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Article

Implications of behavioural economics for the pro-competitive regulation of digital platforms

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Abstract:

In recent years, the relevance of behavioural economics to competition policy has become ever more apparent, especially in digital markets. Choice architecture, which shapes how consumers make decisions online, has been at the centre of numerous recent legal cases brought under competition law, as well as the development of regulations at promoting competition in markets currently dominated by major tech platforms. This article focuses on the impact of behavioural insights for the design and implementation of one such regulation, the EU's Digital Markets Act (DMA). It underscores the relevance of choice architecture to several DMA provisions and emphasizes the necessity of testing different designs—through online experiments, field trials, and surveys—to ensure compliance. Despite their seemingly minor effects today, such improvements to choice architecture could prove pivotal in fostering competitive markets.

Keywords: digital regulation, Digital Markets Act, behavioural economics, competition policy.

JEL codes: K, L

I. Introduction

The relevance of behavioural economics to competition policy has been growing quickly in recent years, especially in digital markets. It has been important within several legal cases brought under competition law and has played a critical role in the development of new pro-competitive regulations for the biggest tech platforms. In this article, we examine the implications of behavioural insights for the design and implementation of one such regulation, the EU's Digital Markets Act (DMA). This focus reflects the fact that the EU legislation has already come into force and is being implemented. However, the discussion is relevant to the UK too, since the UK's own forthcoming regulation is expected to draw from and build upon the EU experience.

We start by explaining why behavioural insights are relevant for competition policy, and in particular for competition policy involving digital firms, and demonstrate how such insights have underpinned high-profile antitrust cases like the European Commission's Google Shopping and Google Android decision (section II).

There is, however, substantial agreement among policy-makers that *ex post* competition law is insufficient to deal with the conduct involved and, as a result, a number of jurisdictions concluded that *ex ante* regulation is required. In section III, we turn our focus to the DMA, the first pro-competition digital platform regulation enacted and implemented globally. We identify the DMA's key provisions that rely on behavioural insights, and also review the implications of behavioural insights on overarching requirements such as effectiveness, anti-circumvention, and proportionality.

Next, we discuss how lessons from behavioural economics on specific biases apply to the relevant DMA provisions and propose that firms aiming to comply with the regulations bear in mind the 4As framework (attend,

access, assess, and act) that describes the steps of the consumer journey from engaging with the product to the purchase decision (section IV).

However, although they are well understood in broad terms, it can be hard to predict the precise impact of behavioural biases on consumer decision-making. For this reason, empirical techniques will be critical to ensuring the effective implementation of the DMA. In section V, we argue that gatekeepers seeking to demonstrate DMA compliance will need to show that they have tested their design against the DMA's requirements. We briefly discuss the pros and cons of the three key empirical tools available—online laboratory experiments, field experiments, and surveys—before providing an overview of the findings of the existing empirical work that analyses research questions relevant to the DMA's provisions.

Finally, we conclude by discussing how even small behavioural changes can have significant market effects and by anticipating the further integration of behavioural economics into competition policy and digital platform regulation (section VI).[1]

II. Behavioural economics and competition policy

(i) What is behavioural economics?

Put simply, behavioural economics incorporates insights on people's behaviour from psychology into neoclassical economics. It departs from a standard assumption that people exhibit full rationality, studying how their behaviour systematically differs from rational behaviour and how this is likely to affect outcomes.

For instance, behavioural economics takes account of our predisposition to stick with the pre-selected option (default bias),[2] to stick with what we are used to (status quo bias),[3] to focus on more prominent information (saliency bias),[4] or to choose the highest ranked option (ranking bias).[5,6]

We note that many of these behavioural biases can likely be explained by rational models, once the cost of effort of processing information is incorporated. For instance, given that people have limited time and attention span, it may well be rational to use a simple rule of thumb (such as choosing the most familiar option) when making decisions.

(ii) Why is behavioural economics relevant to competition policy in digital markets?

A key implication of behavioural economics is that the way choices are framed—the so-called 'choice architecture'—can heavily affect consumer decision-making. As mentioned above, consumers are more likely to choose pre-ticked (default), most prominent, and most highly ranked options, whereas presenting options in a complex way or in a way that involves multiple clicks or 'scare screens'[7] can deter consumers from choosing these.

Since firms commonly control choice architecture, they have the potential to alter consumers' decisions, and thereby alter market outcomes. This is particularly true in an online environment, where firms fully control the interface design consumers use, can experiment with alternative designs, and are able to collect extensive, and often personalized data on how each design impacts consumer decision-making. The potential for this to affect market outcomes will be especially strong in those online markets where a few large platforms control access to a large proportion of consumers.

Of course, choice architecture has the potential to help consumers make good decisions that reflect their underlying preferences. For example, Amazon's recommender systems can be helpful in enabling consumers to identify suitable products among myriad different options. Likewise, Google's search engine plays a critical role in helping users find the websites they are seeking. However, platforms may also have an incentive to design choice architecture to steer consumers towards options that are less in the consumer's interest and more in their own.

