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Judicial Remedies To Restore Competition in
the Market for General Search

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Judicial Remedies To Restore Lost Competition **in the Market for General Search**

September 4, 2024 (Working Draft)

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Fiona Scott Morton, David Dinielli, Alissa Cooper, Gene Kimmelman, Margaret O’Grady²

The Trial

Last month, a United States federal judge found Google (today known as “Alphabet”) liable for illegal monopolization of the general search market. The finding of liability feels in some ways unexpected: courts in the United States, particularly appellate courts whose decisions can appear influenced more by policy and ideology than by evidence, have been trending in a conservative direction in competition cases.

On the other hand, it’s relatively easy to conclude that Google is a monopolist and engaged in monopolization. Google holds 94% of the general search market on mobile and has held a similar share for a decade. One of the ways it has maintained its hold on this market is an arrangement with Apple—its most threatening competitor—that compensates Apple for staying out of the search market. Each year, Google pays Apple more than \$20 billion (US) to make Google search the exclusive default at all search access points on Apple’s operating systems. Each company benefits from the arrangement: Google maintains its monopoly and Apple gets a share of the monopoly rents.

The arrangement, however, also plainly kneecaps current rivals and discourages the development of potential rivals in the search market. One of the findings of the trial (long known in the economics discipline) is that consumers stick with a default choice even when taking just a few minutes to adjust the settings on their handset would give them a different search engine. Default status is therefore economically valuable and, were it available, would be the best way for entering search engines to gain customers. But these exclusive contracts make it virtually impossible for a rival search entrant to outbid Google for a default position on iOS. Rivals therefore cannot get access to compete for the millions of Apple users. And it is not only third parties that the Apple-Google contract blocks. It also eliminates any incentive for Apple to develop its own search engine. Why would Apple bother trying to develop its own search engine to compete with Google’s when, with no effort at all, it can earn billions of dollars just by making Google’s search engine the default on all of Apple’s devices?

² Author affiliations and disclosures appear as an appendix, *infra*.

Google uses a similar strategy to prevent potential search competitors from reaching Google Android users. Independent handset makers must license a mobile operating system in order for their handset to work, and Google’s Android OS is the only option. Therefore, Google has tremendous market power over handset makers and can impose onerous licensing conditions. The licensable Google Android OS includes open-source Android as well as proprietary code embedded in Google Play and in other functionalities as well.³

Google requires, through contracts called Mobile Application Distribution Agreements (MADAs), that any OEM licensing Google Android pre-install a suite of apps and functionalities called Google Mobile Services (GMS).⁴ GMS includes, among other apps and functionalities, the Google Search Widget, Chrome, and Google Play.⁵ Because APIs embedded in Google Play are critical to the proper functioning of the OS, and because Google Play is available only as a part of the GMS suite, OEMs must as a practical matter accept MADAs that requires the installation of the entire GMS suite, including the Google Search Widget and Chrome (which defaults to Google Search).⁶ The MADAs do not expressly preclude OEMs from preinstalling an additional search widget and/or browser. In practice, however, manufacturers recognize that “preloading more than one of the same search access points, especially in similar prominent positions” amounts to “bloatware” that would confuse users if adopted.⁷

The result is that all OEMs that license Google Android, even Microsoft, which owns Bing, manufacture and sell devices on which the Google Search Widget is the only preinstalled search widget, and most OEMs manufacture and sell devices on which Chrome is the only preinstalled browser.⁸ Google additionally enters revenue sharing agreements (RSAs) with OEMs and with carriers whereby the percentage of search revenue shared with the partner is tiered and based on the degree of exclusivity as well as the prominence on the handset that is given to Google Search (through, for example, the exclusive placement of the Chrome browser on the home screen).⁹ The RSAs thus reinforce the coercive effect of the MADAs’ requirement that OEMs install the entirety of the GMS suite of Google products by overlaying a financial incentive not just to install Google features that default to Google Search, but also to give them prominence relative to rivals’ products (including rival browsers) that might steer traffic away from Google Search.¹⁰

Thus, even if device makers might prefer to offer their users a different default search engine, or even multiple differentiated search engines on the front page, Google’s contracts have the effect of preventing it.

³ We define “Google Android” by its function, namely the entirety of all code needed for third-party developers to run their apps. The Android Open Source Project, Google Play Services, and other necessary APIs together constitute “Google Android.”

⁴ See *United States, et al. v. Google LLC*, Cases No. 20-cv-3010; 20-cv-3015, Memorandum Opinion (D.D.C. Aug. 5, 2024), available at <https://static01.nyt.com/newsgraphics/documenttools/f6ab5c368725101c/43d7c2a0-full.pdf>, at 118.

⁵ See *id.* at 119.

⁶ See *id.* at 119-20.

⁷ See *id.* at 121-22.

⁸ See *id.* at 122.

⁹ See *id.* at 123.

¹⁰ See *id.* at 123 (“Google has long viewed RSAs with carriers as essential to securing query traffic on Android devices to the exclusion of rivals.”).

Google’s argument in the trial court—that it’s the best search engine and that’s why everyone uses it—failed for obvious reasons. In the case of an Android device maker, the contracts with Google *require* that Google Search be the exclusive default. In the case of Apple, common sense tells us that if the search engine is indeed the best available, Google need not deploy exclusive contracts to forbid Apple from using a rival search engine. The best component improves quality and therefore generates increased demand for the finished good, so Apple will naturally use it. Here, if the only dynamic at play is that Google’s search engine really is the best, why is Google paying Apple to use it? The true reason is obvious: to freeze the market with Google in place as a monopolist and prevent entry by rivals who might otherwise seek placement on Apple devices, thereby shutting down competition.

