half dozen prominent U.S. and European publishers shared this sentiment with *Politico*. Scott, *supra* note 186 (where Barry Adams from media market consultancy Polemic Digital shared that their publisher clients see a 200-300% lift when using AMP and that "[p]ublishers are held hostage by Google," and where some publishers also shared that their pages are penalized in Google Search results if they do not use AMP); *A Letter About Google AMP*, *supra* note 186 (open letter to Google by 600+ signees complaining about Google Search's preferential treatment of AMP pages).

218. Scott, *supra* note 186.

219. Moses, *supra* note 215. See also Ross Benes, *Publishers Find Google AMP Loads Too Fast for Ad Views*, DIGIDAY (Oct. 9, 2017), <https://perma.cc/U6Y6-7DK8> (industry executive stating that "[t]he whole reason that publishers are considering AMP is that Google gives AMP pages prioritization in search," and "[o]ne person's page speed is another person's monetization problem"). But see also Gabe Bender, *Ads and AMP: Year in Review and Looking Ahead*, AMP (Feb. 14, 2018), <https://perma.cc/LZG2-GU56> (stating that publishers have tripled the amount of money they're making from AMP pages in the past year and sped up the load time of ads).

220. Scott, *supra* note 186 ("The technology allows publishers' mobile sites to be stored in Google's own servers and preloaded on individuals' smartphones, significantly reducing lag time when people are surfing the mobile web on patchy cellphone networks."); *A Letter about Google AMP*, *supra* note 186 ("Search

with Google. Colocation makes it physically impossible for another speed framework to match Google's AMP speeds.

With the Google Search Speed Update pigeonholing websites into further adopting AMP, attention increasingly turned to AMP repercussions on page monetization. Some publishers that adopted AMP reported they either did not make more money per page or made significantly less.<sup>221</sup> Google responded by releasing data rebutting these concerns. It pointed to internal data showing that AMP pages were generating three times more revenue per day.<sup>222</sup> However, what some people might not have noticed was that this was not three times more revenue overall. Rather, it was three times more revenue only from Google's proprietary exchange and buying tools, which are also *colocated* with Google.

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engines are in a powerful position to wield influence to solve this problem. However, Google has chosen to create a premium position at the top of their search results (for articles) and a "lightning" icon (for all types of content), which are only accessible to publishers that use a Google-controlled technology, served by Google from their infrastructure, on a Google URL, and placed within a Google controlled user experience."); Martin Schierle, *Measuring AMP Performance*, AMP (Jan. 17, 2018), <https://perma.cc/NQB2-VHCK> (study concluding that sites delivered from AMP's cache deliver fastest).

221. Greg Sterling, *Report: AMP Causing Monetization Frustration Among Some News Publishers*, SEARCH ENGINE LAND (Oct. 28, 2016), <https://perma.cc/4ZRL-JSUH> (reporting some publishers experience a 50% decrease in revenue per page with mobile AMP pages); Johnson, *supra* note 197 (stating that server side auctions result in less revenue per thousand impressions); Jack Marshall, *Google AMP Gets Mixed Reviews from Publishers*, WALL ST. J. (Oct. 28, 2016), <https://perma.cc/5QW9-GEF7> (*The Washington Post* reporting it generates the same revenue from AMP mobile pages as from non-AMP mobile pages; CNN reporting it also monetizes AMP and non-AMP pages at the same rate; multiple publishers reporting that AMP pages monetize at half the rate of non-AMP pages). *But see* Sluis, *supra* note 194 (stating that server-side auctions result in higher bid density and higher yield).

222. *Ads and Amp*, *supra* note 219 (citing Internal Data, GOOGLE, Feb. 2018) ("In the past year alone, we've seen publishers on AMP reach several milestones: they're generating up to \$6 million per week from ads using Google AdSense and Doubleclick Ad Exchange, earning 3X more revenue per day, and leveraging over 100 ad tech platforms supporting the open source AMP Project.").

More and more, the competition narratives in the ad market echo those happening in parallel in the electronically traded market for equities. Take, for example, the NYSE's recent installation of new microwave antennas on the rooftop of its data center, which increase transmission speeds between traders and the NYSE by two-millionths of a second.<sup>223</sup> The NYSE had announced plans in 2019 to give its affiliated network provider SFTI exclusive access to this faster speed lane, thereby requiring financial traders that do not want to be excluded due to latency to go through SFTI.<sup>224</sup> The NYSE plans prompted complaints from financial traders, alleging that requiring traders to go through SFTI, and SFTI only, to access a particular speed would be anticompetitive and a violation of U.S. antitrust laws.<sup>225</sup>

Another thing to note about the evolution of the securities market is how some stock exchanges have started installing "speed bumps" to intentionally slow down trading, to neutralize speed races. It was Wall

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223. Alexander Osipovich, *NYSE Antennas Spark High-Speed Trader Backlash*, WALL ST. J. (Aug. 8, 2019), <https://perma.cc/FAK8-XCT5>.

224. *Id.*

225. See e.g., Letter from Thomas M. Merritt, Deputy Gen. Couns., Virtu Financial, to Brett Redfearn, Dir., Div. Trading and Mkts., SEC (June 25, 2019), <https://perma.cc/BN6G-EEBY> ("In the same manner that the NYSE would never have been permitted to sell positions on the floor of the exchange on Wall Street within earshot of the specialists to the detriment of the rest of the members for a premium price so too should it be impermissible for the NYSE to do the same with rooftop access to the new exchange 'floor.'"); Sabri Ben-Achour, *Why Are the NYSE and Private Companies Fighting over Two-Millionths of a Second?*, MARKETPLACE (Oct. 7, 2019), <https://perma.cc/6DDZ-2VKD>; Self-Regulatory Organizations; New York Stock Exch. LLC, Nyse Am. LLC, Nyse Arca, Inc., Nyse Chicago, Inc., & Nyse Nat'l, Inc.; Notice of Filings of Partial Amendment No. 3 & Order Granting Accelerated Approval to Proposed Rule Changes, Each As Modified by Partial Amendment No. 3, to Establish A Wireless Fee Schedule Setting Forth Available Wireless Bandwidth Connections & Wireless Mkt. Data Connections, <https://perma.cc/3XHN-3ZVM> announcing SEC approval of NYSE plans on the condition that the NYSE would not have a speed advantage over wireless data providers). Note, NASDAQ provides clients with access to faster data (the FGPA offering) for a cost of \$25,000 per month.

Street veteran Brad Kutsayama who spearheaded such bumps on the public stock exchange IEX, which the SEC approved in 2016.<sup>226</sup> Some academic studies have suggested that slowing things down improves market efficiency. For example, one study by an SEC economist studied how slowing things down can decrease trading costs for individual investors.<sup>227</sup> Another paper released in January of 2020 by the U.K. financial regulator, the Financial Conduct Authority, concluded that eliminating the ultra-fast trading strategies used by high-frequency traders could save investors \$4.8 billion per year.<sup>228</sup> In advertising, however, speed narratives are beholden to Google's power in the search market.

### C. *Inside Information Abuses*

#### 1. *Google's Ad Server Shares Information About Competitors' Trading Activity with Google's Exchange and Buying Tools, Permitting Them to Trade Ahead of Orders*

With AMP and the Search Speed Update, Google's stated priority is how fast webpages load for consumers. But when websites route their ad space to exchanges through header bidding rather than through Google's sell-side, the only way that a website can route its inventory to Google's

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226. Dave Michaels, *IEX Gains SEC Approval for New Stock Exchange*, WALL ST. J. (June 17, 2016), <https://perma.cc/TNT9-XQ4A> (announcing SEC approval of the IEX national stock exchange that slows down trading by 350 millionths of a second).

