

Competition Concerns with Digital Platforms: The European Commission's Google Investigations

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INTRODUCTION

In March 2020, the first six companies in the world by market capitalisation were digital companies, respectively Microsoft, Apple, Amazon, Alphabet (Google), Alibaba, and Facebook. Such large sizes reflect the success of these companies. But with size comes also market power, and the potential to abuse it. Hence it should not be surprising that many of these companies have been, and still are, the object of an intense policy debate and antitrust scrutiny.

From an economics point of view, digital platforms are characterised by features such as economies of scale and network effects, which can bring efficiencies but also the tendency to result in extremely concentrated market structures. On the demand side, it is important to recall that, empirically, many customers are subject to behavioural biases. This means that very few customers conduct limitless searches on alternative platforms before, for instance, purchasing a certain item. Most, instead, tend to follow the suggestions of the main platform they currently use, clicking on the very first items that are being displayed. The combination of these factors implies that competition *in* the market is very limited and subject to several market failures. There may still be competition *for* the market (i.e. dynamic competition), but it is fair to say that the dominance of some of these companies has been quite persistent in the last 5-10 years, so one would not expect sudden changes in the competitive status quo.

In this note, I rely on my personal views and experience as former Chief Competition Economist of the European Commission (2016-2019). I will focus on two of the main Google cases where I directed the economic analysis. I will also briefly refer to an ongoing market study in the UK. The purpose is to show what it takes to run an antitrust case under the current regime in Europe. I also intend to provide a gist of the *evidence* relied upon in the relevant decisions. This body of evidence in turn relies on information provided by Google which can be elicited where relevant. In addition, I have added a few further points when I am aware that they have been submitted by certain third parties even if not quoted explicitly in the decisions.

THE EC'S CASES

The European agencies have looked at Google's conduct in Search in the EU "Shopping" case (started in 2010 and concluded with a finding of infringement in 2017 – de facto though the case was started twice, as Commissioner Almunia had almost agreed on a settlement that fell apart at the last minute, hence Commissioner Vestager started it again). This case remains the model for a number of ongoing complaints though these have not yet been taken to the formal opening of a case (Local, Travel, Jobs); and in the UK's ongoing Digital Advertising market study.

GOOGLE SHOPPING (EU 2017)

In "Google Shopping" [AT.39740 – Google Search (Shopping)] the EC investigated whether Google had used its **dominant position in general search** to direct **traffic originating from consumers searching for products, towards its own shopping site** (the Google Shopping box at the top of the page). The mechanism was described as "self-preferencing" and involved (a) Google placing its own vertical (the PLA, or "Product Listing Ad" box) at

the top of the search results page, and (b) launching a new algorithm (Panda 4) for ranking sites on its search results page, that pushed competition comparison shopping sites down the page. The Commission found Google to have abused its dominant position and issued a fine. The case is being appealed in front of the EU's General Court in Luxembourg.

Note that there are a number of additional complaints in different “verticals” presently sitting with the EC, where parties are seeking to start new investigations along the lines of Shopping: Local, Travel, Jobs. The EC has been reluctant to move forward in those cases as it finds the fact pattern less clear-cut (not the same uniform evidence of rivals being decimated, not the same clear evidence pointing to an algorithm change and suggestive of manipulation that can potentially lead to higher consumer prices and less innovation through a foreclosure of rivals). However, complainants in these cases continue to pursue the EC (Yelp, Expedia, etc.) and have been submitting various pieces of evidence.

1. Market definition

The EC argued that Google Shopping operated within the product market of comparison shopping services. It defined comparison shopping services as “specialised search services that: (i) allow users to search for products and compare their prices and characteristics across the offers of several different online retailers (also referred to as online merchants) and merchant platforms (also referred to as online marketplaces); and (ii) provide links that lead to the websites of such online retailers or merchant platforms.”¹

The EC stated that comparison shopping services constitute a distinct product market, because the services offered are not interchangeable with the services offered by specialised search services with a different product focus (e.g., flight comparison websites), online search advertising platforms, online retailers, merchant platforms, or offline comparison shopping tools.

Google claimed instead that the relevant product market in which its Google Shopping product operates comprised both comparison shopping services and merchant platforms – in effect, Amazon. Google argued that merchant platforms provide a product search and comparison function that is substitutable with comparison shopping services from the perspective of users and online retailers, to the product search and comparison function provided by comparison shopping services.

The EC argued that merchant platforms are not part of the same market as comparison shopping sites as

- (a) Google distinguishes comparison shopping services (including its own comparison shopping service) from merchant platforms;
- (b) Comparison shopping services and merchant platforms are business partners in a vertical relationship;
- (c) Comparison shopping services and merchant platforms serve different purposes from the perspective of users; and
- (d) Comparison shopping services and merchant platforms provide different services to online retailers.

Elaborating slightly on these points, the EC argued that:

- Google itself stated that Google Shopping is different from a merchant platform and states on its own website that “Google Shopping does not sell products directly to shoppers, instead we collect product information from participating merchants and make those products searchable for you. Our job is to find the product you want and point to the store that sells it. [...] You can't buy products directly on www.google.com/shopping. We help you find the items you're looking for and point you to stores (both online and offline) that offer them for sale.”
- On the demand-side, comparison shopping services enable a user to view a wide range of offers and help to make an informed purchase decision. However, comparison shopping services are just intermediaries insofar as they do not facilitate sales themselves. They also do not offer after-sale services. Thus, Google Shopping is different to, for example, Amazon Marketplace, which holds inventory and facilitates purchases. In addition, comparison shopping services do not usually list offers from non-professional merchants or used products. Thus, Google Shopping is not comparable to eBay, either. Furthermore, responses to an EC request for information revealed that comparison shopping websites and merchant platforms view each other as business partners rather than competitors.
- On the supply-side, comparison shopping websites and merchant platforms require a different infrastructure. Whilst comparison shopping websites just enable online retailers to attract potential purchasers, they do not take over any steps associated with the logistics of a sale, such as warehousing, delivery, payments, etc. Moreover, comparison shopping websites do not interact with small businesses

¹ Google Search (Shopping) Prohibition Decision, ¶ 191.

that do not have any online portals. Merchant platforms, however, do sometimes store inventory of smaller businesses without their own online presence.

- Comparison shopping websites are usually remunerated based on traffic they generate for online retailers (i.e., based on clicks) whereas merchant platforms are remunerated either through a commission for each sale or based on the margin they earn between their purchase costs and the price at which they can sell their inventory.

In coming to these conclusions, the EC relied on Google’s submissions, the inspection of the Google Shopping website, Google’s internal documents, and responses to RFIs. However, it did not perform formal quantitative analyses to determine the relevant product market. Google did complain that the EC should have carried out a SSNIP test; however the EC responded that SSNIP tests are not the only way of defining a market and in any case a SSNIP would not be an appropriate tool as Google Shopping is free for users.

Most importantly, the EC also pointed out that even if one defined the market to include both comparison shopping services and merchant services, the traffic share of the former was substantial in all thirteen countries in which Google abused its dominant position, and therefore even under a broader product market the conduct would be problematic.

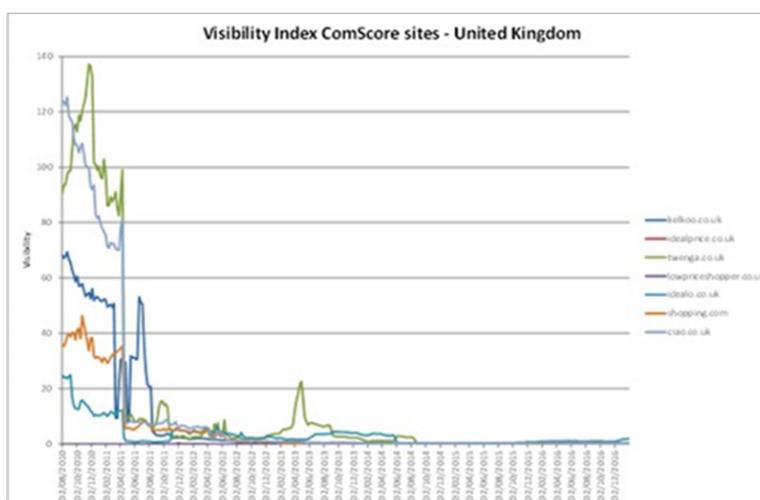
2. Empirical analyses to support findings of foreclosure

The EC conducted a variety of empirical analyses outlined in the following sections to support the following building blocks of its case: (I) Google adopted conduct to more favourably position its own comparison shopping service on its general search page; (II) traffic from Google’s search page to Google shopping increased as a result, while traffic to competing sites decreased; (III) traffic diverted from competitors by Google’s conduct could not be replaced by other means; (IV) Google’s conduct harmed the competition.

2.1 Google positioned its own comparison shopping service more favourably on its general search page

First, the EC provided evidence that Google reduced the visibility of competing comparison shopping services on its general search results page. The visibility of competing shopping services on Google’s search page was tracked for multiple European countries using a variety of metrics. An example below for the United Kingdom shows considerable and persistent drops in competitor’s visibility when Google launched its Panda Algorithm in 2011. Specifically, competitor’s visibility in Google general search results pages “was at its highest at the end of 2010 and beginning of 2011, (ii) was followed by a sudden drop after the launch of the Panda algorithm in the respective EEA country and (iii) no sustainable recovery occurred afterwards”.

Figure 1: UK – Sistrix Visibility Index for comparison shopping sites with highest volume of traffic based on ComScore



Source: Google Search (Shopping) Summary Decision, Page 82

2.2 Google’s conduct increased traffic from Google’s search page to Google Shopping, and decreased traffic to competing sites

The EC conducted graphical analyses outlined below to show that the anti-competitive conduct increased traffic to Google’s comparison shopping service at the expense of competitors, by (I) graphically demonstrating the strong direct relationship between visibility on, and traffic from, Google search results pages; (II) showing graphically that Google Shopping benefited from an increase in traffic from Google search results page; and (III)

showing graphically that competitors saw a decrease in traffic from Google's search results page.

(a) Google displaying its own Google Shopping service visibly on its general search results page increased traffic to Google Shopping

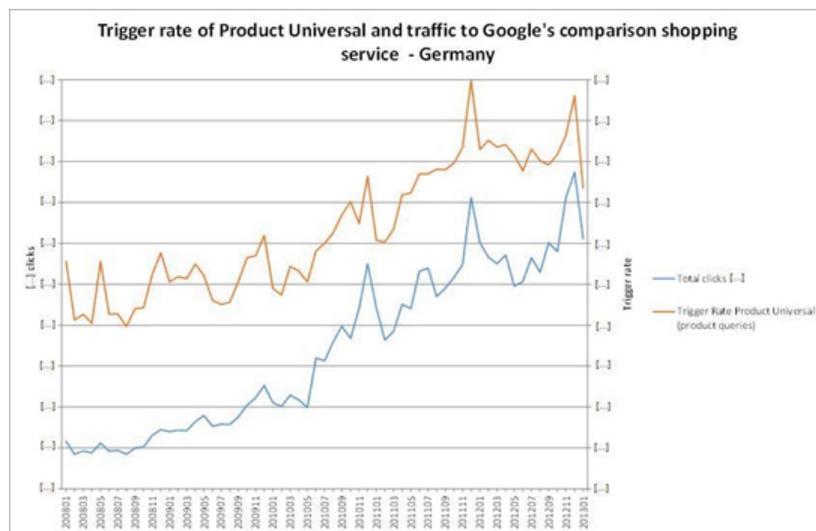
The EC analysed the relationship between visibility on, and traffic from Google search results pages, separately for Google Shopping and for competitors. The EC showed that traffic to Google Shopping from Google's general search results pages was strongly related to Google Shopping's visibility on Google's general search results pages.

To investigate this association, the EC looked at trigger rates of Shopping Units. Trigger rates refer to the proportion of queries/keywords for which a particular website or service is displayed ("triggered") among generic search results on Google's general search results pages. Shopping Units (formerly known as Product Universals) are specialized search results shown on top of Google's general search results page following a search query.

The EC compared, during certain reference periods between 2008 and 2014, trigger rates of Shopping Units in the United Kingdom, Germany, France and the Netherlands with traffic from Google's general search results pages to Google Shopping. The EC's comparison indicated that higher trigger rates of Google's own comparison shopping service in its general search results pages are associated with increased traffic to that service.

In Figure below for Germany, for instance, the blue line shows total clicks on Google Shopping, and the orange line shows Google Shopping's trigger rate. The two lines are strongly correlated.

Figure 2: Germany - Traffic from Google's general search results pages to Google Product Search, compared to the trigger rates of the Product Universal in Google's general search results pages



Source: Google Search (Shopping) Summary Decision, Page 142

(b) The EC analysed the relationship between competing websites' visibility and prominence on Google's general search results page and traffic to those websites, concluding that Google's conduct reduced traffic in many cases

The EC conducted a similar analysis as other countries by looking at the association between movements in the Sistrix Visibility Index and generic search traffic to those competing comparison shopping sides.²

For each of them, it found that "the evolution of the Sistrix Visibility Index for these specific domains of competing comparison shopping services follows a similar trend to the evolution of the generic search traffic from Google's general search results pages to these domains." This suggests that how prominently a website is displayed on the general search results page has a significant impact on traffic to that website. Consequently, by placing its Google Shopping results in Shopping Units at the very top of the general search results page, traffic to competing shopping comparison website was lower than it would have been but for Google's conduct. Indeed, the EC concluded that following Google's anti-competitive conduct, "traffic to almost all competing comparison shopping services has declined on a lasting basis or remained broadly stable".