The Purpose of Remedies

The court has set a September 6 status conference to address the process for determining appropriate remedies. As framed by the Supreme Court, Section 2 remedies should “start from the premise that adequate relief in a monopolization case should put an end to the combination and deprive the defendants of any of the benefits of the illegal conduct and break up or render impotent the monopoly power found to be in violation of the Act.”¹¹

Thus, the principal goal of a court-ordered remedy should not be to punish, but rather to restore the lost competition. The fact that punishment is not the principal goal, however, does not mean that the monopolist will or should find the remedies painless. Dismantling or blunting the monopolist’s power (whether through conduct remedies or structural remedies) necessarily will be costly to the monopolist. This is not to be avoided, but rather advances one appropriate purpose of Section 2 remedies as stated by the Supreme Court: to deprive the monopolist of the fruits of its illegal conduct.¹² If restoring the lost competition is costly for the monopolist, that is not a concern; it is equitable for the monopolist to bear those costs. The need to restore the lost competition generates a logical path that arrives at an effective remedy. In this process there is no role for assumptions about general types of remedies – for example, whether behavioral or structural remedies are better – because it is focused on the competition goal.

In the case of Google Search, what remedies might restore the lost competition? Many policy experts despair of finding any remedy at all because Google “is the best” search engine so nothing can be done. This point of view misses two key issues. First, search engines may horizontally differentiate; not everyone needs to have the same favorite search engine. A competitive market might have given us rival engines that differentiate through specialized curation, vetted information, innovative privacy preservation technologies, cross-domain searching functions like Spotlight or Branch, and so forth.

Second, the “remedies won’t do anything” view is stuck in the market we have now and does not recognize its potential dynamic nature. When Google obtains all the search data while ensuring that competitors have almost none, unsurprisingly it can build the best search engine. As rivals gain access to more search query data, however, their results will improve and make them more attractive to users. If a rival can obtain default status, it will obtain data,

¹¹ *United States v. Grinnell Corp.*, 384 U.S. 563, 577 (1966) (emphasis added); see also *United States v. United Shoe Mach. Corp.*, 391 U.S. 244, 250 (1968) (“[I]n a [section] 2 case . . . it is the duty of the court to prescribe relief which will terminate the illegal monopoly, deny to the defendant the fruits of its statutory violation, and ensure that there remain no practices likely to result in monopolization in the future.”).

¹² See *Grinnell*, 384 U.S. at 577.

and then quality. The current inability of competitors to begin moving along this virtuous circle of customer-data-quality-more customers means that there is no business future for them. No matter how significant the innovation by the potential rival, there will be no venture capital funding for an entrant in a world where it cannot obtain customers.

On the other hand, if we consider a dynamic equilibrium in which an innovative competitor is permitted to compete for a contract to be a default search engine—perhaps it starts with default status on one handset model or one type of search access point—then the entrant can get funding because there is a path to success. Data will lead to rapid improvement in quality, in turn leading to more intense competition between the entrant and Google as quality converges. This environment is one in which entrepreneurs and funders can thrive and grow, and thus kick start innovation. Successful remedies will open up the market so that competition on the merits can take place.

There are a number of remedies to consider, as we and others have previously written.

Restrict Google's Contracts

Remedies are traditionally classified into two categories: conduct remedies and structural remedies. Some interpretations of the *Microsoft* decision interpret it as eliminating the possibility of a structural remedy in the Google search case. This seems to be an unnecessarily simplistic reading in light of both Supreme Court doctrine and the text itself.¹³ Whatever tool could restore the lost competition in an efficient and effective way should be considered as a remedy, and those that are most effective and least disruptive should be chosen. We follow this approach in the argument that follows.

We begin with the most obvious remedy in light of the court's findings: Google should not be permitted to enter any contract that *requires* a distribution partner to make Google Search the default or the exclusive search engine at any search access point on any device or browser, or to pre-install any app or widget that has the effect of defaulting users to Google Search (e.g., the widget, the browser), in exchange for any type of consideration. This prohibition would apply to Google's relationships with independent handset makers and browsers such as Safari and Firefox.

Consider first the impact of this restriction on Google's relationship with Apple. Google could not contract to pay for an exclusive or default position on any iOS or macOS distribution channel. Apple could not sell off the default position to Google, but it could sell its default position to Bing. Apple could also enter with an Apple search engine. Both of these are more expensive options for Apple relative to sharing Google's monopoly rents because Bing monetizes at a lower rate and is less popular, while building a search engine is expensive. Nonetheless, both options would generate conditions that would permit Google's rivals, whether Apple, Bing, or a third-party search engine, to gain a foothold and begin to compete with Google.

¹³ See *Massachusetts v. Microsoft Corp.*, 373 F.3d 1199, 1231 (D.C. Cir. 2004) (en banc) (describing the goal of Section 2 remedies as "restoring conditions in which the competitive process is revived and any number of competitors may flourish (or not) based upon the merits of their offerings").

Under the remedy, Samsung could not be *required* by the terms of its Android contracts to exclusively install or default to Google search. Like Apple, Samsung could sell its default search positions to Bing or develop its own search engine. Notice, however, that if Samsung tried to sell its default search positions, Google could simply raise Samsung's cost for the Android operating system. This would both re-capture the revenue and punish Samsung for sponsoring a competitor, thereby forcing Samsung to abandon its plans to use a different search engine as the default on its devices. We discuss the Android ecosystem in more detail below.

But critically, prohibiting defaults and exclusives will not restore competition in our view because of the market position Google has achieved with its illegal conduct. Simple pre-installation by OEMs of a Google search widget on the home screen or Chrome would achieve very similar results to those of exclusive contracts. This is because of the high existing use of Google Search and Chrome, combined with the "stickiness of defaults" and consumers' limited interest in installing rival software. In short, consumers are used to Google, and it is high quality, so distribution partners will simply preinstall it in exchange for a share of search revenue.