227. Edwin Hu, *Intentional Access Delays, Market Quality, and Price Discovery: Evidence from IEX Becoming an Exchange*, (Div. Econ. & Risk Analysis Working Paper Series, 2018) (finding that trading delays on securities exchanges reduced trading costs for consumers for some stocks).

228. AQUILINA ET AL., *supra* note 24; *see also* Jonathan Macey & Maureen O'Hara, *Regulating Exchanges and Alternative Trading Systems: A Law and Economics Perspective*, 28 J. LEGAL STUD. 17 (1999) (discussing fair competition and how unequal access to data can weaken information efficiencies and lead to larger intermediary spreads and noting that vertical economies of scale may provide a counterbalance to these arguments).

exchange is by *sequentially* routing it to Google's exchange *after* the space has cleared in another in header bidding.<sup>229</sup> The sequence is necessary because Google's trading venue refuses to return bids through header bidding.<sup>230</sup> The two-step setup ultimately adds latency to consumer page loads, reserving the benefits of speed to those that stay within Google's Walled Garden.

For many years, the two-step setup and latency provided Google with a competitive advantage: it permitted Google to use information about the trading activity of rival exchanges to inform its own trading activity in the market.<sup>231</sup> If a publisher like *The Register* routed its ad space through header bidding, the winning bid belonging to the non-Google exchange was passed into the publisher's ad server—usually, Google's. From 2015 through 2019, Google's ad server then passed information

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229. See, e.g., *What is Prebid.js?*, PREBID (2020), <https://perma.cc/4DEY-VZJ6> (explaining how PreBid auctions occur before publishers' ad server is called and stating that the ad server starts after header bidding concludes). When publishers do sequentially route to Google's ad server (Google Ad Manager, or GAM), they can then route the impression either to Google's exchange (or a non-Google exchange "line item" that the publisher has set up in their ad server) or to Google's multiple-exchange solution Open Bidding. See *How Open Bidding Works*, GOOGLE AD MANAGER HELP (2020), <https://perma.cc/FEU7-AZTW>. Note, this sequence also occurs when a publisher uses a server-side header bidding vendor such as PreBid or Amazon's Transparent Ad Marketplace (TAM).

230. Sluis, *supra* note 200 ("The Google exchange formerly known as AdX doesn't participate in Prebid or TAM, leaving a gap which prevents publishers from shifting their entire auction to the header.").

231. Specifically, this occurred as part of Google's "Dynamic Allocation" setup and may have ended with Google's unified pricing changes introduced in the fall of 2019. People in the industry routinely discussed this Google information advantage. See Garrett Sloane, *WTF is Dynamic Allocation?*, DIGIDAY (Apr. 14, 2016), <https://perma.cc/LWM2-F2ZZ> (where chief revenue officer of media publisher states "Google had an informational advantage to buying the best impressions, and the informational advantage came from the fact that they own the ad server").



about that winning bid (e.g., \$10.48) to Google's exchange.<sup>232</sup> Google's exchange then passed that the bid to its own bidders, including the largest bidder by trading volume, Google Ads.<sup>233</sup> At the end of that circuitous information sharing, Google's ad server permitted Google Ads, DV360, or another bidder in Google's exchange to trade ahead of rivals' orders by paying one penny more.<sup>234</sup>

In the equities market, the intermediary broker dealers that trade on behalf of third parties, as well as on behalf of themselves, and even run a trading venue, must manage conflicts of interest and use ethical walls to prevent sensitive trading data from flowing from one business division to another. When a broker uses information about a customer's trading activity to race in front of orders and trade for its own benefit, it is called front running or trading ahead and is prohibited (and even criminal).<sup>235</sup> In the unregulated online advertising market in Silicon Valley, a world

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232. *Id.*

233. Specifically, the bid from header bidding became the reserve price (i.e., the floor price) that a bidder in Google's exchange could displace. *See generally* Sarah Sluis, *Google's First-Price Auction Switch Is Making Header Bidding Partners Win More*, ADEXCHANGER (Sept. 5, 2019), <https://perma.cc/57UF-WVMW> ("In the previous second-price auction model, Google reserved a 'last look' advantage that allowed it to bid last after everyone had already submitted their bids. It could win impressions for a penny more than the highest bidder, allowing it to cherry-pick valuable users and clear more impressions than its competitors.").

234. *Id.*

235. *See* RENA MILLER & GARY SHORTER, CONG. RSCH. SERV., R44443, HIGH FREQUENCY TRADING: OVERVIEW OF RECENT DEVELOPMENTS (2016); Edward B. Rock, *Foxes and Hen Houses? Personal Trading by Mutual Fund Managers*, 73 WASH. U. L.Q. 1601, at 1607 (1995) (noting that front running is usually handled through stock exchange and self-regulatory organization rules but that it could also be construed as a violation of Section 10(b) and Rule 10b-5). Note, front running prohibits dealers from trading ahead of client orders handled by the broker division. In advertising, by refusing to deal directly with third-party exchanges and intermediaries and forcing publishers instead to go through a two-step routing process, Google technically avoided trading ahead of a third party it had a direct relationship with.

apart from Wall Street, industry insiders nicknamed this somewhat similar setup Google's "last look."<sup>236</sup>

Last look helped Google's exchange and buying tools to further consolidate their respective market shares. Publishers may have discovered header bidding to get around Google's routing restrictions and to route their ad space to multiple exchanges at the same time, but the DoubleClick ad server, with its overwhelming market share, still set the end-rules of the game. With header bidding, non-Google exchanges could compete against each other all day long for publisher's inventory only to have Google's ad server let Google's exchange jump ahead of orders and displace trades by a penny.

It wasn't just competition that last look distorted. There were also concerns around implications to market efficiency, ultimately measured by trading costs. Remember, advertising auctions are normally "blind" — buying tools return bids on behalf of advertisers without knowing what others are simultaneously returning as their bids. With last look, one trading division at Google (i.e., the ad server) let the other trading divisions (i.e., the exchange and buying tools) see information about rivals' bids (i.e., their winning bid). That permitted a buyer like Google Ads to know what the bidders with the user ID information disadvantage would pay for an ad (e.g., \$10.48, not \$14, CPM) and use that information to bid lower than what it otherwise would have bid for the same space.<sup>237</sup> As discussed above, it is difficult to say whether lower prices paid by Google Ads benefitted advertisers on the other ends of these trades or whether they instead permitted Google as the intermediary to keep a wider spread.

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236. See Sluis, *supra* note 233.

237. Most publishers use Google's ad server and Google's ad server shares superior information about users' identity with Google Ads and DV360 than it shares with others. See *supra* Part III.A. Google's ad server also shares with advertisers bidding through Google superior information about publisher price floors. Sluis, *supra* note 200 (discussing how Google's ad server does not share floors with exchanges outside of Google's Open Bidding integration).

