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COMPETITION, DEFAULTS, AND ANTITRUST REMEDIES IN DIGITAL SEARCH



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The rapid growth in digital platforms and information technology are greatly affecting how consumers discover and purchase products, making online markets the most attractive advertising media for firms. The business model of most digital platforms where online ad is sold is that of a two-sided market, where one group has preferences regarding the number of users in the other group. This positive cross-side network effect endows dominant platforms with huge comparative advantages and this "winner takes all" tendency raises antitrust concerns. To present supplemental thoughts on how to enhance competition in digital markets, we study the recent changes involving search advertising related to the EU Commission *Google Android* case.

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01

INTRODUCTION

With the rapid development in information technologies, digital platforms have flourished and reshaped the economies. The expansion in digital user base has been further accelerated since 2020, when we all experienced the global COVID-19 pandemic. The social distancing rules and lockdown policies during this crisis pushed a large majority of users to switch from in person to online activities, such as online meetings and shopping. Therefore, the proper design of digital platforms, as well as the mechanisms through which they compete, and, also, how competition is realized within the different platforms, is crucial to avoid waste and enhance social welfare.

The convenience of the internet has endowed users with more accessible information, but at the same time it has increased users' dependence on search engines during their daily lives. Both the rapid expansion in customer size and users' growing dependence on online platforms are making digital markets the most attractive advertising media for firms. Indeed, digital advertising has been widely perceived as the financial engine behind most online platforms, so understanding the latter requires an in-depth understanding of the former. By analyzing the recent changes to default search apps on Android devices driven by the European Commission "Google Android case,"¹ we aim to present some supplemental thoughts on how to enhance competition in digital markets.

02

SEARCH IN DIGITAL MARKETS

Compared with traditional media, digital advertising has several unique characteristics. First, the potential customer base

in digital markets is much larger than in off-line markets. By early 2021, the number of active internet users has achieved 4.66 billion, taking up to 60 percent of the global population. Among them, 92.6 percent of them access the internet through mobile devices.² In addition to the tremendous market size, targeting is another distinctive feature of digital advertising.³

Similarly, compared with traditional media, online platforms have much easier access to users' information. The rich data set with rapid-developed algorithms enable advertisers to be better matched with potential customers and enjoy possibly cheaper prices. Moreover, the correlation between user base and targeting accuracy is further enhanced by the presence of network effects, which make the user base grow exponentially and make it stick to the platform. Consequently, this positive loop further accelerated the growth in digital advertising.

These unique features of digital advertising have motivated a tremendous number of firms to shift their marketing budgets from TV, radio, and newspapers to digital platforms – most notably Google and Facebook, but also Amazon, Taobao, and most of the tech giants dominating modern economies. Spending on digital advertising was estimated to have reached a total of US\$378 billion in 2020 and to have overtaken advertising on traditional media in nearly all developed economies.⁴ Digital advertising has developed into a vital section of the digital economy, and its regulation receives enormous attention.

Studies on the inner workings of how internet advertising space is sold by online platforms form the fundamental building blocks of the current understanding of the digital economy,^{5,6} and there are growing efforts by regulators worldwide to assess whether competition is working properly in this market. In the absence of effective competition, incumbent digital platforms have low incentives to innovate, limiting the speed at which consumers might benefit from technological progress.⁷

Lack of competition might also mean both reduced choice for consumers and high advertising prices for businesses, implying further welfare loss for consumers through increased product prices. Finally, the shift of advertising revenues toward digital platforms is undermining the profitability

1 The change implemented by Google is not formally a remedy imposed by the European Commission, but a behavioral change adopted by Google in accordance with and in response to the EC competition concerns.

2 For more information, please visit <https://www.statista.com/statistics/617136/digital-population-worldwide/>.

3 Bergemann, D., & Bonatti, A. (2011). "Targeting in Advertising Markets: Implications for Offline vs. Online Media," *Rand Journal of Economics*, 42 (3), 417-443

4 For more information, please visit: <https://www.statista.com/statistics/237974/online-advertising-spending-worldwide>.

