

REMEDIES FOR SELF-PREFERENCING: DOMINANCE AND ITS DISCONTENTS

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ABSTRACT

“Self-preferencing” by online platforms has become a hot (and hotly contested) issue. Antitrust authorities have imposed conduct remedies, and billions of dollars in fines on Google (\$2.7 billion), Apple (\$1.95 billion) and Amazon (\$1.3 billion). We study the impact of two sequentially imposed remedies to self-preferencing – the “equal treatment” remedy imposed on Google by the European Commission in 2017, and the requirement of non-discriminatory treatment imposed on gatekeeper platforms by the Digital Markets Act in 2024. We find clear evidence that each of these remedies affected the architecture and labeling of the Google Search Results Page. We simulated the impact of these changes on click-through rates and find evidence of a modest impact. These findings demonstrate both the impact and the limitations of conduct remedies.

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Financial support for some aspects of this project were received from the McCarthy Institute, the University of San Francisco, the University of Illinois, and Fairsearch. The McCarthy Institute has received unrestricted and restricted grants from various sources, including Microsoft and various law firms. Some of the results in this paper were previously presented to DG-Comp personnel and at a program sponsored by Fairsearch in December, 2013, as well as at Golden Gate University School of Law in 2020. We acknowledge the hard work of five student research assistants: Daedalus Laroche and Payton Love (ASU) and David Afahame, Geoffrey Kasler and Teanne Nguyen (Golden Gate).

I. Overview.....	2
II. Background on Self-preferencing	5
A. Evolution of Google’s Search Output – and Competitor Complaints	5
B. Enter Antitrust	6
1. U.S. Antitrust investigations.....	6
2. European Antitrust investigations	8
C. Enter the Digital Markets Act.....	12
III. Previous Research.....	13
IV. Methodology	14
A. Overview.....	14
B. Pilot Study of Equal Treatment Remedy: Products	15
C. Full Study of Equal Treatment Remedy: Flights, Hotels, Restaurants.....	16
D. Study of DMA Prohibition on Self-Preferencing: Flights, Hotels, Products, Restaurants.....	16
E. CTR Simulation Study.....	17
V. Findings	17
A. Pilot Study	17
B. Full Study of Equal Treatment Remedy	19
C. Effects of the DMA	27
D. SRP Architecture and CTRs	27
VI. DISCUSSION	29
A. Impact of the equal treatment and DMA remedies.....	29
B. Impact of Remedies on CTRs.....	29
C. Implications of Our Findings for Regulatory Intervention.....	29
D. Limitations of Our Work	30
VII. Conclusion	31

I. OVERVIEW

Over the past two decades, controversy has repeatedly erupted over “self-preferencing” by online platforms. Amazon has been accused of favoring its own products and services (i.e., “Amazon Basics” and “Amazon Fulfillment Services”) over products and services offered by third party vendors. Apple has been accused of discriminating in favor of Apple Music. Google has been accused of favoring its own “vertical” (i.e., specialized or topical) search results over competing vertical results offered by other entities.

These complaints have attracted attention from legislators and antitrust enforcers. Effective March, 2024, the European Union Digital Markets Act

(DMA) prohibits “gatekeeper” digital platforms from engaging in self-preferencing, by *inter alia* ranking or presenting their own products and services more favorably than unrelated third parties.¹ Congress has considered (but not enacted) multiple bills that would prohibit or limit self-preferencing by dominant platforms.²

Antitrust enforcers have also been quite active in this space. In 2024, Apple was hit with a \$1.95 billion fine by the European Commission for preferring Apple Music to Spotify and other music app developers.³ In 2023, the U.S. Federal Trade Commission (“FTC”) and 17 state attorneys general filed a lawsuit against Amazon, alleging various antitrust claims, including the argument that Amazon was biasing its “search results to preference Amazon’s own products over ones that Amazon knows are of better quality.”⁴ In 2022, the European Commission (EC) published a settlement (called a “Commitment”) that was aimed at reducing Amazon’s self-preferencing in logistic services.⁵ In 2021, the Italian Competition Authority (ICA) fined Amazon 1.1 billion Euros, and imposed remedies that were again aimed at reducing self-preferencing in Amazon’s logistic services. In 2018, the Competition Commission of India fined Google \$21.1 million for favoring Google Flight Search over rival travel sites. In 2017, the European Commission (“E.C.”) fined Google \$2.7 billion, and gave it 90 days to give “equal treatment” to rival “shopping” services or face additional fines.⁶ The fine was recently affirmed by the European Union’s Court of Justice in September, 2024.⁷ A private lawsuit against Google

¹ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022R1925>

Article 6 of the DMA provides that “[t]he gatekeeper shall not treat more favourably, in ranking and related indexing and crawling, services and products offered by the gatekeeper itself than similar services or products of a third party.” Instead, the gatekeeper is required to “apply transparent, fair and non-discriminatory conditions to such ranking.” Id.

² See, e.g., American Innovation and Choice Online Act, S. 2033, 118th Cong. <https://www.congress.gov/bill/118th-congress/senate-bill/2033>; American Innovation and Choice Online Act, S. 2922, 117th Cong., <https://www.congress.gov/bill/117th-congress/senate-bill/2992>; Anticompetitive Exclusionary Conduct Prevention Act of 2020, S. 3426, 116th Cong., <https://www.congress.gov/bill/116th-congress/senate-bill/3426/text>.

³ See Arjun Kharpul, *Apple hit with more than \$1.95 billion EU antitrust fine over music streaming*, CNBC (Mar. 4, 2024), <https://www.cnbc.com/2024/03/04/apple-hit-with-more-than-1point95-billion-eu-antitrust-fine-over-music-streaming.html>.

⁴ <https://www.ftc.gov/news-events/news/press-releases/2023/09/ftc-sues-amazon-illegally-maintaining-monopoly-power>

⁵ https://ec.europa.eu/commission/presscorner/detail/en/ip_22_7777

⁶ https://ec.europa.eu/competition/antitrust/cases/dec_docs/39740/39740_14996_3.pdf

⁷ Google/Alphabet v. European Commission, In re Google Shopping, https://curia.europa.eu/juris/document/document_print.jsf?jsessionid=9AB3F4B3A3F7A029259C5309E0F06AA8?mode=DOC&pageIndex=0&docid=289925&part=1&doclang=EN&text=&dir=&occ=first&cid=616947

seeking \$3.86 billion for self-preferencing/abuse of dominance is currently pending.⁸

Scholars have written at length about these disputes – with opinions polarized along predictable lines. Intervention-oriented antitrust scholars have hailed the virtues of these interventions and complained about the inability of antitrust enforcers to decisively address these problems by breaking up the offenders. Skeptics have criticized these efforts, and predicted multiple adverse consequences will result if these efforts are upheld by the courts.

Considerable attention and ink has been devoted to the costs and benefits of self-preferencing by online platforms -- but much less has been spent on the issue of remedies. Self-preferencing by online platforms could be eliminated by prohibiting online search entirely -- but for obvious reasons, that approach has found no takers. Less sweeping remedies are also available, such as prohibiting online platforms from engaging in any ancillary businesses, or from offering any “vertical” (i.e., specialized) searches. Alternatively, one could prohibit “excessive” self-preferencing, or impose an *ex ante* requirement of “parity of treatment.” Even these less sweeping remedies involve complex definitional and monitoring obligations – and their effectiveness is ultimately an empirical question.

We study the impact of two sequentially imposed conduct remedies -- the “equal treatment” remedy imposed on Google by the European Commission in 2017, and the ban on self-preferencing imposed by the Digital Markets Act (DMA) in 2024. Using data from three European countries and a control country (the U.S.), we find clear evidence that both remedies have affected the architecture and labeling of the search results page (SRP) in the affected countries. We study the effect of these changes on click-through rates (“CTRs”) using an online simulation. We find that these remedies increase CTRs on rival links, with the magnitude of the increase a function of SRP architecture and labeling and inherent brand strength of the rival link. We also show that other remedies (including those proposed by Google before the equal treatment remedy was imposed) had at most a modest impact on CTRs on rival links -- and even that modest impact could be erased by other changes to the SRP.

