

Appendix Q: exploitation of market power

Introduction

1. We have found that Google and Facebook have market power in search and display advertising, respectively.
2. An important consequence of this market power is that it creates conditions where it is more difficult for rivals to compete on an even basis with Google and Facebook. This can be exacerbated by certain aspects of Google's and Facebook's behaviour that make it more difficult for rivals to compete, which can in turn reduce the ability and incentive for rivals to innovate. It is very hard to assess the scale of harm to consumers from the loss of innovation that otherwise would have happened. However, in our view it could be very high, particularly given the strategic significance of Google's search engine and Facebook's social media platform as key gateways for businesses to reach consumers.
3. This appendix looks at how Google and Facebook can exploit their market power in digital advertising in a static sense, for example through setting higher advertising prices. In most markets, market power translates directly to worse market outcomes, such as higher prices. In digital advertising, prices are set by auction, based on the bids submitted by advertisers, rather than being set directly by suppliers. This raises an important question as to whether digital advertising platforms with market power have the ability to influence the prices that advertisers pay. Higher advertising prices matter, as we would expect them to be passed on to consumers through higher prices of goods and services across the economy.
4. Below we therefore assess how Google can exploit the market power of its search engine and at how Facebook can exploit market power in display advertising.

Search

5. In this section we set out:
 - how search engines maximise revenues when selling search advertising;
 - the ability of search engines to influence market outcomes;
 - how competition affects the incentives for search engines to influence market outcomes; and
 - evidence of how Google's behaviour has affected market outcomes in practice.

How search engines maximise revenues

Basic characteristics of search advertising

6. Search advertising inventory takes the form of links that appear in search engine results pages (SERPs) in response to user search queries. These links are shown alongside organic search results, leaving the user to decide whether to click on the advertising links or the organic search results.
7. Google currently shows two different types of ad, text ads and specialised product listing ads (PLA).¹ Text ads provide a link to a website with a short description whereas PLA provide a link to purchase a product, a link to the provider's website and an image of the product.
8. Advertisers choose which user search queries they want their ads to appear in response to by selecting keywords. The search engine then matches these keywords to user search queries.
9. Search engines can show multiple ads per search and categorise this advertising inventory according to ranking. Higher ranked ad inventory is shown nearer the top of the SERPs and is more likely to be clicked on by users, all else equal.
10. In the vast majority of cases, advertisers will only pay the search engine when a consumer clicks on their link. Prices take the form of cost-per-click ('CPC'). In a small minority of cases advertisers may choose to pay for impressions² or for conversions.³
11. Search engines typically use second-price auctions to set the prices for advertising inventory, where the price paid by the advertiser that wins the auction (and so the right to display the link in relevant search results) is determined in part by the value of the next highest bid.
12. A key feature of search advertising auctions is that the ranking of bids is also determined by 'quality' (in particular the relevance to the search query of the underlying content of the advertiser website to which the advertising links). Search engines assess quality directly and use this assessment to weight bids from different advertisers on a real-time, in-auction basis. These

¹ Google currently allows a maximum of eight text ads to appear on every SERP, four at the top of the page and four on the bottom of the page. These limits and the way search advertisements are presented have changed over time.

² If buying impressions, the advertiser pays whenever the link appears in the search results, regardless of whether the consumer clicks on the link.

³ If buying conversions, the advertiser pays whenever the customer performs a follow-on action such as completing a transaction on the advertiser's website.

weightings have a direct bearing on whether the advertiser's link is displayed in search engine results at all for any given search and on the price if the ad is displayed. Higher quality will mean the search engine places greater weight on the advertiser's bid, with the result that its advertising is more likely to appear in search results and at a lower cost-per-click. The price paid by the winning advertiser is equivalent to the bid that would have been required to match the second-highest bid, given the relative quality weighting of the two bids, or the reserve price if there is no second-highest bid that is eligible to show.