This could in turn have implications for competition. Consider, for instance, a situation in which a dominant platform designs its choice architecture to favour its own services over those of third parties. Such 'self-preferencing'

[1] This article provides a policy-focused overview of these topics, drawing on prior research by the authors and others.

[2] For an academic overview of default effects, see Jachimowicz *et al.* (2019). For a policy discussion, see Competition and Markets Authority (2022*a*, paras 4.27–4.34).

[3] For a systematic review of the literature that measures status quo bias across a variety of fields, see Godefroid, *et al.* (2023).

[4] For a discussion on how salience affects economic behaviour, see Bordalo *et al.* (2022).

[5] See Competition and Markets Authority (2022*a*, paras 4.35–4.41).

[6] In this article, such systematic behavioural patterns are interchangeably referred to as 'behavioural biases', 'behavioural effects', or 'behavioural insights.'

[7] These are screens that provide a warning with a disproportionate deterrent effect. For example, a warning that the user is about to download an app that has not been approved by their device supplier could deter the user from continuing, even if it would in fact be safe to do so.

can act to leverage market power from the platform's core market into an adjacent market, stifling competition in the latter.

This was the core issue in the European Commission's Google Shopping case (European Commission, 2017). The Commission found that Google had abused its dominant position as a search engine by favouring its own comparison-shopping service, Google Shopping. Google did this by placing the Google Shopping 'Box' saliently at the top of the search results page, while simultaneously demoting competing comparison-shopping services down within the organic search results. The Commission argued that Google thereby generated more traffic for its own service, making it more attractive to merchants, and increasing its ability to generate revenues. Evidence provided within the decision showed that traffic to Google Shopping increased steeply within a short period of time following Google's changes, and that there was a reduction of traffic to competing search engines in parallel. Figure 1 below (copied from the Commission's decision) presents this evidence for the UK, where Google changed the ranking algorithm in April 2011. In November 2021, the European General Court upheld the Commission's decision almost in its entirety.[8]

The Commission's 2018 Google Android decision was similarly underpinned by choice architecture, this time in relation to default settings.[9] Exploiting the 'must have' nature of its app store (the Play Store), Google was able to require manufacturers of Android mobile devices to pre-install the Google Search app and show it prominently on their home page. While consumers could theoretically download alternative search apps and use them instead, few in fact did. Rather, they exhibited status quo bias, sticking with the pre-installed apps. Evidence in the decision for the EU shows that in 2017, 90–100 per cent of all search queries on Android devices were made via Google Search. This compared to 10–20 per cent on Windows Mobile devices, on which Google Search was not pre-installed.[10]

The Commission concluded that Google's restrictions acted to cement its dominance in general search, at a time when the importance of mobile internet was growing significantly.[11] Again, the General Court largely confirmed the Commission's decision, noting in relation to the discussion of status quo bias that 'none of the criticisms put forward by Google can be levelled against the Commission's analysis'.[12]

In addition to leveraging market power across markets, digital platforms may also build on behavioural insights to protect their market power within the same market. For instance, the UK Competition and Markets Authority's

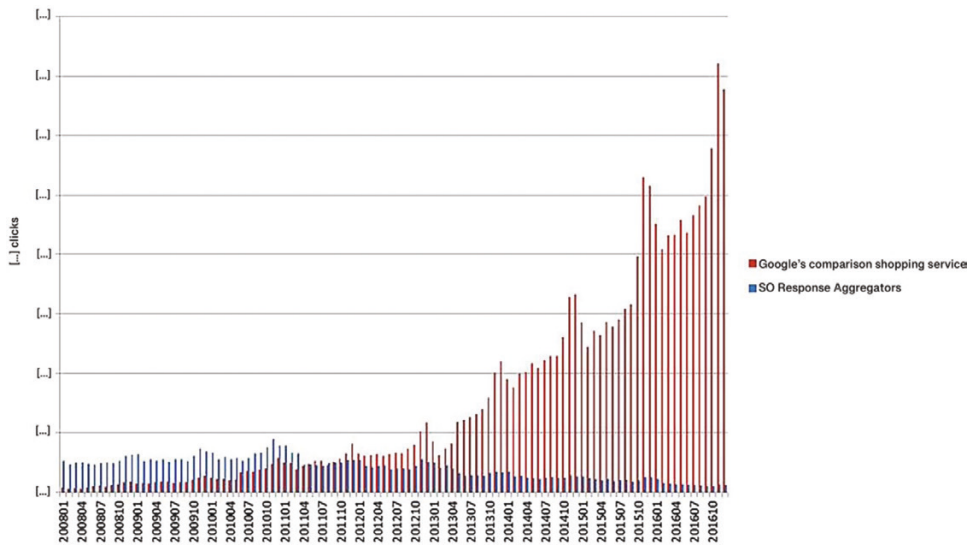

Figure 1: Traffic from Google's general search results page, 2008–16, UK

Notes: The analysis relies on data on number of clicks Google submitted to the Commission and covers the period from January 2008 to December 2016.