5 Varian, Hal R. 2007. "Position auctions," *International Journal of Industrial Organization*, 25(6).

6 Levin, J. (2013). "The Data Revolution and Economic Analysis" in Acemoglu, Arellano, Dekel (eds.) *Advances in Economics and Econometrics*. Cambridge University Press, 2013, Vol. 1.

7 Takalo, T., Tanayama, T. & Toivanen, O. (2013). "Market failures and the additional effects of public support to private R&D: theory and empirical implications," *International Journal of Industrial Organization*, 31, 634-642.

of newspapers and other publishers, making it harder for them to produce valuable content.

Despite efforts by both researchers and regulators, it remains uncertain to us whether and how competition for the digital platforms, instead of emerging endogenously from the intermediaries or other players, can be induced by regulators. While the heated policy debate on this topic is still ongoing, some first attempts in regulation are emerging.

03

ANDROID CHOICE SCREEN

Since 2019, several influential policy reports have argued in favor of introducing new regulations for digital markets.⁸ The proponents of this approach argue that for the largest digital platforms (certainly the so-called “FAANGs” – Facebook, Amazon, Apple, Netflix, and Google, – but possibly even smaller platforms), proceeding through the antitrust laws by verifying *ex post* whether they illegally altered competition is ineffective. The *ex post* approach is too slow and, moreover, being developed for markets not organized as platforms, it is mostly inadequate for digital markets. Hence, an *ex ante* regulatory approach is required to determine which types of practices should be forbidden.

A. Choice Screen Auction

Google, as a dominant global search engine, has raised regulatory concerns over the lack of a level playing field. Therefore, a series of investigations and new legislations have been proposed to limit the number of its practices. On July 18, 2018, the European Commission (“EC”) fined Google €4.34 billion for imposing illegal restrictions on Android device manufacturers and mobile network operators.⁹ The case revolved around contractual restrictions that Google had allegedly imposed to strengthen its dominant position in the market for internet search.

The EC Directorate-General for Competition established that Google’s conduct constituted an abuse of dominance. Market dominance *per se* is not illegal under European Union law. However, a dominant company has a special responsibility to ensure that its conduct does not distort competition. In the period considered, Google offered its mobile apps to manufacturers as a bundle (Google Mobile

Services) which included the Play Store, the Google Search app, and the Google Chrome browser. The abuse revolved around the fact that manufacturers were required to pre-install both the Google Search app and the Google Chrome browser. Both apps represent important entry points for search queries on mobile devices.

The EC concluded that Google’s behavior reduced both the incentives for users to download competing search and browser apps and the incentives for manufacturers to pre-install such apps, thus reducing competition in search. Hence, the EC, in addition to imposing a fine, also coordinated with Google a change in business practices involving the determination of the default search engine on new Android devices.

“*The EC Directorate-General for Competition established that Google’s conduct constituted an abuse of dominance*”

From March 2020, Google had to implement a choice screen for general search providers on all new Android phones and tablets shipped in the European Economic Area (“EEA”) and the UK where the Google Search App is pre-installed. During the device setup, users will be required to select their preferred search provider from a screen offering a choice of four different providers. Choosing a search provider will (i) set the search provider in a home screen search box; (ii) if Google Chrome is installed, set the search provider as Chrome’s default search provider; and (iii) install the search app of the selected provider. An auction will determine the other search providers that will appear in the choice screen along with Google.¹⁰

The auction will be conducted quarterly, and separately for each EU Member State. In each auction, search providers will bid the amount that they are willing to pay Google every time a user selects them from the choice screen. The three highest bidders will appear on the choice screen for that country (together with Google, all in random order) and if a provider is selected by a user, it will pay the amount of the fourth-highest bid received. If fewer than three eligible search providers bid in the auction, any remaining slots will be filled randomly from the eligible search providers on a per device basis.