Suppose Apple and Samsung each said that it would offer to pre-install (but not set as the default) the best search engine it could find from among those that agree to give the OEM 40% of search revenue? Bing and Google both would agree to pay 40% of revenue to be preinstalled on Apple. However, 40% of Google's search revenue will be more money than 40% of Bing's revenue because Google's data advantage makes its advertising more valuable, and so Apple and Samsung both would pre-install Google search. The result would be identical to the market today, with Google and Apple splitting the monopoly search rents on iOS. On Android, Google would retain its monopoly position and gain back its monopoly profits by adjusting the Android license fee to recapture any lost revenue. This reasoning illustrates how allowing Google to contract or pay for distribution, even without allowing them to contract or pay for defaults or exclusives, will likely perpetuate the status quo in search.

The key to maximizing the incentive for entry is to prohibit Google from offering any payment *at all* to distribution channels like Apple. Apple would then fail to receive its annual \$20B payment. But it could earn back a fraction of that by defaulting to Bing or its own search engine, and sponsoring entry of rivals that could provide more alternatives in future years. Samsung may appear to have the same incentive to pre-install Bing, but this is not the case; Google can claw back any revenue gained by Bing through the Android license fee.

However, there are important downsides to banning payments *from* Google. The search revenue that Google shares today with distribution partners lowers the cost of handsets to end consumers and provides innovation and quality in browsers. These benefits would be eliminated if payments are prohibited. Whereas, when several search engines compete for distribution, they give search revenue to handset makers. The handset makers, in turn, compete for consumers by offering cheaper and better handsets (due to the additional source of revenue) and in this way, the profits from search end up in the hands of consumers. If the court forbids Google from making these payments to OEMs and browsers, Google earns a windfall profit. Google simply keeps the \$26B plus that it would have paid Apple and others. Moreover, it can spend a portion of that \$26B on advertising to teach users how to adjust their defaults to choose Google. Then Google can continue to enjoy the full financial benefit

of the installation and use of Google search that is carried out by users themselves. Competition will not have meaningfully changed.

The Fundamental Conflict in Remedy Design

The discussion above highlights that there are two simultaneous dynamics a remedy must harness to ensure healthy search competition in the long run: entry and price competition. The difficulty in designing a remedy is driven by a fundamental conflict: *Google's revenue sharing payments to distribution partners harm the ability of rivals to enter, while Google's revenue sharing payments to distribution partners help consumers by lowering handset and browser costs.*

Goal 1: A remedy should provide Apple (and others) an incentive to enter to compete with Google Search; right now, Google pays Apple enough so that, for Apple, staying out is more lucrative than entering.

Goal 2: A remedy should make rival search engines bid high revenue shares to get advantageous placement on handsets, browsers, and other distribution channels, including default placements. Vigorous competition in the hardware market will turn that additional revenue into lower prices for handsets so the profits from search end up in the hands of consumers. In the browser market, the additional revenue will fuel quality, differentiation, and innovation.

Choosing a remedy that emphasizes one of these objectives but not the other is unattractive. On the one hand, choosing a remedy that maximally incentivizes entry requires banning payments by Google and causes financial gain for the company found to be an illegal monopolist. A remedy that raises Google's profits will be difficult for consumers to support. In addition, under this remedy, OEMs and browsers must choose a rival search engine if they wish to earn any revenue, and there is only one choice in the market today, Bing. All distributors will pre-install Bing and therefore almost all consumers will experience the sudden loss of Google search. This also may be hard for consumers to understand. Worse, the market power that Bing will gain due to this remedy means that, at least in the short term, it has no need to offer distributors a high revenue share to obtain a default position. On the other hand, a remedy that delivers lower prices to users (allowing for distribution partners to share in search revenue) leads to the preservation of the status quo in search. If Apple and Samsung are permitted to accept payment from Google, they will announce the terms they require and make Google search pre-installed and easy to for consumers to choose. Entrants will once again be unable to outbid Google and will be excluded.

A Remedy Proposal

Perhaps the best way forward is literally the middle ground: Google can pay for half of the market only. We propose the following remedy design.

The *first condition* of an effective remedy must be to prohibit Google from entering contracts that require any channel partner (device manufacturer, browser) to provide it with exclusive or default positions. Rival search engines are of course unaffected by the remedy and may enter such contracts and pay for favorable positions, including exclusive, pre-installed, and default positions.

If, however, a third party chooses for its own reasons to preinstall or otherwise favor Google search, Google should be permitted to pay that distribution channel (manufacturer, browser, or other partner) a share of the search revenue not to exceed 40 percent. The 40 percent share was revealed at trial to be the amount that Google pays Apple today.¹⁴ However, the remedy would place two crucial limitations on any such arrangement. *First*, the third parties should retain total freedom to deploy the Google functionalities that default to Google Search (including the search widget, Chrome, Maps, etc.) as they see fit. Thus, the arrangements would be terminable at will by the third parties, who could cease using Google at any time and for any reason (other than those proscribed by law). Google should have no claim or expectancy relating to its continued placement or nor any claim to revenues generated by such continued placement. And at all times consumers retain the right to easily change the default search engine on their device or browser.

Second, any such arrangement would be subject to a coverage cap: Google would be enjoined from sharing any of its search revenue for all searches that exceed 50 percent of the total users of a manufacturers' devices (or a partner's distribution channel). By limiting payment to half of users, the coverage cap gives OEMs and browsers an incentive to go out and find another search engine that will give it revenue for the other half of users. The business directed to search entrants will allow them to improve and then compete going forward for exclusives and defaults in any distribution channel. The OEM or browser would determine which users get which search engine preinstalled. If Google search is the luxury option, OEMs may preinstall it on the most expensive handsets while the cheaper ones get rivals like Bing. If a user changes her default to Google from Bing and that causes the OEM to exceed the cap, Google cannot pay any more in revenue and therefore the OEM cannot earn any revenue from that incremental user. This gives the OEM an incentive to act as an agent for rival search engines, urging users to switch to rivals so that the OEM earns a revenue share on each user instead of hitting the cap.¹⁵

Regulation of the revenue share to a maximum of 40% is necessary to forestall Google from offering an 80% revenue share on half of consumers while expecting to earn 100% on the other half. An 80% payment for searches by consumers below the 50% cap combined with a tacit understanding with the distribution partner not to invite in a rival will result in a 100% Google search usage share on that partner's device or browser. Such an arrangement would be a circumvention of the remedy that would replicate the status quo. The remedy must further require that in order for Google to pay a partner a share of search revenue, Google and the partner cannot have any other relationship that would allow the two parties to circumvent the payment cap. The structure of Google Android licensing is obviously a problem in this scenario which we will come back to below.