Source: European Commission (2017, p. 146, Graph 45).

[8] General Court of the European Union (2021).
[9] European Commission (2018*a*).
[10] European Commission (2018*a*, Table 11, p. 176).
[11] European Commission (2018*b*).
[12] Court of Justice of the European Union (2022).

(CMA) 2022 Mobile Ecosystems Market Study concluded that Google protects the position of the Play Store through a range of practices that limit alternative routes of app distribution.[13] For example, the study presents evidence showing that users have to go through multiple steps and face several scare screens if they want to download apps through a browser instead, and that few users make it through this complex and off-putting process.

III. The role of behavioural economics in the design of the DMA

While there have been several high-profile competition law cases against major digital platforms across the globe, a number of jurisdictions—including the UK and EU—have concluded that *ex post* competition law is insufficient to deal with the conduct involved. Instead, *ex ante* regulation is required.

There are several reasons for this.[14] First, antitrust cases simply take too long, which makes them an unsuitable tool for fast-moving markets that are prone to tipping. Second, in order to make them manageable, the cases tend to be relatively narrow and specific, but this means that the decisions typically provide insufficient guidance and deterrent effect. Third, some key drivers of market power, such as economies of scale and scope and network effects, are intrinsic to these markets, rather than a reflection of digital firms' anti-competitive behaviour. Finally, and most importantly for the current article, the remedies authorities adopt often involve changes to the design of the choice architecture, which is far from straightforward and requires ongoing monitoring, effectively turning competition authorities into regulators anyway.

The DMA was the first wide-ranging pro-competition digital platform regulation globally to be enacted and implemented. It is one of the key building blocks of the EU's digital strategy and aims to ensure that a small number of 'gatekeepers' (large online platforms with entrenched market positions) behave in a way that is fair to business users and supports contestable markets. The DMA contains a collection of requirements that set out what gatekeepers must and must not do, and these requirements build heavily on behavioural insights, including lessons from the antitrust investigations referred to above.

(i) Key DMA provisions relating to choice architecture

The main requirements the DMA imposes on gatekeepers are contained in Articles 5 and 6. Several of these essentially relate to the choice architecture consumers[15] face when using those platforms.

Some of these provisions require that the gatekeeper enables certain consumer actions. For instance:

- Article 5(4) requires that consumers should be able to access and use content, subscription, and features within an app, even if these were not purchased via the gatekeeper.
- Article 6(3) requires that consumers should be able to easily change their default settings on the gatekeeper's operating system, virtual assistant, and/or web browser, where these direct consumers towards the gatekeeper's services.
- Article 6(4) requires that consumers should be enabled to install third-party apps or app stores—without using the gatekeeper's proprietary app store—and to easily set these apps and app stores as their default, if they wish to do so.
- Article 6(6) requires that consumers should face no restriction on switching between apps and services that they access via the gatekeeper's core services.

These various provisions give more freedom to consumers in changing whether and how they use the gatekeepers' services, in particular when consumers seek to use third-party services within the gatekeeper's ecosystem.

Additionally, some provisions introduce changes that actively require consumers to make specific decisions. For instance:

- Article 5(2) requires that consumers must be provided with a specific choice, and give consent, before a gatekeeper can use their personal data in various specified ways.
- Article 6(3) mandates that, at a consumer's first use of a gatekeeper's web browser, virtual assistant, or search engine, they must be asked to choose their default service (web browser, virtual assistant, or search engine) from a list of the main available providers.

[13] Competition and Markets Authority (2022*b*).
[14] For a full discussion, see Fletcher (2023).
[15] The DMA in fact uses the term 'end users' rather than 'consumers', but we employ the latter, given it is the more common term in the existing economics literature.

Finally, a few provisions allow for third parties to alter the choice architecture consumers face. For instance, Article 6(4) requires that if consumers download third-party apps or app stores, these should be able to prompt consumers to make them their default.

It is clear from these requirements that they are designed to address some of the issues that arose in earlier competition cases, as described in section II above.[16] The provisions seek to promote consumers' use of third-party browsers, search engines, and app stores, as well as to encourage consumers to think carefully about the consents they provide around the use of their personal data. If successful, these changes should create a more level playing field for third-party services and thus promote greater contestability.

(ii) The DMA requirements of effectiveness and anti-circumvention

In addition to the wording within specific DMA provisions, Article 8 of the DMA contains a broader over-arching requirement that these provisions must be complied with in a way which is effective in achieving the DMA's overall objectives (fairness and contestability).