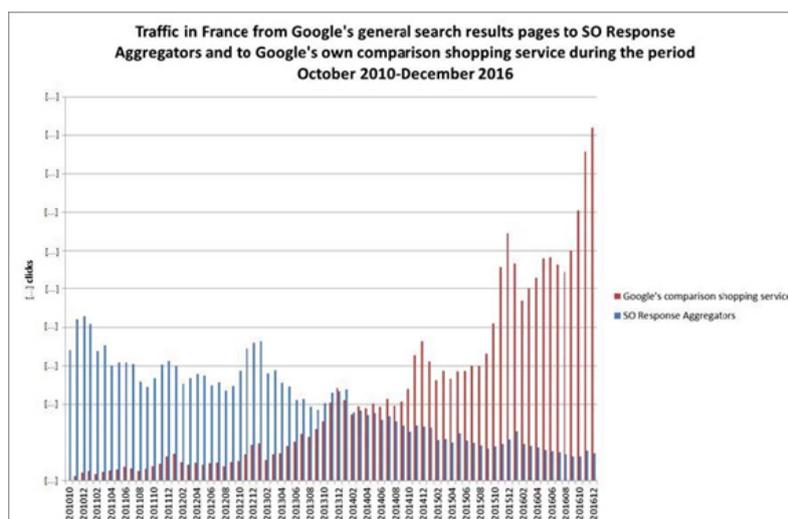
² The Sistrix Visibility Index accumulates the click-through rates for different key word searches and therefore provides a measure of how prominently a website is shown on Google's general search results page.

2.3 Traffic to Google Shopping from Google search result pages increased significantly and on a lasting basis, while often diverting traffic away from its competitors

The EC conducted a graphical analysis of traffic evolution to show that Google's conduct boosted traffic from Google's search results pages to its own comparison shopping service. The reference periods correspond to the dates as of which Google began to implement the conduct. In particular, for certain sub-periods between January 2008 and December 2016, the EC plotted and compared the evolution of traffic from Google's general search results pages to Google's own comparison shopping service and to the competing comparison shopping services in the United Kingdom, Germany, France, Spain, Italy, the Netherlands, Denmark and Poland. The results show that, while timing of conduct differed across the countries, during the time periods when Google started implementing its conduct, the traffic to Google's comparison shopping service from Google's general search results pages has substantially increased for all analysed European countries, whereas traffic from Google's general search results pages to the competing comparison shopping services has decreased (in the United Kingdom, Germany, France and Spain), remained broadly stable (in Italy and the Netherlands, where the conduct has been in place for a shorter period) or increased to a more limited degree (in Denmark and Poland, where the conduct has been in place for an even shorter period).

Figure 3 shows an example of the EC's graphical analysis for France. It covers in particular the period between October 2010 (i.e. the start of conduct) and December 2016 and shows that (I) competitors initially had more search traffic than Google Shopping; (II) since the time of the alleged conduct (i.e. October 2010) traffic to Google Shopping begins to increase rapidly (i.e. red bars on the chart) while competitors' traffic starts to decline (i.e. blue bars on the chart); (III) this pattern persists, so that towards the end of the period Google Shopping has considerably more traffic from Google search results pages than its competitors do.

Figure 3: Traffic in France from Google's general search results pages to the 361 SO Response Aggregators and to Google's own comparison shopping service during the period October 2010 – December 2016



Source: Google Search (Shopping) Summary Decision, Page 147

The EC took the view that this graphical analysis of traffic evolution provides a reliable evidence of the impact of the ranking and visibility of a given website on its generic search traffic from Google's general search results pages. Google's conduct led to a lasting decrease in traffic for almost all competitors in each of the EEA countries in which the conduct took place.

It should be remembered that these competitors were successful businesses operating in competitive national markets across Europe (with a number operating in multiple markets successfully). Google has suggested that these competitors simply failed to compete effectively with Google in the comparative shopping services ("CSS") market. But the nature of the decline – all competitors, in all markets – at a time of rapid market growth, is not credibly explained by this theory.

2.4 Traffic diverted from competitors by Google's conduct is large and cannot be replaced

The EC argued that competing comparison shopping sites could not replace the traffic diverted by Google's anti-competitive conduct. The EC argued in particular that (I) traffic from Google's search results pages was a significant proportion of traffic for competing comparison shopping sites; and (II) alternative sources of traffic could not effectively replace traffic diverted from Google's search results pages.

(a) *Traffic from Google’s search results pages was a significant proportion of traffic for competing comparison shopping sites*

For each competing comparison shopping service, the EC looked at the share of EEA traffic generated from different sources such as generic search results, AdWords, direct navigation (e.g. apps) and other. AdWords are search advertisements drawn from Google’s auction-based online search advertising platforms, which may be returned on Google’s general search pages in response to a user’s query on Google Search. As an example, Table 1 shows traffic composition for a subsample of competing comparison shopping sites, for each year between 2011 – 2016 and is broken down by source. Results demonstrate that generic search traffic from Google’s general search results pages accounts for a large proportion of the overall traffic of competing comparison shopping services. For the reasons outlined in the subsequent sections below, none of the existing alternative sources of traffic currently available to competing comparison shopping services can effectively replace generic search traffic from Google’s general search results pages (e.g. AdWords, mobile apps, direct traffic and other sources such as affiliate websites, social networks, or paid traffic from other general search services).

Table 1: Sources of traffic to competing comparison shopping websites in the EEA

Group	Year	Traffic from generic search results	Traffic from AdWords ^{647 648}	Direct Navigation (including apps)	Traffic from other sources	Total traffic (visits)
[...]	2011	83%	1%	7%	9%	106 950 217
	2012	82%	4%	7%	7%	139 133 711
	2013	75%	7%	11%	7%	190 649 938
	2014	75%	12%	8%	6%	214 657 421
	2015	66%	21%	8%	5%	233 275 770
	2016	61%	24%	9%	6%	234 308 088
[...] ⁶⁴⁹	2011	[65-75]%	[5-15]%	[5-15]%	[5-15]%	387 817 001
	2012	[55-65]%	[15-25]%	[5-15]%	[5-15]%	514 062 265
	2013	[45-55]%	[25-35]%	[15-25]%	[5-15]%	739 724 469
	2014	[45-55]%	[15-25]%	[15-25]%	[5-15]%	713 083 781
	2015	[45-55]%	[15-25]%	[15-25]%	[5-15]%	672 973 258
	2016	[35-45]%	[25-35]%	[15-25]%	[5-15]%	744 503 251
[...]	2011	[...]	[...]	[...]	[...]	[...]
	2012	[...]	[...]	[...]	[...]	[...]
	2013	[...]	[...]	[...]	[...]	[...]
	2014	[...]	[...]	[...]	[...]	[...]
	2015	[...]	[...]	[...]	[...]	[...]
	2016	[...]	[...]	[...]	[...]	[...]
[...] ⁶⁵⁰	2011	43%	22%	1%	34%	205 737 984

Source: Google Search (Shopping) Summary Decision, Page 163

(b) *Alternative sources of traffic cannot effectively replace traffic diverted from Google’s search results pages*

The EC analysed AdWords as a possible alternative source of traffic. AdWords are search advertisements drawn from Google’s auction-based online search advertising platform which may be returned on Google’s general search pages in response to a user’s query on Google Search. The EC argued that, while for most comparison shopping services, traffic from AdWords is the main alternative to generic search traffic from Google’s general search results pages, AdWords could not effectively replace traffic from Google’s generic search results pages. It showed that (I) click-through rates on AdWords were lower than on Google’s generic search results pages; (II) AdWords had a similar conversion rate and lower spending per head, than Google’s generic search results pages in spite of its higher cost; (III) limited growth in AdWords visits or spending on Google by competitors since Google’s anti-competitive conduct. I can provide more details if requested to elaborate further.

3. Evidence of anti-competitive effects of Google’s conduct under Google’s alternative broader market definition

As discussed above, the EC defined the relevant market as the national market for comparison shopping services. It set out to show also that, even under the alternative product market definition proposed by Google (i.e. product market including both comparison shopping services and merchant platforms), Google’s conduct would still have had anti-competitive effects on a substantial part of the market - i.e. at least the comparison shopping services segments of the possible broader market, which constitutes a large chunk of the overall market.

3.1 EC's methodology

For all thirteen European countries (individually and together), in which the conduct takes place, for the period 2011-16, the EC estimated the relative importance of comparison shopping segments by assessing the *relative traffic size of the comparison shopping services segments* (i.e. Google Shopping and the competing comparison shopping services) as a percentage of the total traffic of the possible national markets comprising both comparison shopping services and merchant platforms. Thus, the EC was assessing the importance of the comparison shopping segments, which are the ones (unlike merchant platforms) affected by the conduct. The data on traffic for Google Shopping, comparison shopping competitor services and merchants was collected from both Google and the third parties (i.e. other comparison shopping services and merchants).

3.2 Googles' conduct would have been capable of having anti-competitive effects on a significant part of the possible market for comparison shopping services and merchant platforms

The results of the analysis, presented in the table below, demonstrate that traffic generated by the comparison shopping services (both Google Shopping and competitors) constitutes a significant part of the possible market for comparison shopping services and merchant platforms in all thirteen EEA countries during the period 2011-2016. Therefore Google's conduct would have been capable of having, or likely to have, anti-competitive effects on a significant part of the market even under Google's broader market definition.

Table 2: Traffic share of comparison shopping segment on the possible market for comparison shopping services and merchant platforms, 2011-2016 (range indicated for three data sensitivity scenarios)

Country	Based on total traffic	Based on traffic from Google's general search results page
UK	9-24%	20-57%
Germany	14-28%	30-54%
France	24-45%	31-56%
The Netherlands	45-65%	60-69%
Italy	23-41%	31-57%
Spain	20-65%	32-68%
Austria	16-37%	24-48%
Belgium	21-44%	31-54%
Czech Republic	47-87%	73-85%
Denmark	39-74%	60-74%
Norway	18-64%	39-62%
Poland	17-42%	37-46%
Sweden	41-85%	59-69%

Source: Para 638 of the EC Google Shopping decision

4. Consumer welfare: EC concluded that Google's potential to foreclose competing comparison shopping services may lead to higher prices, less innovation and reduced ability to access the most relevant content to the detriment of consumers

The EC did *not* provide in the decision direct quantitative evidence of consumer welfare harm, although it had conducted extensive econometric analyses in the course of the investigation. In the end it decided not to include those in the Decision. It argued that, in the first place, the conduct's potential to foreclose competing comparison shopping services had the potential to lead to *higher fees for merchants, higher prices for consumers, and less innovation*:

- “The conduct is capable of leading competing comparison shopping services to cease providing their services due to reduced visibility, traffic (as demonstrated empirically above) and thus revenues. This would allow Google to impose and maintain higher fees on merchants for participation in its own comparison shopping service. *These higher costs for merchants are capable of leading to higher product prices for consumers*”.
- The conduct was deemed “likely” to reduce the incentives of competing comparison shopping services to innovate. “Competing comparison shopping services will have an incentive to invest in developing innovative services, improving the relevance of their existing services and creating new types of services

only if they can reasonably expect that their services will be able to attract a sufficient volume of user traffic to compete with Google's comparison shopping service”.

- As shown in the sections above, under Google’s conduct the competitor comparison shopping services suffer enormously from the reduced traffic, reducing both their incentive and ability to innovate.
- Google, on the other hand, had shown little incentive to innovate in the CSS market, largely following product and technical innovations produced by competing CSSs. These included:
 - Extraction of product data by crawling merchant sites, and then improving this by having merchants provide this data in a feed (Google continued the inferior crawling method for some time before ‘catching up’ with feeds).
 - Developing and maintaining a product database to match offers from different merchants.
 - Rich display formats for comparison shopping.
 - Feature extraction on offers and products (tagging) to enhance search results.
 - Product reviews on CSSs (which Google scraped and used on its own product without permission).
- None of these key features of Google’s service were Google innovations. Without the resources or incentives to invest on their CSS sites any longer, innovation dried up – for example, at least one CSS worked on integrating local stock information and providing ‘localised’ shopping comparison, but was forced to abandon that because of lack of resource. Google’s own service has not had to develop further significant innovations because of lack of this competitive pressure.

Second, the conduct was deemed likely to *reduce the ability of consumers to access the most relevant comparison shopping service*:

- Since users tend to consider that search results that are ranked highly in generic search results are the most relevant for their queries and click on them irrespective of whether other results would be more relevant for their queries.
- Google did not inform users that the Product Universals/ Shopping Units were positioned and displayed in its general search results pages using different underlying mechanisms than those used to rank generic search results. While the “Sponsored” label may suggest that different positioning and display mechanisms are used, that information is likely to be understandable only by knowledgeable users.
- Users are generally drawn to the most attractive format of result (particularly when positioned at the top of the page). Using a display format with pictures and prices, similar to those on CSS rivals but positioned on the general search page, meant users were much less likely to look for alternative results below.
- Furthermore, the rich display formats take up considerable space on the search page (and even more so on mobile devices). This pushes the generic results down the page and many or all of them ‘below the fold’, meaning they are not visible without scrolling. Users are simply less likely to find results which require further actions to see them, when the visually attractive results are presented to them first.

The Commission Decision did not specifically include an analysis of the cost per click for merchants from Google’s PLA, or cost of sale for merchants. Given the wealth of competition to provide Shopping traffic before Google’s conduct started, and the significant reduction in competition thereafter, it is safe to assume that the conditions existed for Google to raise prices for merchants (who, most likely, would raise prices in turn for consumers).