⁸ These include the U.S. Stigler Committee Report, the Furman Review for the UK government, the Competition Policy for the Digital Era report by the European Commission and the UK Competition and Markets Authority Interim Report on Online Platforms and Digital Advertising.

⁹ For more information, please visit https://ec.europa.eu/commission/presscorner/detail/en/IP_18_4581.

¹⁰ For more information, please visit <https://www.android.com/choicescreen/>.

B. Revised Choice Screen

This pay-to-play model has then received numerous criticism and questions in the past two years. First, people are concerned that the market share of Google seems to remain undented after the screen choice auction.¹¹ According to the StatCounter data, Google's market share on the mobile platform stood at 97.05 percent in September 2021, which is only 0.36 percent lower than that in March 2020, when the choice screen auction first started.¹²

Second, search engines competing with Google complained about the fact that the auction mechanism favors search engines that extract high value from customers' data (or from customers).¹³ Specifically, this criticism emphasizes that the choice screen auction tends to price out those popular search alternatives without a business model capable of generating revenues, particularly those aiming at solving broader social, ethical, or ideological problems.¹⁴

For instance, DuckDuckGo is a search engine that stresses protecting the privacy of searchers and avoiding the "filter bubble" of personalized search results. Like many search engines, a source of its revenues is the advertising and sponsored links, but a difference lies in its advertising being based on the keywords used in the search box and not on the user's data. For example, if a user searches for "car," they may be shown a car ad. However, this ad is based solely on the search term and not on a "profile" of the user constructed by the search engine.

Therefore, online ads on DuckDuckGo may be less relevant to the user and so less likely to be clicked on, affecting DuckDuckGo's revenues. Ideological reasons notwithstanding, DuckDuckGo's business model may hinder its ability to effectively participate in the auction. Analogously, the search engine Ecosia, whose business model is a "social business," donates 80 percent of its profits from advertising to support reforestation projects. This is another search engine with a business model that may not be capable of generating enough revenues. On October 27, 2020, DuckDuckGo, Lilo, Seznam, Ecosia, and Qwant filed an open letter to Google and EC, expressing their dissatisfaction with the pay-to-play model in the choice screen auction.¹⁵

To promote the antitrust goal of the choice screen, EC decided to make further adjustments over this pay-to-play setting. Beginning on September 1, 2021, a revised choice screen appeared on new devices in the EEA and the UK. With the new mechanism, participation in the choice screen became free of charge. Particularly, search engines satisfying the criteria do not need to pay when appear or are selected by a user.

Furthermore, the number of search engines that appear on the choice screen also increases. On the new choice screen, the five most popular eligible general search engines in each country (including Google, all in random order) will always be displayed at the top of the customer's scrollable list. Specifically, the initial set of these top five search services is decided based on its market share estimated by StatCounter and should be refreshed annually. There are then up to seven remaining search services, which are randomly chosen among eligible search engines, will be listed below the popular ones in random order.

04

POTENTIAL DETERMINISTIC FACTORS

The influence of the revised choice screen remains unclear, as little evidence is available in such a fleeting period. However, the market response and search engines' feedback regarding previous choice screen auction do have silver linings. It reminds us of the need to carefully consider the characteristics and properties of search before proposing new rules for this market.

First, it is critical to figure out whether the digital market resembles a natural monopoly. The property of market type greatly affects whether antitrust remedies should be applied and how to make it more efficient.

Second, we shall investigate whether users of search engines are rational players, meaning that they always choose the

¹¹ For the comprehensive empirical investigation over the quantitative effect of the choice screen, please check Decarolis, F., Li, M., Paterollo, F.(2021). "Search Engine Competition: Evidence from the Android Choice Screen" Bocconi University-IGIER, working paper.

¹² For more information, please visit <https://statcounter.com/>.

¹³ Specifically, DuckDuckGo produced seven articles between October 2019 and May 2021, mainly on the possible defects of the choice screen auction on competition and proposed potential improvements. The series of posts is available at: <https://spreadprivacy.com/tag/preference/>.