Maximising revenue

13. Most of the costs faced by a search engine are fixed in the short term. A profit maximising search engine will therefore need to consider how to maximise the revenue it generates. The total revenue a search engine makes from advertising is the product of the following three outcomes:
 - a) the total number of searches;
 - b) the quantity of advertising clicks sold per search;
 - c) the price of each click (CPC).
14. Search engines can influence the total number of searches either by attracting new users or by influencing existing users to carry out more searches. In practice, search engines are likely to face trade-offs in taking actions that increase the revenue from each search but decrease the total number of searches. In particular, increasing the quantity of ads shown may drive higher CTR but may harm the overall volume of searches, as users may switch to alternative search engines or decide to perform fewer searches. Increasing the quantity of ads may also lead to lower CTR over the long term if it results in users learning to avoid clicking on ads altogether. As discussed further below, this constraint is particularly relevant for understanding competition between search engines.
15. The quantity of ads sold is determined by the number of impressions and the propensity of users to click on the ads that are shown, known as the 'click-through rate' (CTR). Users are more likely to click on ads when they perceive them to be relevant to their query. This provides a rationale for the search engine to weight bids by quality when conducting auctions.
16. The revenue earned from each ad is given by the product of the price of each click and the clickthrough rate (CPC x CTR). In selecting and ranking multiple ads in response to a query, search engines take account of the total revenue each ad is likely to generate ie (CPC x CTR), rather than simply the

advertiser's bid. This means that it may sometimes be preferable for a search engine to rank an ad more highly if it is likely to be clicked on by users more frequently, even if the advertiser has bid a lower CPC.

17. In order to maximise the total revenue from a search, a search engine needs to maximise the sum of (CPC x CTR) for all of the ads shown. Because organic results are effectively provided by the search engine for free and do not generate revenue, to generate more revenue search engines ideally want to increase the CTR for the ads shown in aggregate by influencing users to click on paid advertising rather than organic results.

Ability of search engines to influence market outcomes

18. To the extent that search engines are able to influence the number of searches, the prices (CPC) or the quantity of ads sold per search (CTR), they are able to increase the revenues they earn. This section discusses the various 'levers' at their disposal to do so, including:
 - the ad load and presentation of ads;
 - the way quality is weighted;
 - the reserve price;⁴
 - the keyword matching algorithms used to determine auction eligibility;
 - automated processes carried out on behalf of advertisers such as automated bidding; and
 - influence over advertiser campaign options.
19. For each lever, we discuss below the mechanism through which it may affect the CPC, CTR and number of searches. Each lever may affect more than one outcome and consequently the search engine may face trade-offs in their use.
20. We then set out Google's views on its ability to adjust these levers.

Ad load and presentation

21. Search engines can determine the overall limit on the number of ads that can appear in search results and how these ads are presented alongside organic search results. Showing a greater proportion of ads relative to organic search results can increase the propensity of users to click on ads, driving up the

⁴ The reserve price determines the price paid by the advertiser if there are no sufficiently high competing bids.

quantity of ads sold. Similarly presenting ads in a way that attracts consumer attention, or in a way that makes them less distinguishable from organic search results, can increase the propensity of users to click on them. Both text ads and PLA can be shown at the top of the SERP where consumers are more likely to click, resulting in organic search results appearing further down the SERP.

22. Allowing more ads, or more prominent ads, to be shown for each search can generate additional revenue for the search engine through increasing the CTR for advertising inventory at the expense of organic traffic. However, allowing for a greater ad load may also mean that some are less relevant to the user search query, compromising the quality experienced by the user. If users are able to switch to alternatives, this may reduce the overall volume of searches. Consequently, a search engine may face a trade-off between driving higher CTRs (and so revenues per search) and maintaining user quality to drive a higher overall number of searches.