Our study highlights the importance of evaluating the actual real-world impact of remedies – rather than simply hoping for the best or expecting the worst. Our methodology provides a framework for antitrust

⁸ <https://www.ideal.de/unternehmen/pressemitteilungen/ideal-is-expanding-its-claim-for-damages-against-google?cmpReload=true>.

enforcers to evaluate the impact of proposed remedies and simulate the likely effects of various adaptive responses/circumvention strategies.

II. BACKGROUND ON SELF-PREFERENCING

A. *Evolution of Google's Search Output – and Competitor Complaints*

The fight over self-preferencing by online platforms has been going on for almost twenty years. For Google, the fight has coincided with various changes in the SRP. Google originally presented only unpaid search results, in the form of links to other websites.⁹ Google introduced paid ads in 2000 and moved from a “ten blue links” model to “Universal Search” in 2007.¹⁰ Instead of its original model of providing links to other websites, Google sought to answer users’ questions directly—and in some instances, imbedded the results of one or more specialized (“vertical”) searches provided by Google.¹¹

Current Google vertical search options in the U.S. include Google Maps, Google Flights, Google Local (previously known as Google Places), and Google Shopping. Google’s critics complain that it “hard codes” the appearance of these vertical searches to ensure they appear near the top or above the algorithmic search results.¹² And, each of these verticals has other features that make it more visually striking and attention grabbing. For example, Google Shopping has images of the products that were searched for, along with a direct link to a merchant where the product may be purchased.

⁹ David A. Hyman and David J. Franklyn, *Search Bias and the Limits of Antitrust: An Empirical Perspective on Remedies*, 55 *Jurimetrics J.* 339–380 (2015).

¹⁰ Marissa Meyer, *Universal Search: The Best Answer is still the best answer*, Google Official Blog, May 16, 2007, at <http://googleblog.blogspot.com/2007/05/universal-search-best-answer-is-still.html>. See also Danny Sullivan, *Google Launches “Universal Search” & Blended Results*, Search Engine Land, May 16, 2007, at <http://searchengineland.com/google-20-google-universal-search-11232>

¹¹ *Id.*

¹² Benjamin Edelman, *Hard-Coding Bias in Google “Algorithmic” Search Results* (November 15, 2010), <http://www.benedelman.org/hardcoding/>; Benjamin Edelman & Benjamin Lockwood, *Measuring Bias in “Organic” Web Search* app. 1 (Jan. 19, 2011), <http://www.benedelman.org/searchbias/appendix1.html> (Appendix 1: Others’ Concerns about Search Engine Bias); see also Marissa Mayer, *Presentation at Seattle Conference on Scalability: Scaling Google for Every User*, in GOOGLE TECH TALKS, YOUTUBE (June 23, 2007), <http://www.youtube.com/watch?v=LT1UFZSbcxE#t=44m50s> (“[When] we roll[ed] out Google Finance, we did put the Google link first. It seems only fair right, we do all the work for the search page and all these other things, so we do put it first. . . . That has actually been our policy, since then, because of Finance. So for Google Maps again, it’s the first link.”).

B. Enter Antitrust

Google's competitors complained that they were being disadvantaged by this self-preferencing. Several of these companies formed "Fairsearch," which aggressively lobbied for the FTC and DG-Comp to bring antitrust actions against Google.¹³ Hearings before the Senate Antitrust Committee in 2011 provided a platform for the airing of this dispute.¹⁴ Investigations were then launched in both the U.S. and Europe.

1. U.S. Antitrust investigations

The FTC launched a formal investigation of Google's advertising and search practices in 2011.¹⁵ The investigation was closed in 2013 with a settlement that did not address the issue of self-preferencing. The FTC's press release made it clear that the agency found little merit in the claims regarding self-preferencing and dismissed the argument that Google's practices raised antitrust concerns.¹⁶

Google's critics vigorously protested the failure of the FTC to address self-preferencing – but to no avail.¹⁷ The issue resurfaced in March, 2015, when

¹³ FAIRSEARCH, <http://www.fairsearch.org> (last visited May 7, 2013).

¹⁴ *The Power of Google: Serving Consumers or Threatening Competition? Hearing Before the Subcomm. on Antitrust, Competition Policy and Consumer Rights of the S. Comm. on the Judiciary*, 112th Cong. 35–36 (2011), available at <http://www.gpo.gov/fdsys/pkg/CHRG-112shrg71471/pdf/CHRG-112shrg71471.pdf>.

¹⁵ Jessica Guynn & Jim Puzanghera, *FTC Launches Investigation of Google*, L.A. TIMES (June 25, 2011), <http://articles.latimes.com/2011/jun/25/business/la-fi-google-ftc-20110625>; see also Thomas Catan & Amir Efrati, *Feds to Launch Probe of Google*, WALL ST. J. (June 24, 2011), <http://online.wsj.com/article/SB10001424052702303339904576403603764717680.html>.

¹⁶ Press Release, Fed. Trade Comm'n, Google Agrees to Change Its Business Practices to Resolve FTC Competition Concerns In the Markets for Devices Like Smart Phones, Games and Tablets, and in Online Search (Jan. 3, 2013), available at <http://www.ftc.gov/opa/2013/01/google.shtm>; see also *Statement of the Federal Trade Commission Regarding Google's Search Practices: In the Matter of Google Inc.*, FTC File Number 111-0163, FED. TRADE COMM'N (Jan. 3, 2013), available at https://www.ftc.gov/system/files/documents/public_statements/295971/130103googlesearchstmttoftcomm.pdf.

The settlement did include a separate "Letter of Commitment," in which Google promised to provide a mechanism whereby website owners could opt out of having their content appear on Google's vertical search options. Letter from David Drummond, Senior Vice President of Corporate Dev. & Chief Legal Officer, Google Inc., to Hon. Job Leibowitz, Chairman, Fed. Trade Comm'n (Dec. 27, 2012), available at https://www.ftc.gov/system/files/documents/closing_letters/google-inc./130103googleletterchairmanleibowitz.pdf.

¹⁷ See, e.g., *Google Wins an Antitrust Battle*, Editorial, N.Y. TIMES, Jan. 6, 2013, at SR10, available at <http://www.nytimes.com/2013/01/06/opinion/sunday/google-wins-an-antitrust-battle.html>; Pamela Jones Harbour, Op-Ed., *The Emperor of All Identities*, N.Y. TIMES, Dec. 19, 2012, at A35, available at <http://www.nytimes.com/2012/12/19/opinion/why->

a portion of the FTC's Bureau of Competition staff report was inadvertently disclosed to the Wall Street Journal.¹⁸ Although the report was incomplete, it showed that Google, had in fact targeted its rivals in vertical search, by adopting "a strategy of demoting or refusing to display links to certain vertical websites in highly commercial categories."¹⁹ The inadvertent disclosure attracted considerable public attention, prompting the FTC to issue a statement reiterating its support for the terms of the original settlement.²⁰

The issue emerged again in 2021, when Politico published several articles based on leaked documents relating to the original FTC investigation.²¹ Politico's spin on the documents suggested that FTC lawyers were keen to pursue a case based on self-preferencing, compared with the FTC economists who poured cold water on the case. This spin harkens back to "attorney-based description of [FTC] economists in the 1970s as 'case

google-has-too-much-power-over-your-private-life.html; Edward Wyatt, *Critics of Google Antitrust Ruling Fault the Focus*, N.Y. TIMES, Jan. 7, 2013, at B1, available at <http://www.nytimes.com/2013/01/07/technology/googles-rivals-say-ftc-antitrust-ruling-missed-the-point.html>; John Cassidy, *Why the Feds Should Have Been Tougher on Google*, NEW YORKER (Jan. 8, 2013), <http://www.newyorker.com/online/blogs/johncassidy/2013/01/why-the-feds-should-have-been-tougher-on-google.html>; FairSearch Panel "Lessons from the Google-FTC Settlement", FAIRSEARCH.ORG (Apr. 12, 2013), <http://www.fairsearch.org/general/video-fairsearch-panel-lessons-from-the-google-ftc-settlement/>; *The FTC's Missed Opportunity on Google*, BLOOMBERG (Jan. 3, 2013, 1:05 PM), <http://www.bloomberg.com/news/2013-01-03/the-ftc-s-missed-opportunity-on-google.html>.