¹⁴ Ostrovsky, M. (2021, July). "Choice screen auctions". In Proceedings of the 22nd ACM Conference on Economics and Computation (pp. 741-742).

¹⁵ For more information, please visit https://ddg-staticcdn.s3.amazonaws.com/press/2110_Search_coalition_letter_calling_on_a_default_ban_in_DMA.pdf.

search engine with the highest quality. The neglect of users' behavior bias may lead us to wrong predictions and move the market in unexpected directions. Without figuring out these two dimensions, it is challenging for us to provide correct insights into how optimal regulation should be designed.¹⁶

05

NATURAL MONOPOLY

Like most digital platforms, Google is a typical two-sided market. There are two distinct groups of agents: the consumers who search for keywords, and the advertisers who seek to capture their attention. Google's search engine is the platform that brings both sides of the market together.

One unique feature that distinguishes the two-sided market from others is the network effect, indicating the dependence of a user's surplus the size of the user base.¹⁷ More precisely, the cross-group network effect exists when a user's surplus is affected by the number of users on the other side of the market, while the within-group network effect exists when the surplus is affected by the number of users on the same side of the market.

Both the positive cross-group network effect and within-group network effect are observed on Google. First, the platform becomes more attractive to advertisers when there are more consumers, and possibly more search queries on Google. Furthermore, the more advertiser and more consumers are on the platform, the more accurate the targeting provided by Google. Therefore, consumers and advertisers both can expect better matching with larger user bases on both sides of the market.

With these positive network effects, the number of advertisers joining Google depends heavily on the number of consumers. Therefore, attracting enough consumers plays a crucial role in the successful operation of Google. Otherwise, the market may collapse due to the well-known chicken-egg problem.

Another element sometimes stressed by commentators is the linkage between sponsored and natural links, and how

higher quality of the latter implies more value of the former. The user base and the users' data can be used also to target non-sponsored searches, for example based on the geographical location of the user. This might allow Google to provide a more "relevant" product for the users, therefore becoming more attractive for them compared to other search engines, where the results are targeted based on a smaller user base (and therefore less precise) or are not targeted at all (such as with DuckDuckGo).¹⁸

As shown by existing research,¹⁹ a platform's optimal pricing in the two-sided market is jointly determined by elasticities on both sides of the market and any network externalities. Since the surplus of an advertiser depends more heavily on the number of customers, it is optimal for Google to provide free services to consumers and build a large user base. According to the latest survey, the number of Google users worldwide is approximately 4 billion.

Because there are only 4.66 billion internet users globally, Google's market share in search engines is astonishing. This, in turn, makes Google more valuable for advertisers, who mainly provide revenue to the search engine. Furthermore, the substantial number of users and advertisers can possibly generate a positive loop for Google's growth. The more consumers make Google more valuable to advertisers, and the more advertisers also indicate better financial support for search engine development and more appealing service to users.

The presence of these network effects implies a tendency for digital platforms to assume a "winner takes all" form, where the market tips to a situation of highly concentrated oligopoly or even monopoly. This feature puts into question whether the forces of free market competition are enough to guarantee that this concentration does not harm consumers and businesses. Although reducing Google's user size diminishes its comparative advantage over rivals, it may also hurt consumer surplus at the same time, as users benefit from the network effects generated by large user sizes.

Both the positive cross-group network effect and within-group network effect are observed on Google

¹⁶ For the comprehensive overview, please check Viscusi, W. K., Harrington Jr, J. E., & Vernon, J. M. (2005). Economics of regulation and antitrust. MIT Wollmann, T. G. (2019). "Stealth consolidation: Evidence from an amendment to the Hart-Scott-Rodino Act," American Economic Review: Insights, 1(1), 77-94.

¹⁷ Belleflamme P. & Peitz, M., (2018). "Platform and Network Effects," in Corchon & Marini (eds), Handbook of Game Theory and Industrial Organization, Cheltenham: Edward Elgar.

¹⁸ See <https://spreadprivacy.com/google-filter-bubble-study/>.

