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The Counterintuitive Economics of Default Positions

Abstract

Which supplier should control the default slot on digital devices? We analyze alternative ways to assign the default position for digital goods like search engines. First, we show that competitive bidding for the default usually rewards the higher-quality incumbent, yet it can reduce consumer welfare by cranking up ads and data extraction. Second, and perhaps surprisingly, giving the challenger a regulatory slice of defaults dulls rivalry and raises both firms' profit while harming consumers. Third, "choice screens" boost short-run consumer welfare, but starve the weaker firm of scale and learning and thus limit long-run competition. The choice among these alternatives depends in large part on the relative importance of long-run learning effects.

1. Motivation

An important controversy regarding key digital products is how to choose the supplier whose product will be preset as the default for consumers? In many situations where competing products vie for the default position, the selection is made by a third party that supplies a different good to the consumers. For example, the manufacturer of a PC or a mobile device may choose the browser, search engine, or other software that will be pre-installed. Although consumers may switch to a non-default product, doing so can entail switching costs that create significant inertia; many consumers lack the technical savvy to switch or the willingness to incur the hassle.

A striking example comes from the landmark case brought by the U.S. Department of Justice (DOJ) versus Microsoft in the late 1990s for exclusionary practices against Netscape's Navigator browser, the main competitor to Microsoft's Internet Explorer browser. A key piece of the DOJ's evidence was the much larger growth in Explorer's market share at Internet Service Providers (ISPs) that agreed to distribute Explorer as the default browser: from 20% to 90% vs. from 20% to 30% at other ISPs (Dunham [2006]). Even where switching appears easy—"just a click away" for some digital products—the default position can be valuable, as evidenced by the large payments that firms are willing to make for this position.[1] Google reportedly pays hundreds of millions of dollars annually to be the default search engine on Mozilla's Firefox browser; billions annually to be the default search engine on Apple's Safari browser; and considerable sums to other parties such as wireless carriers (DOJ [2020]; Ostrovsky [2023]). The European Commission's [2018] Android decision, finding that Google foreclosed distribution outlets to competing search engines, flagged such default payments to third parties, as did the DOJ's [2020] lawsuit.[2]

The Google search controversy offers a useful springboard for addressing some questions of broader interest. Often, as with Google in search, one of the firms vying for the default position enjoys a quality advantage, for example due to initially superior technology. Critics worry that the leading firm may prolong its dominance by paying for default positions at key distribution outlets to deprive rivals of the scale needed to compete effectively. Google, or a similarly situated leading firm, might plausibly counter that its willingness to outbid rivals for default status derives only from its product superiority (e.g. Walker [2020]), because a firm that expects to *retain* more consumers than would a lower-quality rival typically is willing to spend more to *attract* consumers. For example, in

Milgrom and Roberts [1986] a higher-quality firm is willing to spend more on advertising which acts as a signal of quality. A similar finding occurs in the search models of Athey and Ellison [2011] and Chen and He [2011], where competing firms bid for higher ad positions that will be searched earlier by consumers.[3]

The greater-sales argument, however, may be less applicable to bidding for default position for search engines or some other major digital products. With virtually all consumers obtaining the product from one firm or the other, both firms would achieve equal gains in sales from obtaining the default. Thus, it is not obvious whether superior quality alone would induce Google to outbid a rival for default. In our setting, what will matter is firms' relative ability to monetize the default position.

Moreover, some critics dispute Google's claim that it offers a superior product. They argue that while Google may deliver more relevant search results, it offers a worse overall consumer experience than some other search engines because it engages in excessive monetization, e.g. through intrusive tracking or by prioritizing ads over natural search results. They contend that Google's enduring market share dominance is attributable to its ubiquitous default position, not to superior quality. This in turn raises the question: If Google offers an inferior product, how can it outbid rivals for the default position?

2. Economic Model for Analysis

Our paper (Chen and Schwartz [2025] addresses two broad issues. First, what are the characteristics of equilibrium when the default position is assigned through competitive bidding? In particular, does the high-quality firm necessarily win? Is consumer welfare higher in this case than it would be if the default were awarded to the lower-quality rival? Second, compared to the high-quality firm winning, what are the welfare effects of alternative regulatory schemes? Specifically, we consider assigning the default position for some share of consumers to one firm and the rest to the rival, or letting consumers choose their own preferred default ("Choice Screen").