¹⁸ See, e.g., Brody Mullins, Rolfe Winkler and Brent Kendall, *Inside the U.S. Antitrust Probe of Google*, WALL ST. J. Mar. 19, 2015, available at <http://www.wsj.com/articles/inside-the-u-s-antitrust-probe-of-google-1426793274>; See, e.g., Rebecca Ruiz and Conor Dougherty, *Take Google to Court, Staff Report Urged FTC*, N.Y. TIMES, Mar. 19, 2015, available at http://www.nytimes.com/2015/03/20/technology/take-google-to-court-staff-report-urged-ftc.html?_r=0.

¹⁹ Id.

²⁰ <https://www.ftc.gov/news-events/press-releases/2015/03/statement-chairwoman-edith-ramirez-commissioners-julie-brill>

²¹ Leah Nylen, *How Washington Fumbled the Future*, POLITICO, March 16, 2021, <https://www.politico.com/news/2021/03/16/google-files-ftc-antitrust-investigation-475573>; Leah Nylen, *The Google Files: 4 Things The Documents Reveal*, POLITICO, March 16, 2021, <https://www.politico.com/news/2021/03/16/google-files-what-the-documents-reveal-475577>; Leah Nylen, *The government's lawyers saw a Google monopoly coming. Their bosses refused to sue*, POLITICO, March 16, 2021, <https://www.politico.com/news/2021/03/16/google-files-mobile-search-market-475576>

killers’ . . . certain attorneys in the [FTC] legal shops retained the ‘case-killer’ view of [FTC] economists into the 1980s.”²²

More recently, the FTC revisited the issue of self-preferencing by dominant online platforms, bringing a case against Amazon.²³ The current FTC chair has made it clear that he is concerned with the behavior of large online platforms.²⁴ The DOJ and multiple states have sued Google for monopolization, and the District Court recently ruled against Google.²⁵

2. European Antitrust investigations

In February 2010, several companies filed complaints with the European Commission claiming “that Google downgraded their sites in its [algorithmic] search results to weaken potential competitors for advertising.”²⁶ On November 30, 2010, the European Commission announced a formal probe to “investigate whether Google has abused a dominant market position in online search by allegedly lowering the ranking of unpaid search results . . . by according preferential placement to the results of its own vertical search services in order to shut out competing services.”²⁷ While the European Commission conducted its investigation, there have been additional complaints from other

²² Paul Pautler, *A History of the FTC’s Bureau of Economics*, American Antitrust Institute Working Paper 15-03, fn 386 https://www.antitrustinstitute.org/wp-content/uploads/2018/08/FTC-Bureau-of-Economics-History_0.pdf (“Also see Katzman (1980, pp. 51, 53) for an attorney-based description of economists in the 1970s as “case killers,” a view Katzman finds to be overstated. Certain attorneys in the legal shops retained the “case-killer” view of economists into the 1980s.”) The reference to Katzman (1980) is to ROBERT A. KATZMAN, *REGULATORY BUREAUCRACY: THE FEDERAL TRADE COMMISSION AND ANTITRUST POLICY* (MIT Press, 1980).

²³ Nancy Scola, *Sources: Feds taking second look at Google search*, Politico, May 11, 2016, at <https://www.politico.com/story/2016/05/federal-trade-commission-google-search-questions-223078>

²⁴ https://www.ftc.gov/system/files/ftc_gov/pdf/ferguson-goat-concurrence.pdf
<https://www.ftc.gov/news-events/news/press-releases/2025/02/federal-trade-commission-launches-inquiry-tech-censorship>
<https://www.promarket.org/2025/04/17/transcript-ftc-chair-andrew-ferguson-keynote/>

²⁵ Department of Justice Press Release, *Justice Department Statements on the U.S. District Court for the District of Columbia’s Decision in U.S. v Google*, <https://www.justice.gov/opa/pr/justice-department-statements-us-district-court-district-columbias-decision-us-v-google>

²⁶ James Kanter & Eric Pfanner, *Google Faces Antitrust Inquiry in Europe*, N.Y. TIMES, Dec. 1, 2010, at B1, available at <http://www.nytimes.com/2010/12/01/technology/01google.html>; Richard Waters & Niki Tait, *Google Faces Brussels Antitrust Scrutiny*, FINANCIAL TIMES (Feb. 24, 2010, 3:42 PM), <http://www.ft.com/cms/s/2/46018520-20da-11df-b920-00144feab49a.html>.

²⁷ Press Release, European Comm’n, Antitrust: Commission Probes Allegations of Antitrust Violations by Google (Nov. 30, 2010), available at http://europa.eu/rapid/press-release_IP-10-1624_en.htm.

companies.²⁸ As part of its investigation, the European Commission explicitly identified self-preferencing as an antitrust concern.²⁹

In an attempt to resolve this dispute, Google made a series of three settlement proposals to DG-Comp.³⁰ The first settlement proposal (April, 2013) provided that Google would label and clearly separate “promoted links to its own specialised search services so that users can distinguish them from natural web search results,” and “display links to three rival specialised search services close to its own services, in a place that is clearly visible to users.”³¹

Critics made it clear they were unsatisfied with the initial settlement proposal from Google.³² DG-Comp subsequently rejected the first

²⁸ See Alex Barker, *Antitrust Chief Holds Aces in Google Case*, FINANCIAL TIMES (Jan. 10, 2013, 7:44 AM), <http://www.ft.com/cms/s/0/42a827b2-5b24-11e2-8d06-00144feab49a.html>; Foo Yun Chee, *EU Sees Google Competition Deal After August*, REUTERS (Feb. 22, 2013), <http://www.reuters.com/article/2013/02/22/us-eu-google-idUSBRE91L0EJ20130222>; Greg Sterling, *Europeans Taking Sweet Time in Resolving Antitrust Case With Google*, SEARCH ENGINE LAND, (Feb. 25, 2013, 10:26 AM) <http://searchengineland.com/europeans-taking-sweet-time-in-resolving-antitrust-issues-with-google-149603>; Aoife White, *Google Antitrust Scrutiny Mounts in Europe*, BLOOMBERG (May 7, 2012, 4:00 PM), <http://www.bloomberg.com/news/2012-05-07/google-antitrust-scrutiny-mounts-in-europe.html>.

²⁹ Memorandum, European Comm’n, Commission Seeks Feedback on Commitments Offered by Google to Address Competition Concerns—Questions and Answers (Apr. 25, 2013), available at http://europa.eu/rapid/press-release_MEMO-13-383_en.htm.

³⁰ James Kanter, *In Europe, New Protest Over Google*, N.Y. TIMES, Apr. 9, 2013, at B1, available at <http://www.nytimes.com/2013/04/09/technology/09iht-google09.html> (noting that the European Commission was “receiving proposals this week from Google to clear up concerns about its search practices, and that he [Mr. Alumnia, the E.C. head of antitrust] hoped they would make it easier for Internet users to identify when Google was promoting its own services rather than those of competitors who might offer better results”).

³¹ Press Release, European Comm’n, Antitrust: Commission Seeks Feedback on Commitments Offered by Google to Address Competition Concerns (Apr. 25, 2013), available at http://europa.eu/rapid/press-release_IP-13-371_en.htm.

³² Id. The first settlement proposal also allowed websites to “opt-out from the use of all their content in Google’s specialised search services, while ensuring that any opt-out does not unduly affect the ranking of those web sites in Google’s general web search results,” and “offer all specialised search web sites that focus on product search or local search the option to mark certain categories of information in such a way that such information is not indexed or used by Google make it easier for Internet users to identify when Google was promoting its own services rather than those of competitors who might offer better results”).