As the case summaries above demonstrate, firms' design choices, such as saliency or the language used, can have strong effects on consumer behaviour. The effectiveness requirement is thus relevant from a behavioural economics perspective, since it implies that gatekeepers must think carefully about the way they frame the consumer choices described above. If the DMA provisions are to be effective in delivering fairness and contestability, it is incumbent on gatekeepers to ensure that the choice architecture around consumer decision-making supports this.

The importance of choice architecture in this context is also supported by Article 13—an anti-circumvention provision—which specifically prohibits behaviour that undermines effective compliance, including via the 'use of behavioural techniques or interface design'.

In Fletcher and Vasas (2024), we draw a distinction between two ways in which behavioural effects can harm competition. On the one hand, competition may be limited due to intrinsic behavioural effects that arise without any deliberate action of the gatekeepers, for example, simply because consumers exhibit status quo bias. On the other hand, some competition concerns may arise due to firms deliberately manipulating behavioural biases, for example by making their proprietary services more prominent or the default, or by making the process of switching a default setting unduly complex. While the line between these two mechanisms is blurred, and both need to be considered when designing compliance measures, we would expect the DMA provisions to be more effective in overcoming the latter than the former. If consumers are not inclined to download a new app store or switch their default web browser, there is only so far that gatekeepers can be expected to push them to do so. And even the most perfectly designed choice screen may struggle to overcome familiarity bias. 'To google' has become a commonly used term for searching the web, which demonstrates just how familiar we all are with Google's search services. As such, we might expect many consumers, when given a choice, to choose Google as their preferred search engine, irrespective of whether it in fact provides the best search service for their needs.

The DMA is unlikely to solve at one go the competition concerns arising from behavioural effects in these markets. However, by creating a more level playing field for third-party providers, it at least opens the door to greater contestability, and we may see this door being used more over time, with the increased incentives the DMA should provide for disruptive innovation.

(iii) Proportionality under the DMA

While there is a clear focus within the DMA on effectiveness, Article 8 and Recital 29 also refer to proportionality. More generally, the general principle of proportionality in EU law covers the DMA, too.[17] The DMA should thus be interpreted as requiring gatekeepers to implement the provisions above in a way that is effective but not disproportionate in achieving the objectives of the regulation.

But what does this mean in practice? Fletcher (2024) argues that the key issue concerning proportionality in the context of choice architecture relates to user autonomy. Consider a choice box for a default search engine, for example. Contestability might be best achieved by making it reasonably difficult to find the gatekeeper's own product (see empirical findings on this in section V, below). However, such a design could lead to consumers who actively prefer the gatekeeper's product failing to choose it, thus disrespecting their preferences and their autonomy.

Clearly, there is a delicate line to tread here between effectiveness and consumer autonomy. Gatekeepers will need to try to identify choice architecture that best achieves the former while respecting the latter.

[16] For an overview of antitrust cases that are relevant for the obligations in Article 5 and Article 6 of the DMA, see Cremer *et al*. (2023).
[17] Art. 5(4) TEU provides that 'Under the principle of proportionality, the content and form of Union action shall not exceed what is necessary to achieve the objectives of the Treaties'. Consolidated version of the Treaty on European Union [2008] OJ C115/13.

IV. Lessons from behavioural economics for implementing the DMA

While the DMA is clearly intended to address competition problems linked to behavioural effects, the Commission has provided little guidance on how to implement the DMA's requirements. It is for the gatekeepers to introduce measures and then to submit an annual report setting out why they are compliant.

In the context of the provisions listed above, this raises the question of precisely what changes gatekeepers should be making to their choice architecture to ensure compliance. For example, under Article 6(3), some gatekeepers will be required to give consumers an upfront choice of default browser, virtual assistant, and/or search engine, but how should this choice be presented to ensure that consumers make a properly considered decision? Likewise, under Article 6(4) consumers must be given the opportunity to download third-party app stores. For this provision to be effective in promoting contestability, it will be important that this process is as straightforward as possible.

(i) Selected relevant behavioural effects[18]

In designing their choice architecture in this context, gatekeepers will need to think carefully about consumers' behavioural biases and how to best ensure effective decision-making in their presence. This is not likely to be straightforward as there are a wide range of behavioural biases that may be relevant.

For instance, we know from behavioural economics that varying the saliency of different options can be a powerful way of steering users towards particular options, and away from others. This could be achieved through using different font sizes, colours, or even colour contrast. For example, one of the concerns highlighted in the CMA's 'Online Platforms and Digital Advertising' Market Study,[19] in relation to Facebook and Google's data collection practices, was that they made the 'consent' button far more salient than the alternative. This would not seem likely to be compliant with Article 5(2).

Likewise, as discussed above, ranking effects can also be influential. It will be important for contestability, therefore, that the gatekeeper does not systematically position its own service at the top of the list of options.