Weighting for quality

23. As mentioned above, a key feature of search auctions is that advertiser bids are weighted for quality in determining the outcomes of the auction. Search engines have flexibility in how they weight for quality. This process is one way that search engines can influence outcomes and prices.
24. As discussed above, even a search engine that is solely interested in maximising revenues per search (CTR x CPC) will want to weight for quality to some extent to ensure that the ads which are shown are more likely to be clicked on. However, this does not account for the trade-off between driving higher revenues per search and maintaining user quality to drive a higher overall number of searches. To account for this trade-off, a search engine may want to put additional weight on quality, or alternatively to generate greater revenues it may not put any additional weight on quality.
25. In practice, Google may be able to generate greater revenues through how it weights quality in two ways. One way may be for Google to reduce the relative weighting placed on quality compared to advertiser bids in its auctions. This may result in more direct competition between advertisers on price and more ads being shown, resulting in increased revenues.⁵ An alternative way is for Google to set lower Ad Rank Thresholds.⁶ This would

⁵ Revenue Optimization in the Generalized Second-Price Auction, David Thompson and Kevin Leyton-Brown, 2013.

⁶ The Ad Rank Threshold is a quality-adjusted reserve price and determines the threshold an advertiser's quality-adjusted bid would need to exceed for the ad to appear in search results.

result in more ads being shown, increasing the ad load at the expense of relevance to users.

Reserve prices

26. Search engines are also able to determine the reserve prices used for auctions. Increasing reserve prices can lead to higher price outcomes in search auctions, where there are bids that exceed the reserve price set. This effect can either be direct, or indirect:
- In auctions where only one bid exceeds the 'Ad Rank threshold', advertisers pay the reserve price because no other competitors are eligible to show. Advertisers pay the reserve price of about 50-70% of the time (impression weighted), representing about 10-30% of Google's revenues.
 - In auctions where multiple bids exceed the reserve price, the reserve price will directly affect the price paid by the lowest ranked (lowest ad position) bidder in the same way. The reserve price is also likely to influence the equilibrium behaviour of all of the other bidders in the auction, indirectly affecting the equilibrium prices for the higher ranked ad inventory as well. This is because from an advertiser's perspective a higher reserve price increases the cost (and so reduces the ROI) of the lowest position ad inventory relative to the other ad inventory. The result will tend to be that all advertisers will want to bid more in equilibrium.⁷
27. In practice, Google's Ad Rank Threshold also acts as its reserve price. This means that Google may face a trade-off in that higher Ad Rank Thresholds may drive higher prices but also result in fewer ads being shown. However, we note that the Ad Rank is auction specific and varies over time. This means that Google, insofar as it has insight into the likely pattern of bids in different types of auction, could set higher Ad Rank thresholds in some auctions to drive higher CPC and lower Ad Rank thresholds in other auctions to drive higher ad load.

Keyword generation and matching

28. Search engines use algorithms to match keywords chosen by advertisers to relevant user search queries. This determines which auctions advertiser bids are eligible for. It is therefore possible for the search engine to influence which auctions advertisers participate in. For example, a search engine can make advertisers bid into more auctions by matching the chosen keywords to a

⁷ See 'Optimal Auction Design and Equilibrium Selection in Sponsored Search Auctions', Edelman and Schwartz, 2010.

broader set of queries. In addition, while advertisers have discretion over choice of keyword, search engines can influence this choice through tools (such as Google's keyword planner) which assist the advertiser by generating keyword ideas.

29. The way keyword generation and matching algorithms work can influence both the quantity of ads shown and prices as they determine the auctions that bids are eligible for. All else equal, broader matching would lead to more competing advertiser bids and therefore to higher revenues per auction. Broader matching may also lead to lower quality ads being shown, ie ads that were less relevant to the user query. This may reduce the quality of the user experience. The search engine may therefore face the same trade-off between driving higher revenues per search and maintaining user quality to drive a higher number of searches.