An additional condition that could open the market slightly more would be requiring Google to offer a choice screen whenever a channel partner has preinstalled Google search. This choice screen would provide more agency for users who are in the 50% whose search revenue is accruing in part to Google and consequently are getting Google search as a default. The choice architecture will have to be overseen by a technical committee comprised of experts chosen by the United States in order to ensure it is neutral. Because choice screens

¹⁴ The revenue share is invariant to whether the partner preinstalls one app or a chain of Google apps such as Chrome and search.

¹⁵ If an OEM has a user using Google search inside Chrome and another using Google search as a widget they each count as one user. Any preinstallation or favoring of Google search by the channel partner causes that user to count in the share of Google search users.

are easy to manipulate, the remedy would prohibit Google from paying the partner if the choice screen is not approved by the technical committee.

When this remedy comes into force, OEMs and browsers will need to adjust their defaults for already existing customers as well as new ones. The stock of handset users of search will experience a software update on the first day of the remedy, if not before, in order to reflect the new contracts and choices. An OEM, for example, can require browsers and apps to provide versions of their software with different default search engines pre-installed for the OEM to deploy. It can also alter the default search engine called by any element of the operating system so that only half the consumers use Google Search. If the OEM values a reputation for respecting user choice concerning their search engine, it could offer a search engine choice screen and accept the preferences of its users; it simply would not earn search revenue on Google users above the 50% cutoff level. To earn more search revenue, an OEM could combine the choice screen with in-kind benefits for users who choose non-Google search engines, e.g. free photo storage. Such benefits would raise the share of rivals, benefit consumers, and earn revenue for the OEM.

The bilateral relationship between Google and any type of channel partner would be regulated by the remedy. Google could not pay a revenue share (or any consideration) for more than 50% of users of a browser. Likewise, Google could not pay for more than 50% of users given a pre-installed widget by a telecom carrier. The same would be true for any OEM. Google will need to measure user-installs for each partner and share the figures regularly. Each of these partners can preinstall Google search for some consumers and not for others in their layer and there is no need for them to coordinate. Indeed, a consumer who is exposed to different search engines due to different preinstallation strategies among their browser, OEM, and carrier, will learn about options in the marketplace. Furthermore, the remedy should forbid Google from gathering data from distribution partners about their installations and forbid Google from trying to coordinate those partners to preinstall Google's products for particular users.

The coverage cap will significantly reduce the amount that Apple receives from Google (likely by more than 50 percent, because the previous payment reflected the value of *total* exclusion of rivals). This disproportionate loss of revenue may force Apple to consider entry itself to re-capture the lost search revenue (Goal 1). Moreover, the rule would ensure that search engines *other* than Google could bid successfully to be the default search engines for the other 50 percent of the searches on Apple and other devices (Goal 2). Even better, if those rivals gain in quality, they can also be entrants (Goal 1). While rival search engines will pay Apple to be the default search engine for some or all of the second 50 percent of searches (those not covered by Google's defaults), Apple may feel that its own product would produce both more revenue and a better user experience, and for this reason may enter.

Chrome

The role of the handset maker in moving users to Bing highlights the fact that the remedy just described will not work in the case of user-downloaded Chrome on desktop. And yet desktop users also suffer from blocked entry and lost competition by virtue of the vertical integration of the monopoly Google search into Chrome on desktop. A remedy that can be used to help desktop users is to mandate that Chrome offer a neutral search choice design to its desktop customers with the details and cadence of delivery reflecting all that has been learned from choice screen mandates around the world. This would need to be coupled with behavioral

remedies prohibiting Google from otherwise giving preference to Google search in any way, including by prompting Chrome users to switch to Google search; degrading the performance, functionality, or user experience of search rivals in Chrome; and preferencing Google search in Chrome's browser settings.

However, we do not think the choice design remedy is strong enough to restore effective competition in search. Recall that Google initially created Chrome for desktop platforms, such as Windows and macOS, to direct users to Google Search on platforms that it did not control.¹⁶ Google has also used its monopoly position in search to drive adoption of Chrome by employing dark patterns nudging users to install Chrome and through prominent advertising for Chrome in Google search ads.¹⁷ Google uses Chrome to repeatedly push users to adopt services such as Chrome Sync and Sign-in, which provide vast amounts of browsing history data to Google from across Google and non-Google websites. According to Google's own disclosures, by default these services share browsing history data with Google to help Google improve search.¹⁸ These rich data are unavailable to Google's search rivals and contribute to the quality of Google search. Data also increase the monetization rate on Google search engine results in Chrome. These facts explain why Chrome for desktop is a critical channel for maintaining and expanding Google's search dominance. They also explain why we believe that restoring competition in search requires including Chrome in the Android spin off described below.

Failing to address Chrome in a potential package of remedies would leave a significant loophole for Google to exploit to maintain and expand its monopoly in search. In a scenario where remedies are applied to Google's contracts with third-party browser vendors and to Android but not to Chrome, Chrome would become the only search access point that Google directly controls that is not subject to remedies. At the same time, Google would likely face a loss of search market share, and Microsoft's Bing would likely see a gain, at least in the short run. This foreseeable outcome would motivate Google to become ever more aggressive in maintaining and expanding Chrome's market position, both as a vector to maintain search market share, and as a defense against its most significant competitor in both the search and browser markets, Microsoft. In other words, the prospect of losing users to both Bing and Edge simultaneously may result in Google doubling down on pushing Chrome to consumers. For example, Google could use its presence via widgets, ad display, and analytics on large swaths of websites to display notices indicating to users that the sites would work better on Chrome, encouraging users to switch. If Chrome vertically integrates Google search by default with no user choice and no prohibitions on Chrome self-preferencing Google search, such tactics will undermine other remedies designed to induce entry in search.