The EC decided not to conduct an econometric analysis of the impact on final prices. But should an enforcer decide to do so (with the right data), there is a possibility to address quantitatively the question of: in the end, are consumers worse off? The simplest form would be, for instance, to scrape in a country (e.g. Amazon.de in Germany) for multiple bestselling products in different product categories. Then search would be based on keywords about those products (e.g. “Baby car seat”) on google.de and rival CSSs (Billiger.de and Guentiger.de). Then one could compare prices for the *same product* on Google and others, and determine which one is more expensive.

GOOGLE ANDROID (EC 2018)

In July 2018 the European Commission (EC) fined Google €4.34bn for imposing anti-competitive restrictions on Android OEMs and MNOs since 2011 with the purpose of cementing its dominant position in a general internet search [AT.4099 – Google Android].

The EC concluded that Google was dominant in the markets for (i) general internet search services, (ii) licensable smart mobile OS and (iii) app stores for the Android mobile OS. Google was accused of engaging in three illegal practices, all of which denied rival engines the possibility to compete on the merits and therefore constituted an abuse of dominant position: (i) tying of Google's search and browser apps to its popular Play Store (i.e. app store); (ii) revenue share payments conditional on exclusive pre-installation of Google Search; (iii) obstruction of development and distribution of competing Android operating systems ("Android forks") through anti-fragmentation agreements signed between Google and OEMs/MNOs.

1. Market definition

The EC concludes that the relevant product markets are: (i) the market for the licensing of smart mobile OSs; (ii) the market for Android app stores; (iii) the market for the provision of general search services; and (iv) the market for non OS-specific mobile web browsers. In order to define these markets, the EC relies on responses regarding demand and supply substitution as submitted by OEMs, MNOs and competing search engines. The EC also uses the empirical evidence such as a price differentiation analysis and surveys, in order to assess the closeness of competition between Android OSs and iOS.

In this Decision, smart mobile devices that run on any version of Android, including modified versions (so-called "Android forks"), are referred to as "Android devices". Smart mobile devices approved explicitly or tacitly by Google as "Android compatible"³ are referred to as "Google Android devices".

1.1 Google's dominant position in the market for the licensing of smart mobile OSs

(a) Market definition

The EC concludes that the licensing of smart mobile OSs (including both smartphones and tablets) constitutes a separate relevant product market, on which Google holds a dominant position on the worldwide market (excl. China) since 2011. The EC argues that smartphone OSs and tablet OSs belong to the same market as, from a demand-side perspective, the same OS, or similar versions of it, power both smartphones and tablets, while, from a supply-side perspective, the OS developers use nearly the same OS version for both smartphones and tablets.

The EC concludes that the market *does not* include PC OSs, basic and feature phone OSs, and non-licensable OSs (such as Apple's iOS or BlackBerry OS) since, as confirmed by multiple OEMs and MNOs:

- a) PC OSs: From a demand-side perspective, OEMs require smart mobile OSs to power their smart mobile devices and cannot use PC OSs for that purpose. From a supply-side perspective smart mobile OSs require functionalities that are specific to smart mobile devices and are different from those of PC OSs (e.g. due to smaller screen sizes, wireless functions, simpler apps), and therefore any production switch from PC OSs to smart mobile OSs would require substantial time and investment as confirmed by a number of PC OSs developers in their responses to the EC's RFIs.
- b) Basic and feature phone OSs:⁴ From a demand-side perspective, basic and feature phone OSs cannot be installed on smart mobile devices because of their reduced functionalities. From a supply-side perspective, no developer of basic and feature phone OSs has successfully launched a smart mobile OS in the last five years.
- c) Non-licensable smart mobile OSs (e.g. iOS and Blackberry): From a demand-side perspective, OEMs cannot obtain a license to use iOS or BlackBerry OS as these are vertically integrated and do not grant licences to third parties. From a supply-side perspective, neither Apple nor BlackBerry has licences or announced its intention to license its smart mobile OS to any third party.

The EC's position was challenged by Google's claims of iOS and Android being part of a single market since: (i) Apple iOS and Android are competing to attract users and app developers and clearly tracking each other's release dates; (ii) some OEM/MNO responses, certain Google documents as well as competition assessments in Australia, Canada and the US indicate the existence of competition between iOS and Android; and (iii) the EC failed to apply the SSNIP test; (iv) EC former decisions (e.g. Google/Motorola Mobility) defined a single market for smart mobile OSs.

³ Android devices can be either compatible or incompatible with Google's own Android OS depending on whether they pass Google's Compatibility Definition Document and Compatibility Test Suite. As discussed in more detail below, under the anti-fragmentation agreements, incompatible devices are not allowed to receive Google's products such as the Play Store app, Chrome app, Search app and others.

⁴ Basic phone is a category of mobile phone only capable of voice calling and text messaging. Feature phone is a category of mobile phones that adds minimal smartphone features to those of a basic phone, such as rudimentary web browsing capabilities.

These claims are rejected by the EC as: (i) iOS and Android release dates appear not to be close once the EC removes the intermediate update versions of iOS, that were misleadingly added by Google to its submissions; (ii) respondents to investigation and Google' internal documents may have acknowledged the degree of substitution on a user-level, but did not indicate that iOS and Android OS can be seen as substitutes from an OEM perspective. At the same time, Australian and Canadian competition authorities were focused on Apple's behaviour and did not need to analyse the existence of a market for licensable smart mobile OSs, while the US FTC was focused on in-app advertising rather than OSs; (iii) the EC is not required to carry out a SSNIP test, however it (as discussed below) assessed the extent of user and developer switching in the event of a small but significant, non-transitory quality degradation of the licensable smart mobile OS; (iv) the EC has never defined a single market for smart mobile OSs, in particular in the Google/Motorola Mobility merger decision.

(b) Dominance: Google has had a market share over 70% on Google Android OS since 2011

In order to demonstrate Google's dominant position, the EC calculates the market shares of Google and competing developers of licensable smart mobile OSs. As shown in the Figure 9 below, Google's worldwide volume market shares (excl. China) of licensable smart mobile OSs were 72% in 2011 and over 90% in 2013-16 (i.e. Google Android OS excluding forks) with the second most important player Microsoft having less than 2% share in 2016. Since non-licensable OSs (e.g. Apple and BlackBerry) exert little constraint, these are excluded from the market. However, it does not change the conclusion: including non-licensable OSs leads to Android share increasing from ~45% in 2011 to ~80% in 2016 with Apple having ~17-25%.

Figure 9: Worldwide (excluding China) market shares for licensable smart mobile devices OSs (in volume of smartphones and tablets sold)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Google Android	0.0%	0.7%	7.2%	38.0%	72.0%	87.4%	91.8%	93.3%	94.2%	96.4%
Firefox OS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.0%
Linux	12.3%	15.4%	9.0%	4.8%	4.2%	1.8%	0.6%	0.3%	0.1%	0.1%
Maemo/MeeGo	0.0%	0.0%	0.1%	0.4%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%
Palm OS	2.2%	2.6%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sailfish OS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Symbian	73.0%	63.5%	67.2%	48.6%	18.9%	4.3%	0.4%	0.3%	0.2%	0.1%
Tizen	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.2%
webOS	0.0%	0.0%	1.6%	1.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%
Windows	12.5%	17.8%	14.4%	7.1%	2.8%	4.0%	5.7%	5.0%	4.5%	1.9%
Fire OS ⁴⁴¹	0.0%	0.0%	0.0%	0.0%	1.6%	2.4%	1.5%	0.4%	0.6%	1.3%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%

Source: Table 3 from the EC Google Android decision

The EC additionally uses Statista's publicly available data to illustrate that Google Android also enjoys the largest installed base of smart mobile OSs: 2,156m Google Android smartphones compared to 518m iOS and 24m Windows Mobile in July 2016.

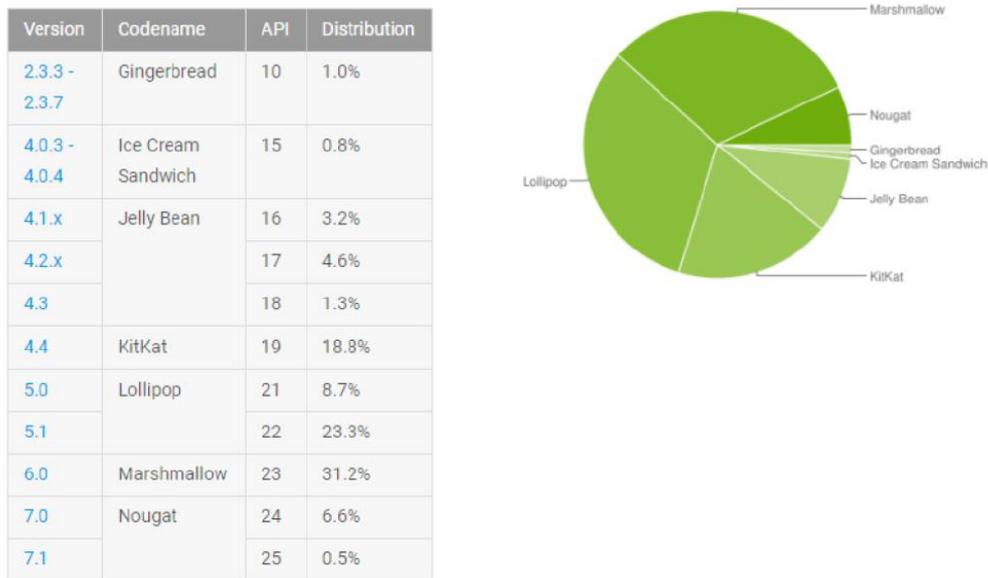
(c) Dominance: Yandex's evidence from both customer survey and Android OS's lagged updates show an insufficient constraint from non-licensable OSs

The EC concludes that non-licensable smart mobile OSs, such as iOS and BlackBerry OS, exercise an insufficient indirect constraint on Google's dominant position in the worldwide (excluding China) market for licensable smart mobile OSs. The EC uses multiple empirical evidence to demonstrate that users are unlikely to switch to other devices in the event of a small but significant, non-transitory deterioration of the quality of Google Android.

First, the EC relies on an international consumer survey based on Nielsen data in 2012 as this survey reveals that users in Italy and the UK list multiple factors for choosing a device such as "stylish design" and "ease of use" in addition to OS ("good operating system"). OEMs and MNOs also support this view in their responses to the EC RFIs.

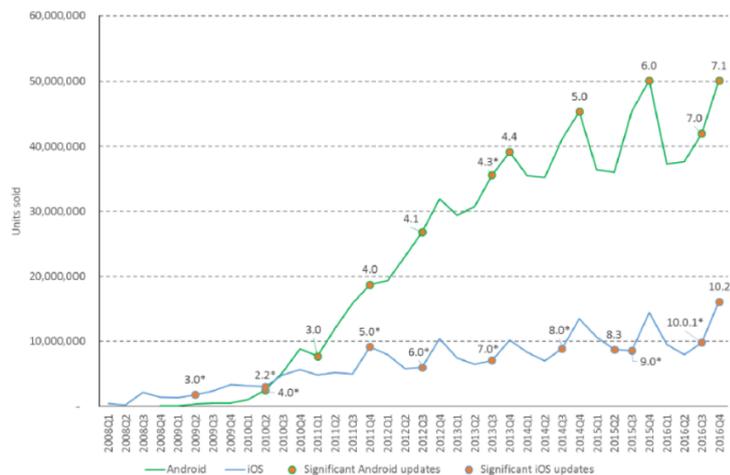
Second, the EC presents empirical evidence submitted by the Russian search engine Yandex. As shown by Yandex in Figure 10 below, the breakdown of Google Android devices by OS indicates that, although Android OS updates are lagging on the majority of devices, this does not turn the users away. Thus, OEMs consistently fail to deliver punctual updates to the Google Android OS: as of May 2017, only 7.1% of devices were operating on the latest OS version (“Nougat” Oct 2016) with further 31.2% operating on the second latest version (“Marshmallow” 2015). Despite this, Google Android’s share of devices has consistently increased in 2011-16.

Figure 10: Breakdown of Google Android devices by releases of OS as of May 2017



Source: Figure 10 of the EC Google Android decision. Figure of "Further evidence on the competitive interaction between licensable and non-licensable OS", CRA study on behalf of Yandex submitted on 16 June 2017 (Doc ID 8031) extracted from <https://developer.android.com/about/dashboards/index.html>

Figure 11: Units sold of Android and iOS phones in Europe, and significant Android and iOS updates⁵



Source: Figure 11 of the EC Google Android decision

Yandex further submits a study that, as depicted on Figure 11 ABOVE, shows that there is a generally upward trajectory of sales of Google Android devices with no evidence that this trend accelerates when a new Google Android OS update is launched or decelerates when a new iOS update is launched.

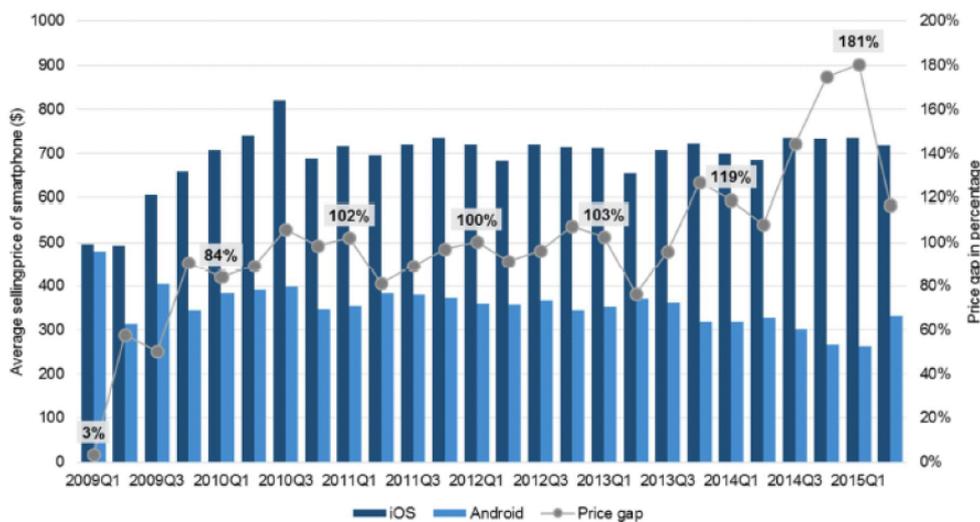
5 An Android or iOS update was deemed to be significant and therefore worth being included in the graph if it fell in the top ten, in terms of the number of features added to the OS. Data labels corresponding to a significant Android or iOS updates have an asterisk besides them if they coincided with the introduction of a new model of the Samsung Galaxy S or iPhone respectively (this analysis focused on releases of the Samsung Galaxy S, as Samsung enjoyed the greatest market share among producers of Android phones over the period in question, and Galaxy S is its flagship series).