We tackle these issues using a parsimonious model that captures salient features of the search engine environment. Consumers choose between two competing suppliers of a given

product that differ only in product quality.[5] Their valuations for the products are high enough that (virtually) all consumers will choose to obtain the product from one of the firms.. Each firm sets the level of a monetization activity, 'charge' for brevity, which harms a consumer but generates revenue as a general function of the charge. This formulation admits broad interpretations of the charge, monetary and/or non-monetary (see also de Cornière and Taylor [2019]), as many digital products have zero price but firms can monetize them through other methods, including (unwanted) targeted advertising, selling consumer data to a third party, or using consumer information to engage in price discrimination for a related product. A simple way to capture the distinction is to suppose that a level of monetization x harms consumers by x, but yields the firm revenue ax. If x is the dollar price, then a =1. If a >1, x can be viewed as mildly annoying advertising (the firm gains more revenue than the consumer loses utility) while $a < 1$ represents creepy advertising (the firm gains less than consumers lose). The value of a will mainly affect the level of total welfare (consumer surplus plus firms' profits) under alternative default assignments).

Consumers are presented with one product as the default and can switch to the other product by incurring a private *switching cost* randomly drawn from a known probability distribution.[5] Heterogeneous switching costs are the only difference among consumers. Consumers decide whether to switch from the default product by considering the firms' known qualities and their (simultaneously-chosen) observed charges, as well as the private switching cost.[5]

Under *competitive bidding*, a third party selects the default product and assigns the default position to the highest-bidding firm. The two firms A and B (e.g. Google and Microsoft with its search engine Bing) bid for the default position anticipating the equilibrium outcomes under the two alternative default assignments.[6] An alternative to competitive bidding is to assign the default position through *regulation,* whereby *each firm is assigned a share of the default positions*, e.g. equal shares (assign to each firm the default for half the consumers). Instead of assigning the default, a leading alternative approach is to let individual consumers choose their preferred default, as required by the European Union's [2022] Digital Markets Act ("Choice Screen"). We analyze the welfare properties of all three assignment schemes.

3. Competitive Bidding for the Default Position: Findings

Under competitive bidding, the third-party (e.g. Apple assigning the default position on Sits browser Safari) awards the default position to the product (search engine) whose provider submits the higher bid for default (e.g. to Google search or Microsoft's Bing).[6]

We first observe that the higher bidder is the firm in whose hands the default position generates the higher profit for the two firms combined, that is, higher industry profit than the alternative default assignment, incorporating how the default assignment will affect firms' subsequent charges to consumers, hence their revenue. The intuition is this: firm *A'*s (maximum) bid equals the increase in its profit from shifting default to it from firm *B*, while firm *B*'s bid is the increase in its profit from the reverse shift. Thus, firm *A* wins only if its profit gain from obtaining the default exceeds firm *B*'s loss, i.e. if industry profit is higher if firm *A* gets the default.[7]

Under mild conditions on the distribution of consumer switching costs the winner of the default will provide lower utility to consumers than the rival, e.g. if Google wins, it adopts a profile of charges that yield lower utility than Bing despite Google's quality advantage. This is consistent with claims by some Google critics that its excessive monetization outweighs its quality advantage, leading to a worse consumer experience overall. Observe, however, that the same would be true if Bing won, which is unlikely but possible as explained shortly! The intuition is straightforward: at charges that yield consumers equal utility from the default and non-default product, the default firm keeps all consumers and the rival gets none. The default firm typically prefers, however, to adopt a somewhat higher charge, cede some consumers to the rival (by delivering lower utility), and earn more on its remaining consumers, those with higher switching costs.

The distribution of consumers' switching costs plays a key role in the remaining results: which firm wins the default, and how does consumer welfare compare under the alternative assignments. In particular, what matters is whether the density of switching costs is 'skewed' towards high values of switching costs or towards low values, roughly, if there are more consumers with higher rather than lower switching costs. With an equal number (uniform distribution) or the density skewed towards high values, the higher quality firm wins. However, if the distribution is skewed towards low switching costs, the lower-quality firm may win. The mechanism is subtle and not obvious initially, but quite

intuitive once understood. When the higher-quality firm wins, there is less switching in equilibrium. Therefore, the switching cost of the marginal consumer—the one who is indifferent between staying with the default or switching to the rival—will be lower when the higher-quality firm wins, and higher if the rival wins (as the switching consumers are those with switching costs below this threshold). What happens to the density at the marginal consumer if the higher-quality firm wins, compared to the rival winning? If the density is uniform, nothing. But if the density is skewed towards low values, the density at a lower switching cost (as occurs when the higher-quality firm wins) will be larger. Finally, the density of consumers at a particular switching costs represents the slope of a firm's residual demand or, in words, the share of consumers a firm would lose from a small increase in its charge: such an increase will shift consumers to the rival in proportion to the density ("number") of consumers at that point. Thus, if the switching cost density is skewed towards low values, assigning the default to the higher-quality firm will make firms' demands more sensitive to their charge, incentivizing a decrease in charges. If this effect is strong enough, industry profit could be higher if the lower-quality firm wins the default!