³² See, e.g., James Kanter, *Rivals Are Invited to Review Google Antitrust Settlement*, N.Y. TIMES, Apr. 26, 2013, at B3, available at <http://www.nytimes.com/2013/04/26/technology/26iht-google26.html>; *Responses to Google’s Proposed Remedies to the European Commission*, FAIR SEARCH.ORG EUROPE,

settlement proposal and requested further concessions.³³ Google subsequently made two additional settlement proposals, in October, 2013 and February, 2014.³⁴ In the final settlement proposal, Google promised to label and physically separate its specialized (vertical) search results from algorithmic search results, and “display prominent links to three rival specialised search services in a format which is visually comparable to that of links to its own services.” However, these rivals would have to pay for this access to the Google SRP, using the same auction mechanism that Google used for vendors who wished to be included in the Google Shopping region.

DG-Comp accepted Google’s third settlement proposal,³⁵ but the settlement collapsed in September 2014.³⁶ A new head of DG-Comp took over in November 2014,³⁷ and the first formal Statement of Objections was issued

<http://www.fairsearcheurope.eu/responses-to-googles-proposal-to-the-european-commission/> (last visited Mar. 10, 2015).

³³ James Kanter & Claire Cain Miller, *In European Antitrust Fight, Google Needs to Appease Competitors*, N.Y. TIMES, July 18, 2013, at B1, available at http://www.nytimes.com/2013/07/18/technology/europe-wants-more-concessions-from-google.html?_r=0; Foo Yun Chee, *EU Demands More Concessions from Google to Settle Case*, REUTERS (July 17, 2013), <http://www.reuters.com/article/2013/07/17/us-eu-google-idUSBRE96G0FK20130717>; Frances Robinson, *EU Tells Google to Offer More in Search Probe: Competition Watchdog Says Search Giant Must Make Further Concessions*, WALL ST. J. (July 17, 2013, 7:53 AM), <http://online.wsj.com/article/SB10001424127887323993804578611362017999002.html>.

³⁴ Aoife White, *Google Publishes Concessions Deal to Settle EU Antitrust Probe*, BLOOMBERG (Feb. 14, 2014, 10:59 AM), <http://www.bloomberg.com/news/2014-02-14/google-publishes-concessions-deal-to-settle-eu-antitrust-probe.html>.

See also https://ec.europa.eu/commission/presscorner/detail/en/IP_14_116

³⁵ Press Release, European Comm’n, *Antitrust: Commission Obtains from Google Comparable Display of Specialized Search Rivals* (Feb. 5, 2014), available at http://europa.eu/rapid/press-release_IP-14-116_en.htm?locale=en. See also Nick Summers, *Google Finally Settles Its Antitrust Case in the EU with Commitment to Promoting Rival Services*, TNW (Feb. 5, 2014, 1:33 PM), <http://thenextweb.com/eu/2014/02/05/google-finally-settles-antitrust-case-eu-commitment-promoting-rival-services/>.

³⁶ Tom Fairless, *EU Asks More of Google: European Union Antitrust Authorities Seek Fresh Concessions From Internet Giant in Ongoing Probe*, WALL ST. J. (Sept. 8, 2014, 12:49 PM), <http://www.wsj.com/articles/eu-asks-more-of-google-1410180167>.

³⁷ Tom Fairless, *Google Must Improve Search Settlement or Face Charges, EU’s Almunia Says: Antitrust Chief Says Investigation Hasn’t Been Swayed by Political Pressure*, WALL ST. J., (Sept. 23, 2014, 8:27 AM), <http://www.wsj.com/articles/google-must-improve-search-settlement-or-face-charges-eus-almunia-says-1411462097>.

on April 15, 2015.³⁸ The Statement of Objections reflects the E.C.'s conclusion:

that Google gives systematic favourable treatment to its comparison shopping product (currently called 'Google Shopping') in its general search results pages, e.g. by showing Google Shopping more prominently on the screen. It may therefore artificially divert traffic from rival comparison shopping services and hinder their ability to compete on the market. . . . The Commission's preliminary view is that to remedy such conduct, Google should treat its own comparison shopping service and those of rivals in the same way.³⁹

In 2016, the EC sent Google a supplementary Statement of Objections, outlining

a broad range of additional evidence and data that reinforces the Commission's preliminary conclusion that Google has abused its dominant position by systematically favouring its own comparison shopping service in its general search results. The additional evidence relates, amongst other things, to the way Google favours its own comparison shopping service over those of competitors, the impact of a website's prominence of display in Google's search results on its traffic, and the evolution of traffic to Google's comparison shopping service compared to its competitors.⁴⁰

After a year of further proceedings, the EC fined Google \$2.7 billion on June 27, 2017, and gave Google 90 days to give “equal treatment” to rival shopping services.⁴¹ Google announced that it would implement an “equal treatment” remedy while it took steps to challenge the EC's ruling. As noted previously, the E.C.'s equal treatment remedy was upheld – first by the European Union's General Court in 2021, and then by the European Union's Court of Justice in September, 2024.

The Statement of Objections and fine were hailed by Fairsearch and its members, but jubilation quickly turned to disappointment and complaints that the EC's remedies did not address the underlying problem of self-preferencing. A study done in 2020 claimed that Google was not complying with the equal treatment remedy because less than 1 percent of

³⁸ European Commission Fact Sheet, Antitrust: Commission sends Statement of Objections to Google on comparison shopping service, Apr. 15, 2015, at http://europa.eu/rapid/press-release_MEMO-15-4781_en.htm

³⁹ Id.

⁴⁰ http://europa.eu/rapid/press-release_IP-16-2532_en.htm

⁴¹ http://ec.europa.eu/competition/antitrust/cases/dec_docs/39740/39740_14996_3.pdf (imposing fine of 2.42 billion Euros, or roughly \$2.7 billion).

the traffic through Google Shopping went to rival comparison shopping services.⁴²

C. Enter the Digital Markets Act

The next development was the adoption of the DMA by the European Union. The DMA was adopted because of the perception that it was too costly, time-consuming, and ineffective to bring individual antitrust cases against dominant platforms.⁴³ The DMA imposes a series of obligations on gatekeeper platforms, with one provision directly addressing self-preferencing:

The gatekeeper shall not treat more favourably, in ranking and related indexing and crawling, services and products offered by the gatekeeper itself than similar services or products of a third party. The gatekeeper shall apply transparent, fair and non-discriminatory conditions to such ranking and related indexing and crawling.⁴⁴

“Ranking” is defined quite broadly by the DMA, reflecting the remedial scope of the Act.⁴⁵ In September, 2023, the EC designated Google as a gatekeeper, triggering the DMA’s broader prohibition on self-preferencing compared to the equal treatment remedy imposed in 2017.⁴⁶ The EC’s designation identified six “core platform services:” Google Maps, Google Play, Google Shopping, Google Search, Google Android, and Google Ads.⁴⁷

In response to the DMA, Google announced various changes to the SRP in Europe. The changes included a tab on the top of the SRP that links to

⁴² Javier Espinoza, *Google Shopping accused of failing to address competition problems*, Financial Times, Sep. 27, 2020, <https://www.ft.com/content/4c6f06b9-a984-429e-b397-332a1779bd71>. See also Thomas Hoppner, *Google’s (Non-) Compliance with the EU Shopping Decision*, Competition Law in Practice (2020), [https://www.hausfeld.com/uploads/documents/googles_\(non\)_compliance_with_google_search_\(shopping\).pdf](https://www.hausfeld.com/uploads/documents/googles_(non)_compliance_with_google_search_(shopping).pdf).

⁴³ <https://apnews.com/article/google-antitrust-lawsuit-europe-tips-9b100e96d23849b742d27c457157b6bc>

⁴⁴ Article 6(5) of the DMA.

⁴⁵ Article 2(22) of the DMA defines ranking as “the relative prominence given to goods or services offered through online intermediation services, online social networking services, video-sharing platform services or virtual assistants, or the relevance given to search results by online search engines, as presented, organized or communicated by the undertakings providing online intermediation services, online social networking services, video-sharing platform services, virtual assistants or online search engines, irrespective of the technological means used for such presentation, organisation or communication and irrespective of whether only one result is presented or communicated.”