The EC additionally relies on Yandex’s price differentiation analysis and survey analysis (the latter showing high OS brand loyalty amongst users) in order to demonstrate that iOS exercises insufficient indirect constraints on Google Android OS.

(d) Dominance: Yandex’s price differentiation and survey brand loyalty analyses further show an insufficient constraint from non-licensable OSs

First, the EC concludes based on Yandex’s price differentiation analysis that users looking for less expensive devices cannot switch to iOS even after Apple launched cheaper models. The EC estimates that there were significant (84-181%) price differences between iOS and Android smartphones in Europe in 2010-2015Q1 with more than half of Android devices prices below \$350, while the cheapest of recently launched iPhone C & SE are still priced above (i.e. from \$550 and \$399). The results are shown in the Figure 12 below.

Figure 12: Average selling price of iOS and Android smartphones in Europe, 2009-2014



Source: Figure 13 of the EC Google Android decision

Second, while lower-end Android device users might not be able to switch to iOS due to higher price, even if higher-end Android users switch to iOS, they would still be affected by Google: the EC estimates Google’s worldwide share of searches on iOS is also above 90%. The EC however does not include the results of its estimation in the decision.

Third, the EC points again to the Yandex’s survey of UK Android users that reveals more than 90% of Google Android smartphone users would most likely consider purchasing a new Google Android smartphone, thus indicating that high consumer brand loyalty does not make iOS a strong constraint to Google Android.

1.2 Google’s dominant position in the market for Android app stores

i. Market definition

The EC concludes that Android app stores constitute a separate relevant product market, on which Google holds a dominant position on the worldwide market (excl. China) since 2011. The EC argues that the market includes different app stores for Google Android.⁶ This is because, from a demand-side perspective, an OEM can choose from a number of different Android app stores, while from a supply-side perspective, while it would be difficult for a developer to replicate the feature of Google’s app store (Play Store), excluding these from the market would make it even less favourable to Google. The market also includes app stores for other Android devices since, from a supply-side perspective, app stores developed for other Android devices can be easily modified to run on Google Android devices due to source code similarities between different Android OSs.

The EC however concludes that the market *does not* include other apps, app stores for non-Android licensable smart mobile OSs, and app stores for other non-licensable smart mobile OSs (e.g. Apple’s AppStore), because:

⁶ These include Google’s Play Store, the Amazon AppStore, Samsung’s Galaxy App store, Opera, Yandex store, Aptoid.

- a) Other apps: From a demand-side perspective, app stores serve different purposes than other apps (i.e. allowing users to search for and download other apps) and cannot, therefore, be replaced by other apps. From a supply-side perspective, the development of an app store required significant time and resources, regardless of whether the developer in question has already developed other apps.
- b) App stores for non-Android licensable OSs: From a demand-side perspective, once an OEM has decided to install Android OS on its devices, it cannot, for technical reasons, pre-install an app store that has not been developed for Android. From a supply-side perspective, developers of app stores for other licensable OSs (e.g. Microsoft) are unlikely switch to Android as the app store development requires significant time and resources. This conclusion was challenged by Google’s claims that users and developers will switch away in the case of a decline in the quality of the app store, but the EC noted that the switching costs and the degree of OS loyalty are high and there is in any event only a limited number of alternative licensable OSs to switch to.
- c) App stores for non-licensable OSs: From a demand-side perspective, the app stores of Apple and BlackBerry have been specifically developed for iOS and BlackBerry OS and cannot run on Android. From a supply-side perspective, developers of app stores for non-licensable smart mobile OSs are unlikely to start developing app stores for Android due to their vertically integrated business model. The conclusion was challenged by Google’s claims that (i) some of Google’s internal documents and Apple’s communications to investors and the findings of Australian and the US competition authorities confirm the substitutability of the Play Store and Apple’s App Store; (ii) the Play Store and the Apple Store have similar characteristics, prices and intended use; (iii) the EC ignores competition at the user and app developer level. The EC however rejects these claims as (i) Google’s internal documents are either outdated (2010) or rely on a survey of developers who simply assess relative performance of app stores rather than evaluate substitution. Similarly, Apple’s communication to investors simply uses the Play Store as its benchmark. As above, the focus of ACCC and the US FTC was on Apple and mobile advertising, respectively, rather than Android apps. (ii) The Play Store and the AppStore have several differences such as ratings and data reporting and charge developers according to different policies.

ii. Dominance: Google has been pre-installed on more than 90% of Android OS devices and accounts for more than 90% of downloads since 2011

In order to demonstrate Google’s dominance, the EC calculates volume market shares of pre-installed app stores based on total sales of smartphones and tablets that use Android OS. As shown in Figure 13 below, Google’s Play Store was pre-installed on more than 90% of Android OS smart mobile devices and accounted for more than 90% of all downloaded apps since 2011 (worldwide excl. China). For comparison, the second-largest app store – Samsung Galaxy App, was pre-installed on less than 50%, with the remaining app stores having shares of less than 10%.

Figure 13: Worldwide (excluding China) shares of pre-installation for app stores on total sales of smart mobile devices using Android

App store	2011	2012	2013	2014	2015	2016
Play Store	[90-100]%	[90-100]%	[90-100]%	[90-100]%	[90-100]%	[90-100]%
Amazon Appstore	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[5-10]%	[5-10]%
Aptoide	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%
LG Electronics	[5-10]%	[5-10]%	[5-10]%	[0-5]%	[0-5]%	[0-5]%
Samsung Galaxy Apps	[30-40]%	[40-50]%	[40-50]%	[30-40]%	[30-40]%	[30-40]%
SFR	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%
Yandex	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%

Source: Table 4 of the EC Google Android decision

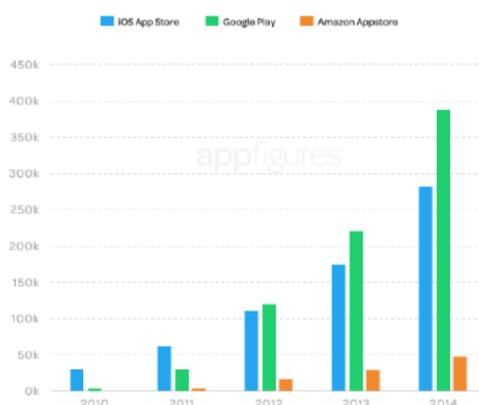
The EC also calculates shares of app stores by the number of total app downloads and notes that no downloadable app store has achieved any meaningful market shares. Overall, the number of apps available on the Play Store is incomparably larger than that of its competitors: the Play Store offered 2.8m apps in March 2017 with other app stores massively lagging behind: e.g. less than 1m for Aptoide; less than 1m for Amazon; less than 0.2m for Samsung Galaxy.

iii. Dominance: Non-licensable OS such as iOS and BlackBerry exert insufficient constraint as it is too expensive for users to switch away

The EC concludes that iOS AppStore and BlackBerry's app store exert insufficient constraint on Google Android's Play Store because a small but significant non-transitory increase in Play Store's app prices would not make consumers switch away from the Play Store to AppStore/BlackBerry Store. This is because Android consumers need to purchase new iOS/BlackBerry phones to access iOS/BlackBerry app stores instead of Android's Play Store. The EC estimates the amount spent on apps over the lifetime of a smart device (~\$15 = \$5 per year * 3 years) being a small proportion of the device's price.

Moreover, the EC uses publicly available data to show Google's relative strength compared to other non-licensable OS (iOS App Store and Amazon Appstore) in its ability to use the substantially higher number of app store developers, as depicted in the Figure 14 below.

Figure 2: Total number of developers by app store



Source: Figure 17 of the EC Google Android decision

1.3 Google's dominant position in the market for provision of general search services

i. Market definition

The EC concludes that the provision of general search services constitutes a separate relevant product market, on which Google holds a dominant position in each national EEA market since 2011. The EC notes that general search services belong to a different product market than other online services (e.g. content sites, specialised search services and social networks) since these sites serve different purpose as the primary use of the general search service is to guide users to other sites rather than directly offer the information, products and services. At the same time, the product market *includes* (i) PC and smart mobile devices; (ii) all different smart mobile OSs; and (iii) all entry points. This is because, from a demand-side perspective, users expect to receive the same general search services regardless of device (PC vs smart mobile), type of smart mobile, or entry point used. From a supply-side perspective, the underlying technology for the two is the same. For instance, the same undertakings offer search services on both PCs and smart mobile devices: Google, Bing, Yandex, Yahoo, DuckDuckGo. The cost of developing a search app to run on different mobile OSs is small compared to the overall investment required to develop a general search service.

The conclusion was challenged by Google's claim that specialised search services should be included to the market as they exercise a constraint on general search services for the categories of queries, for which their search functionalities overlap. The EC rejects this claim as the general and specialised search services still do not offer the same functionalities even on the overlapping queries: for instance, for services specialised in travel, users may look for hotels within a certain number of stars or certain part of the city, and these functionalities are not available to the same extent on a general search service.

ii. Dominance: high market shares of Google's general search services

To demonstrate Google's dominant position in general search services, the EC calculates market shares of Google and competing general search services for each EEA country from 2011 to 2016. The EC uses multiple data sources (such as Nielsen, AT Internet, StatCounter) and several volume metrics (page views, site visits), all of which indicate that Google's general search share was above 80-90% across the EEA countries since 2011. Table 3 shows an example extract of site visit market shares for several EEA countries based on data from AT Internet

and StatCounter. The EC also notes that there are high barriers to entry with several companies abandoning their own search technology (e.g. Ask.com and Yahoo!) while Microsoft is the only significant EEA entrant since 2007 (less than 6% share in any EEA country).

Table 3: Google, Bing and Yahoo market shares in general search in EE countries in 2016 (extract for a subsample of EEA countries)

Country in the EEA	Google	Bing	Yahoo!
Austria	94.2%	3.5%	1.8%
Belgium	94.1%	3.8%	1.1%
Bulgaria	97.8%	1.0%	0.8%
Croatia	97.2%	1.3%	1.2%
Cyprus	95.0%	2.5%	1.6%
Czech Republic	80.5%	1.9%	0.8%
Denmark	95.7%	2.6%	1.4%
Estonia	93.1%	1.8%	0.7%
Finland	96.3%	2.3%	0.9%
France	94.1%	3.5%	2.1%
Germany	93.2%	4.0%	1.6%

Source: For the full table including all EEA countries refer to Table 6 of the EC Google Android decision

iii. Dominance: Microsoft’s survey indicates consumers are unlikely to switch away from Google

The EC finds it unlikely that a substantial proportion of Google users would switch search service in the event of a small but significant non-transitory deterioration of the Google’s search quality. For this, the EC relies at Microsoft’s survey, which indicates that only 20% of consumers multi-home between multiple search engines in France, Germany, Italy, Spain and the UK (i.e. defined as conducting more than 5% of queries on at least two search engines) with Google primary search users multi-homing ~7 times less than the primary users of Bing/Yahoo. Therefore, there is a little scope to believe that many users would be switching their search away from Google to any additional search services they might be using.

1.4 Separate market for provision of non OS-specific web browsers

(a) Market definition

The EC concludes that non OS-specific mobile web browsers constitute a separate relevant product market. The EC argues that mobile web browsers developed for different small mobile OSs belong to the same product market. This is because, on the one hand, from a demand-side perspective, OEMs / MNOs and users can install web browsers that are developed for their OS, but on the other hand, from a supply-side perspective, a number of developers offer their web browsers for different mobile OSs (e.g. Chrome on Android and iOS) and a relatively small investment is needed to port a mobile browser app to a different OS from the one it was originally designed for. At the same time, the EC concludes that the market *does not* include:

- a) Web browsers for PCs: From a demand-side perspective, PC web browsers and mobile web browsers rely on different technology because of the differences between OS for PCs and smart mobile devices (e.g. screen size). From a supply-side perspective, it would require a significant time and substantial investments for developers of PC web browsers to switch to the development of mobile web browsers.
- b) Other apps: From a demand-side perspective, web browsers are a general entry point for accessing web content, and users do not download an app for each web page they visit. From a supply-side perspective, the development of a mobile web browser requires time and resources, therefore it is unlikely that a developer of other apps would start developing mobile apps in response to a small but significant, non-transitory quality deterioration of mobile browsers.
- c) OS-specific mobile web browsers (i.e. available only for a non-licensable smart mobile OS such as Apple’s Safari): From a demand-side perspective, these web browsers are available only as a part of a non-licensable smart mobile OS and thus are not an alternative for OEMs and MNOs. From a supply-

side perspective, developers are unlikely to switch from non-licensable to licensable OS web browsers in the event of a small but significant non-transitory deterioration of the quality of non OS-specific mobile web browsers as the strategy of these developers is based on the tight integration of hardware and software rather than on the licensing of their software to third parties.