By the same logic, if density is skewed towards high values—a sufficient condition for the higher-quality firm to win the bidding for the default—we show that consumer welfare is lower than it would be under the reverse assignment. The reason is that awarding the default to the higher-quality firm incentivizes higher charges (hence industry profit is higher), and harms consumers.

4. Regulatory Split of Default Position: Findings

Suppose regulatory intervention awards the default position at one half of consumers to each firm, instead of all positions to the higher-quality firm, the likely outcome under competitive bidding. Paradoxically, this results in higher industry profit and lower consumer welfare than if the higher-quality firm obtains the default everywhere. The reason is *softened competition*, resulting in higher charges. See also Katz [2024]. The lower-quality firm now is motivated to raise its charge so as to exploit some of its default consumers, those with high switching costs. The foreseen increase in its charge pushes the higher-quality firm to raise its charge as well, resulting in higher charges, greater profits but lower consumer welfare than if the higher-quality firm wins under competitive bidding.

Product quality with learning effects. The argument for splitting the default position rest, however, on a force we have ignored so far: that product quality may be endogenous and, in particular, a firm's quality improves with its number of users due to learning effects, and does so at a diminished rate, so that reducing Google's share by, say, ten percent and transferring it to the weaker product Bing will benefit Bing's quality by more than it harms Google. If this effect is powerful enough, it is indeed possible for splitting the default to benefit consumers ultimately by improving the weaker firm's quality and competitiveness

An alternative to splitting the default that some have suggested is *mandatory data sharing*.[8] This seemingly is an obvious remedy, because sharing historical data may be 'easy' and is non-rivalrous—it can improve efficiency of the receiving firm without impeding the sharing firm's efficiency. However, the required data is often complex and rapidly changing, which can hamper regulatory enforcement of data-sharing obligations. Additionally, and less obvious, there can be a rivalrous aspect in the use of data because two firms may choose different interactions with a user in response to the same raw data. (We credit an oral remark by Michael Katz for this point, though he may not recognize it ....) For example, faced with a given search query, firm *A* will place a certain ad whereas firm *B* might have preferred to experiment with a different ad for learning purposes depending on its existing knowledge. Thus, firm *B* would not learn as much from obtaining *A*'s raw data, including the ad's outcome, as it would if it served that customer as the default and controlled ad placement. On the often unappreciated nuances of data sharing and competition policy, see Cremer et al. [2019].

5. Choice Screen: Findings

Instead of assigning a default product to consumers, an prominent alternative policy known as "choice screen" allows consumers to choose their preferred default from a set of displayed options. A choice screen was adopted in the Commission's Android [2018] case, where Google was required to display other search engines in addition to its own. The Digital Markets Act adopted by the European Union [2022] requires all large online platforms designated as "gatekeepers" to provide choice screen for users to select their default apps for online search engines, virtual assistants, or web browsers.

We analyze a choice screen policy under the same informational assumptions of our core model. However, instead of being assigned a default product, consumers now choose their preferred product without having to incur a switching cost. Since consumers differ only in

their switching costs, which are now rendered moot, and are identical in their product valuations, the equilibrium resembles Bertrand competition with asymmetric product qualities: the lower-quality firm sets its charge equal to marginal cost and the higher-quality firm captures the entire market while charging a premium equal to its quality advantage. Ironically, the lower-quality firm would attract no customers in such a scenario, unlike the bidding-for-default outcome when the higher-quality firm wins. In the latter scenario, the higher-quality firm exploits consumers' heterogeneous switching costs by setting a charge that yields lower utility than consumers would obtain by switching to the rival (before incorporating switching costs), which allows the rival to attract some (switching) customers in equilibrium.[9]

This stark pattern—that a choice screen policy would lead all consumers to choose the stronger product—emerges in our setting because of some special assumptions. Notably, consumers are heterogeneous only in their switching costs, and have perfect information about qualities and firms' charges. Relaxing either assumption could result in some consumers forgoing the stronger product under a choice screen. In fact, Decarolis et al. [2023] found that Google incurred modest decreases in its search market share after the introduction of a choice screen. Such a pattern could be explained by factors outside our model, notably, richer consumer heterogeneity, that would allow both firms to attract consumers under Bertrand competition with no preassigned defaults. For instance, consumers may differ in their valuation of quality (as with standard vertical differentiation) and/or in their 'location' (horizontal differentiation à la Hotelling, e.g. the weight placed on accuracy of search results versus invasion of privacy). Imperfect information also would open up a range of possibilities.[10]