Automated bidding

30. With automated bidding, advertisers provide the search engine with a performance goal (eg to maximize clicks or maximize conversions for a given budget) and then allow the search engine to use algorithms to dynamically set CPC bids to meet the advertiser's stated performance goals. For 2019, [40-50%] of Google's UK search advertising revenue came from advertisers using automated bidding, while the remainder set maximum CPC bid limits.⁸
31. Automated bidding has the potential to substantially improve advertising performance on behalf of advertisers. However, from an advertiser's perspective, automated bidding is a 'black box' as the algorithms can be highly complex, relying on machine learning processes and incorporating various informational signals (which may for example be based on information about the user or the context of the query) that the advertiser does not have access to. This is further complicated by the fact that the search engine may carry out automated bidding on behalf of multiple advertisers competing in the same auctions.
32. Reflecting its opaque and complex nature, we heard concerns that automated bidding has the potential to be implemented by the search engine in a way that results in equilibrium auction outcomes that are worse for advertisers collectively ie where prices are higher or more ads are shown, generating greater revenues for the search engine at the expense of higher net advertising costs for advertisers. For example, a travel search provider submitted that controlling both the mechanics (setting the rules) and dynamics

⁸ Google response to CMA RFI, 30 April 2020

(controlling advertisers bids) of search ad auctions, if left unchecked, could allow Google to extract maximum advertising revenue for itself without creating additional advertiser value or consumer benefit.

33. In addition, we note that the use of automated bidding instead of setting a maximum CPC raises the risk that some of the advertising bought may have a negative ROI for the advertiser. This is likely to be a risk particularly for smaller or less sophisticated advertisers.

Influence over advertiser campaign choices

34. In order to buy ads on Google, advertisers access the Google Ads interface where they can choose the keywords they want to target, the matching algorithm and their bidding strategy. These choices determine the eligibility of the advertiser's bids for different auctions which, among other factors, may influence the prices paid by advertisers.
35. There are ways in which Google can influence advertiser's choices when setting up and running campaign on Google Ads. For example, Google pre-selects various options by default. These are discussed in more detail in Appendix N. In principle, this may allow Google to influence advertiser choices in a way that results in greater revenue for Google at the expense of higher costs for advertisers. Again, this is likely to be a risk particularly for smaller or less sophisticated advertisers.

Google's views on ability to influence auction outcomes

36. Google told us⁹ that any ad-supported content provider across all types of media has to decide on various parameters, including the maximum number of ads shown, the actual number of ads shown, the price of an ad in different positions and the reserve price. Changing any of these parameters may change the advertising auction. Consequently, Google told us that the view we expressed in our interim report that 'Google could in principle apply its various levers to exploit market power' applied equivalently to any other ad-supported content provider in other media.

How competition affects incentives to influence outcomes

37. Search engines are two-sided platforms that compete for both consumers and advertisers. Search engines attract consumer attention through offering high-quality, relevant search results and then monetise this attention by offering the

⁹ Presentation by Hal Varian, Google / CMA meeting 26 February 2020.

opportunity for advertisers to incorporate relevant advertising into these results.

38. Below we discuss how the competitive constraints on search engines from users and advertisers may affect a search engine's incentives to use the 'levers' described in the previous section to generate revenue. We then explain based on this how we would expect market power to affect outcomes.

Competition for users

39. Search engines can compete over quality to attract users and increase the number of searches carried out. This allows search engines to sell a greater quantity of advertising inventory and generate more revenue. As set out in Chapter 3, we have identified five main dimensions of quality, including the relevance of results, ease of use, the attractiveness of the interface, privacy and trust and user rewards and incentives.
40. As highlighted above, an important trade-off faced by a search engine is between the ad load and the quality of search results to users. The more ads are shown, the more likely some will be less relevant to the user search query, compromising the quality experienced by the user. In a similar way, a search also faces a trade-off between the degree to which it weights bids by relevance and the quality of search results to users.
41. These trade-offs may constrain a search engine's ability to generate advertising revenues in two ways. First, users may respond to increased ad load or reduced relevance by reducing their propensity to click on or interact with ads over the long term, a phenomenon known as 'ad blindness'. Second, there may be a constraint from competition, as users respond to increased ad load by switching to rival search engines where quality is perceived to be higher.
42. Ad blindness appears to be a key consideration for Google when setting ad load. Using experimental techniques, Google has found higher ad loads and reduced relevance to have significant negative impacts on the propensity of users to click on ads and consequently on its long-term revenues.¹⁰ Google now takes this into account when making decisions regarding ad load and presentation.
43. We have not found evidence that Google actively considers the impact of ad load on the propensity for users to switch to alternative search engines.