While Google claims that Microsoft is an example of a company that launched its Edge browser for iOS and Android in October 2017, the EC notes that it is a direct confirmation of OS-specific mobile web browsers not being part of the same market: Microsoft launched Edge for Android and iOS only after it discontinued active development of its own OS (in July 2017). By contrast, prior to that, Microsoft never granted any license to its OS-specific mobile web browser (i.e. when the web browser was part of Microsoft's non-licensable smart mobile OS).

2. Empirical analyses to support Google's abuse of dominant position

2.1 Conduct: tying of (1) the Google Search app with the Play Store; (2) of Google Chrome with the Play Store and the Google Search app

The EC concluded that the tying of Google Search app with the Play Store constitutes an abuse of Google's dominant position in the worldwide market (excluding China) for Android app stores. The EC also concluded that the tying of Google Chrome with the Play Store and the Google Search app constitutes an abuse of Google's dominant position in the worldwide market (excluding China) for Android app stores and in the national markets for general search services.

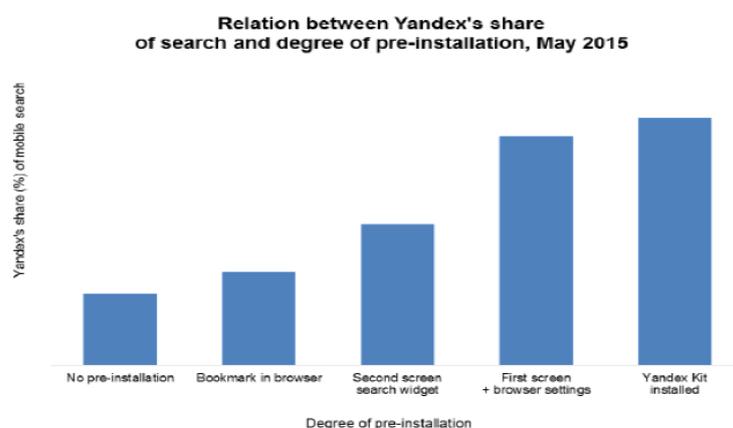
In its evaluation, the EC estimated effects of pre-installation on Google's usage and revenues as described in more detail below. The EC argues that pre-installation is important for service providers because it can increase significantly on a lasting basis the usage of the service provided by the app and by the web browser. This significant increase in usage is the reason why service providers, including Google, remunerate OEMs and MNOs for pre-installing their apps (on an exclusive or non-exclusive basis), for setting their services as default ("default setting"), and/or placing apps in a premium position on smart mobile devices ("premium placement").

2.1.1 Pre-installation is an important channel for distribution of general SEARCH APPS (e.g. Google Search)

(a) Pre-installation and default settings could significantly increase on a lasting basis the usage of the search apps

The EC uses multiple examples of how pre-installation of the search apps affected search engines' popularity in various countries during different periods of time. For instance, Yandex's analysis indicates that Yandex's general search share in Russia in May 2015 is 2-5 times higher on those Android devices on which its search widget was pre-installed on the home screen and set as default in the pre-installed mobile web browser. Figure 15 below illustrates Yandex's share of general search queries depending on installation status.

Figure 15: Yandex's share of general search queries on smart mobile devices depending on various scenarios of pre-installation and default setting



Source: Figure 18 of the EC Google Android decision

The EC points also into another example of increased usage due to pre-installation: Microsoft’s share in the US mobile search queries reached 15-25% in 2010-11 during which Microsoft has agreed with Verizon to pre-install Bing on six models of Google Android.

(b) Google gets consistently higher usage and revenues from mobile devices that pre-install Google apps

The EC concludes that Google itself enjoys higher usage and revenues from mobile devices that pre-install Google apps. First, the EC relies on the FairSearch’s study (see Figure 16 below) that looked at UK monthly app usage in February 2016 and evidenced that Google Search app was used by 76% vs 17% users of Google Android (pre-installed) vs iOS (not pre-installed, must download).

Figure 16: Comparison of usage of Google apps (pre-installation vs download on Android/iOS devices), United Kingdom survey, February 2016

Google Applications	iOS % Reach	Android % Reach
<i>Google Applications preinstalled on all smartphones</i>		
Google Drive (Mobile App)	1.873	39.118
YouTube (Mobile App)	50.438	68.918
Google Search (Mobile App)	17.405	75.538
Google Maps (Mobile App)	22.445	59.212
Google Play Movies (Mobile App)	0.263	4.048
Gmail (Mobile App)	11.58	57.521
Google Play Music (Mobile App)	0.436	14.516
<i>Google Applications preinstalled on some smartphones</i>		
Google Photos (Mobile App)	0.679	19.789
Hangouts (Mobile App)	0.879	8.318
Google+ (Mobile App)	0.863	15.215
Google Docs (Mobile App)	0.707	7.702
<i>Google Applications not preinstalled on smartphones</i>		
Google Earth (Mobile App)	1.693	3.103
Google Authenticator (Mobile App)	0.5	0.837

Source: Table 10 of the EC Google Android decision. Note: “Reach” - % of users who use the app at least once a month.

Second, the EC’s own analysis of general search queries data of mobile devices in France, Germany, Italy, Spain and the UK between 2014-17 indicates that on Windows Mobile devices (pre-installed Bing, but not Google Search) Google Search accounted for less than 50% of general search queries with Bing having shares ranging between [50-90]%. By contrast, on Google Android devices (Google Search practically always pre-installed), Google Search accounted for more than 90% of queries. The results of the EC’s calculations are presented in the Figure 17 below. While the EC’s calculations on revenues are redacted from the decision due to confidentiality, the EC additionally estimated Google having significantly higher worldwide revenues from general search apps on Google Android (i.e. mobile devices with pre-installed apps) than on iOS (no preinstallation) in 2014-16.

Figure 17: General search queries shares for general search services providers on Windows Mobile and Google Android

General search queries shares on Windows Mobile devices for largest EU countries				
	2014	2015	2016	2017
AOL	[0-10]%	[0-10]%	[0-10]%	[0-10]%
Ask	[0-10]%	[0-10]%	[0-10]%	[0-10]%
Bing	[50-60]%	[60-70]%	[70-80]%	[80-90]%
Google	[40-50]%	[30-40]%	[20-30]%	[10-20]%
Yahoo	[0-10]%	[0-10]%	[0-10]%	[0-10]%

General search queries shares on Google Android devices for largest EU countries				
	2014	2015	2016	2017
AOL	[0-10]%	[0-10]%	[0-10]%	[0-10]%
Ask	[0-10]%	[0-10]%	[0-10]%	[0-10]%
Bing	[0-10]%	[0-10]%	[0-10]%	[0-10]%
Google	[90-100]%	[90-100]%	[90-100]%	[90-100]%
Yahoo	[0-10]%	[0-10]%	[0-10]%	[0-10]%

Source: Table 11 of the EC Google Android decision.

Second, the EC reveals multiple examples of pre-installation driving up usage shares and being key to web-browsers' success in different countries across different time periods: (i) Six months after **Bing** was preinstalled in Mexico (July 2013) Bing's query share increased from [0-10]% to [50-60]%; (ii) Mozilla changed US default from **Google** in Firefox 33 to **Yahoo** in Firefox 34. As a result, Yahoo's (Google's) query shares were 29% (63%) vs 10% (82%) on Firefox 34 vs Firefox 33. (iii) Shares of **Yandex** in Russia were [5-10]% vs [20-30]% on the devices where Yandex browser was not vs was pre-installed; (iv) **Bing's** pre-installation on Nokia in India and Brazil drove its query shares to [20-40]% compared to [0-10]% in any EEA country.

(b) Pre-installation enhanced Google's revenues on a number of occasions

While the EC does not share details of its calculations due to confidentiality reason, the EC has also estimated that pre-installation has the ability to enhance Google's revenues:

- 1) Worldwide revenues from general search queries on Google Android devices in 2014-2016 via Google Chrome (pre-installed) are higher than those obtained via other mobile web browsers (not pre-installed);
- 2) Worldwide revenues from general search queries on iOS devices in 2014-2016 via Safari (pre-installed) are higher than those obtained via Google Chrome (not pre-installed).

(c) Competitors' web browser downloads cannot offset the competitive advantage from Google's pre-installed web browsers

Downloads cannot be compared in reach and effectiveness to the pre-installation of Google Chrome. To demonstrate this, the EC calculates that, in 2013-16 competing non-Google web browsers were downloaded only on a portion of mobile devices that had Google Chrome browser pre-installed: less than [40-50]% worldwide and less than [10-20]% in EEA.

(d) Competitors' web browser pre-installations cannot offset the competitive advantage from Google's pre-installed web browsers

Pre-installation agreements with OEMs and MNOs cannot be compared in reach and effectiveness to the pre-installation of Google Chrome web browser. The number of pre-installations on Google Android devices of each competing non OS-specific mobile web browser is significantly lower than the number of preinstallations on Google Android devices of Google Chrome. Figure 19 below shows that while Google Chrome is pre-installed on ~70% worldwide devices, competitors are only at [20-30]% for Samsung's browser; [10-20]% for Opera; [5-10]% for UC Browser; [5-10]% for Huawei since 2014.

Figure 19: Percentage of pre-installations of mobile web browsers on Google Android devices worldwide in 2013-2016

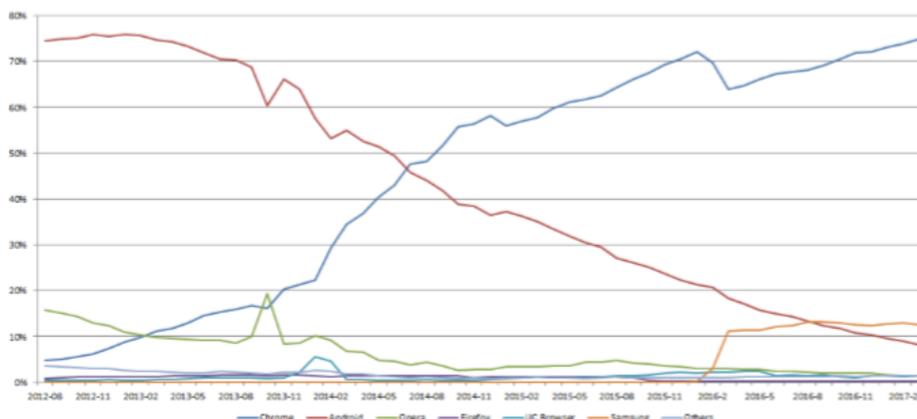
Mobile browsers	2013	2014	2015	2016
% of Google Chrome on Google Android devices	64.1%	67.3%	71.4%	69.0%
% of non-Chrome on Google Android devices	[50-60]%	[40-50]%	[50-60]%	[50-60]%
Of which:				
HTC	[0-5]%	[0-5]%	[0-5]%	[0-5]%
Huawei	[5-10]%	[5-10]%	[0-5]%	[5-10]%
LG	[5-10]%	[0-5]%	[0-5]%	[0-5]%
Mozilla	[0-5]%	[0-5]%	[0-5]%	[0-5]%
Opera	[0-5]%	[5-10]%	[10-20]%	[10-20]%
Samsung	[30-40]%	[20-30]%	[20-30]%	[20-30]%
Sony	[0-5]%	[0-5]%	[0-5]%	[0-5]%
UC Browser	[0-5]%	[0-5]%	[0-5]%	[5-10]%
Yandex	[0-5]%	[0-5]%	[0-5]%	[0-5]%

Source: Tables 19 of the EC Google Android decision.

(e) **Google's competitive advantage resulting from the tying and the inability of competing non OS-specific mobile web browsers to offset that advantage is consistent with the evolution of market shares**

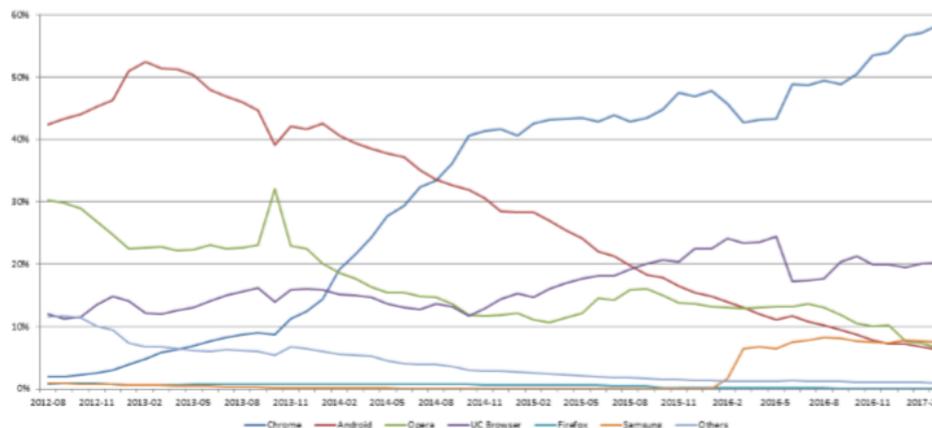
The EC compared the evolution of Google's usage shares on mobile devices and PC to confirm that browser pre-installations on mobiles were the reason of a relatively stronger mobile usage share growth. EEA usage shares of Google Chrome increased from 4.7% to 74.9% in 2012-17 on mobile web browsers, while only from 32.1% to 53.4% for PC. Similarly, worldwide usage shares of Google Chrome increased from 2.0% to 58.3% in 2012-17 on mobile web browsers, while only from 34.7% to 62.8% for PC. Figures 20 and 21 below demonstrate usage shares of non-specific mobile web browsers on both EEA and worldwide bases.

Figure 20: Usage share of non OS-specific mobile web browsers in Europe between August 2012 and March 2017



Source: Figure 21 of the EC Google Android decision.