The number of available options, the information provided about them and the frequency with which a choice is offered can also affect the decisions that consumers make. 'Choice overload' describes the phenomenon whereby too many options can lead to less deliberate decisions. 'Information overload' and 'choice fatigue' occur when too much information and too many choices, respectively, lead people to disengage. In any of these cases, consumers are more likely to choose randomly or to use 'rules of thumb' that may not result in selecting the most suitable option. These various effects suggest that gatekeepers should give consumers enough information and options to make a reasoned choice, but that too much of either—or asking too frequently—could worsen consumer decision-making. Even the choice of language used for providing information can be important as risk warnings that are stated in unduly stark terms, so as to act as 'scare screens', could discourage consumers from downloading perfectly suitable and safe third-party apps or app stores.

Complexity may also deter consumers from desired actions. For example, consumers may be less likely to change their default settings the more clicks it takes to do so and the harder it is for them to find the relevant settings. Likewise, they may have an inclination to 'skip' decisions, which means that gaining a reasoned choice of default setting may require either that the choice is not 'skippable' or, if it is, that the consumer must be asked again at a later stage, rather than skipping the choice completely.

(ii) Applying the '4As' framework

In designing their choice architecture, Fletcher (2024) argues that gatekeepers should also consider the 'attend, access, assess, and act' framework of consumer decision-making. This 4As framework describes the four main steps a consumer might take when choosing a product or service. The framework was originally designed for competition and consumer protection investigations, but it is equally relevant in the context of the DMA. When considering the likely effectiveness of its measures under the DMA, gatekeepers need to consider how their choice architecture is affecting each of these steps, bearing in mind the lessons from behavioural economics described above.

The first step, 'attend', is important since, if they are to make any reasoned decision, consumers need first to attend to (or engage with) the market. The requirement, under Article 6(3), that gatekeepers must prompt consumers to choose their default browser and search engine reflects the fact that most consumers might well not ever engage with this choice otherwise. Article 6(4) also contains a provision whereby third-party apps or app stores, downloaded by a consumer, can prompt consumers to choose whether to make them their default.

[18] Fletcher and Vasas (2024) provide a more extensive discussion of behavioural insights which might play a role during the implementation of specific provisions.
[19] Competition and Markets Authority (2020).

It is, of course, important that such prompts—whether by the gatekeeper and third parties—are used responsibly and not in a manner which effectively circumvents or undermines the DMA. For example, gatekeepers should not use prompts to try and encourage consumers to switch their default setting back to the proprietary option.

Naturally, there are limitations to how much the DMA can achieve via such prompts. Some consumers simply will not engage with the options the choice screen offers, irrespective of the design. This raises a difficult DMA implementation question. Does effective compliance require the gatekeepers to implement a choice architecture that nudges consumers towards the option that best achieves contestability, or should they simply focus on nudging consumers to think about what is best for them? In theory, the former might seem likely to be most effective in achieving the DMA's objectives in the face of consumer non-engagement, but we note that this could lead to consumers being nudged towards options that do not best fit their interest.

The second step, 'access', relates to the importance of consumers having relevant information before making a choice. Such information could include not only information about the options available, but also about the process. For this step to work well for consumers, it is a key consideration whether the choice is reversible and whether that is made clear; whether it is straightforward to find the appropriate choice within the device's settings; and whether the customer journey is the same for third-party services as it is for proprietary services.

The third step, 'assess', relates to how choices are framed. This requires not only that the relevant information should be true and 'graspable', but also that the choice architecture does not systematically steer consumers towards proprietary options.

Finally, the 'act' step relates to the need for consumers, after they have deliberated, to act on their decision. Simple and easy navigation with no unnecessary steps, delays, or friction in the user journey will be crucial for this.

V. Assessing different choice architectures

The discussion in this article so far has been largely theoretical, albeit based on an understanding of behavioural effects that draws on extensive academic literature. However, that literature only gets us so far. While it highlights the key behavioural biases to consider, we cannot know how relevant such biases are in any given market context without measuring them. Likewise, while we know that choice architecture can impact consumer decision-making, it is often hard to predict *ex ante* how different gatekeeper designs will affect consumer choices without empirical testing.

As such, to demonstrate their compliance with the DMA, the gatekeepers will not only need to show that they have considered their choice architecture carefully, but also that they have tested it. This testing can take place both *ex ante* during design stage and through *ex post* evaluation of impact once implemented. Gatekeepers are well placed to do such testing, given the online nature of user interfaces and the large number of users they interact with during a short period of time. In fact, digital platforms have long been carrying out so-called 'A/B testing' to refine their choice architecture, and such techniques can equally be used to support their DMA compliance.

The three main types of *ex ante* testing of choice architectures that could inform the assessments are online laboratory experiments, field trials, and surveys. Each of these has its own strengths and weaknesses and fulfils a slightly different role in evidence accumulation.[20]

Online laboratory experiments, in which participants are usually compensated for but do not know the purpose of the research, are useful in providing a framework within which particular design elements can be tested as participants are required to engage with the decision and can be asked follow-on questions. However, exactly because participants dedicate their time and effort to carrying out the task, often to a larger extent than they might do in real life and therefore might be expected to make more informed and reasoned decisions, online lab experiments may well overestimate (but can also underestimate) the impact of a design change.