⁴⁶ https://ec.europa.eu/commission/presscorner/detail/en/ip_23_4328

⁴⁷ Id.

comparison sites; the removal of Google Flights from the SRP; and the creation of a new region that includes comparison sites and some direct results.⁴⁸

Prior to 2024, Google had repeatedly represented that it was in compliance with the obligations imposed by the equal treatment remedy. These changes to Google's SRP post-DMA highlight that Google believed (and acted on the belief) that the DMA imposed additional requirements over and above the equal treatment remedy that was imposed in 2017.

Finally, in September, 2025, the EC hit Google with a \$3.5 billion fine for violations of the DMA involving ad tech.⁴⁹ Google had previously offered to make changes to the SRP involving in an attempt to settle the case before the fine was imposed.⁵⁰ It seems likely that Google will attempt to settle the case by offering additional changes to the SRP. Because no changes have been made as a result of the ad tech case, we do not consider that issue further.

III. PREVIOUS RESEARCH

There is a substantial (and often heated) literature on the frequency and merits (or lack thereof) of self-preferencing.⁵¹ Because we focus on the issues of remedies, we need not enter into these disputes.

⁴⁸ See Carolina Jativa et al., Navigating the Digital Markets Act: How are Google SERPs Evolving in Europe? Search Engine and Digital Insights, May 7, 2024, <https://pros.com/navigating-digital-markets-act/>; Nicola Agius, *Google unveils major changes to ensure Digital Markets Act compliance*, Search Engine Land, Mar. 5, 2024, <https://searchengineland.com/google-changes-digital-markets-act-compliance-438158>; Oliver Bethell, *An Update on our preparations for the DMA*, Google Blog, Jan. 17, 2024, <https://blog.google/around-the-globe/google-europe/an-update-on-our-preparations-for-the-dma/>.

Rivals were quick to condemn these changes as insufficient to satisfy the requirements of the DMA. Dennis Schaal, *Google's Flight Search Changes in Europe Get Thumbs Down from eDreams Odigeo*, Skift, Jan. 23, 2024, <https://skift.com/2024/01/23/googles-flight-search-changes-in-europe-get-thumbs-down-from-edreams-odigeo/>; Emily Chissell, *Europe's final countdown - will the DMA be top of the pops or major flop?* Keystone Insights, Jan. 23, 2024, <https://www.keystone.ai/news-publications/europes-final-countdown>.

⁴⁹ Foo Yun Chee, Google hit with \$3.45 billion EU antitrust fine over adtech practices, Reuters, Sep. 5, 2025, at <https://www.reuters.com/legal/litigation/google-hit-with-345-billion-eu-antitrust-fine-over-adtech-practices-2025-09-05/>. See also Statement by Executive Vice-President Ribera on the adoption of the Google Adtech decision, Sep. 3, 2025, at https://ec.europa.eu/commission/presscorner/detail/es/statement_25_2034.

⁵⁰ Foo Yun Chee, Google makes new proposal to stave off EU antitrust fine, document shows, Reuters, July 2, 2025, at <https://www.reuters.com/legal/litigation/google-offers-new-proposal-stave-off-eu-antitrust-fine-document-shows-2025-07-02/>.

⁵¹ For those interested in the frequency of self-preferencing by online platforms the relevant literature includes: Benjamin Edelman & Benjamin Lockwood, Measuring Bias in

As it happens, the literature on remedies for self-preferencing by online platforms is quite limited. In an earlier article, we used a simulation to examine the impact of “architectural” remedies (i.e., requiring Google to provide prominent links to three rival specialized search services), and labeling remedies (i.e., requiring Google to more clearly label its specialized/vertical search results) on CTRs.⁵² Our findings indicate that consumers have sticky expectations about how search results are presented, and their click-through behavior tracks those expectations, irrespective of how search results are labeled.⁵³ However, major architectural changes can have a substantial impact on CTRs.⁵⁴ We concluded that “these findings suggest that the impact of architectural remedies will depend greatly on their design features, while labeling remedies are unlikely to have a significant impact.”⁵⁵

Another study evaluated the impact of the EC’s equal treatment remedy, using data on click through rates. **(More to come on Hausfeld.)**⁵⁶

Finally, a third study used data on searches by Amazon to quantify the extent of self-preferencing pre- and post-DMA. **[More to come on Waldfogel).]**⁵⁷

IV. METHODOLOGY

A. Overview

To assess the impact of the E.C.’s equal treatment remedy, we conducted a pilot study followed by a more comprehensive study. Both studies focused on actual search results in four countries: France, Germany, the United

“Organic” Web Search (Jan. 19, 2011), <https://www.benedelman.org/searchbias/>; Joshua D. Wright, Defining and Measuring Search Bias: Some Preliminary Evidence (George Mason Law & Economics Research Paper No. 12-14, 2011), <https://laweconcenter.org/images/articles/definingmeasuring.pdf>; Benjamin Edelman and Zhenyu Lai, *Design of Search Engine Services: Channel Interdependence in Search Engine Results*, 53 J. Marketing Res. 881 (2016).

For those interested in the debate over the merits of self-preferencing/vertical integration, the relevant literature includes: Sam Bowman & Geoffrey Manne, *Platform Self-Preferencing Can Be Good for Consumers and Even Competitors*, Truth on the Market, Mar. 4, 2021, <https://truthonthemarket.com/2021/03/04/platform-self-preferencing-can-be-good-for-consumers-and-even-competitors/>; Lina M. Khan, Amazon’s Antitrust Paradox, 126 Yale L.J. 710 (2017).

⁵² Hyman & Franklyn, *supra* note 9.

⁵³ Id.

⁵⁴ Id.

⁵⁵ Id.

⁵⁶ Hausfeld, *supra* note 42

⁵⁷ Joel Waldfogel, Amazon Self-preferencing in the Shadow of the Digital Markets Act, at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4787390.

Kingdom, and the United States. As part of the E.C., France and Germany are subject to the “equal treatment” remedy. The United Kingdom has withdrawn from the E.C., but Google was still using a common search infrastructure, so SRPs in the U.K. are de facto (if not de jure) subject to the equal treatment remedy as well. The United States serves as our control – since Google’s SRPs in the U.S. are not subject to the equal treatment remedy.

We used the same approach to study the impact of the DMA.

B. Pilot Study of Equal Treatment Remedy: Products

For the pilot study, we focused on consumer products. We began by identifying the five most popular brands of twelve consumer products (bottled sparkling water, beer, cheese, children’s toys, coffee, conditioner, energy nutrition bar, moisturizer, paper towels, shampoo, spaghetti, and toilet paper) in each of the four countries. To identify the specific brands, we used a VPN to simulate a user running a search in each country – and then searched in each country for “most popular [consumer product] in [xx country]” – for each of the twelve consumer products. We cleared cookies after each search. So, for the U.S., the search would be “most popular bottled sparkling water in U.S.,” while for France the search would be “most popular bottled sparkling water in France.” We conducted a total of forty-eight searches (12 products x 4 countries) and then abstracted from each search the five most popular brands for each of the twelve consumer products.

We then used a VPN set for each individual country to run four searches (two desktop searches and two simulated mobile searches) for each of the most popular brand name products (60 searches, for 12 products x 5 most popular brands). Thus, in total, there were 240 searches in each of the four countries in our dataset, for a total of 960 SRPs. Each search was for “brand name – product” – so if the product was beer, and the brand name in a particular country was Kronenbourg, the search was for “Kronenbourg beer.”

We coded each of the SRPs based on whether product ads appeared; whether the ad region included Google links, rival shopping service links, or both; the identity of the rival shopping services; and the location of each of these links in the product ad region. The U.S. served as our control. We present the results of our pilot study in Part V.a., *infra*.

C. Full Study of Equal Treatment Remedy: Flights, Hotels, Restaurants

One obvious limitation of the pilot study is that we were running searches for different brands in different countries. Although our results captured what an ordinary user would see if they searched for a popular consumer brands in specific countries, this design complicates the comparability of our findings across geographic jurisdictions.