Severing the Link between the Operating System and Search

The remedy above requires Google to remove any requirement that Google Android licensees pre-install or position its search engine or make it a default in any search distribution channel such as the home screen or browser. However, simply changing these contracts is unlikely to make a meaningful difference to the behavior of licensees. Device manufacturers' relationships with Google are characterized by complete dependence. There is only one

¹⁶ See <https://blog.google/products/chrome/chromes-turning-10-heres-whats-new/>, " You know the box at the top of Chrome that combines the search bar and address bar into one? We call it the Omnibox, and we built it so that you can get to your search results as fast as possible."

¹⁷ Google Chrome's Antitrust Paradox, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4780718

¹⁸ See <https://support.google.com/websearch/answer/54068>.

mobile OS available for them to license, and, without an OS, they have no product to sell. If such a manufacturer sponsors entry of a rival search engine for 50% of its users, Google can simply raise the price of Google Android to punish the manufacturer and force it to drop the rival.

We saw exactly this response in France a few years ago. Google raised the price of Google Android by 40 Euro from its previous price of zero. The company took this strategy because Huawei wanted to preinstall the rival search engine Qwant.¹⁹ Google paired the 40 Euro price increase on the OS with a similar sized discount for OEMs who chose to preinstall Google search rather than Qwant. Demand for Qwant disappeared because the additional 40 Euro cost would have rendered the handset uncompetitive. Moreover, Google is not limited to formal contractual punishments for licensees.

Indeed, there are all manner of services that Google provides licensees such as technical support, software updates, complementary apps such as YouTube, cloud credits, etc., that the manufacturer puts at risk if it opposes Google in search. Therefore, to successfully apply a remedy of forbidding exclusive contracts and stimulating entry, the court must de-couple control over Google Android from Google Search.

This de-coupling can be carried out either through a spin-off or through structural separation. We explain below why a spin-off is preferable to a court-ordered and -supervised structural separation.

Before going further, it is necessary to explain the origin and functioning of open-source Android. Android Inc. was launched in 2003.²⁰ Its founders aimed to develop an operating system that was more responsive to user location and preferences than the other then extant operating systems. Android struggled financially until Google purchased it in 2005, for \$50M.²¹ Early on, Google signaled an openness to engaging partners in the development a platform for mobile phones based on the Linux kernel. In 2007, a consortium of technology companies called the Open Handset Alliance (of which Google was a member) publicly assumed control of developing the Android operating system.²² Leaders of this coalition (including Google executives and the founders of Android Inc.) unveiled the first version of a phone running on the Android operating system in 2008.²³

Since acquiring it, Google has envisioned and managed Android principally as a system for delivering its various products into the hands of consumers – a system that cannot be captured by any one particular participant in the mobile ecosystem.²⁴ Thus, even though Android's development now is steered by Google's Android Open Source Project (AOSP),

¹⁹ See Qwant's open letter to lawmakers (October 2021), https://ddg-staticcdn.s3.amazonaws.com/press/2110_Search_coalition_letter_calling_on_a_default_ban_in_DMA.pdf; see also Heidhues et al., *More Competitive Search Through Regulation*, 40 Yale J. Reg. 915, 940 (2023) (describing Google's response to Qwant's efforts to obtain placement on Huawei handsets).

²⁰ "Google's Android OS: Past, Present, and Future", PhoneArena(Aug. 18, 2018).

²¹ See Lisa Eadicicco, *THE RISE OF ANDROID: how a flailing startup became the world's biggest computing platform*, Business Insider (May 27, 2015), available at <https://www.businessinsider.com/how-android-was-created-2015-3>.

²² See *Industry Leaders Announce Open Platform for Mobile Devices*, Open Handset Alliance (Nov. 5, 2007), available at https://www.openhandsetalliance.com/press_110507.html.

²³ See Transcript, *T-Mobile launches G-1, first Google Android phone*, CNET: Your Guide to a Better Future (Sept. 23, 2008), available at <https://www.cnet.com/videos/t-mobile-launches-g1-first-google-android-phone/>.

²⁴ See *id.*

rather than the Open Handset Alliance, the project’s goals, including the commitment that Android remain open source, have remained constant. Google currently describes AOSP’s purpose as follows:

[T]o make sure there would always be an open platform available for carriers, OEMs, and developers to use to make their innovative ideas a reality. We also wanted to avoid any central point of failure, so no single industry player could restrict or control the innovations of any other. Our single most important goal with the AOSP is to make sure that open-source Android software is implemented as widely and compatibly as possible, to everyone's benefit.

A functioning handset, however, does not run on AOSP alone. Many of the APIs and other code necessary for the operating system to function and interoperate with apps is proprietary to Google, and resides, for example, within the code for the Google Play Store. This is why we have defined “Google Android” to include AOSP along with whatever other code is necessary to make functioning handset, wherever that code resides, including in the Play Store. The fact that a fully functioning handset requires more than just the open source code managed by AOSP, but also proprietary code controlled by Google, means that OEMs always have access to a stable version of the Android operating system that is sure to work on their devices. But that access is always conditioned on agreement to a MADA that has the result of ensuring that virtually all searches on Android devices are run through Google Search.

An Android divestiture would proceed two steps. As an initial step, Google would spin off the Google subsidiary that currently manages AOSP and restore it to independent governance, as a non-profit foundation, perhaps by re-establishing something akin to the Open Handset Alliance or an open source operating system non-profit such as Debian or Arch Linux. This would return the structure of the market to what it looked like before Google asserted management of the open-source project through AOSP.

Second, Google would need to contribute to the new entity all elements of “Google Android”—that is, the sum total of code necessary for the proper functioning of handsets, presumably that which currently is embedded in the Play Store—not captured by the spin off of the AOSP.²⁵ All the code needed for apps to run correctly, including Google Play Store, therefore, would become the property of the independent entity.