Therefore, we are not suggesting that a choice screen would necessarily reduce the weaker firm's market share. Nevertheless, our analysis offers the following robust insights. There is a strong presumption that a choice screen would be the superior policy for consumer welfare in the short run if consumers face de minimis cost to set up the default themselves through the choices presented. Consumers would then obtain their preferred choice. Additionally, they would benefit from lower monetization charges because competition is intensified. From a longer-run standpoint, however, a choice screen may be inferior to some regulatory default assignments. If product quality improves with a firm's share of consumers at a diminishing rate, then shifting some consumers to the weaker firm will increase the latter's quality more than it reduces the leader's quality and ultimately

consumers can benefit. Under a choice screen, too few consumers would choose the lower-quality product because consumers individually ignore the positive competition externality they generate by enabling the weaker firm to improve its quality. Thus, if the predominant policy concern is to enable improvement by the weaker a choice screen approach can be problematic.

6. Concluding Remarks

Finally, we note that our model omits some features that could yield a better alignment between consumer welfare and the default assignment under competitive bidding. The leading firm may have an advantage not only in quality but also in monetization efficiency (e.g. better targeting of ads), that would yield it greater revenue than to the rival per dollar harm to consumers. Alternatively, or in addition, it may enjoy greater utilization of its product by consumers than would the rival, instead of our assumption of fixed aggregate consumption. Lastly, the third-party may assign the default position not solely based on the highest bid, but also weighing its customers' utility from the competing products (e.g. Apple claims it selects the default search engine that is best for iPhone buyers). Therefore, it may award the default to the second-highest bidder if that assignment is better for consumers.

Additionally, our model abstracts away from some additional considerations that can be relevant in practice. For instance, consumers may have imperfect information about product quality, and they may also place different values for the quality increase (as in models of vertical differentiation). Nevertheless, we hope it captured some of the relevant tradeoffs involved in different ways of assigning the default position and revealed some non-obvious possibilities.

Notes

[1] Switching between browsers in the late 1990s was more difficult than switching between search engines today, notably due to the slowness of downloading a second browser via a narrowband Internet connection.

[2] In August 2024, U.S. federal judge Amit Mehta found Google's default agreements anti-competitive, a ruling Google has vowed to appeal.

[3] Although firms charge equal prices in those models, a higher-quality firm outbids lower-quality rivals for a higher position because increased exposure yields it more product matches than to such rivals and hence greater sales.

[4] Our main model has fixed qualities, hence abstracts from concerns that Google maintains a quality advantage partly by denying rivals the scale needed to improve their quality. Departing from fixed qualities, we briefly consider a scenario where quality can be improved by serving more consumers. This scenario is at the heart of the DOJ's [2020] complaint against Google. DOJ argues that search algorithms improve with the number of users due to learning via experimentation, and that by obtaining default status at leading distribution outlets Google deprives rival search engines of users, impairing their quality without necessarily raising its own quality as much.

[5] Much of our analysis would also apply if (heterogeneous) switching costs were replaced by (varying degrees of) status quo bias. Such bias has been shown to be important (see Fletcher [2023] and the references cited therein). We adopt the switching costs formulation primarily for purposes of welfare analysis. To illustrate the distinction, letting consumers choose their preferred default at the outset benefits them in our setting by avoiding switching costs but may be detrimental if decision making is onerous.

[6] Closest to our work in focusing on default position is Hovenkamp [2026], whose basic setting is similar. His analysis focuses heavily on the Google search engine case. A key limitation of his analysis is the assuming that consumers have identical switching costs and their demands are linear. Correspondingly, some of the findings differ, for example, the higher-quality firm always outbids the rival for the default position in his setting but not always in ours.

[7] Observe that this industry-profit logic need not extend beyond duopoly: with three or more

firms, the bidding firms will indeed incorporate how the default affects their profits, but the effect on other firms may differ depending on who wins the default.

[8] Indeed, Judge Mehta presiding over the DOJ's trial against Google involving search engines mentioned this remedy, citing law journal articles about the benefits of data sharing.

[9] In the colorful and instructive classification of strategic posture by Fudennberg and Tirole (1984), the higher-quality firm behaves like a "fat cat" exploiting its installed base by raising its charge, which allows the weaker firm to survive.