Figure 21: Usage share of non OS-specific mobile web browsers worldwide between August 2012 and March 2017



Source: Figure 22 of the EC Google Android decision.

The EC notes that the increase in Google Chrome's usage share on non OS-specific mobile web browsers does not seem to be explained by a substantial quality advantage in the eyes of Android users as evidenced by Play Store app ratings. According to Play Store ratings data as of April 2017: (i) Google Chrome had an average rating of 4.3 (7.4 million reviews); (ii) Opera Browser had an average rating of 4.3 (2.2 million reviews); (iii) Opera Mini had an average rating of 4.4 (3.2 million reviews); (iv) Firefox had an average rating of 4.4 (2.8 million reviews); (v) UC Browser had an average rating of 4.5 (13.9 million reviews); and (vi) the UC Browser Mini had an average rating of 4.4 (2.8 million reviews).

In particular, despite being rated more highly on the Play Store than Google Chrome, Firefox continues to struggle to gain adoption on smart mobile devices (0.1% usage share on mobile web browsers in Europe in March 2017), despite much broader adoption on PCs (20.9% usage share on PC web browsers in Europe in March 2017).

2.2 Conduct: licensing of the Play Store and the Google Search app being conditional on the anti-fragmentation obligations

The EC noted that since at least 1 January 2011, Google made **the licensing of the Play Store and the Google Search app conditional on hardware manufacturers agreeing to the anti-fragmentation agreements** and this constitutes an abuse of the dominant positions in the worldwide market (excluding China) for Android app stores

and the national markets for general search services. These agreements prevent OEMs / MNOs from selling devices on modified versions of Android (“Android forks”).

The EC calculates that anti-fragmentation agreements between Google and OEMs covered 90-100% of worldwide (excl. China) smart mobile devices in 2013-2016 (excl. non-licensable OSs such as e.g. Apple⁷). And this prevented an entrance of multiple differentiated Android OSs (i.e. so-called “forks”) with Amazon’s Fire OS being the most prominent example. Amazon was not able to secure production from any OEM despite, as of 2013, 75% of the apps in Google’s Play Store being compatible with Fire OS and [700,000 – 900,000] apps having been developed for Fire OS.

2.3 Conduct: portfolio-based revenue share payments to OEMs / MNOs conditional on the pre-installation of no competitive general search service

The EC believes that a substantial number of Google Android devices sold in the EEA were covered under the **revenue share payment agreement**. The Commission concludes that between 1 January 2011 and 31 March 2014, Google abused its dominant position in the national markets for general search services by granting revenue share payments to OEMs and MNOs on condition that they pre-install no competing general search service on any device within an agreed portfolio. As a result, if an OEM or MNO had pre-installed a competing general search service on any device within an agreed portfolio, it would have had to forego the revenue share payments not only for that particular device but also for all the other devices in that portfolio.

The EC estimated that competing general search could not have offered OEMs and MNOs enough revenues to compensate for the loss of Google’s portfolio-based revenue share payments across the entire portfolio of Google Android devices:

- (i) First, each OEM / MNO that entered into revenue share agreements received payments for [70-80]% of Google search queries as Google did not grant revenue share for the remaining [20-30]% of Google queries.
- (ii) However, the EC uses data on combined non-Google query shares on mobile apps and browsers to estimate that pre-installation of a competing search app (in addition to the mandatory Google Search app) would have driven away from Google at most 22.5% of Google Search’s queries. Therefore competing search company has to suggest a larger proportion of revenue share payments for these 22.5% to match Google’s revenue share payments from [70-80]% queries. Depending on Google’s agreed revenue share terms, competing companies would, therefore, have to offer a revenue share between 30% to 150% per each device.
- (iii) Even if suggested revenue share is below 100% per above, it is still impossible to match Google’s revenues given that competing general search services would have had to compensate an OEM or MNO for the loss of Google’s payments across its *entire* portfolio of Google Android devices while being pre-installed only on *new* devices. This is because a competing general search service could not have been pre-installed on the devices already sold to users and on which an OEM or MNO obtained portfolio-based revenue share payments from Google.
- (iv) More detailed calculations and examples are given in Section 13.4.1.2 of the EC Google Android decision.

3. Consumer welfare: Google’s conduct tends to harm, directly or indirectly, consumer as it increases competitors’ barriers to entry and expansion and thus reduces innovation and consumer choice in general search apps, web browsers, and alternative Android OSs

3.1 Tying practices

The EC concludes that **the tying of the Play Store and the Google Search** as well as **the tying of Chrome with the Play Store and the Google Search app** reduce competitors’ incentives to innovate and invest in improvements such as algorithms and user experience design for both their search apps and web browsers and is therefore *capable of harming, directly or indirectly, consumers, who, as a result of Google’s interference with the normal competitive process, may see less choice of general search services and web browsers available*. This is because, as empirically evidenced above, Google’s pre-installation significantly boosts its usage, and Google therefore makes it harder for competing general search services and web browsers to gain search queries and the respective revenues and data needed to improve their services. The conduct further increases barriers to entry by

⁷ See Table 1 of the EC Google Android decision. Smart mobile OSs are developed by vertically integrated OEMs such as Apple or BlackBerry for use in their own smart mobile devices (“non-licensable smart mobile OSs”), or by providers such as Google or Microsoft which then license their smart mobile OS to OEMs (“licensable smart mobile OSs”).

making it harder for competitors to challenge Google's dominant position for general search services as competitors must spend substantial resources to overcome *the status quo* advantage of pre-installation.

3.2 The anti-fragmentation obligations

The EC concludes that **the anti-fragmentation obligations** reduce the incentives of market participants to develop Android OS variations ("Android forks") and provide distinctive features and additional functionalities to smart mobile devices, and therefore *tend to harm, directly or indirectly, consumers, who as a result of Google's interference with the normal competitive process may see less choice of smart mobile OSs suitable for their needs*. An illustration of this is provided by the example of consumers *not being able to purchase devices based on Fire OS*, a forked version of Android developed by Amazon that was generally considered as a high-quality fork of Android and which was prevented from finding even a single distribution channel due to OEMs being hesitant to manufacture Fire OS devices as this would breach the Google anti-fragmentation obligations. Amazon's plans to licence its Fire OS were eventually withdrawn and Amazon's internal documents as well as its correspondence with OEMs demonstrate that the anti-fragmentation obligations were an important cause of the failure of Amazon's efforts to license Fire OS.

3.3 The anti-fragmentation obligations

The EC concludes that **exclusivity portfolio-based revenue share payments** deterred innovation to the detriment of consumers as some general search services with more focused offering may not be able to achieve the scale and access to users that would allow them to invest in R&D. This is because Google has prevented competing search services from gaining incremental search queries and the respective revenues and valuable user data needed to improve and develop innovative features such as innovation in algorithm and user experience design. The portfolio-based revenue share payments also reduced Google's incentives to improve the quality of its general search service as it did not compete on merits with other search services. As empirically evidenced above, the competitors cannot match Google's revenue share payments due to both Google's strong position in search services and competitors' low pre-installation levels at the current devices.

CMA'S ONLINE PLATFORMS AND DIGITAL ADVERTISING MARKET STUDY (2019)

On 3 July 2019, the UK's CMA commenced a market study on online platforms and digital advertising in the UK, with emphasis on Google and Facebook. An Interim Report was published on 18 December 2019, and a final report is scheduled for publication early in July 2020. I discuss below empirical evidence only with respect to Google's position and conduct in the markets for general search and open display advertising provided in the interim report. Since this is a market study rather than litigation or merger control, the CMA has refrained from going into much detail on product market definitions and has left some aspects of it open.

The CMA predominantly relied upon (i) internal data from Search engines (including Google and Bing); (ii) third-party data providers such as Comscore and Statcounter; (iii) internal data and submissions from advertisers, publishers, and publisher ad servers; and (iv) publicly available financial statements.

The Interim Report's provisional findings were that Google has a dominant position in the market for general search advertising, and has a very strong position in various segments of a loosely defined market for open display advertising. These positions are further entrenched by barriers to entry and expansion specific to these markets, such as Google's default search engine position on most of UK's smartphones, or the economies of scale and scope associated with the processing of click-and-query data.

The Report also raises concerns regarding Google's ability to abuse these dominant positions, to increase its profits and exclude rivals. In search advertising, the Interim Report notes Google's ability to divert traffic away from rival specialised search services, its ability to design ad auction mechanism that maximize its own profits at the expense of users, and its ability to crowd out generic search results with paid search results. On the market for display advertising, the Interim Report highlights Google's ability to tie its various intermediation services to exclude rivals, or to benefit from the lack of transparency of the successive intermediation auctions system to extract rents from advertisers and publishers.

1. Market definition and market power

1.1 Google's dominant position in the market for general search advertising

- (a) *The CMA finds that specialised search services do not belong into the same product market as general search services except for possibly Amazon's specialised search services*

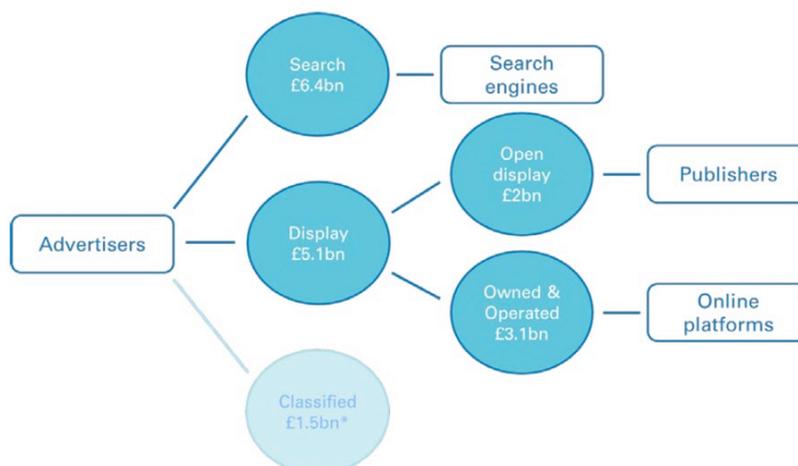
In the interim report on the market study “Online platforms and digital advertising” (“Interim Report”), the CMA considers the market for digital advertising as distinct from traditional offline advertising, as online advertisers can use data to target their audiences based on intent.⁸ Based on statements and evidence provided by media agencies and advertisers, the CMA further divides the market for digital advertising into the market for search advertising, the market for display advertising, and the market for online classified advertising. The market for search advertising is then broken down more narrowly into general search advertising and specialised search advertising. The analysis supporting this segmentation is presumably less sophisticated than it would have been in a litigation or merger control setting.

Google contested the CMA's approach and suggested that the market for specialised search services and the market for general search services should form the same relevant product market. However, the CMA disagreed almost entirely with one small possible exception (outlined below), referring to the Google Shopping decision, where Google also attempted to achieve a broader product market definition. Furthermore, the CMA referred to responses from advertisers that unanimously submitted that general and specialised searches are not substitutes. The CMA notes first that general and specialised search services appear to be considered as complements by advertisers, while specialised search services consider themselves as vertically related to search engines through which users usually find specialised search services.

The only possible exception is Amazon's specialised search services. This assessment is due to the fact that although Amazon is still accessed through Google Search often, it also generates a significant amount of searches from users directly starting on the Amazon webpage. In addition, the CMA notes that other specialised search engines such as Booking.com may fall into the same market once their name recognition reaches a degree at which they are not dependant on traffic from Google. The CMA emphasizes that these are merely “possible” exceptions, as it does not conclusively need to decide whether to include Amazon in the same product market or not for the purpose of this market study.

Figure 4 below illustrates the market for digital advertising and its estimated size.

Figure 4: Overview of the UK market for digital advertising.



Source: Interim Report, Figure 1

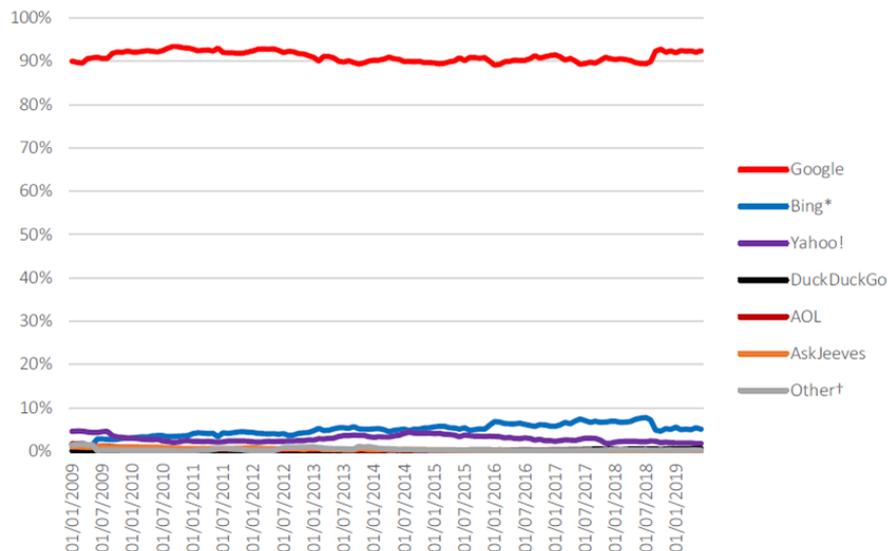
⁸ In the specific case of video advertising, the CMA acknowledges that TV advertising can be substitutable to online video advertising in certain circumstances (i.e. when a relevant audience can be defined based on a TV program). However, it also concludes that TV advertising is unlikely to constitute an effective substitute for smaller advertisers due to the scale required to purchase TV advertising.