According to some discussion of the topic, Google's ad server stopped passing the "price to beat" to Google's exchange in late 2019.<sup>238</sup> However, monitoring whether this conduct has in fact stopped is more difficult. Around the same time that Google stopped permitting itself to view the "price to beat," Google started rounding down the timestamps of bids in the consolidated auction reports it shares back with publishers. The reports previously disclosed the time in *microseconds* (i.e., 23:59:59.998877) that each exchange submitted a bid for a publisher's space. Now, Google would start to round down those timestamps from microseconds to the nearest *hour* (i.e., 23:00:00.00000).<sup>239</sup> Without precise timestamps, it becomes difficult to monitor if the ad server continues to let Google's exchange trade ahead of rival exchange bids. For instance, the ad server might receive Exchange B's bid of \$10.48 first, pass information about that bid to Google's exchange, and let Google's exchange return a slightly higher bid of \$10.49 a few milliseconds later. Without precise timestamps, publishers would not know.

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238. See Sluis, *supra* note 200 ("[W]hen Google made its changes to unified pricing and switched to a first-price auction this fall, it removed one distinct advantage in open bidding, known as 'last look.' Until a couple of months ago, open bidding used the results of the Prebid and TAM auctions as the "price to beat" for all the open-bidding buyers. That extra information meant that open-bidding buyers could outbid Prebid and TAM winning bids.").

239. Google Ad Manager Help, *Data Transfer Fields*, GOOGLE (2020), *supra* note 90; *Ad Manager Data Transfer Reports*, GOOGLE AD MANAGER HELP (2020) <https://perma.cc/8QSV-YBQF> (describing the various types of reports Google's ad server shares with market participants); Google Ad Manager Help, *Bids Data*, *supra* note 135 (discussing the Bid Data file NetworkBackfillBids that contains information about bids coming in from Google's exchange and Google Open Bidding auctions; stating that Google truncates timestamps of bids to the nearest hour); Damien Geradin & Dimitrios Katsifis, *Trust Me, I'm Fair: Analysing Google's Latest Practices in Ad Tech from the Perspective of EU Competition Law*, 16 EUR. COMPETITION J. 11 (2020), (discussing how sellers used timestamps of bids field called "TimeUse2" and field called "KeyPart" to tie information about bids from Google auctions to information about bids from header bidding auctions in the NetworkCodeServes/NetworkBackfillCodeServes file but can no longer do so because Google rounded timestamps).

In the securities market, we require intermediaries to disclose trading timestamps in milliseconds or a finer increment to help to protect against these types of market abuses. In fact, the SEC has prosecuted some traders for redacting timestamps in order to conceal the fact that they were trading ahead of orders. For example, in 2004, the SEC and the National Association of Securities Dealers (predecessor to the Financial Industry Regulatory Authority) charged the Knight Trading Group for trading ahead of client orders and recording inaccurate trade execution times to evade client oversight.<sup>240</sup> In advertising, weak competition permits a powerful market intermediary like Google to negotiate out of timestamp disclosures.

## 2. *Google Amends Terms and Conditions to Breach "Ethical Walls"*

Google misuses the material nonpublic information belonging to third-party market participants in another way: by breaching ethical walls and trading on their sensitive non-public data. Publishers protect their financial interest in the online content they produce by limiting third parties' access to their readership data. For instance, say user 1Q2W3E reads *The Journal's* "Heard on The Street" column about investing, which permits that publisher to solicit high bids for its ad space from advertisers like Goldman Sachs and Barclays. If another site, say user 1Q2W3E's email provider, knows that user 1Q2W3E reads *The Journal's* "Heard on the Street" column, the email provider can use that information to solicit bids from Goldman Sachs and Barclays too, even though the

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240. *In re Knight Securities L.P.* Respondent, SEC Admin. Release No. 50867, 2004 WL 2913488 (Dec. 16, 2004) <https://perma.cc/4JTN-ET2Q> (discussing how misreporting timing of trades permitted Knight to trade ahead of orders and defraud thousands of customers); Ann Davis, *How Knight Clients Failed to Recognize Questionable Trades*, WALL ST. J. (Dec. 17, 2004), <https://perma.cc/2PHK-S75U>; Harvey L. Pitt, *Conflict of Interest Lessons from Financial Services*, COMPLIANCE WEEK (Feb. 21, 2005), <https://perma.cc/2HKL-GJJJ> (reflecting on how the Knight problem was a conflicts of interest problem).

email provider produces no content and only knows that user 1Q2W3E buys lots of widgets from Amazon. Simply put, by appropriating a competing ad seller's readership data, the email provider can increase the supply of space available to users known to be interested in investing, depressing clearing prices for that type of advertising and hurting the content creator's ability to monetize its original work.

Historically, when competition in the online advertising market worked, Google safeguarded such sensitive business data behind effective ethical walls. Google became aware of such data in the course of licensing its buy-side and sell-side ad server to market participants. Recall, in 2008, Google explained that Google could not "do anything" with that data because ownership vested in publishers and advertisers.<sup>241</sup> As a result, Google had a duty to safeguard that data and could not use it for its own financial gain.

However, as Google's market power grew, Google tore down these data separations. Shortly after acquiring DoubleClick, Google started to restrict publishers' and advertisers' access to DoubleClick user IDs.<sup>242</sup> Then, in 2012, Google amended its terms and conditions to obtain permission to merge data from DoubleClick with data from other Google business divisions, including Google's exchange division and Search and YouTube.<sup>243</sup> In 2016, Google amended its policies again, this time to combine DoubleClick data with data Google separately has about consumers'

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241. *The Google-DoubleClick Merger*, *supra* note 82.

242. *See AdExchanger Q&A*, *supra* note 89.

243. For a summary of Google's 2012 privacy change, see *Google Merges Privacy Policies and Data Across Services*, PRIVACY INT'L (Jan. 25, 2012), <https://perma.cc/8B6J-8VFT>, which states, "In 2012, Google announced it would condense 70 different privacy policies into a single one that would allow the company to merge the data collected across all its services, including Maps, Search, Android, Books, Chrome, Wallet, Gmail, and the advertising service provided by its DoubleClick subsidiary into a single database." Impressively, the FTC Commissioner and public interest groups the Electronic Privacy Information Center (EPIC), Center for Digital Democracy, and U.S. Public Interest Research Group

identity.<sup>244</sup> In 2018, Google started obtaining access to users' readership information on third-party sites and apps directly from the Chrome browser, circumventing the need to negotiate for these rights with third parties (e.g., publishers and advertisers).<sup>245</sup>

Google also turns those information advantages into financial gain. In addition to obtaining access to such data through data set mergers and through Chrome, Google obtains permission to *use* that information to buy and sell in the advertising market for its own interests. With the 2012

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raised concerns in 2007 around approving a Google-DoubleClick merger without imposing restrictions on Google's ability to merge data sets. *See* Complaint and Request for Injunction, Request for Investigation and for Other Relief, Second Filing of Supplemental Materials in Support of Pending Complaint and Request for Injunction, Request for Investigation and for Other Relief, and Dissenting Statement in Google and DoubleClick, *supra* note 80. EPIC also challenged Google's 2012 plan to merge datasets by filing a temporary restraining order and preliminary injunction compelling the FTC to force Google to abide by an October 13, 2011 FTC Consent Order. The 2011 Consent Order required Google to establish new privacy safeguards for users and to subject itself to ongoing privacy audits. The federal court ultimately dismissed EPIC's complaint on the ground that the FTC has discretion over whether to enforce its Consent Orders and that the exercise of such discretion is not subject to judicial review. *See EPIC v. FTC (Enforcement of the Google Consent Order)*, ELEC. PRIVACY INFO CTR., <https://perma.cc/N2BE-T3S6>.