¹⁰ See '[Focusing on the Long-term: It's Good for Users and Business](#)', Henning Hohnhold, Deirdre O'Brien and Diane Tang, 2015.

However, this may be due to the fact that Google currently faces limited competition from rival search engines, as evidenced by its persistently high market share. In our view, the evidence that higher ad load reduces the propensity of users to click on ads indicates that ad load is an important driver of quality for users. Therefore, competition between search engines over quality for users would be likely to provide an important constraint on ad load in a more competitive market.

44. The fact that search engines are able to set ad load independently for different search queries may reduce the competitive constraint from users switching in response to ad load to some extent. The ability to set ad load independently means that search engines are able to discriminate in response to any differences in competitive conditions across search queries. For example, they can set a higher ad load for more commercial search queries where ads are more relevant and the incentives to generate more revenue are greater, while setting lower ad load for search queries where ads are less relevant. To some extent this may allow search engines to generate more revenue while preserving the overall quality of the user experience.

Competition for advertisers

45. In addition to competing over quality to attract consumer attention, search engines can also compete more directly for advertisers across various dimensions.
46. Buying search advertising is a data-driven process that requires advertisers to make many granular decisions, including which keywords to bid for, how flexible to be in matching keywords to search queries, which consumers to target and how much to bid.
47. As set out in Appendix N, advertisers typically buy search advertising to directly generate sales or other types of conversion. This means that when buying search advertising, advertisers care primarily about the performance of the advertising, as captured for example by its return on investment. Many advertisers attempt to optimise their expenditure on search advertising continuously over time, by setting their bids to allocate their expenditure to the keywords, search engines and target audiences where their return on investment is greatest. Often, they will use advertising technology tools, such as Google's SA360, to automate this process.
48. This provides a direct mechanism for competition to occur between search engines on the advertiser side of the platform. If the return on investment from advertising on one search engine is greater than another, eg because the conversion rate is higher or the cost-per-click lower, advertisers can be

expected to divert expenditure to bidding for keywords on the search engine where the return is greater.

49. This mechanism may reduce the incentive for a search engine facing competition from rivals to generate revenue using many of the 'levers' described in the previous section, including the setting of reserve prices, a keyword generation and matching and automated bidding. The use of any of these levers is likely to reduce the performance of advertising bought on the search engine, for example by increasing the cost-per-click, resulting in advertisers switching to rivals where performance is relatively better.
50. The fact that prices for advertising inventory shown in response to different search queries are set by independent auctions means that competitive constraints on the advertising side may vary from query to query. As for ad load, search engines may have the incentive to discriminate in their use of the various levers in response to any differences in competitive conditions for different search queries.
51. Search engines also compete for advertisers on other dimensions, such as the quality of interface offered to advertisers and the use of data to offer more granular audience targeting and the measurement of advertising outcomes. As search advertising inventory relates to the intent expressed by specific consumer search queries, audience targeting is incrementally less valuable than in display advertising. However, most advertisers and media agencies we contacted did use audience targeting to some extent. As search advertising is often used for achieving conversions, measurement of outcomes and attribution analysis is particularly important.

Summary of how market power affects outcomes

52. Based on the above discussion, relative to a more competitive market we would expect a search engine with market power could:
 - set higher ad load or reduce the weighting of bids by relevance, as it would face less competitive constraint from users switching; and
 - influence higher ad prices, via the use of auctions to maximise revenues, and by using the 'levers' described in the previous section, including the setting of reserve prices, keyword generation and matching, and automated bidding.
53. Both of these mechanisms would result in higher advertising costs. In the case of ad load, this is because a higher ad load increases the CTR for advertising inventory at the expense of organic traffic. The additional

advertising would ‘crowd out’ organic search to some extent, increasing the importance for advertisers of paid search relative to organic search. These advertising costs would be likely to ultimately be passed on to consumers in the form of higher prices for the products and services sold by advertisers. In addition, higher ad load or reduced weighting of bids by relevance will result directly in lower quality for users.