(b) *Google has a very high share in general search advertising and faces only one relevant competitor*

The CMA calculated market shares for general search advertising, using different metrics, including page referrals, total page views, time spent on the given website, and revenue generated. According to the CMA estimates, Google has a market share of more than 90% in the market for general search advertising in the UK, both in terms of traffic and revenue. The only relevant and fully independent competitor in this market is Bing (operated by Microsoft). Bing's market shares were up to 8% both in terms of traffic and revenue.

For instance, using data on page referrals provided by Statcounter (a web analytics service that tracks visits to its member sites), the CMA found that Google had a share of supply of nearly 90% in the UK over the last ten years, while Bing's share of supply fluctuated between 1% and 8% over the same period. See Figure 5 below.

Figure 5: Google Search's share of supply by page referrals in the UK over time.



Source: Appendix C, Figure C.6

Supply shares measured in value provide a very similar picture: in 2018, Google generated approximately £6 billion in revenue through its general search advertising business. In comparison, the total size of the UK general search advertising market is estimated to be around £6.4 billion. In contrast, Bing only generated revenues of approximately £460 million in the UK in the same year, so only about 8% of total general search revenue.

(c) *Google's position in the different market for online generic search advertising is entrenched by barriers to entry and expansion*

The CMA notes that Google's dominance on search advertising is entrenched by several barriers to entry exist.

First, Google benefits from network externalities as access to user queries is key to drive participation of advertisers. As potential entrants need to compete with Google's ability to match advertisers' needs with a broad range of user queries, Google's scale represents a barrier to entry. Likewise, Google's default position on most UK mobile devices allows Google to generate more user queries, thereby attracting more advertisers.

Second, the CMA notes that transaction costs prevent the long tail of small advertisers to look for ad space on multiple platforms. As these small advertisers have to access Google's proprietary inventories, they most often single-home on Google Ads. This single-homing trend may in turn allow Google to run auctions characterized by higher bidding density, and thus to extract higher prices from advertisers.

Finally, Google's access to its own first-party data and the integration of its advertising and analytics services create an advantage in audience targeting and performance metering that constitutes an entry cost for potential entrants.

(d) *The search advertising auction mechanism does not preclude existence of market power*

In light of the previous points, the CMA concludes that Google could abuse its market power to increase its profits, despite the auction mechanism on which search advertising is constructed. According to the CMA, a dominant search engine has the ability to design the auction mechanism so as to extract higher prices from advertisers, and can sell more advertising space at the expense of generic search results. These options are described in more details

in section 5 of the Interim Report. The CMA identifies this as a potential concern as these distortions are likely to be passed on to consumers through higher prices.

1.2 Google’s strong position in the market for open display advertising

(a) *Google has a very strong position in several segments of the market for open display advertising in the UK*

Open display advertising consists of digital display advertising that are purchased and sold via an intermediary that is not itself a publisher. The CMA leaves open the question of whether all segments of the open display advertising market should be considered as distinct product market. However, it provides an overall estimate of Google’s market share. Based on conversations with industry participants, the CMA understands that Google has a market share of about 90% for open display advertising in the UK.

Using this share of 90%, the CMA attempts to reverse-engineer the size of the market as outlined below.

First, Google provided the CMA with the number and value of ads it provided through its three open display advertising products.

Second, Google provided the CMA with quantity and pricing data. More specifically, ads can be placed by Google either through one of its programmatic auction software or through other sources, such as from third-party ad networks. Google can observe quantity and prices for the former, but not for the latter, for which it only has data on quantity.

Then, the CMA assumed an average cost per mille/ thousand (CPM) of \$2 for the latter, based on average prices passing from supply-side platforms (SSPs) and ad networks in the UK. To the observed and assumed CPM, the CMA applied an upward adjustment to account for fees charged by demand-side and supply-side intermediaries.

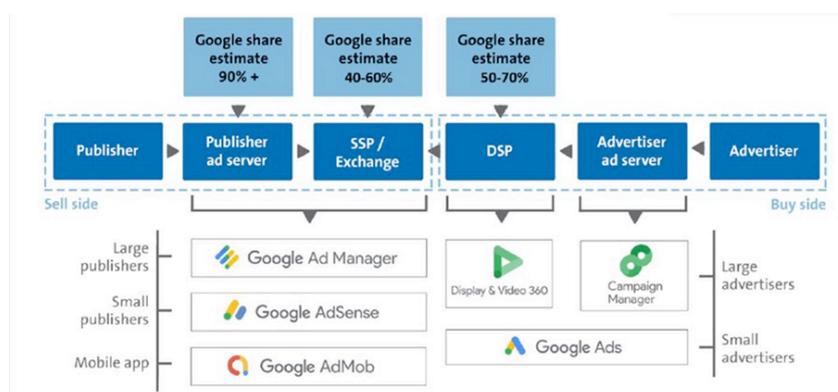
Using these steps, the CMA estimates that the size of the UK market for open display advertising is of £2 billion.

(b) *Google is the largest provider of publisher ad servers, SSP, and DSP services in the UK*

The CMA also estimated revenue shares in the different segments of the market for open display advertising. The CMA estimates that Google’s share of supply is of 90%, 40%-60%, and 50%-70% for publisher ad servers,⁹ SSPs,¹⁰ and DSPs,¹¹ respectively. However, the CMA could only use total revenues provided by the SSPs and DSPs from which it received data, so the numbers may be inaccurate and overstate Google’s shares.

Figure 6 below provides an illustration of Google’s publisher ad server, SSP, and DSP market shares. Furthermore, it illustrates how Google’s vertical advertising chain operates. The potential anti-competitive effects arising from this vertical integration are outlined further below.

Figure 6: Illustration of Google’s advertising vertical chain and its market shares for the markets for publisher ad server, SSP, and DSP services.



Source: Interim Report, Figure 5.10

⁹ Publisher ad servers manage the publisher’s inventory and are responsible for the decision logic underlying the final choice of which ad to serve, based on the bids received from different SSPs and the direct deals agreed between the publisher and advertisers. Publisher ad servers typically charge publishers a fee based on the volume of advertising processed.

¹⁰ SSPs provide the technology to automate the sale of digital inventory. They allow real-time auctions by connecting to multiple DSPs, collecting bids from them and performing the function of exchanges. They can also facilitate more direct deals between publishers and advertisers. SSPs are typically remunerated through a revenue share agreement with publishers.

¹¹ DSPs provide a platform that allows advertisers and media agencies to buy advertising inventory from many sources. DSPs bid on impressions based on the buyer’s objectives and on data about the consumers. DSPs usually charge advertisers a percentage of their media spend.

2. Conduct and issues

2.1 Google's potentially problematic conduct/ position in the market for general search advertisement

- (a) *Other general search engines do not have access to the same amount of data and cannot crawl websites to the same extent*
- (i) *Google benefits from its vast tagging coverage*

Some advertisers and platforms allow third-parties to install cookies and tags on their websites, which enable platforms such as Google to extract data from those websites.

Evidence submitted to the CMA (exact sources not specified in the report, though) suggests that Google has tagged 88% of all UK websites. In stark contrast, Microsoft has only tagged 1% of all UK websites. Oracle submitted that approximately 75% of the 100,000 top websites have Google Analytics installed.

Relatedly, Google collects data directly through consumer-facing services, of which it has 53 in the UK, including Google Search. In addition, Google receives data submitted through its Android apps. Therefore, through its Android apps, Google has a strong competitive advantage to other platforms with regards to data collection.

- (ii) *Smaller search engines may not have access to crawling information to the same degree Google does*

To enable search engines to find websites, the websites must allow search engines to crawl the web. For new or updated websites, search engines can submit crawl requests. However, webmasters are more likely to respond to requests from Google than less relevant search engines and thus, reduced crawling capabilities may make new entry into the market for general searches very challenging.

Amongst other reasons, increased bandwidth costs can lead webmasters to intentionally block some crawling requests. DuckDuckGo (a small search engine provider), for example, submitted that many webmasters block its crawling requests.

- (b) *Significant barriers to entry due to economies of scale*
- (i) *Google benefits from more click-and-query data than its competitors*

The CMA states that the possession of click-and-query data allows search engines to improve their search algorithms. This is particularly crucial for so-called "tail queries", which are search keywords that have not been used before. According to Google and Microsoft submissions, though, such "tail queries" account for 15% of all queries. Due its scale advantage and default position on mobile, Google's stock of click and query data constitute in itself a competitive advantage.

For this reason, in its preliminary conclusions on remedies and interventions, the CMA suggested that the voluntary sharing of proprietary Google click-and-query data could help bridge Google's scale advantage and allow rivals to compete.

In its response to the Interim Report, Google contended the relevance of this proposition. Google first argues that sharing click and query data would not produce any gain:

- Data sharing would not be effective as 15% of queries are unique and are not informed by past queries;
- Data sharing among rivals (Yahoo and Bing) never had any positive results due to diminishing marginal returns;
- Past initiatives from Google to share its click and query data did not have any material effects on competitors.

In addition, Google adds that such an intervention would likely be detrimental due to the following consequences:

- Sharing click and query data would deter innovation by revealing proprietary algorithms;
- Sharing click-and-query data would incentivize competitors to create Google-copycats.

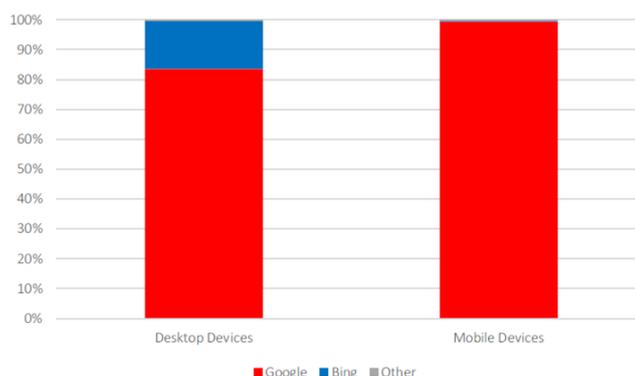
- (ii) *Indexing the web is associated with enormous costs*

Developing a web index and crawling the website is not only more difficult for smaller competitors due to webmasters blocking their crawl requests (as explained above), but also associated with substantial upfront cost. Competitors Yandex and Mojeek suggested that the economies of scale associated with web-indexing are a more serious barrier to entry and expansion than the blocking of crawl requests.

(iii) *Google paid \$1.3 billion to phone manufacturers in exchange for having Google Search as default browser pre-installed in the UK alone*

According to internal Google documents, the company paid \$1.3 billion to phone manufacturers for having Google Search as default-browser pre-installed, which accounts for about 16% of Google's search revenue in the UK. Due to network externalities on the search advertising market, Google's default position as a search engine on mobile devices allows it to generate more user queries, which in turn drives larger advertiser participation.

Figure 7: Proportion of desktop and mobile browser sectors for which Google and Bing hold default search engine positions.



Source: Appendix C, Figure C.10

(c) *Google's dominant position in the market may enable it to earn excess returns*

(i) *Google has generated unusually high profit margins, but profitability has declined since its peak in 2010*

Using Alphabet's revenue and earnings before interest and taxes (EBIT) from its public financial statements, the CMA estimated Alphabet's profit margins. These were as high as approximately 35% in 2010 but fell below 20% in 2018.

(ii) *Alphabet had a ROCE of 30% in 2018 compared to a WACC of just 9%, suggesting excess profits*

According to the CMA, excess profits can best be measured through the return on capital employed (ROCE)¹² to its weighted-average cost of capital (WACC), i.e., its cost to finance its capital. The CMA considers a ROCE that significantly exceeds the WACC over a long period of time as problematic and indicative of a potential competition concern. In a competitive market, the ROCE should decline and not exceed the WACC substantially as the business matures.

Using other similar NASDAQ companies as a comparison, the CMA estimated a WACC of 9% for Alphabet. The CMA used a CAPM approach to estimate the cost of equity component of the WACC. However, the CMA estimated Alphabet's ROCE at an average 47% over the last twelve years, and as high as 81% in 2010. In 2018, the ROCE declined to 30%, though this still vastly exceeds the WACC.

(iii) *Alphabet's Google segment (including Google Search and YouTube) had a ROCE of 38% in 2018 and 44% when factoring out the EC fine*

Since Alphabet's business can be broadly split into the Google segment (Google Search, AdSense, Ad Manager, Gmail, YouTube, etc.) and other ventures (e.g., various research-intensive projects such as self-driving cars), the CMA calculated a separate ROCE restricted to the Google segment.

Confining the analysis to the Google segment, the CMA estimated a Google-only ROCE of 38% in 2018. Since Google accrued an EC fine in 2018, this Google-only ROCE would have been as high as 44% had Google not been fined.

To estimate a ROCE specific to Google Search, the CMA sought to measure the revenues attributable to search, to measure direct costs, to estimate the operational costs that should be appropriately allocated to the search business, and to estimate the required investment to build the search engine platform. To do so, the CMA

¹² The ROCE is defined as EBIT divided by capital employed (total assets including cash and marketable securities minus current liabilities). See Appendix D, ¶ 15.