244. Angwin, *supra* note 105; *Google Privacy Policy*, GOOGLE (Mar. 31, 2020), <https://perma.cc/MS8P-WWBG> (explaining to consumers that information about their "visits to sites and apps that partner with Google," including from sites that use Google advertising services, may be combined with other data Google has about the consumer "in order to improve Google's services and the ads delivered by Google"). Google's merger of datasets also poses negative implications to consumer privacy, which was a concern also raised by public interest groups and FTC Commissioner Pamela Jones Harbour at the time of the Google-DoubleClick merger. *See* Complaint and Request for Injunction, Request for Investigation and for Other Relief, Second Filing of Supplemental Materials in Support of Pending Complaint and Request for Injunction, Request for Investigation and for Other Relief, and Dissenting Statement in Google and DoubleClick, *supra* note 80 (explaining that when it comes to Google and DoubleClick potentially merging datasets, privacy concerns are "the other side of the coin").

245. Green, *supra* note 114 and accompanying comments.

change, privacy commissioners in Europe lamented that the change permits Google to “combine almost any data from any services for any purposes.”<sup>246</sup> With the 2016 change, Google obtained specific permission to use the data “to improve ... ads delivered by Google.”<sup>247</sup> Today, via Chrome, Google obtains permission to use third party readership data to sell advertising, including advertising on its own properties Search, Gmail, and YouTube.<sup>248</sup>

Since 2012, Google’s decisions to merge data across internal business divisions have primarily gained attention as harming consumer privacy—by combining the consumer records of one division with the consumer records of another, Google develops deeper and deeper profiles of consumers’ online behavior.<sup>249</sup> However, these data mergers also distort competition outcomes in advertising markets. Google merges data sets in ways that conflict with the interests of market participants.<sup>250</sup> Google can use third party readership data to disproportionately sell more ads on Google properties.<sup>251</sup> In financial markets, this progression cannot happen, in part because intermediaries cannot negotiate out their duty to act in their customers’ best interest.

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246. Letter from Article 29 Data Prot. Working Party to Larry Page, CEO, Google (Oct. 16, 2012), <https://perma.cc/4LQJ-3D45>.

247. *Google Privacy Policy*, *supra* note 244.

248. Green, *supra* note 114 and accompanying comments. Note, with the 2012 and 2016 changes, it is unclear whether Google terms with publishers and advertisers separately restrict Google’s use of this data. However, with the Chrome changes, it does not appear that any counterparty relationship with publishers and advertisers could restrict Google’s use of this parallel data set.

249. *See, e.g., Johnny Ryan, Failure to Enforce the GDPR Enables Google’s Monopoly*, BRAVE (Feb. 18, 2020), <https://perma.cc/3VRB-P7BZ> (describing Google’s merger of privacy policies as an “internal data free-for-all”).

250. Specifically, the terms appear to permit Google to use information belonging to third-party buyers and sellers obtained by the ad server division and Chrome to buy and sell in the marketplace and on exchanges.

251. *See* discussion *supra* note 154.

The reasons that we prohibit such conduct in financial markets also exist in advertising markets: Google gained access to confidential business data by rendering unrelated business services, the use of such data provides Google with an unmatched information advantage when buying and selling, and letting Google trade on those information advantages may dissuade firms from participating in online advertising markets at all.<sup>252</sup> In other words, the practice is not merely unfair, it reflects a socially undesirable allocation of property rights in information that can result in long-term output declines. The publisher was the party that risked capital, hired journalists, and produced content to know that user 1Q2W3E is interested in investing. The property right in that piece of information should be allocated to the party that bore the costs of producing it (i.e., the website), rather than the trading intermediaries that websites use (i.e., Google's sell-side ad server, Google's exchange, Google's buy-side DSP, or even Chrome).

#### IV. POLICY CONSIDERATIONS

##### A. *Advertising Exchanges Should Provide Fair Access to Information and Speed*

Outside of antitrust enforcement, lawmakers might lean on the principles of financial regulation to develop a framework to protect competition in advertising markets. In 1934, Congress developed a competition framework for the securities markets, viewing them as an "important national asset" that should be "preserved and strengthened."<sup>253</sup> As this Part explores, the electronic markets for sports tickets, theatre tickets, airfares,

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252. My argument is that because Google does not actually produce content in advertising markets, such information appropriation conduct may lead to overall output declines, which is a traditional welfare concern. For a closely related conversation around how information misappropriation by large digital firms may deter entry and chill innovation, see Khan, *supra* note 20, at 1008-15.

253. Securities Exchange Act, 15 U.S.C. § 78k-1(a)(1)(A) (2012) ("The securities markets are an important national asset which must be preserved and strengthened.").



and cryptocurrencies have been sufficiently important to warrant some kind of intervention.<sup>254</sup> What about advertising? It is a primary driver of the business of journalism and news, a cornerstone of democracy, and surely worthy of equal scrutiny.

One basic rule that lawmakers ought to borrow from the equities market and apply in advertising is a requirement that exchanges provide all bidders with fair access to both data and speed. Google's exchange should share user identity information and speed with intermediaries in a non-discriminatory manner. It could even colocate with bidders in neutral colocation facilities, as other exchanges and intermediaries already do.

Lawmakers have applied the same principle to address parallel competition problems in other electronically traded markets. Exchange access problems related to data and speed came up in the much smaller electronic trading market for event tickets. There, differential access to speed and information was distorting competition between those buying and selling on the new, centralized electronic ticket marketplaces.<sup>255</sup> For example, buying at "lightning speed" allowed some computerized ticket brokers to buy 1000-plus tickets per minute and over 90% of desirable tickets to major concerts from trading venues like Ticketmaster and Stubhub, before consumers had enough time to check-out online.<sup>256</sup> The ability to exclude competition from consumers allowed intermediary brokers to buy up tickets on initial release then resell them back to consumers at high mark-ups—49% higher on average, but sometimes over 1000%, according to one investigation.<sup>257</sup>

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254. See discussion *infra* notes 259-61 (event tickets), 262-66 (cryptocurrencies), and 288-90 (airfares).

255. Schneiderman, *supra* note 26.

256. *Id.* at 8, 18-19 (detailing that one high-speed buyer purchased 1,012 tickets to a 2015 U2 concert in Madison Square Garden in under one minute); see also Tod Marks, *Why Ticket Prices Are Going Through the Roof*, CONSUMER REPS. (June 30, 2016), <https://perma.cc/C25Y-QBS7>.

257. Schneiderman, *supra* note 26, at 4.

To address these speed and data competition problems in the electronically traded ticket market, lawmakers in the U.S. and globally passed legislation. Thirteen states, including New York, California, Pennsylvania, and Florida, passed legislation that restricts ticket brokers and other buyers from using high-speed bot software on the centralized ticket marketplaces to distort competition between those buying on the same venue.<sup>258</sup> Congress in 2016 then extended these state restrictions to ticket brokers nationally with the Better Online Ticket Sales Act.<sup>259</sup> The UK, Australia, and Canada also passed legislation restricting speed practices to safeguard access to ticket marketplaces.<sup>260</sup> Across jurisdictions, protecting fair access to the trading venues was the driving concern.<sup>261</sup>

Similarly, lawmakers are now monitoring emerging cryptocurrency markets for fair access problems that stem from the role that data and speed play with electronic trading.<sup>262</sup> In 2018, the NYAG conducted an

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258. Robert McFadden, *The BOTS Act: A Small Step for Fankind When a Giant Leap Is Needed*, 55 WASHBURN L.J. 427 (2016).