Field trials (which include A/B testing) could be viewed as the 'gold standard' as these allow for design choices to be tested in real life settings. Participants are unaware that they are part of an experiment, and therefore the results are more likely to approximate the true impact of a change. However, the field trials most relevant for DMA compliance can typically only be carried out by the gatekeepers, using confidential data. They are likely therefore to be something of a 'black box' from the perspective of both the Commission and third parties.

The Commission should expect gatekeepers to be carrying out such A/B testing and to present the results as part of their compliance reporting. It may even seek to have an active oversight role of the testing process, especially where it has compliance concerns. However, its inherent 'outsider' perspective and the control of the gatekeepers

[20] For a discussion on the role of these different techniques, see Vasas (2023).

over the design and implementation of the testing may limit the evidential weight that can be placed upon such evidence.[21]

Finally, surveys can also be valuable, especially in narrowing down the set of options to be considered in online laboratory or field experiments. Surveys tend not to provide reliable estimates of expected impact in quantitative terms, partly as people's actual behaviour often differs from their stated intentions and preferences. Surveys can nonetheless provide useful directional and comparative evidence and can also be useful as a supplement to experiments to understand how consumers feel about the choices they made.

In addition to the above, *ex post* evaluation may be possible, in particular where different choice architecture designs have been implemented for distinct groups of consumers. 'Difference-in-difference' econometric techniques can be used to assess the impact of these design differences on consumer choices. Such analysis is similar to A/B testing in that it looks at real world reactions, and it has advantages in that it can be carried out by independent third parties (if they have access to the required data) and can potentially examine longer-term effects. However, it can only be used to assess the comparative effect of designs that have actually been implemented, which inherently limits its value.

(i) Existing relevant empirical work

Although digital platforms frequently carry out A/B testing, the results of this work are typically confidential. As such, most of the publicly available work in this area takes the form of online laboratory experiments.

In 2020, DuckDuckGo carried out an experiment with Android users in Europe, which tested alternative choice screen designs for setting a default search engine. The aim of DuckDuckGo's research was to establish (i) how many search engines can fit on a typical Android phone screen and (ii) whether people scroll to see search engines beyond the first screen. They found that almost all Android phones in Europe can display five search engines and about half can display six or more, and that over 60 per cent of people scroll past a first screen (even when Google is shown on the first screen). Placing Google on the fourth screen, which required consumers to scroll down, reduced the proportion of consumers selecting Google by 5 percentage points (from 80.8 per cent) relative to placing Google on the first screen.[22]

EU consumer body, BEUC, commissioned Bonanza Design to run a similar online experiment in May 2023, but this time testing out a number of other design choices.[23] The study aimed to assess how different designs affect the way users interact with choice screens in the context of the DMA. This study again found that removing Google from the first page, such that participants needed to scroll down to see it, decreased Google's share, albeit only by 2.1 percentage points (from 78.4 per cent). It also found that including logos was useful, with the removal of logos increasing Google's share by 6.7 percentage points.[24] However, the findings were less strong and/or counterintuitive for a variety of other design elements tested, such as providing an additional educational screen on the choice box.

Mozilla commissioned an experiment to test various features of choice screens for browsers both in mobile and desktop setups, in order to provide data-driven behavioural evidence that helps understand and predict how people will engage with choice screens.[25] The results showed that providing additional information had no statistically significant impact on default browser choice, nor did increasing the number of browsers.[26] However, the experiment found evidence of ranking effects: not being ranked #1 resulted in a reduction of 5–8 percentage points in the shares of Chrome, Firefox, and Samsung Internet in the mobile environment. The ranking effects appeared mostly insignificant in the desktop set-up, but this may be because the ranking was horizontal in that set-up, rather than vertical.[27]

Finally, the Mozilla report finds that people are significantly more likely to choose the pre-installed browser as their default if the choice screen is shown at first use of the browser (19 per cent) compared to when it is shown

[21] Another pillar of the EU's digital regulation, the Digital Services Act (DSA), includes obligations that apply specifically to very large online platforms and search engines. We note that as part of this regime, 'vetted researchers' may request data from these very large platforms and search engines to conduct research on systemic risks in the EU (see Article 40 of the DSA). However, there is no similar allowance in the DMA, and even if there were, researchers would be limited to reviewing existing data, rather than designing or implementing field experiments themselves.

[22] 'Search Preference Menus: Google Auction Ignores Screen Size and Scrolling', 20 May 2020, available at https://spreadprivacy.com/search-preference-menus-scrolling/.

[23] BEUC (2023). See also Bonanza Design (2023)..

[24] The study does not report p-values or statistical significance and it is thus unclear whether these effects are statistically different from zero.

[25] 'Can Browser Choice Screens be Effective?' (Mozilla, 2023).