Accordingly, the full study used a different approach. We identified 30 prominent cities worldwide, and then ran searches in the same four countries for three activities involving each of these cities: i.e., “flights to xx,” “hotels in xx,” and “Italian restaurants in xx.”⁵⁸ As in the pilot study, we used a VPN set to each of four countries (i.e., France, Germany, U.K. and U.S.), clearing cookies after each search. Thus, there were a total of 90 searches per country (30 for flights to a particular city, 30 for hotels in a particular city, and 30 for Italian restaurants in a particular city) for each of four countries. This approach allows us to compare results across searches, service/product types, and countries.

Unlike our pilot study, where rivals were bidding to purchase a spot in the ad region, in the full study rivals can purchase ads or they can bid for a spot in a box for rival verticals (both which can appear above or below the location of any Google vertical). However, as with the pilot study, our primary focus was how often “rival” vertical search results appear on the SRP in the three countries subject to the equal treatment remedy. To evaluate that issue, we coded each of the 360 SRPs based on whether there was a Google vertical (i.e., Flights, Hotels, and Business Profile); whether the Google vertical included Google links, rival vertical links, or both; the identity of the rival verticals; and the location of each of these links. As with the pilot study, the U.S. serves as our control. We present the results of the full study in Part V.b., *infra*.

D. Study of DMA Prohibition on Self-Preferencing: Flights, Hotels, Products, Restaurants

To evaluate the impact of the DMA prohibition on self-preferencing, we used the same methodology as in our earlier studies of the impact of the equal treatment remedy. We conducted an identical set of searches for flights, hotels, products, and restaurants in France, Germany, the U.K. and

⁵⁸ The 30 cities were: Bangkok; Barcelona; Berlin; Cairo; Chicago; Delhi; Frankfurt; Hong Kong; Johannesburg; Lagos; Lisbon; London; Los Angeles; Madrid; Manila; Mexico City; Mumbai; New York; Osaka; Paris; Rio De Janeiro; Rome; Santiago; Seoul; Shanghai; Singapore; Sydney; Tokyo; Toronto; and Warsaw.

the U.S. (which again serves as our control. We then coded the content. We present the results of this study in Part V.c., *infra*.

E. CTR Simulation Study

The pilot and full studies allow us to describe the physical appearance (i.e., the architecture and labeling) of SRPs in various countries. But, architecture and labeling only take us so far. To evaluate the impact of these changes, we need to know what effect (if any) these changes have on click-through rates (CTRs) on the SRP. Accordingly, we used an online simulation/survey to evaluate the impact of SRP architecture and labeling on CTRs. We present the results of our study of CTRs in Part V.d., *infra*.

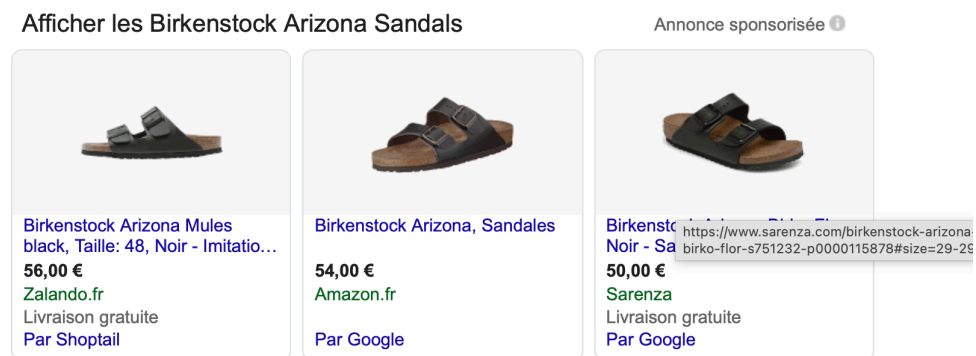
V. FINDINGS

A. Pilot Study

As noted previously, our pilot study focused on the five most popular brands for twelve different products in three test countries (France, Germany, and the U.K.) and one control country (U.S.). In response to the equal treatment requirement, Google dropped its use of a separate Shopping vertical in Europe, and presented product ads in a single ad region, separate from the results of the algorithmic search.

Figure 1 shows a typical SRP from Europe. In Figure 1, we searched for Birkenstock Arizona Sandals using a VPN set for France.

Figure 1. SRP for Birkenstock Arizona Sandals search (France)



For each search, we coded whether (i) an ad region appeared on the SRP; (ii) determined the categories of entities that appeared in the ad region/Shopping vertical (i.e., Google only; Google + rivals, or rivals only)

and (iii) counted the number of “slots” in the ad region/Shopping vertical that were accounted for by Google vs. rivals. For example, in Figure 1, there is an ad region, with a total of three slots, one of which is from a rival (Shoptail) and the other two of which are from Google.

Table 1 presents top-level results demonstrating the impact of the equal treatment remedy, based on the appearance and content of the SRP in Europe compared to our control (U.S.).

Table 1. Impact of the “Equal Treatment” Remedy: Products

	SRP with Ad/Shopping region	Google Only	Google + Rivals	Rivals Only
France	26%	8%	76%	15%
Germany	27%	13%	80%	8%
U.K.	4%	44%	44%	11%
All (Europe)	19%	13%	76%	11%
U.S.	xx%	100%	0%	0%

As Table 1 shows, 19% of the 180 searches for particular brand-name products in Europe resulted in an ad region (range: 4% - 27%). When an ad region appeared in Europe, Google-only links appeared 13% of the time (range: 8% - 44%), Google and rival links appeared 76% of the time (range: 44% - 80%), and rival-only links appeared 11% of the time (range: 8% - 15%). By comparison, in the U.S., a Shopping vertical appeared xx% of the time, but 100% of the links in the Shopping vertical were Google-only.

Of course, Table 1 does not indicate the “market share” of the ad region accounted for by rivals, nor which rivals they were from. Table 2 presents summary statistics on Google and rivals in terms of slot market share of ad slots.

Table 2. Frequency of Link Source

Link	France	Germany	U.K.	All Europe	U.S.
Google	45%	51%	65%	49%	100%
Kelkoo	13%	9%	0%	10%	0%

FeedPrice	20%	1%	0%	10%	0%
Productcaster	8%	6%	4%	7%	0%
Smarketer	0%	6%	0%	3%	0%
All others	14%	26%	30%	20%	0%

Note: Figures for Europe are limited to instances where both Google and rival links appeared on the SRP.

In combination, Table 1 and Table 2 make it clear that the equal treatment remedy had a significant impact on the appearance and contents of the SRPs that appear after a product-related search was conducted in Europe.

In fairness, people use the Internet to purchase many things. Our focus on product searches might lead to unrepresentative results for search as a whole. And, as noted above, our methodology for identifying which products we searched for in the pilot study complicates any claims for representativeness. Accordingly, we extended our research using a wide ranging approach that included multiple search vertical offerings.

B. Full Study of Equal Treatment Remedy

As described previously, our full study of the equal treatment remedy involved searches in three different categories (i.e., flights, hotels, and an Italian restaurant) for 30 cities. All ninety of these searches were conducted with a VPN set to each of four countries. As with our pilot study, we are evaluating how often Google verticals and rival links appeared.

Instead of using a single consolidated ad region (as it does for product-related searches), the Google SRP for flights, hotels, and restaurants after the equal treatment remedy was imposed has up to four distinct zones:

- i. Algorithmic results;
- ii. Paid ad region;
- iii. Google vertical (Flights, Maps, Local); and
- iv. Rival vertical links

When the SRP in Europe displays rival verticals in the flights, hotels, and business profile space, they are clearly broken out, and appear quite different than the Google vertical. For example, in France when searching for a flight, the rival links appear in a box with the logos of each individual company and its name – but no additional information. By comparison, the

Google Flights vertical provides more information, including a list of the airlines that fly to the specified destination, a price, and a pre-filled form with which to obtain further information about flying on a particular day.