259. Better Online Ticket Sales Act, 15 U.S.C. § 45c (2016) [hereinafter “BOTS Act”]. The New York State legislature later made its law stronger by increasing civil fines and imposing criminal penalties for violations of the New York state anti-bot law. Press Release, Andrew Cuomo, Governor, N.Y., Governor Cuomo Signs Legislation Combating Unfair Ticket Purchasing and Reselling Practices (Nov. 28, 2016), <https://perma.cc/ATL9-MDST>.

260. Digital Economy Bill 2017, Dep’t. for Culture, Media, and Sport Supp. Memo (UK) (prohibiting the use of bots to circumvent ticket marketplace rules); Ticket Sales Act, S.O. 2017, c. 33, Sched. 3 (Can.) (prohibiting the use of bot software to circumvent ticket marketplace access rules); Fair Trading Amendment (Ticket Scalping and Gift Cards) Act 2017, No. 52/2017 (NSW) (amending the Fair Trade Act of 1987 to include regulation of ticket scalping and gift card expiry dates).

261. See, e.g., BOTS Act, *supra* note 259 (stating aim of legislation is to “ensure equitable consumer access to tickets”).

262. In the U.S., the SEC, the Commodity Futures Trading Commission (CFTC), and the New York State Department of Financial Services share some oversight over the cryptocurrency market. For example, under a new law passed

investigation to determine if cryptocurrency exchanges and broker intermediaries were engaging in the sort of conduct that regulators watch for in financial markets, including whether exchanges were providing some traders with superior access to data and speed.<sup>263</sup> The cryptocurrency exchanges that responded to the NYAG's investigation self-reported they were not.<sup>264</sup> Since the NYAG's market investigation, securities regulators globally have echoed the NYAG's concerns.<sup>265</sup> In 2018, the International Organization of Securities Commissions (IOSCO) released its own report on the market, advising regulators to monitor whether cryptocurrency

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by New York in 2015, exchanges operating in the state of New York have to submit their exchange rules to the state and obtain a license to operate. 23 CRR-NY, ch. I, pt. 200. Under the Exchange Act, the SEC has jurisdiction over securities and it has used the Howey Test to determine that virtual currencies are securities and exercise jurisdiction over the market. *Framework for "Investment Contract" Analysis of Digital Assets*, <https://perma.cc/7WXS-95NG> (last updated Apr. 3, 2019). The CFTC has ruled that Bitcoin and other virtual currencies are a "commodity" under Section 1a(9) of the Commodity Exchange Act of 1936 (CEA), which grants the CFTC jurisdiction over market participants for fraud and manipulation. *In re Coinflip Inc. et al.*, Respondent, CFTC, No. 15-29 (Sept. 17, 2015), <https://perma.cc/7F3G-ZY3L>.

263. UNDERWOOD, *supra* note 26.

264. *Id.* at 25 ("Trading platforms that engage in proprietary trading on their own venues uniformly claimed to the OAG that their trading desks had no informational or other trading advantage over customers."). Note, the NYAG was nonetheless concerned that cryptocurrency exchanges provide varying levels of access that may let sophisticated traders "leverage access and speed to power sophisticated automated trading strategies – strategies that can negatively affect the trading performance of everyday, non-automated customers" buying and selling on the same venue. *Id.*

265. BOARD OF THE INTERNATIONAL ORGANIZATION OF SECURITIES COMMISSIONS, ISSUES, RISKS AND REGULATORY CONSIDERATIONS RELATING TO CRYPTO-ASSET TRADING PLATFORMS: CONSULTATION REPORT (Int'l Org. of Sec. Comm'n 2019) [hereinafter IOSCO CRYPTO CONSULTATION REPORT] (drawing on feedback from securities regulators globally, including those in the U.S., the U.K., France, Germany, Japan and China, and raising concern over market integrity, non-discriminatory access, management of conflicts of interest, and transparency); ASIA SECURITIES INDUSTRY AND FINANCIAL MARKETS ASSOCIATION, ASIFMA BEST PRACTICES FOR DIGITAL ASSET EXCHANGES (2018) (raising similar concerns).

actors are upholding principles long-held in the securities market, including fair access to exchanges.<sup>266</sup> Given the similarities between the structure of the electronically traded equities and ads markets, ad exchanges are deserving of the same attention from regulators and legislators.

*B. Steps Toward Identifying and Managing Intermediary Conflicts of Interest*

*1. Structural Separations*

We might address other competition problems in advertising markets by leaning on a second core principle from the securities market toolbox: identify and manage intermediary conflicts of interest. In financial markets, the approach to managing conflicts has ebbed and flowed from requiring structural separations to imposing conflicts of interest and disclosure rules. After the Great Depression, Congress passed the Glass-Steagall Act, which took the structural separation approach and prohibited banks, for example, from running a broker dealer or underwriting securities offerings.<sup>267</sup> Financial conglomerates like J.P. Morgan had a year to divest their conflicting operations (J.P. Morgan's brokerage and investment division became Morgan Stanley).<sup>268</sup> That structural separation approach later gave way to allowing some firms to engage in conflicting lines of business but requiring that they manage their conflicts.<sup>269</sup>

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266. IOSCO CRYPTO CONSULTATION REPORT, *supra* note 265, at 10 (discussing need to “[e]nsure that access to the system or exchange and to associated products is fair, transparent and objective” and that exchange procedures apply fairly and on a non-discriminatory basis).

267. Commercial banks were prohibited from engaging in investment banking activity generally. *See generally* Banking Act, Pub. L. No. 73-66, 48 Stat. 162 (1933) (current version at 12 U.S.C. § 227).

268. Julia Maues, *Banking Act of 1933 (Glass-Steagall)*, FED. RES. HIST. (Nov. 22, 2013), <https://perma.cc/2LUP-PATS> (providing a summary of the structural separation approach taken by Glass-Steagall).

269. The Gramm-Leach-Bliley Act in 1999 repealed parts of the Glass-

Despite these relaxations, policymakers continue to prohibit a company that runs a public stock exchange from simultaneously running a division that trades on the exchange. That division between the operator of an electronic marketplace and the middlemen trading in the market is upheld in other markets too. For example, the companies that operate the major electronic event ticket marketplaces — Ticketmaster, Stubhub, AXS, and Telecharge — do not simultaneously operate a ticket broker. To be discussed further in the following Part, the centralized computerized marketplaces for airfares also eventually parted ways with their airline-owners. Google might similarly be required to divest its business divisions that have a conflict with Google participating in the market as a seller of ad space: its exchange, its buy-side and sell-side intermediaries, and the Chrome browser.

## 2. *Conduct and Disclosure Rules*

Outside of such structural separations, we might manage conflicts of interest through conduct and disclosure rules. In the equities trading market, multi-service financial firms cannot misuse information belonging to third-party traders, must maintain ethical walls, and cannot route orders in a discriminatory manner.<sup>270</sup> Google's ad trading intermediaries (i.e., ad server & buying tools) might similarly be prohibited from abusing their access to third parties' sensitive information, be required to put up ethical walls, and be prohibited from routing trading activity to Google's exchange and properties in a discriminatory manner.

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Steagall Act to enable financial holding companies to underwrite securities, act as a broker-dealer, and engage in other conflicting lines of business. Gramm-Leach-Bliley Financial Modernization Act, Pub. L. No. 106-102, 113 Stat. 1338 (1999) (codified in scattered sections of 12 U.S.C. and 15 U.S.C.). See generally Jeffrey Bingham, *Scaling Chinese Walls: Insights from *Afra v. JPMorgan Chase**, 4 WM. & MARY BUS. L. REV. 767 (2013).