[26] See columns 'T1 v T2' (additional information) and 'T2 v T3' (increase in number of browsers) in Table 2.2 in Annex 2. Available at https://research.mozilla.org/files/2023/09/Annexes-1-to-3.pdf.

[27] See Tables 2.26 and 2.27 in Annex 2. Available at https://research.mozilla.org/files/2023/09/Annexes-1-to-3.pdf.

at device set-up (11 per cent). However, unlike the studies described above, the pre-installed browser in this experiment was not the market leader (i.e. Google Chrome) but rather Samsung Internet for mobile devices and Microsoft Edge for desktops.[28] The findings on the impact of changing the timing of the choice screen may not carry over to a situation where Google Chrome is the pre-installed browser.

Moving away from laboratory experiments, Decarolis *et al*. (2023) use the difference-in-difference approach to investigate the effect of remedies in three different jurisdictions—the EEA, Russia, and Turkey—all relating to Google's default search engine status. The aim of the study is to quantify the impact of regulatory interventions that open the possibility of being the preset default search engine on mobiles for competition. The EEA and Russian remedies involved introducing a choice screen, requiring Google to prompt users to select from a list of search engines. The requirement covered all new Android devices in the EEA and all new and existing Android devices in Russia. The intervention in Turkey did not require a choice screen but instead prohibited Google from requiring default search engine status on Android devices made by third-party original equipment manufacturers.

Decarolis *et al*. compare the evolution of search market shares in these jurisdictions with countries without any similar intervention during the period. The paper finds that the remedies reduced Google's market share in search by 2 percentage points in the EEA, 7 percentage points in Russia, and 12 percentage points in Turkey, relative to the countries used as a benchmark. As the authors conclude, 'these results underscore the crucial role of preset default in mobile internet search' and note also that, across these cases, 'the success of the intervention rested to some extent on the presence of a viable competitor'. This latter observation relates to the relatively high popularity of search engine Yandex in Russia and in Turkey, compared with Google's rivals in the EEA. However, the differences between these remedies are also interesting. DuckDuckGo has argued that the limited impact of the EEA remedy is down to the poor design of the choice box.[29]

VI. Conclusions

Overall, the existing publicly available empirical research supports the importance of choice architecture, but only ranking seems to have a clear and robust effect. There is little consistent evidence in relation to other possible design elements. Moreover, even the impact of ranking is relatively small. This could raise the question of whether such choice architecture changes will make any difference. Is it all worth it?

We would argue that it is. Google has had strong market position in both browsers and search for a prolonged period. There is thus a high-level consumer familiarity and loyalty which is bound to influence consumers' decision-making, at least over the short term. However, even seemingly small changes in the market shares could have a big impact in this market. A few extra percentage points of market share for smaller providers could dramatically improve their access to data, which is in turn critical for improving their services, and could also enable them to monetize their services more effectively. In turn, this should allow them to build their reputation and customer base and become stronger challengers over the medium term.

As we argue above, the DMA's requirements could also prove critical if and when new disruptive innovations challenge the market power of gatekeepers. For instance, the choice box may allow search engines deploying artificial intelligence (AI) in innovative ways to get easier access to consumers and thus gain popularity faster.

Moreover, the findings above relate to third-party research which is not necessarily well-positioned to identify the most effective choice architecture design for promoting contestability. The true potential of optimal choice architecture design could be substantially greater. Going forward, to demonstrate their DMA compliance, we would expect the gatekeepers to carry out targeted testing of their choice architecture and to share their findings with the Commission. We would also expect the Commission to provide some oversight of their testing programmes. It will be illuminating for policy-makers and academics alike to observe the development of this new source of behavioural economics evidence, including in the UK where the CMA has recently gained additional powers to implement the UK's new pro-competition digital regulation regime, the Digital Markets, Competition and Consumers Bill (DMCC).

We note that this is unlikely to be the end, in terms of integrating behavioural economics into digital regulation. As consumer choices play a crucial role in contestable markets, we would expect that behavioural effects and choice architecture will continue to introduce new challenges over time. These could involve the attempted use of choice architecture to achieve restrictions where more formal measures are not allowed. For example, an ongoing

[28] See column 'T3 v T4' in Table 2.2 in Annex 2. Available at https://research.mozilla.org/files/2023/09/Annexes-1-to-3.pdf.
[29] 'Search Preference Menus: Improving Choice With Design', 28 January 2020. Available at: https://spreadprivacy.com/search-preference-menu-design/.

US antitrust case against Amazon highlights concerns regarding Amazon using the high salience of its 'Buy Box' to implicitly impose a 'price parity' provision, thereby constraining price competition (FTC, 2023).