[10] For example, suppose firms adjusted their charges to the new equilibrium levels after the introduction of a choice screen policy, but only a fraction of consumers observed these new charges while the rest based their product choices on the historical charges under the default regime. We saw that hose charges resulted in lower utility from the default product than from the rival hence the fraction of consumers who observe only the historical charges will select the weaker product under a choice screen.

References

- Dunham, W., 2006, 'The Determination of Antitrust Liability in United States v. Microsoft: The Empirical Evidence the DOJ Used to Prove Its Case,' *Journal of Competition Law and Economics*, 2(4), pp. 549–671.
- U.S. Department of Justice, 2020, United States, et al. v. Google LLC, Complaint,20 October. Available at https://www.justice.gov/atr/cae-document/file/ 1329131/dl?inline.
- Ostrovsky, M., 2023, 'Choice Screen Auctions,' *American Economic Review*, 113(9), pp. 2486–2505.
- Walker, K., 2020, 'A Deeply Flawed DOJ Lawsuit that Will Do Nothing to Help Consumers,' Google Official Blog, 20 October, https://blog.google/ outreach-initiatives/public-policy/response-doj/.
- Milgrom, P. and Roberts, J., 1986, 'Price and Advertising as Signals of Product Quality,' *Journal of Political Economy*, 94(4), pp. 796–821.
- Chen, Y. and He, C., 2011, 'Paid Placement: Advertising and Search on the Internet,' *Economic Journal*, 121, pp. F309–F328.
- Athey, S. and Ellison, G., 2011, 'Position Auctions with Consumer Search,' *Quarterly Journal of Economics*, 126(3), pp. 1213–1270.
- Chen, Y. and Schwartz, M. 2025. 'Assigning Default Position for Digital Goods: Competition, Regulation ,and Welfare,' *Journal of Industrial Economics*, May 2025.
- Hovenkamp, E., 2026, 'The Competitive Effects of Search Engine Defaults,' *Journal of Law and Economics* forthcoming.
- de Cornière, A. and Taylor, G., 2019, 'A Model of Biased Intermediation,' *RAND Journal of Economics*, 50(4), pp. 854–882.
- Klemperer, P., 1987, 'Markets with Consumer Switching Costs,' *Quarterly Journal of Economics*, 102(2), pp. 375–394.
- Farrell, J. and Klemperer, P., 2007, 'Competition in Markets with Switching Costs and

Lock-In,' in Armstrong, M. and Porter, R. (eds.), Handbook of Industrial Organization, Volume 3, pp. 1967–2072.

- Chen, Y., 1997, 'Paying Customers to Switch,' *Journal of Economics and Management Strategy*, 6(4), pp. 877–897.
- Bedre-Defolie, Ö. and Biglaiser, G., 2017, 'Contracts as Barriers to Entry in Markets with Nonpivotal Buyers,' *American Economic Review*, 107(7), pp. 2041–2071.
- Fletcher, A., 2023, 'The Role of Behavioural Economics in Competition Policy,' *Working Paper* (Social Science Research Network, 1239 University Avenue, Rochester, New York, U.S.A.).
- Katz, M., 2024, 'Does it Matter if Competition Is Fair or on the Merits? An Application to Platform Self-Preferencing,' *Review of Industrial Organization,* 66, pp. 43-70.
- Crémer, J.; de Montjoye, Y.-A. and Schweitzer, H., 2019, 'Competition Pol- icy for the Digital Era,' *European Commission Directorate-General for Competition Discussion Paper* (Publication Office of the European Union, Luxembourg). Available at https://op.europa.eu/en/publication-detail/-/publication/ 21dc175c-7b76-11e9-9f05-01aa75ed71a1.
- European Commission, 2018, Commission Decision C(2018) 4761 final of 18 July 2018 relating to a proceeding under Article 102 TFEU and Article 54 EEA (Case AT.40099 – Google Android). Available at: https://ec.europa.eu/competition/antitrust/ cases/dec_docs/40099/40099_9993_3.pdf
- European Union, 2022, Regulation (EU) 2022/1925 of 14 September 2022 on contestable and fair markets in the digital sector (Digital Markets Act), OJ L 265, pp. 1–54. Available at https://eur-lex.europa.eu/eli/reg/2022/1925/oj/eng.
- Fudenberg, D. and Tirole, J, 'The Fat-Cat Effect, the Puppy Dog Ploy, and the Lean and Hungry Look,' *American Economic Review*, 74(2), pp. 361–366.
- Decarolis, F.; Li, M. and Paternollo, F., 2023, 'Competition and Defaults in Online Search,' *Working Paper* (Social Science Research Network, 1239 University Avenue, Rochester, New York, U.S.A.).