270. For the best execution (routing) rule, see *supra* note 53. For conflicts of interest data rules, restrictions on client data use, and ethical wall requirements, see *supra* notes 54-56.

Lawmakers could also require Google's ad trading intermediaries on the buy-side and sell-side to act in the best interest of their customers. If Google was required to do so, it would not have been able to negotiate out of duties historically owed to its publisher and advertiser customers. Such a fiduciary framework would revert ownership in ad server user IDs back to publishers and advertisers, empowering them to share these IDs as they see fit. Conversely, such a rule would prohibit Google from merging data it obtains through the operation of trading intermediaries, with other Google data, for the purpose of trading on inside information advantages.

Importantly, countervailing user privacy concerns can be managed by prohibiting companies from collecting sensitive consumer data (e.g., health), limiting what data can be used for targeted advertising, and giving consumers the ability to opt-out of behaviorally targeted ads altogether through a simple, national, opt-out regime. This approach would strike a healthier balance between privacy and competition.

Policymakers have ported this way of thinking about market structure to other electronic trading markets too. Take, for example, the growing concern over conflicts of interest and insider abuses in cryptocurrency markets. When the NYAG investigated the market in 2018, they raised concerns that some cryptocurrency firms have conflicts: they are operating an exchange while simultaneously trading in their own market, sometimes accounting for up to 20% of trading activity.<sup>271</sup> That finding led the NYAG to flag the risk of "insider abuses" and advise that "[m]anaging conflicts of interest is a serious and growing issue in the virtual marketplace."<sup>272</sup>

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271. UNDERWOOD, *supra* note 26, at 25 (highlighting the risk of insider abuses and noting that "[t]rading platforms [that responded to the Initiative] that engage in proprietary trading on their own venues uniformly claimed to the OAG that their trading desks had no informational or other trading advantage over customers").

272. *Id.* at 21.

The international body of securities commissions echoed the same concerns and advised that lawmakers take the regulatory “toolkit” for managing conflicts and market abuses in financial markets and repurpose them for cryptocurrency trading.<sup>273</sup> In a recent report, it highlighted that “[t]he existence of unmitigated conflicts can negatively impact investor protection and confidence, as well as fair, efficient and transparent markets.”<sup>274</sup> The conflicts it highlighted included when a company runs an exchange while simultaneously trading on it or possessing an interest in a traded crypto asset.<sup>275</sup>

Outside of the cryptocurrency marketplaces, lawmakers have exhibited concern about conflicts of interest and associated “inside” information abuses in gaming and betting markets. When it came to light in 2015 that an employee of major gaming platform DraftKings misappropriated information submitted by the platform’s users to inform their own play to make a \$350,000 profit, DraftKings was accused of allowing “insider trading.”<sup>276</sup> The news spurred the NYAG to launch a probe into

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273. See generally IOSCO CRYPTO CONSULTATION REPORT, *supra* note 265 (highlighting concern over market integrity, transparency, and the management of conflicts of interest).

274. IOSCO MARKET STRUCTURE CONSULTATION REPORT, *supra* note 48, at 16 (“CTPs that position themselves to provide end-to-end services . . . may have additional conflicts. Traditionally, these roles have been performed by independent parties. When CTPs provide such end-to-end services, any conflicts of interest that arise need to be mitigated to prevent potential market misconduct and/or investor protection concerns.”).

275. *Id.* at 20 (stating a key issue of IOSCO Principle 31 5(d) is “[a]ddressing any conflicts of interest that arise between [a market intermediary’s] interests and those of its clients. Where the potential for conflicts arise, a market intermediary should ensure fair treatment of all its clients by taking reasonable steps to manage the conflicts through organizational measures to prevent damage to its clients’ interest, such as: internal rules, including rules of confidentiality; proper disclosure; or declining to act where conflict cannot be resolved”).

276. Specifically, the employee used information about which players DraftKings users picked for their roster. Joe Drape & Jacqueline Williams, *Scandal Erupts in Unregulated World of Fantasy Sports*, N.Y. TIMES (Oct. 5, 2015),

whether employees could “gain[] an unfair financial advantage in a contest ... by exploiting their access to nonpublic data.”<sup>277</sup> DraftKings rival FanDuel then started prohibiting its own employees from playing fantasy sports games at all, as well as prohibiting employees of other platforms from playing on its site.<sup>278</sup> Similarly, after a Supreme Court ruling in 2018 permitted individual U.S. states to legalize sports betting, lawmakers introduced federal and state legislation prohibiting bets made on material nonpublic information (colloquially called “insider betting”).<sup>279</sup> The State of New Jersey passed legislation prohibiting operators of sports betting operations from taking wagers from persons that work for or are affiliated with the operator.<sup>280</sup>

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<https://perma.cc/LCG7-GCL6> (where sports and gambling attorney Daniel Wallach remarks, “It is absolutely akin to insider trading. . . It gives that person a distinct edge in a contest.”); REUTERS, *DraftKings and FanDuel on Defensive over Insider Betting Revelations*, GUARDIAN (Oct. 5, 2015), <https://perma.cc/G3XH-RMU8>; Bourree Lam, *The New York Attorney General’s Investigation of DraftKings and FanDuel*, ATLANTIC (Oct. 7, 2015), <https://perma.cc/V8T9-LVNA/>.

277. Lam, *supra* note 276; Darren Rovell, *New York Attorney General Launches Inquiry into DraftKings, FanDuel*, ESPN (Oct. 6, 2015), <https://perma.cc/GG4P-99YQ>. The New York Attorney General’s office later brought and settled suit with DraftKings and FanDuel for false and deceptive advertising. Press Release, Eric Schneiderman, Att’y Gen., N.Y., A.G. Schneiderman Announces \$12 Million Settlement with DraftKings and Fanduel (Oct. 25, 2016), <https://perma.cc/C6QM-LY4Z>.

278. Drape and Williams, *supra* note 276.

279. *Murphy v. National Collegiate Athletic Association*, 138 S. Ct. 1461 (2018). For an example of legislation introduced at the state level, see, e.g., S17D § 1367(w)(vii) (N.Y. 2019) (defining a “prohibited sports bettor [as] . . . any individual with access to non-public confidential information about sports wagering” among other circumstances”). For legislation introduced at the federal level, see Sports Wagering Market Integrity Act of 2018, S. 3793, 115th Cong. (2018).

280. Assemb. B. 4111 § 2(f)(4) (N.J. 2018) (“[A]n operator shall adopt procedures to prevent persons from wagering on sports events who are prohibited from placing sports wagers. An operator shall not accept wagers from any person whose identity is known to the operator and . . . who has access to nonpublic



Policymakers similarly managed intermediary conflicts of interest in the computerized marketplaces for airline tickets.<sup>281</sup> In the late 1970s, airlines began routing their airfares into centralized marketplaces, now called global distribution systems (GDSs), where travel agents could find and book airfares electronically.<sup>282</sup> In the early stages of this market's evolution, major airlines like American and United owned and ran the main GDSs, Sabre and Apollo, respectively—similar to how Google, as the largest seller of digital advertising today, concurrently runs the largest advertising exchange.<sup>283</sup> Early on, rival airlines lodged complaints over how the airline-owned marketplaces were preferentially routing travel agents to the airline-owner's tickets.<sup>284</sup> As a result, the Civil Aeronautics Board (CAB) and the DOJ opened investigations in 1982 and 1983.<sup>285</sup>

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confidential information held by the operator.”). Outside of introduced legislation, the media has continued to explore this parallel between information advantages in sports betting and insider trading. See Jacob Gershman, *The Brave New World of Betting on Athletes' Data*, WALL ST. J. (March 10, 2020), <https://perma.cc/WG7U-D84H> (discussing how athletes' biometric health data could soon provide unfair information advantages when sports betting).