Figure 2, Panel A shows a screenshot of part of the SRP for a flight to Lagos, Nigeria when the search was run on a VPN set to France. Figure 2, Panel B shows a screen of part of the SRP for a hotel in Lagos, Nigeria. Figure 2, Panel C shows a screenshot of part of the SRP for an Italian restaurant in Lagos, Nigeria. All three of the screenshots omit the algorithmic content and ads and are limited to the Google vertical and rival verticals.

Figure 2: Appearance of Google SRP

Panel A. Flight Search

Rechercher des vols sur

Skyscanner

Kayak

Expedia

eDreams

Opodo

Vols à destination de Lagos, Nigeria

Paris (tous les aéroports)

Lagos, Nigeria (LOS)

dim. 5 juin
< >

lun. 13 juin
< >

Économique

Aller-retour

Sans escale

Émissions faibles

mai
juin

28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
S D L M M J V S D L M M J V S D L M M J V S D L M M

Plusieurs compagnies
+9h 15min
Correspondance
à partir de 603 €

KLM
+9h 15min
Correspondance
à partir de 604 €

Air France
6h 25min
Sans escale
à partir de 681 €

Autres compagnies
+9h 15min
Correspondance
à partir de 680 €

→
Afficher les vols

In Figure 2, Panel A, the box that contains the rival verticals appears above the Google Flights box and is labeled “Rechercher des voais sur.” The Google flights vertical appears immediately below that box, with the legend, “Vols a destination de Lagos, Nigeria.”

In Figure 2, Panel B, we show the results of a search for “hotels in Chicago,” again using a VPN set for France.

Panel B. Hotel Search

Rechercher des résultats sur

[B Booking.com](#)
[TripAdvisor](#)
[Hotels.com](#)
[Expedia](#)
[KAYAK](#)

Hotels | Chicago, Illinois, États-Unis À propos de ces résultats

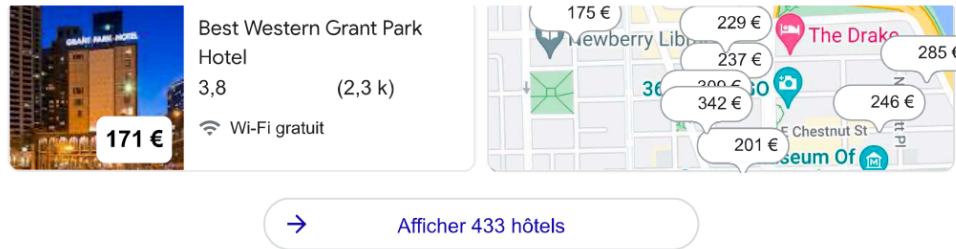
📅 jeu. 19 mai
 📅 ven. 20 mai
 👤 2 ▼

🌟 Les mieux notés
 💰 Économiques
 💎 Séjours de luxe
 🔄 Annulation g. >

Hotel	Rating	Reviews	Price	Features
LondonHouse Chicago, Curio Collection by Hilton	4,5	(4,3 k)	229 €	Spa, Wi-Fi gratuit
Sofitel Chicago Water Tower	4,6	(2,7 k)	237 €	Apprécié des clients de France
Allerton Hotel	3,8	(2,9 k)	233 €	Wi-Fi gratuit

Price comparison bubble chart (prices in €):

- 188 €
- 189 €
- 237 €
- 122 €
- 183 €
- 233 €
- 234 €
- 244 €
- 222 €
- 342 €
- 222 €
- 378 €



In Figure 2, Panel B, the box that contains the rival verticals appears above the Google vertical and is labeled “Rechercher des resultats sur.” The Google vertical contains a map, images of certain hotels, and is much more visually and informationally rich.

Finally, in Figure 2, Panel C, we show a screenshot of the results for a search for “Italian restaurants in Frankfurt, again using a VPN set for France.

Panel C. Italian Restaurant Search

Google

italian restaurants in frankfurt


Tous Maps Images Shopping Actualités Plus Outils

Environ 27 400 000 résultats (0,64 secondes)

Rechercher des résultats sur


Tripadvisor LES 10 MEILLEURS... TheFork The 10 Best Italian Restauran... Yelp THE BEST 10

Restaurants Italiens




Note Cuisine Prix Horaires


Pasta Davini
4,6 (381) · €€€ · Italienne
Heiligkreuzgasse 9A
Fermé · Ouvre à 17:00 mer.
Repas sur place · Vente à emporter · Aucune livraison



Quattro Ristorante Italiano
4,4 (1 k) · €€ · Italienne
Gelbehirschstraße 12
Ferme bientôt · 23:30
Repas sur place · Vente à emporter · Livraison sans contact



Machiavelli
4,6 (88) · Italienne
Kronberger Str. 46
Fermé · Ouvre à 18:30 mer.
Repas sur place · Vente à emporter · Aucune livraison



→ [Autres adresses](#)

As in Figure 2, Panel B, the box that contains the rival verticals appears above the Google vertical and is again labeled “Rechercher des resultats sur.” The Google vertical contains a map, images of certain dishes served by particular restaurants, and is much more visually and informationally rich.

In the appendix, we present similar screenshots for each of our service categories (flights, hotels, restaurants) for Germany and the U.K. As these screenshots reveal, each country/line of service has its own labeling convention for the Google SRP and for the rivals.

Table 3 presents summary results for the 30 city-specific searches, each run for flights, hotels, and an Italian restaurant in four different countries.

Table 3.

	Google Vertical only	Rival Links Vertical only	Both	Neither
France	1%	0%	98%	1%
Germany	1%	2%	97%	0%
U.K.	1%	0%	99%	0%
All (Europe)	1%	1%	98%	0%
U.S.	100%	0%	0%	0%

We observe dramatically different patterns in Europe (where the equal treatment remedy applies, and 98% of the time there is both a Google vertical and rival vertical links on the SRP) vs. the U.S. (where the equal treatment remedy does not apply and the Google vertical accounts for 100% of verticals).

Unlike Table 1, we do not observe material differences in the patterns in France, Germany, and the U.K. It is unclear whether we observe these differences in Table 1 because we searched for products (and for different products in each country) vs. searched for services and the same services (i.e., flights, hotels, and an Italian restaurant) in the main study, or because there was a gap in time between our pilot and the main study, or for some other reason. Further research will be necessary to sort out that issue.

Table 3, like Table 1, does not cast light on which rivals appear in the rival links region of the SRP. Table 4 presents data on that issue, broken out by vertical type (flights, hotels, and restaurants), and by country.

Table 4.

Panel A: Flights – Share of Rival Links

Link	France	Germany	U.K.	All Europe
Skyscanner	21%	22%	21%	21%
Expedia	20%	21%	19%	20%
Kayak	20%	20%	16%	19%
cheapflights	8%	6%	16%	10%
edreams	8%	5%	1%	4%
All others	23%	25%	27%	25%
Total	132	128	141	401

Panel B: Hotels – Share of Rival Links

Link	France	Germany	U.K.	All Europe
tripadvisor	21%	19%	20%	20%
booking	20%	20%	20%	20%
Hotels	18%	6%	13%	12%
Kayak	15%	5%	15%	12%
Agoda	12%	10%	6%	9%
All others	15%	40%	25%	27%
Total	150	150	150	150

Panel C: Restaurant – Share of Rival Links

Link	France	Germany	U.K.	All Europe
Present	31%	32%	32%	32%

tripadvisor	30%	31%	33%	31%
Timeout	7%	8%	12%	9%
theculturetrip	9%	7%	9%	8%
Zomato	4%	4%	3%	4%
All others	19%	18%	10%	16%
Total	90	90	90	90

We also examined the frequency with these and other firms appeared in the various possible zones of the SRP (i.e., algorithmic results, “regular” ads, Google vertical, and rival verticals). Table 5 presents the results of that analysis for the search for flights in France, Germany, and the U.K.