Because Google has maintained AOSP in the same manner for many years, there already is a functioning entity (albeit one currently controlled by Google) with people experienced with, and processes designed for, a mission that is practically purpose-built to take on the role of new home for the divested operating system. Google’s own description of how it manages the Android Open Source Project demonstrates that AOSP easily could continue its current mission, independent of Google. Google says, for example, that it has “committed the professional engineering resources necessary to ensure that Android is a fully competitive software platform.”²⁶ These resources, already committed to Android, presumably could simply remain with the newly spun-off entity. Google also asserts that it “treats the Android project as a full-scale product development operation and strikes the business deals necessary

²⁵ See *AOSP Overview*, Source, available at <https://source.android.com/docs/setup/about> (last visited Sept. 1, 2024).

²⁶ See AOSP frequently asked questions (FAQ), *Why is Google in charge of Android?*, Source, available at <https://source.android.com/docs/setup/about/faqs> (last visited Aug. 30, 2024).

to make sure great devices running Android make it to market.”²⁷ In other words, even though Google controls Android, AOSP already is self-sufficient and achieves its goals on its own. Finally, the goals of AOSP as articulated today are fully compatible with the remedial goals of returning competition to search and handsets: AOSP’s “single most important goal” is “to make sure that open-source Android software is implemented as widely and compatibly as possible, to everyone's benefit.”

Another option to accomplish the decoupling is for the court to mandate the creation of a subsidiary of Alphabet that would hold the Google Android OS. This structural separation would allow the OS to stay within the Alphabet corporation, but it would be strictly walled off. The U.S. Federal Communications Commission used this solution when it sought to protect competition in the burgeoning data processing market. After a series of inquiries in the 1960s and 1970s, the FCC mandated that AT&T (and other common carriers of a certain size) could *only* enter the unregulated data market through fully separate subsidiaries. The FCC reasoned that AT&T’s anticompetitive practices prevented “free and fair competition between communication common carriers and data processing companies” and that “appropriate regulatory treatment of these concerns requires a maximum separation of activities which are subject to regulation from non-regulated activities involving data processing.”²⁸ These requirements were termed “maximum separation” safeguards; their stated goal – and their ultimate effect—was to ensure competition in the data processing market.²⁹

More recently, Congress in the Telecommunications Act of 1996 imposed strict structural separation as between local and long-distance providers in order to bring more competition to the telephone market for both local and long-distance service.³⁰ The manner in which the FCC in connection with data processing and Congress in connection with telecommunications provide models for what structural separation might look like here.

The Simpler and More Effective Option: a New Company To Hold and Control AOSP

In our view, the simplest and cleanest remedy is for the court to order Google to spin off the entity that controls AOSP and then to deposit the component parts of the OS into the

²⁷ See *id.*

²⁸ Final Decision and Order, *In re Regulatory and Policy Problems Presented by the Interdependence of Computer and Communication Services and Facilities* (First Computer Inquiry), 28 F.C.C.2d 267 (1971) (Computer I Final Decision) (1971 FCC LEXIS 2066) paras. 9-10 (“[T]he furnishing of such data processing services by carriers should not inhibit free and fair competition between communication common carriers and data processing companies or otherwise involve practices contrary to the policies and prohibitions of the anti-trust laws...[A]ppropriate regulatory treatment of these concerns requires a maximum separation of activities which are subject to regulation from non-regulated activities involving data processing.”) (internal quotations omitted).

²⁹ See Amendment of Section 64.702 of the Comm’n’s Rules & Regs, (Second Computer Inquiry), 77 F.C.C.2d 385 Para. 12 (1980); 1980 FCC LEXIS 188 *389 (“We find that only AT&T and GTE present a sufficiently substantial threat such that they should be required to establish separate corporate entities for the provision of enhanced services and customer-premises equipment. We will not require any other underlying carrier to form separate entities for the provision of these services and CPE.”).

³⁰ See 47 U.S.C. § 272(a)(1) (“A . . . local exchange carrier . . . may not provide any service described in paragraph (2) unless it provides that service through one or more affiliates that . . . are separate from any operating company entity that is subject to the requirements of . . . this title; and . . . meets the requirements of subsection (b) [including that the separate entity operates independently, maintains separate books and records, is managed by separate officers, directors, and employees, obtains separate credit, and documents any transactions with the long-distance provider in writing that is subject to public inspection]”).

independent entity (NewCo). Because of the tremendous market power inherent in the Google Android OS, some regulation of NewCo's practices would be needed. To prevent recreating the problematic situation that caused the antitrust violation, NewCo would be restricted from expanding to other lines of business. Licensing fees would be non-discriminatory and linear in the number of devices in order to give small licensees the same cost profile as large ones. No bundling or tying would be permitted. The Google Play Store and Chrome would be part of the licensed Android OS without any requirement on whether to use it. The absence of tying or other licensing conditions would mean that handset makers could install rival stores and users could download such stores.³¹ The license fee would be set at a FRAND rate to ensure widespread use as well as support of ongoing R&D. The court would create a technical committee to oversee the divestiture process and later, to advise it on FRAND terms. Court oversight will remain as a backstop.

This environment would give manufacturers the security of licensing the operating system they are accustomed to (including all the APIs necessary for a well-functioning device) at a regulated price. The engineers and other employees who maintain and advance on the development of Google Android could be hired by NewCo. As is done by Google today, NewCo would review the apps that developers write for the Google Android OS in exchange for a reasonable fee. Authorized apps would operate correctly on authorized handsets.

OEMs could then bargain over search engine placement and percentage of search revenue to be paid to Google without fear of losing access to a competitively-priced operating system. An OEM could install a competing search engine like Bing as its default if it offered more search revenue and this competitive pressure would raise the payments that Google makes to OEMs. Consumers would pay less for handsets because that higher level of search revenue earned by OEMs would be competed away in handset prices. Thus, a larger share of what now constitute monopoly profits for Google would find its way into consumer pocketbooks.