281. For a history of the early evolution of the airline intermediary market, see Duncan Copeland & James McKenney, *Airline Reservations Systems: Lessons from History*, 12 MGMT. INFO. SYS. Q. 353 (1988).

282. The GDSs (initially called CRSs) were intermediary markets between airlines and travel agents. See Cindy Alexander & Yoon-Ho Lee, *The Economics of Regulatory Reform: Termination of Airline Computer Reservation System Rules*, 21 YALE J. ON REG. 369 (2004).

283. See Douglas Feaver, *CAB Chairman Promises Best Computer Ticket Information*, WASH. POST (July 21, 1983), <https://perma.cc/RAR3-LVTN> (“American and United airlines both sell computer reservation systems and between them have locked up about 80 percent of the market.”); Aimee Minick, Comment, *Computer Reservations Systems, Airlines, and the Internet*, 65 J. AIR L. & COM. 891 (2000); Computer Reservation Systems: Alleged Competitive Abuses and Consumer Injury, 48 Fed. Reg. 41,171, 41,173 (Sept. 14, 1983) (codified throughout 14 C.F.R. ch. II).

284. See generally Copeland & McKenney, *supra* note 281.

285. *Id.* at 363 (summarizing early investigations by CAB and the DOJ).

After lengthy investigations, the CAB and the DOJ concluded these practices distorted competition.<sup>286</sup> This kickstarted two decades of regulation of these computerized marketplaces starting in 1984, even though the wider airline industry was deregulated in 1978.<sup>287</sup> To manage conflicts of interest, the regulatory regime sought to correct problems of “fair access.”<sup>288</sup> The first rules promulgated by CAB in 1984 prohibited airline-owned-marketplaces from steering travel agents to the GDS-owner’s own tickets and engaging in other forms of discrimination.<sup>289</sup>

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286. U.S. DEP’T. OF JUST., REPLY COMMENTS TO NOTICE OF PROPOSED RULEMAKING COMPUTER RESERVATION SYSTEM REGULATIONS (2003) (explaining how this practice was exclusionary); Larry Locke, *Flying the Unfriendly Skies: The Legal Fallout Over the Use of Computerized Reservation Systems as a Competitive Weapon in the Airline Industry*, 2 HARV. J. L. & TECH. 219, 224 (1989) (summarizing that the DOJ ultimately did not bring charges but did find that airlines used their control of CRSs to weaken competition in the airline market); Alexander & Lee, *supra* note 282, at 380 (discussing how CAB thought preferential routing foreclosed competition and how these concerns underpinned CAB rules promulgated in 1984).

287. The Airline Deregulation Act of 1978 ended forty years of the Civil Aeronautics Board (CAB) regulating the airlines as a public utility (e.g., CAB set routes and fares). The Airline Deregulation Act also vested ongoing regulatory authority in CAB until 1984 and Section 411 of the Federal Aviation Act permitted the DOT to subsequently assume regulatory oversight of the GDS market. Note, however, Congress gave the DOT a mandate to prohibit unfair methods of competition, which captures a wider range of conduct than that prohibited under antitrust laws. *See generally* Timothy Ravich, *Deregulation of the Airline Computer Reservation Systems (CRS) Industry*, 69 J. AIR L. & COM. 387 (2004); Alexander & Lee, *supra* note 282.

288. *See, e.g.*, Feaver, *supra* note 283 (where Dan McKinnon, Chairman of the Civil Aeronautics Bureau, states that the forthcoming rule “would take a close look at ensuring fair access” for airlines and consumers).

289. As a part of these rules, the GDSs could not price discriminate between airlines, had to charge airlines the same fees for the same levels of service, had to make certain GDS data available to all participating airlines for purchase, and could not engage in display and functionality bias. *Carrier-Owned Computer Reservations Systems*, 49 Fed. Reg. 11,644 (Mar. 27, 1984) (codified at 14 C.F.R. pt. 255); Alexander & Lee, *supra* note 282, at 395-96 (providing a summary of the non-discrimination rules).

The Department of Transportation (DOT) later took over the regulation of these marketplaces and dealt with a second discriminatory routing problem similar to one that Google presents today. American and United airlines refused to make their tickets available for sale in rival marketplaces, just as Google today refuses to sell its Search and YouTube ad space through rival exchanges and buying tools.<sup>290</sup> Because an airline like American had power in particular geographic airfare markets, it could pressure travel agents in those locations to use its own marketplace, Sabre, instead of a competitor's.<sup>291</sup> But once agents chose Sabre, Sabre would steer travel agents to buy American airfares over others.<sup>292</sup> The initial "withholding" permitted a major airline like American to distort competition in the intermediary airfare marketplaces, as well as in the airfare market, because travel agents tended to use just one reservation system.<sup>293</sup> The architecture of the advertising market presents the same concerns.

To address competition concerns, the DOT adopted a "mandatory participation rule" in 1992 that forced airlines like American and United to route their inventory into rival ticket marketplaces in addition to their own.<sup>294</sup> Wanting to stop the dominant European airlines from similarly

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290. See generally Alexander & Lee, *supra* note 282, at 380 (explaining the different ways airlines distorted competition between reservations systems, including by refusing to "participate in" rival computer reservation systems).

291. The withholding of tickets from rival GDSs was also thought to constitute a barrier to entry in the GDS market. See generally *id.* at 393.

292. *Id.* at 379-80.

293. Computer Reservations System (CRS) Regulations: Statements of General Policy, 67 Fed. Reg. 69,366 (Nov. 15, 2002) (codified at 14 C.F.R. pts. 255, 399), (stating that travel agents primarily used one reservation system, which resulted in the chosen system having market power over agents).

294. The 1992 mandatory participation rule required airlines that operated a marketplace to route their tickets into rival marketplaces as long as terms were commercially reasonable. Computer Reservation System (CRS) Regulations, 57 Fed. Reg. 43,780, 43,800 (Sept. 22, 1992) ("We conclude that this [mandatory participation] requirement is justified on competitive grounds, since it will keep a

distorting competition, Europe adopted mandatory routing out rules too.<sup>295</sup> However, attempts to manage conflicts of interest eventually gave way to structural separations. Facing continued regulatory scrutiny, the airlines eventually divested their ownership interests in the GDSs altogether.<sup>296</sup>

Google might similarly be required to route YouTube ad space out to rival exchanges and buying tools. However, overall, the complexity and dynamism of high-tech ad markets, combined with the difficulty lawmakers had enforcing non-discrimination rules in the airfare marketplaces and the challenges financial regulators continue to have policing ethical wall separations, likely buttress efficacy arguments for the structural separation approach.<sup>297</sup>

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CRS owner from using its dominance of a regional airline market as a tool for obtaining dominance in the area's CRS market."); *see generally* Alexander & Lee, *supra* note 282. A parallel issue comes up in other markets. For example, the New York Attorney General's office recently stated that if NFL sports teams require ticketholders to resell their NFL tickets using a specific ticketing market or exchange, this conduct might be a "restraint of trade" that "impede[s] consumer access to alternative ticketing resale platforms." Schneiderman, *supra* note 26, at 32.