¹⁹ Rochet, J. C., & Tirole, J. (2004). "Two-sided markets: an overview," Institut d'Economie Industrielle wp. Roth, A. E. (2015). Who gets what and why, William Collins.

A. Behavioral Bias

More interesting, however, is the situation in which the market is not a natural monopoly. In this case, the regulatory intervention might indeed aim at bolstering competition, but the right tools for achieving this goal will then be crucially dependent on whether the platform's users are rational or have behavioral biases.

Indeed, the design of the choice screen, which requires Google to change both the search engine and internet browser default options during the installation phase of Android-operated mobile devices, has explicitly sought to account for the user default effect. The pre-installation of apps creates a *status quo* bias: users are more likely to stick with the browser and search apps pre-installed on their devices rather than downloading and installing alternatives. In this specific market, the data point to a default effect. For example, according to the CMA (2019), in 2018 in the UK, Google was willing to pay around £1 billion – 16 percent of all its search revenues – to be the default search engine on mobile devices such as Apple phones.

This high willingness to pay to be the default option can be explained by considering that, for instance, in February 2016, only 17 percent of iOS users in the United Kingdom had used their downloaded Google Search app, whereas 76 percent of Android users had used their pre-installed Google Search app. This has implications for the total search volume by mobile devices. For example, in 2016, 95 percent of searches on Android devices with the Google Search app and Google Chrome pre-installed were made using Google, while on Windows Mobile devices on which Google Search and Chrome were not pre-installed, fewer than 25 percent of all search queries were made using Google and more than 75 percent of search queries used Microsoft's Bing search engine, which was pre-installed.²⁰

Whether the platform's users are rational or biased is crucial as it ultimately determines the effectiveness of regulations. For instance, if the users are rational in choosing search services, then the reason they cluster on Google is likely to be the superior quality of its service. In turn, this quality is the outcome of a large number of Google's users. In this case, a regulation mandating Google to share the data from its queries with other search engines would allow these rivals to improve their own quality and, hence, become more effective competitors. Regulatory interventions of this type, centered around data portability and platform interoperability, are the ones most often discussed in the current debate.

²⁰ Additional evidence on the default effect comes from Arcep, the French communications regulator. Through face-to-face interviews with a representative sample of the French population, they found that users strongly prefer the pre-installed browser, with fewer than 20 percent of users using a browser other than the pre-installed one.

²¹ The role of default options in driving choices is a well-known phenomenon (Thaler & Sunstein, 2008) and its relevance for economically important choices has been extensively documented in various environments, especially in the case of household finance problems (see Beshears, Choi, Laibson & Madrian, 2019).

“*Whether the platform's users are rational or biased is crucial as it ultimately determines the effectiveness of regulations*”

However, they will be completely ineffective if behavioral biases are the motive behind a platform's concentration. Continuing with the example of search, suppose that there is no quality advantage of Google relative to its rivals. Consumers, however, have a behavioral bias: due to a default effect,²¹ they will keep using whatever search engine they find pre-installed on their device, without trying out different, possibly better, search engines. In this case, a regulation mandating that Google share its data with the other search engines would be completely ineffective in fostering competition in search. What is needed, instead, is a type of regulatory intervention that accounts for both behavioral biases of the platform's users and limited information about effective alternatives to the dominant platform.

06 CONCLUSION

The advent of digital platforms brought great convenience and benefits to the economies and societies we live in, while it also delivered potential challenges. With the presence of network effect, platforms with large user sizes have comparative advantages and the “winner takes all” issue raised antitrust concerns. To better understand the underlying mechanism through which consumers make decisions and platforms compete among themselves, we study the recent changes in Google Android default search app originating from the EC “Google Android case.”

Based on the adjustment in policy and market feedback, we point out two crucial factors that potentially determine the effectiveness of regulations. The first is whether a market is a natural monopoly; the second is whether the agents that the platform connects are rational players. Through the study, we show the underlying reasons why market properties and consumer behaviors may greatly affect the influences and effectiveness of regulations. ■

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