It is important to note that Google's control over the mobile operating system is existential; there is no other OS that handset makers can license to sell a handset today in the US. While Google's browsers and maps are popular, there are other browsers and other maps that OEMs can preinstall if Google threatens to withhold their most popular apps. There is no substitute for Google Android. This is the reason why either spinning out Android or placing it in an independent and firewalled division of Alphabet is necessary, while a remedy encompassing the other apps is optional.

A Messier Option: Court-Supervised Structural Separation

If the court dislikes the divestitures into NewCo option, it could instead opt for structural separation. A solution is needed to block Google's current ability to degrade a manufacturer's access to the operating system or raise its price, and in that way coerce the manufacturer into preinstalling Google search. Forbidding exclusive or default contracts will be ineffective if such coercion is possible. The link between the operating system and the search business must be severed.

³¹ Forking of Google Android would be permitted as long as any new OS was clearly labeled with a different name and distinguished. Forking has the possibility of confusing consumers if they are unaware of the need to use apps that run on a particular OS. The Android Foundation would ensure that Android continued to work as a coherent ecosystem and handset makers could use it to ensure that their consumers could obtain certified apps. As is done today, the Android Foundation would certify a handset as compliant when it correctly implements the OS so that certified apps can run.

In a structural separation solution, Google would transfer the operating system (Android, Google Play, and any other relevant APIs), Chrome, and all associated employees into a division or subsidiary of Google that is strictly separated, rather than to an independent entity. Because the division or subsidiary would still have an incentive to make as much money for its parent as possible, the separation would have to be accompanied by the imposition of a number of court-ordered conditions. There likely would need to be a commercial committee as well as a technical committee to aid the court's oversight.

Necessary conditions that likely would require significant oversight would include a prohibition on bundling or tying between the OS and any other Google service or benefit, including those that would be managed by other Google divisions. For example, Google would be prohibited from leveraging its control of Google Maps or YouTube with a handset maker in order to coerce use of Google search. License fees would need to be simple linear contracts without discrimination and where any additional services are offered a la carte to all licensees. Because informal communication could aid in coercion, a firewall would be needed to prevent communication between divisions. Employees would not be permitted to move from the OS division directly to other parts of Google and vice versa. The price of the OS would have to be regulated in order to prevent it from being set very high to punish licensees who do not install Google search, or simply set very high to replace the revenue formerly earned from Google search. The court would have to assess what a fair, reasonable, and non-discriminatory price is for Google Android and ensure this was the price charged. Determining FRAND would likely require an accurate measurement of the costs of running Android. The OS division would maintain strictly separate accounting so that the court could determine its costs of R&D and see the prices it was charging to each customer. No infrastructure or fixed costs could be shared, nor would joint procurement be permitted. The monitors would need the authority to obtain information of any kind to ensure compliance with all the restrictions imposed by the court.

This solution would allow a handset maker to license Google Android from the OS division for a fair, non-discriminatory, price without any conditions attached to it. Then that handset maker could then bargain, in theory, freely and separately with another division, Google Search, over the terms on which it would preinstall the service in a widget or browser. As compared to a spin-off, structural separation seems to us likely to impose a significantly larger burden on the Court. As the technology of search, its costs, and demand evolve Google will ask the court to adjust the remedy, necessitating further hearings and collection of evidence. Decisions on what functionalities to include in the operating system will devolve into arguments about what direction benefits Google's business over rivals'. A Google division—even if walled off—retains an incentive to act in ways that benefit its parent, necessitating significant court oversight to ensure the separate division does not coordinate with other divisions of Google in ways that frustrate the very purposes of the separation. NewCo, by contrast, will be an independent nonprofit with a mission and governance that do not give it these problematic incentives.

Both solutions would require the court to engage in some of the same activities, for example a determination of FRAND rates. Because it does not have shareholders, an independent NewCo is likely to have the incentive to set a FRAND price that is similar to the one the court would choose. The court could permit NewCo to determine and impose those rates on its own, subject to challenge only if its rate structure appears problematic. A Google division, by contrast, has a strong incentive to choose a rate that increases the profit of the for-profit

corporation and is *not* FRAND. Therefore, the court will likely need to set up a rate-setting process that is more closely supervised, and the final rate specifically approved. The FRAND rate will change over time, necessitating regular repetition of the process, as is done in music licensing, for example.³²

Separating Chrome from Search

Although the desktop browser market is not characterized by the same level of coercive power that Google can currently exert over OEMs due to their dependence on Android, foreclosing the ability of Google to use Chrome to maintain and extend its search monopoly through purely behavioral remedies may prove to be exceedingly difficult. Should a court-appointed monitor be created to police all the possible ways that Google might seek to give Google search advantages in Chrome or use Chrome to reinforce its existing advantages in search, disputes from Google's search rivals will frequently land back in the court. There are numerous and potentially subtle ways Google could try to advantage its own search engine in Chrome: using the vast network of websites with Google presence to encourage users to switch Chrome's search engine in ways unavailable to search rivals; degrading the performance of rival search engines; reducing support for web standards and compatibility in ways that specifically harm rival providers of both browsers and search (Microsoft and, perhaps in the future, Apple); making it harder to use other Google services in Chrome if Google search is not set as the default; and many more. Gathering evidence and conducting the analysis needed to distinguish cases where Google is violating its commitments from cases of healthy competitive behavior across the adjacent browser, search, and web services markets will occupy the court for years or decades. Identifying potential self-preferencing behavior in Chrome would require a level of technical diligence exceeding the other scenarios where Google has a contract with a third-party browser vendor or OEM that could be scrutinized for violations.