295. Council Regulation 2299/89 of July 24, 1989, On a Code of Conduct for Computerized Reservation Systems, O.J. (L 220) 1 (EEC) (prohibiting CRSs from engaging in discriminatory display or routing and requiring CRSs to permit all airlines to participate in a non-discriminatory manner).

296. Ravich, *supra* note 287 (discussing airline divestiture of GDS ownership interests and concomitant deregulation); Dawit Habtemariam, *A Brief History of Air Travel Distribution*, BUS. TRAVEL NEWS (Oct. 28, 2018), <https://perma.cc/C7WL-53V2> ("At the same time, airlines were divesting their ownership in CRSs. Sabre launched an IPO in 1996 and became fully independent of American Airlines in 2000. Galileo, which had merged with Apollo, went public in 1997. Amadeus, which had absorbed System One, went public in 1999. . . . Given the growing competition and the fact that airlines were divesting their ownership in CRSs, the DOT eliminated some of its CRS regulations and let the rest expire.").

297. *See, e.g.*, Khan, *supra* note 20 (arguing that structural separations are preferable to non-discrimination rules because they may be more effective in policing conduct and they reduce regulatory burden).

### 3. *Transparency and Disclosure*

More transparency and disclosure would also advance healthier competition in advertising markets. In the securities market, mandatory disclosure requirements allow market participants to more fully understand how the complex trading markets work and to better monitor intermediary conflicts of interest.<sup>298</sup> Financial exchanges must disclose to regulators how their trading operations work and obtain regulatory approval for their exchange operations. Broker dealers and other financial intermediaries must disclose information about their trading activity (in milliseconds or a finer increment) and even synchronize business clocks with a universal clock to let others monitor whether they are properly managing their conflicts of interest (and not front-running).<sup>299</sup> Transparency along the same lines in advertising markets would effectuate the same ends.

The principles of transparency and disclosure have been utilized in the emerging cryptocurrency markets too. For example, the State of New York recently passed legislation requiring cryptocurrency exchanges to disclose information about their trading operations before obtaining a license to operate as an “exchange.”<sup>300</sup> When the NYAG investigated this

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298. See, e.g., INT’L ORG. OF SEC. COMM’N, OBJECTIVES AND PRINCIPLES OF SECURITIES REGULATION (2003) (discussing how transparency is a core objective in securities regulation and how transparency helps police market manipulation and unfair trading practices); see also Julie Manasfi, *Systemic Risk and Dodd-Frank’s Volcker Rule*, 4 WM. & MARY BUS. L. REV. 181 (2013) (discussing how disclosure rules can help to manage conflicts of interest).

299. Reporting requirements in Exchange Act Section 13(d) and SEC Rule 13d-1 require brokers to disclose information about proprietary trades in Schedule 13D. 17 C.F.R. § 240.13d-1; 17 C.F.R. § 242.613 (requiring all national securities exchanges and associations to file a “national market system plan to govern the creation, implementation, and maintenance of a consolidated audit trail and central repository” to collect and keep relevant data on trading practices); BD. OF THE INT’L ORG. OF SEC. COMM’N, CLOCK SYNCHRONISATION: CONSULTATION REPORT (2019).

300. See discussion *supra* note 262.

market in 2018, it specifically investigated the issue of transparency around fees, noting “[f]ee transparency is especially important in a complex electronic trading environment like virtual currency.”<sup>301</sup> However, one thing that distinguishes cryptocurrency markets from advertising markets is how cryptocurrency exchanges have already created self-regulatory organizations (SROs) to help to facilitate the surveillance of manipulative and fraudulent trading activity.<sup>302</sup>

Advertising markets would benefit from the same transparency and disclosure approach. Google has pushed back on disclosure requirements for “privacy” reasons, but it is important to note that financial regulators successfully balance similar privacy concerns.<sup>303</sup> At the end of the day, lawmakers strike the right balance with disclosure requirements that allow market participants to understand the market and police intermediaries, alongside industry specific rules that simultaneously address privacy.<sup>304</sup>

#### V.CONCLUSION

Approximately 86% of online display ad space is now bought and sold on electronic trading venues, where buyers and sellers must go through a computerized intermediary to trade. Google dominates these

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301. UNDERWOOD, *supra* note 26, at 11.

302. VIRTUAL COMMODITY ASSOCIATION, <https://perma.cc/7MVF-KGBC> (last visited Nov. 18, 2020).

303. Press Release, Jay Clayton, Chairman, SEC, Statement on Status of the Consolidated Audit Trail (Sept. 9, 2019), <https://perma.cc/45ZA-CHVF>; Patrick Temple-West & Robert Armstrong, ‘Hubble Telescope for Markets’ Attracts Criticism, FIN. TIMES (Oct. 29, 2019), <https://perma.cc/DF64-ZQ9J> (Dennis Kelleger, of consumer advocacy group Better Markets, stating “The finance industry does not want to [sic] the regulators to have the ability to monitor and police their behaviour, and they are using privacy as a pretext.”).

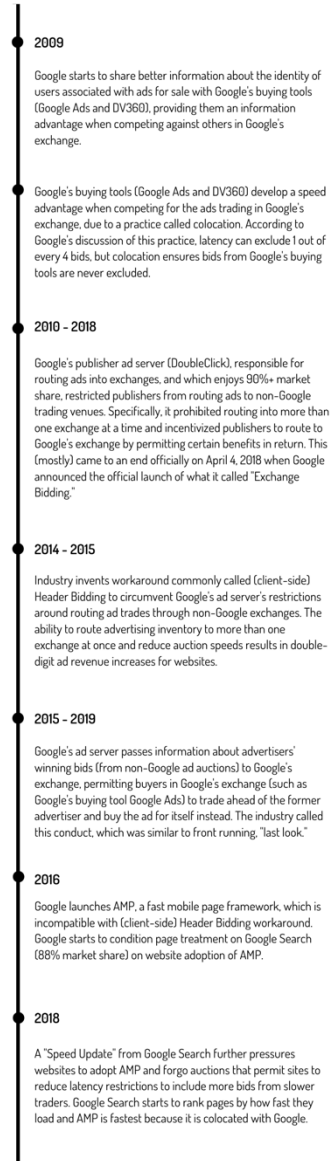
304. This delicate balance came up recently with the SEC’s consolidated audit trail, which is a comprehensive market surveillance initiative. See Clayton, *supra* note 303 (discussing the balancing of personally identifiable consumer information and market surveillance).

markets and distorts competition by engaging in conduct that lawmakers have experience with in other electronic trading markets. Google reserves for itself speed and information advantages, routes order flow to its exchange and websites in a discriminatory manner, and breaches ethical walls to use the sensitive, nonpublic information belonging to third-party buyers and sellers to inform its own trading activity. To protect competition in advertising, lawmakers might borrow the core principles financial regulators have already crafted to address these types of competition problems in other electronic trading markets. That is, require exchanges to provide all traders with non-discriminatory access to information and speed, identify and manage intermediary conflicts of interest, and require trading disclosures to advance these principles in order to protect the overall integrity of the market.

## VI. APPENDIX

A. *Timeline*

## Timeline





B. Screenshot of Auction Timestamp Transparency

Image of header bidding timeouts on *The Washington Post* on November 30, 2019.