Finally, we may also see entirely new issues arising, for instance with the emergence and growing use of AI. There are risks both that poorly designed choice architecture could inhibit competition in AI and that the use of AI could turbocharge the potential for ill-intentioned choice architecture. Competition authorities have recently been exploring such issues and there are further regulatory interventions under way.[30] Overall, given the considerable impact of choice architecture design on consumer decision-making, our view is that behavioural insights will continue to play an increasing role in competition investigations, and in regulatory design and implementation in the digital sector.

References

BEUC (2023), 'An Effective Choice Screen under the Digital Markets Act', available at https://www.beuc.eu/sites/default/files/publications/BEUC-X-2023-131_An_effective_choice_screen_under_the_DMA.pdf.

Bonanza Design (2023), 'Examining the Design of Choice Screens in the Context of the Digital Markets Act', October, Bonanza Design GmbH, available at: https://www.beuc.eu/sites/default/files/publications/BEUC-X-2023-132_Examining_the_Design_of_Choice_Screens_in_the_Context_of_the_Digital_Markets_Act.pdf.

Bordalo, P., *et al*. (2022), 'Salience', *Annual Review of Economics*, **14**, 521–44.

Competition and Markets Authority (2020), 'Online Platforms and Digital Advertising', Market Study Final Report, 1 July, available at https://www.gov.uk/cma-cases/online-platforms-and-digital-advertising-market-study.

— (2022*a*), 'Online Choice Architecture', CMA155, Discussion Paper, April, available at https://www.gov.uk/government/publications/online-choice-architecture-how-digital-design-can-harm-competition-and-consumers.

— (2022*b*), 'Mobile Ecosystems', Market Study Final Report, 10 June, available at https://www.gov.uk/cma-cases/mobile-ecosystems-market-study.

Cremer, J., *et al*. (2023), 'Enforcing the Digital Markets Act: Institutional Choices, Compliance, and Antitrust', *Journal of Antitrust Enforcement*, **11**(3), 315–49.

Court of Justice of the European Union (2022), 'Judgment of the General Court in Case T-604/18, Google and Alphabet v Commission (Google Android)', press release, Luxembourg, 14 September, available at https://curia.europa.eu/jcms/upload/docs/application/pdf/2022-09/cp220147en.pdf.

Decarolis, F., Li, M., and Paternollo, F. (2023), 'Competition and Defaults in Online Search', Centre for Economic Policy Research.

European Commission (2017), 'Google Search (Shopping)', Case AT.39740, Brussels, European Commission.

— (2018*a*), 'Google Android', Case AT.40099, Brussels, European Commission.

— (2018*b*), 'Antitrust: Commission Fines Google €4.34 billion for Illegal Practices Regarding Android Mobile Devices to Strengthen Dominance of Google's Search Engine', press release, Brussels, 18 July, available at https://ec.europa.eu/commission/presscorner/detail/en/IP_18_4581.

Fletcher, A. (2023), 'International Pro-competition Regulation of Digital Platforms: Healthy Experimentation or Dangerous Fragmentation?', *Oxford Review of Economic Policy*, **39**(1), 12–33.

— (2024), 'Choice Architecture for End Users in the DMA', *Implementing the DMA: Substantive and Procedural Principles*, Report by Centre for Regulation in Europe (CERRE), 17 January.

— Vasas, Z. (2024), 'Implementing the DMA: The Role of Behavioural Insights', *Journal of European Competition Law & Practice*, **15**(7), 452–62, https://doi.org/10.1093/jeclap/lpae045

FTC (2023), 'FTC Sues Amazon for Illegally Maintaining Monopoly Power', Case No. 2:23-cv-01495-JHC, press release, available at https://www.ftc.gov/news-events/news/press-releases/2023/09/ftc-sues-amazon-illegally-maintaining-monopoly-power.

General Court of the European Union (2021), 'Judgment in Case T-612/17, Google and Alphabet v Commission (Google Shopping)', Press Release No. 197/21, Luxembourg, 10 November, available at https://curia.europa.eu/jcms/upload/docs/application/pdf/2021-11/cp210197en.pdf.

Godefroid, M.-E., *et al*. (2023), 'How to Measure the Status Quo Bias? A Review of Current Literature', *Management Review Quarterly*, **73**, 1667–711.

Jachimowicz, J. M., *et al*. (2019), 'When and Why Defaults Influence Decisions: A Meta-analysis of Default Effects', *Behavioural Public Policy*, **3**(2), 159–86.

Mozilla Research (2023), 'Can Browser Choice Screens Be Effective?', available at https://research.mozilla.org/browser-competition/choicescreen/.

Vasas, Z. (2023), 'Do Nudges Increase Consumer Search and Switching? Evidence from Financial Markets', *Behavioural Public Policy*, **7**(3), 808–24.

[30] See, for example, the EU AI Act, available at: https://artificialintelligenceact.eu/, accessed on 28 May 2024. The European Council formally adopted the EU AI Act on 21 May 2021 and its publication in the *Official Journal of the European Union* is due in June 2024. We note that Article 5(1)(a) appears to specifically address the use of AI in the context of choice architecture design.