A cleaner and simpler approach would be to include Chrome in either of the structural remedies described above, incorporating the Chrome software, employees, and other assets into the spun-off NewCo or subsidiary. A structural remedy for Chrome would erase the incentive for the browser to preference its own search engine, because Chrome would be structurally separate from Google search. As an independent browser, Chrome for Android would be part of the package licensed by OEMs. Those OEMs would be free to contract with non-Google search engines or with Google search for pre-installation, default positions, or revenue sharing according to the rest of the remedy obligations imposed on Google. Contracts between Chrome for desktop and Google search would be subject to the same restrictions and obligations as those between Google and any other browser vendor, including choice design obligations. The need for a monitor to police each novel form of self-preferencing Chrome might attempt to provide to Google search would be eliminated.

Observers may question whether NewCo would have both the resources and the incentive to continue to maintain the desktop browser. The facts gathered during the trial provide strong evidence that resourcing is unlikely to be a concern. Mozilla spends about \$450M annually to operate the Firefox browser.³³ If we assume an independent Chrome for desktop would cost

³² See generally Ed Christman, *Copyright Royalty Board? Statutory? Mechanical? Performance? A Primer for the World of Music Licensing and its Pricing*, Billboard (Aug. 18, 2016), available at <https://www.billboard.com/music/music-news/music-licensing-pricing-primer-copyright-royalty-board-statutory-mechanical-performance-7476929/>.

³³ <https://assets.mozilla.net/annualreport/2022/mozilla-fdn-2022-fs-final-0908.pdf>

approximately that much to operate, this amounts to about 2% of Bing's current search revenue. Given how few resources are needed to operate a competitive browser relative to the total search advertising market, an independent Chrome interested in monetizing its browser through search revenue sharing seems like it would have options available to do so.

Cross-platform effects would likely further incentivize NewCo to stay in the desktop browser market. Chrome on Android would continue to be an essential component of NewCo's overall Android offering to OEMs. The versions of Chrome that run on Android and desktop are both based on the open-source Chromium project and share a significant code base.³⁴ Browser vendors in the market today are driven to have their users on mobile adopt the same browser on desktop and vice versa, as evidenced by their promotional activities. Browser syncing that allows users to sync their browsing history, bookmarks, and passwords across devices is a table-stakes feature offered by every major browser vendor.³⁵ There is no reason NewCo's incentives would significantly deviate from these realities of the market today.

Additional Thoughts

Whether the court chooses a spinoff or structural separation, Google will need to be enjoined from re-entering the OS or browser market for a period of years. And the court will have to explicitly forbid Google from attempting to re-create its original market power by some form of contract that undoes the remedy.

Additionally, there ought to be some remedies that directly address the court's finding that the fixed costs of running a search engine are high and that the cost of entry helped Google's anticompetitive conduct to be effective. There are two straightforward ways for the court to lower the cost of entry into general search. Among the simplest and least controversial of these remedies is a requirement that Google license its web index to other search engines on FRAND terms. Crawling the entire World Wide Web every day to maintain an index is costly and therefore acts a significant barrier to entry. Moreover, there is little welfare benefit generated by spending the money needed to create more than one web index. Requiring that Google license its index on FRAND terms will promote entry by rivals. A FRAND licensing fee will compensate Google for the cost of sharing the index with competitors and for its continuing efforts to maintain the index, while greatly lowering entry costs for rivals.

The second method of lowering the fixed costs of entry into search is to require Google to share click and query data with rivals. Google could charge a cost-based fee for such data. The European Commission has already mandated that Google share data in Europe. However, for the sharing to be effective, the queries cannot be too aggregated or too old, or they will not be useful to a small entrant trying to train its algorithm. The court will need to make decisions concerning privacy and speed so that sharing of click and query data helps entrants improve their quality. The court will be able to study the European experience and improve upon it.

³⁴ <https://www.chromium.org/Home/>

³⁵ Chrome sync, <https://chrome.google.com/sync>; iCloud for Safari, <https://support.apple.com/guide/icloud/what-you-can-do-with-icloud-and-safari-mm9b8da4f328/1.0/icloud/1.0>; Microsoft Edge sync, <https://support.microsoft.com/en-us/microsoft-edge/sign-in-to-sync-microsoft-edge-across-devices-e6ffa79b-ed52-aa32-47e2-5d5597fe4674>; Firefox sync, <https://www.mozilla.org/en-US/firefox/features/sync/>; Opera sync, <https://www.opera.com/features/sync>.

Final Thoughts

Given the importance of the search market and duration of Google's monopoly, remedies that restore the lost competition will need to be powerful, targeted, and complete. The interlocking suite of remedies we put forward are likely to significantly transform the search market. The finding of liability logically generates the steps needed to restore competition. Only if competition is firmly re-established and protected will the remedy unleash innovation and benefit consumers.

Author Disclosures for

‘Judicial Remedies To Restore Competition in the Market for General Search’

Fiona Scott Morton: Theodore Nierenberg Professor of Economics, Yale School of Management and National Bureau of Economic Research. Within the last three years, she has engaged in economic consulting for Microsoft and for both private and government litigants on issues unrelated to the policies discussed in this article.

David Dinielli: Visiting Clinical Lecturer in Law & Senior Research Scholar, Yale Law School and Senior Policy Fellow, Tobin Center for Economic Policy, Yale University. He has no engagements or affiliations to disclose pursuant to the disclosure policy of the American Economic Association.

Alissa Cooper: Executive Director, Knight-Georgetown Institute (KGI), Georgetown University. She is a member of the board of The Tor Project, Inc. She has no other engagements or affiliations to disclose pursuant to the disclosure policy of the American Economic Association.

Gene Kimmelman: Senior Policy Fellow, Tobin Center for Economic Policy at Yale University and Research Fellow, Mossavar-Rahmani Center for Business & Government at the John F. Kennedy School of Government at Harvard University. Within the last 3 years he has engaged in antitrust and competition policy training for communications professionals, not involving tech sector companies.

Margaret O’Grady: Assistant Professor of Legal Skills, Franklin Pierce School of Law, University of New Hampshire. She has no engagements or affiliations to disclose pursuant to the disclosure policy of the American Economic Association.