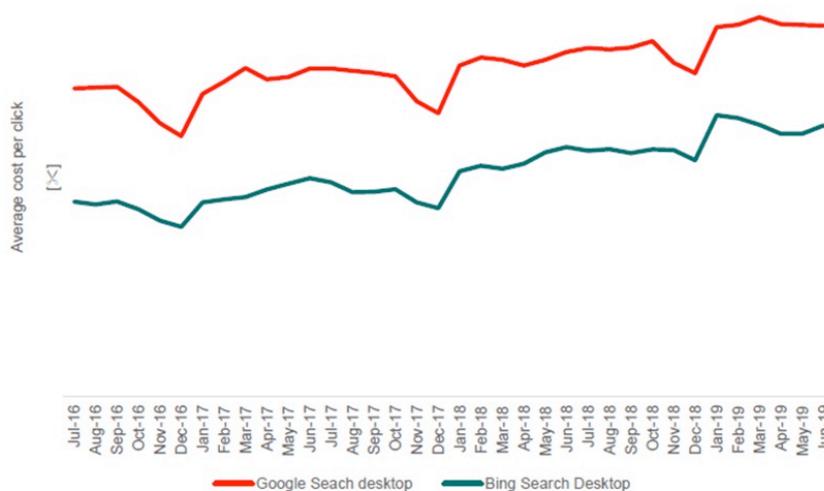
supplemented publicly available information from Alphabet’s financial statements with information provided by Alphabet, such as cost allocations across business segments and geographies.

(iv) *There is evidence that Google charges advertisers more than Bing*

Google has had a higher cost per click than Bing on average. However, Google and Bing’s average cost per click (“CPC”) for searches on mobile phones have been converging and Google’s CPC were only somewhat higher than Bing’s on average in May 2019 (exact values are redacted in the Interim Report). For searches performed through desktops, the average costs per click have not converged for the two providers. Figure 8 below shows the parallel trend for desktop search advertising between Google and Bing.

These price differentials are limited insofar as they do not account for any differences in quality. Google’s superior targeting abilities may yield higher customer conversion rates and explain these price differences.

Figure 8: Monthly average cost per click for desktop search advertising in the UK over time.



Source: Appendix C, Figure C.24

2.2 Google’s potentially problematic conduct/ position in the market for open display advertisement

(a) *Further consolidation in the markets for DSPs, SSPs, and publisher ad servers*

First, the CMA notes that the market for open display has been characterized by a trend of consolidation and market exits, but acknowledges that this trend can be explained by cost reduction and increased efficiencies. For example, an ad server provider submitted to the CMA that following the acquisition of DoubleClick, Google lowered its price charged to publishers by factor ten. Consequently, less efficient competitors (due to their lack of enough scale) may exit the market.

The CMA however investigated whether this trend had adverse effects on prices. The CMA conducted simple calculations to determine the average fees charged by SSPs and DSPs, arriving at weighted average percentage cuts of advertising fees of 18% and 22% for DSPs and SSPs, respectively. The figure for SSPs also include ad networks, which are different insofar as they combine supply- and demand-side intermediation. If the calculation is restricted to pure SSPs, then the weighted average percentage cuts of advertising fees is 15%. This analysis did not lead the CMA to express concerns regarding Google’s pricing schemes.

(b) *Vertical integration of intermediary services*

In addition to the concentration trend outlined above, the CMA also describes a strong trend towards vertical integration, with Google present at every level of the vertical chain of intermediation.

The CMA describes four ways through which Google’s vertical integration could have harmful anti-competitive effects: (i) by using its market power in inventory and data to advantage its own DSP services (Google Ads and DV360); (ii) channelling Google Ads demand through Google’s SSP (AdX) and limiting the integration of AdX with rival publisher ad servers; (iii) self-preferring between Google’s publisher ad server and AdX; and (iv) self-preferring between Google’s DSP and SSP.

Among these concerns, the CMA highlights Google’s ability to tie its advertiser demand (Google Ads) with its ad exchange (AdX) and with its publisher ad server (DFP). For instance, Google AdX does not compete in real time

with other SSPs when receiving requests from non-Google ad servers, nor does it participate to so-called “header bidding” auctions.

Header bidding began to be widely adopted in 2015 as a mechanism to increase competition between SSPs and generate higher revenues for publishers whereby several SSPs can be called and submit their bids simultaneously, before the publisher ad server is called. Header bidding was a way from publishers’ perspective to run auctions effectively outside Google’s ecosystem. However, it is undermined by Google’s refusal to participate in it.

Publishers have told the CMA that, because of this refusal to participate, the only solution to access AdX demand efficiently is to rely on Google’s ad server.

More generally the CMA considers that vertical integration can give rise to conflicts of interest and allow companies with market power at one stage of the value chain to leverage it in other parts of the industry, potentially foreclosing competing providers and/or exploiting publishers.

To this effect, the CMA estimated Google’s ad tech “tax”: the cumulative fee collected by Google along the intermediation chain. This “tax” applies since at various stages of the ad placing process, fees are deducted by intermediaries, such as DSPs and SSPs. The CMA compared Google’s outpayments to its revenues, suggesting that small publishers using Google AdSense appear to retain between 60%-70% of advertisement revenue whereas large publishers using Google Ad Manager appear to retain between 70%-80%. However, the actual percentage of advertisement revenue retained by publishers is likely lower on average, because some publishers may not rely on Google for the entire intermediation process (e.g., may choose a non-Google DSP).

(c) Google’s DSP business might be deliberately exploiting the lack of transparency in the open display advertising intermediation process

Another concern expressed by publishers and investigated by the CMA is Google’s ability to profit from the lack of transparency of successive auction schemes to extract hidden rents from advertisers and publishers.

In simple terms, because Google and some other intermediaries operate on the buy-side and sell-side of multiple auctions, there are concerns that hidden fees may be borne by both advertiser and publisher customers due to the conflicting interests of auctioneers.

More specifically, advertisers purchasing ad space through Google Ads engage in a second-price auction, where the highest bidder wins but pays the second-highest bidding price. Then, Google Ads bids for ad space in the name of this bidder through SSPs, against other DSPs. These different prices bid along the intermediation chain are not known to all the parties involved: advertisers only know how much they bid in the first DSP auction, while publishers only know how much is paid on the second SSP auction.

This lack of transparency raises a competition concern, as some publishers have suggested that this successive auction mechanism allows Google to exploit the “thick” DSP market (i.e., many advertisers bidding) by obtaining high bids (and payments) in the Google Ads auction, but then only submitting lower bids to SSPs despite high demand on the DSP side. In such cases, Google would extract rents from publishers, by extracting part of the surplus generated by the meet of supply and demand. In other words, Google might be exploiting an information gap, because publishers may not be aware of high demand for ad spaces and thus accept low bids, mistakenly believing that these accurately reflect the balance between demand and supply.

As a result of this conduct, and to prevent Google Ads from collecting ad space at a low price, publishers used to rely on a feature of Google’s publisher ad server (formerly DFP, now falling in Google Ads Manager), allowing them to set different auction floor prices for different demand partners. Publishers hence set higher price floors for Google Ads, precisely to prevent it from collecting ad space at low cost. However, Google Ad Manager no longer enables publishers to set price floors differentiated by demand partners.

The CMA has not provided any quantitative evidence on this at this stage but intends to do so in the final report.

Some publishers have made submissions to evidence such a conduct, namely that Google is able to win auctions at a price slightly higher (by a few pennies) than competing SSPs. This hurts both publishers and rival SSPs. More specifically, empirical evidence points to the following mechanisms and effects:

- Google Ads wins a substantial fraction of impressions following header bidding auctions at a price just above the winning header bidding bid.
- Google harms both publishers and rival SSPs by not participating in competing solutions such as header bidding. Google effectively benefits from forcing a sequential auction system rather than having AdX participate in header bidding simultaneously with other SSPs.

Google’s failure to participate in header bidding can have direct and indirect effects. First, Google’s conduct directly lowers the competitive intensity in the ad auction, and hence the yield publishers would earn. Second, it

has an indirect effect by reducing the volume of impressions flowing to rival intermediaries, depriving them of scale and contributing towards the industry tipping towards Google. Publishers' submissions aim to illustrate and empirically quantify these effects.

Google has argued that its novel auction mechanism would alleviate these concerns. Indeed Google recently introduced a unified first-price auction (a.k.a. Unified Pricing Rules, "UPR") in which the winning header bidding SSP, the DSPs bidding into AdX, and SSPs participating in Open Bidding can all take part. As part of this transition, Google has claimed it has removed AdX's ability to observe the bids submitted by header bidding SSPs before running its own auction, the so-called 'last look' advantage.

Publishers have contended Google's claim that this move should lead to a fairer competition between different SSP for two main reasons:

- Conflict of interests are still present as Google's proposed solution still involves both Google receiving information on all bids and Google participating to the auction.
- The ancillary decision by google to restrict the data available to participants of the unified auction makes it difficult for non-Google SSPs to demonstrate their added-value for publishers, while publishers will have less incentive to sustain the costs of integrating non-Google SSPs through header bidding.

From what can be seen in the CMA Interim Report and Google's public response to it, no tangible evidence has been provided by Google to demonstrate that the UPR mechanism will solve the concerns identified by the CMA. In addition, due to recent data sharing restrictions, it has also become more difficult for publishers to prove the opposite.

3. Consumer welfare

3.1 Potentially welfare-enhancing effects

(a) *Google's web-indexing capabilities and large volume of data may improve the quality of targeted advertising*

The CMA suggests that both consumer and producer welfare may increase as a result from more purchases due to a higher quality of targeted advertisement. While the CMA does not mention Google in this context specifically and discussed the beneficial effects of targeted advertising in very general terms, this may suggest that Google's web-indexing capabilities and large volume of data (in particular, click-query data enhancing "tail queries", but also other data collected through its universe of Android apps, for example) may help consumers to find the right products more easily and thus lead to more purchase. The CMA does not perform any analyses to substantiate any potential welfare-enhancing effects of better targeted advertising.

(b) *Technical efficiency gains in the advertising intermediation chain may translate into welfare gains*

As discussed in the section on vertical integration, Google's advertising intermediation chain may yield technical efficiencies, e.g., due to easier matching between DSP and SSP cookies. Such technical efficiencies benefit both advertisers and publishers as well as could potentially translate into more effective ad placement in return. This could again benefit consumers. However, the CMA does not discuss any potential pass-on effects to consumers. Furthermore, it is not entirely inconceivable that such benefits are extracted by the advertisers and publisher, i.e., just increasing producer welfare rather than consumer welfare.

3.2 Potentially detrimental effects on welfare

(a) *Google may abuse its market power to charge anti-competitive prices to advertisers and publishers*

(i) *Google may overcharge advertisers, though the evidence is very weak and circumstantial*

Google's dominant position in the market for general search advertising might enable it to charge anti-competitive prices from advertisers. If Google were to charge higher prices than it would in the competitive counterfactual world, then this could result in loss of consumer welfare, because advertisers may pass their higher cost per click on to consumers through higher prices. However, the CMA has not presented any convincing evidence for this at this stage and the small example of higher average cost per click may be due to differences in quality, as acknowledged by the CMA.

(ii) *Google has the incentive and ability to extract rents from publishers*

As explained in the section on Google's possible conduct in the DSP business, Google has the incentive and ability to exploit/extract rents from publishers due to strong conflicts of interest. Thus, publishers might earn less in terms of ad space revenue than they would in the competitive counterfactual scenario. Ultimately, publishers may then invest less in content, harming consumers. From a welfare perspective, less quality content may reduce engagement, thus fewer ads being viewed and as a consequence, less purchases. This would lower both consumer and producer surplus.

CONCLUSIONS

The main high-level take-aways from the previous sections are possibly the following:

- The cases brought against Google by the EC, and the Digital Advertising market study of the CMA, are based on a wealth of *evidence*. This evidence exists, it takes an effort to collect and analyse it, and of course the parties will respond strongly with their own evidence and interpretation. Still, it all starts from evidence. There is no such thing as an ideological stance, or a protectionist approach of Europe against the US. In the digital space, it happens (for various reasons) that US firms are the most successful ones in Europe, and therefore one naturally looks at their behaviour in that space. There is plenty of other cases where the EU went against European firms in other industries when they happened to be the dominant firms, the 2019 prohibition of the Alstom/Siemens proposed merger in high speed trains is just one among many other examples that I could make.
- Competition policy can and should deal with abuse cases like the ones I have described in this report. At the same time, it has also become apparent how slow the intervention is. There is no timeline to close a case and the companies involved will do all what they legally can to slow down the process. In fast evolving digital industry subject to network effects, this means that, at the end of the case, it will be very difficult if not impossible to repair for the competition lost in the meantime, and for the many companies that went bust during the years it took to conduct a case. Also, in my experience and despite having an overall positive view of the work done by the EC in these cases, enforcers did not devote enough thinking, at the outset of each case, of what theory of harm they really wanted to pursue and what kind of remedies would have been required to solve the case. We see this especially with the Shopping case, where the remedies proposed by Google at the end of the case are not satisfactory three years down the line, though they probably respond to the letter (though not to the spirit) of the decision.
- These problems have certainly been recognised internally by the EC (though in their communications the message is much more nuanced). Many commentators, including myself, have thus recommended to complement ex post competition policy with ex ante regulation, like it is been done in other industries with strong network effects (think of telecoms, energy, railways). Some digital platforms have become essential facilities in many countries (Google for search, Facebook for social networks among certain group ages, Amazon possibly in electronic marketplaces). The key in these industries is to make sure that externalities are not lost (they do generate efficiencies) but should not accrue exclusively to only one firm specifically, as this would be unsustainable for competition. Indeed, in the traditional network industries I just mentioned, the tension between competition and investments has been finely tuned by regulators over time. Analogies with those industries should be seriously taken into account. The EC Commissioner Vestager largely agrees with this view and we are expecting to see the direction the EC will take with ex ante regulation early next year.
- A difference, though, with traditional network industries is that those are still largely national. Instead, digital giants are global and with economic and political resources that are not comparable to any other previous example. Hence, I do not think a piecemeal approach will ever be successful. There are great initiatives currently under way in the digital space not only in the UK, but also in France, Germany, Australia, for instance. But each one of them is just too small to challenge the digital giants. Despite this being a very bad time in history for a multilateral approach, this is the only way to go to find solutions to what is certainly a global problem.