Table 5. Firms that appear on SRP (flights)

	Algorithmic	Ads	Google Flights	Rival Verticals	All
skyscanner	42%	28%	0%	29%	290
expedia	41%	26%	0%	33%	243
Kayak	48%	10%	0%	42%	181
cheapflights	32%	10%	0%	58%	71
british airways	22%	38%	40%	0%	60
Opodo	12%	68%	0%	20%	60
lufthansa	9%	26%	65%	0%	54
United	80%	0%	20%	0%	50
american airlines	65%	0%	35%	0%	48
airfrance	12%	46%	41%	0%	41
Klm	8%	56%	36%	0%	39
edreams	38%	0%	0%	62%	29
Delta	7%	25%	68%	0%	28
emirates	54%	12%	35%	0%	26
Easyjet	64%	0%	36%	0%	25
travel supermarket	27%	0%	0%	73%	22
air canada	10%	5%	86%	0%	21

Table 5 shows that the same firms consistently appear on the SRP, but there are differences by line of business in where on the SRP they appear. For

example, specific airlines appear in algorithmic content, ads, and Google Flights, but not in the rival links. In contrast, travel agencies/aggregators appear in algorithmic content, ads, and rival links, but not in Google Flights. These patterns reflect the varying business models pursued by Google, rival verticals, individual airlines, and travel agencies/aggregators.

C. Effects of the DMA

[We have collected all the data for the post-DMA period, and will it analyzed in time for the conference. If Google makes additional changes to the SRP as a result of a settlement following the ad tech fine imposed in September, 2025, we will collect additional data and include that as well.]

D. SRP Architecture and CTRs

Do any of these changes in the SRP affect CTRs? After all, it is CTRs that drive the economics of web-based platform advertising – and it is advertising revenue that is responsible for the market capitalization of Google/Alphabet. As described previously, to evaluate how SRP architecture and labeling affects CTRs, we tested several variations on the SRP using an online simulation of various product searches.

Table 6. CTR Rates on SRP Variations

Variation	Description		Google Shopping	Alternative Vertical Rival	Share (Alternative Vertical Rival/Both Verticals)
1.	Original SRP (pre-equal treatment remedy)		23.1%	N/A	N/A
2.	Netcompare		N/A	21.10%	N/A
3.	Blue links only with Kelkoo, Pricerunner, or Bizrate on top		3.5%	3.90%	52.5%
	Split Shopping				
4.	Google + Kelkoo	Google Left	12.8%	10.10%	44.1%
		Google Right	8.6%	15.7%	64.6%
5.	Google + Amazon	Google Left	11.0%	17.0%	62.0%
		Google Right	9.0%	23.0%	72.0%
6.	Google + Netcompare	Google Top			
		Google Bottom			

Table 6 confirms our earlier findings that CTRs are greatly affected by the architecture and appearance, but not the labeling of the SRP. As a comparison of Table 6, variations 1 and 2 demonstrates, when we present users with a visually rich region in the SRP (including images of the product and pricing information), roughly one in five users click on that region – whether it is labeled Google Shopping or “Netcompare,” our fanciful control.

The results in Table 6, variation 3 show that eliminating the visually rich content in the Google Shopping/Netcompare region causes the CTR to plummet – confirming that architecture and appearance (but not labeling) are the key drivers of CTRs. A comparison of Table 6, variations 4 and 5 shows that when we split the shopping region in half, we can achieve rough parity in CTRs, with the left position on the SRP getting a higher CTR, whether it is labeled Google, Kelkoo, or Amazon. Finally, Table 6, variation 6 shows that appearing higher on the SRP is an important driver of

CTRs. These findings have obvious implications for predicting/evaluating whether particular changes to Google's SRP comply with the requirements of the equal treatment remedy and/or the DMA.

VI. DISCUSSION

A. *Impact of the equal treatment and DMA remedies*

The equal treatment remedy had a substantial impact on the Google SRP. In the three European countries we studied, we find a material presence of rival vertical links, while in our control country (i.e., the U.S.) we find no evidence of such changes.

[More to come on DMA once the results are analyzed.]

B. *Impact of Remedies on CTRs*

We present suggestive evidence that the changes made to the SRP as a result of the equal treatment remedy [and the DMA?] likely had an impact on CTRs.⁵⁹ But it is not clear whether those changes are sufficiently large to justify the millions of dollars and years of high-end legal talent that have been spent litigating the case against Google – let alone the effort required to enact and implement the DMA. The continued complaints suggests that the equal treatment remedy fell well short of fixing the problem, at least from the perspective of Google's rivals.

C. *Implications of Our Findings for Regulatory Intervention*

Our findings have obvious implications for the framing of a workable remedy, conditional on a finding that the law has been violated. However, it is critical to understand that the availability of a workable remedy does not imply that using that (or any other) remedy is a good idea.⁶⁰ There are sizeable error costs with regulatory interventions, particularly in a rapidly evolving field like search—and particularly when talking about structural (i.e., architectural) remedies. The preferences of regulators (however well informed and public spirited they might be) are likely to differ—sometimes dramatically—from those of consumers. The limits of antitrust (and of

⁵⁹ Cross-refer to Waldfogel.

⁶⁰ Skeptics should consider the psychological impact of being armed with a hammer on the frequency with which one encounters nails – or failing that, objects that are thought to require a good hard pounding.

those implementing antitrust law) are real.⁶¹ Platonic guardians are in short supply, no matter how high the demand.⁶²

Even if one is not prepared to go that far, it is unclear whether antitrust enforcers are demo-ing their proposed remedies before they are implemented – let alone studying the impact once they have been implemented. Such retrospective evaluations are a routine feature of clinical medicine, but are much less common in antitrust enforcement.⁶³

D. Limitations of Our Work

All empirical work has limitations, and this study is no exception. The pilot study involved searches for five popular consumer brands for twelve products in four countries -- rather than searches for the same consumer brand across multiple countries. Our choice of 30 cities for the full post equal treatment study and the DMA study was standardized across countries, but did not capture the full range of searches that were being run by ordinary users.

As for our evaluation of CTRs, we only observe initial clicks. We do not know whether a material number of users will “settle” for what they find when they click on a self-preferenced link vs. clicking back or rerunning the search on Google or another search engine (in which case the initial click causes delay but not permanent diversion).

The complications do not end there. Absent a baseline against which decisions can be measured, how can we evaluate whether those who follow through with a self-preferenced link are actually “settling”? Finally, if a material number of users click back or rerun their search, the amounts that advertisers are willing to pay for inclusion in the self-preferenced region of the SRP will be reduced—which is likely to prompt Google to improve the quality of its self-preferenced results, further undermining the argument for

⁶¹ Frank H. Easterbrook, *The Limits of Antitrust*, 63 TEX. L. REV. 1, 39 (1984) (“Antitrust is an imperfect tool for the regulation of competition. Imperfect because we rarely know the right amount of competition there should be, because neither judges nor juries are particularly good at handling complex economic arguments, and because many plaintiffs are interested in restraining rather than promoting competition.”).

⁶² Cf. Richard H. Thaler, *Level Playing Fields, in Soccer and Finance*, N.Y. TIMES, July 25, 2010, at BU5 (“Consider the Consumer Financial Protection Bureau now being established. Above all, I’d urge the head of this agency to devise rules under the assumption that, someday, he or she will be succeeded by a nitwit.” (emphasis added)), available at <http://www.nytimes.com/2010/07/25/business/25view.html>.

⁶³ William E. Kovacic & David A. Hyman, *Consume or Invest: What Do/Should Agency Leaders Maximize?* 91 Wash. L. Rev. 295 (2016); William E. Kovacic, *Keeping Score: Improving the Positive Foundations for Antitrust Policy*, 23 U. PA J. Bus. Law. 49, 126-129 (2020)

antitrust intervention.⁶⁴ Further research will be necessary to evaluate these matters, and to assess consumer welfare directly.

VII. CONCLUSION

The good news for antitrust enforcers is that their remedies have real world consequences – and that those consequences can be simulated in advance of imposing a remedy and tested after they are fielded. The bad news is we are not aware of any evidence that antitrust enforcers are doing that – let alone conducting routine ex post analysis to determine whether their efforts were worth the candle.

⁶⁴ These matters are, of course complex. *Cf.* Edelman & Lai, *supra* note 51, at 29–30 (developing theoretical model for circumstances when a search engine will divert users to less relevant results).