Evidence of Google’s behaviour and market outcomes

54. In this section we set out our analysis of Google’s actual behaviour over the past few years in relation to the various ways it may be able to exploit market power as discussed above.
55. To assess the extent to which Google has exploited market power, we would ideally want to compare Google’s behaviour today against a situation in which Google faced strong competition from other search engines. However, it is not possible to do this as this ‘competitive counterfactual’ is unobservable. Instead we have assessed changes over time in Google’s monetisation of its search content and compared prices between Google with Bing for overlapping search queries. While these comparisons are imperfect proxies for the competitive counterfactual, they are illustrative of the extent to which Google has been able to exercise market power.
56. We first set out evidence of changes in how Google has monetised its search engine over time. This analysis describes Google’s UK search advertising revenue since 2010 and then breaks it down according to its drivers. It then looks at evidence of how Google has changed the presentation of search advertising in recent years. Our analysis of changes in Google’s monetisation over time illustrates how Google can use the levers described above to generate additional revenues. Increases in monetisation over time would be consistent with Google increasingly exploiting its market power, although changes in monetisation may also be driven by other factors, such as changes in advertiser demand.
57. We then compare Google’s pricing to Bing, its main competitor in general search advertising. Our analysis comparing Google’s prices to Bing’s is not equivalent to comparing Google’s prices against prices in a competitive counterfactual. However, we would expect Google’s prices to be higher than Bing’s, to the extent that Google has market power and Bing represents a weaker alternative for advertisers.
58. Finally, we discuss the overall evidence of Google’s incentive and ability to exploit market power, including Google’s views and evidence from third parties.

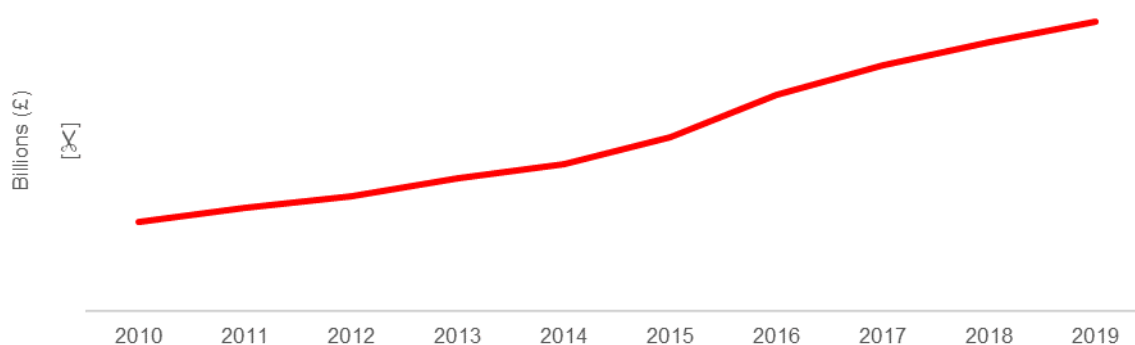
Drivers of changes in revenue over time

59. The analysis below looks at the drivers of changes in Google’s UK search revenues since 2010, including the ad load (both the number of search queries showing ads and the number of ads per search), the click-through rate and prices. We also look at evidence from Google’s internal documents to understand its reasons for making changes. This analysis provides some insight into what Google’s most important revenue-generating ‘levers’ are in practice and how Google approaches the trade-offs described in the previous sections.
60. Our ability to infer the extent to which changes are driven by increases in the strength of Google’s market power or in its willingness to exploit it, or by other factors, is limited. This is because Google has had market power, as demonstrated in part by its persistently high market share, during the entire period we are able to assess.
61. A more detailed breakdown of these outcomes can be found in Appendix C.

Revenue

62. Google’s revenue has been steadily increasing over the past 10 years from 2010 to 2019.

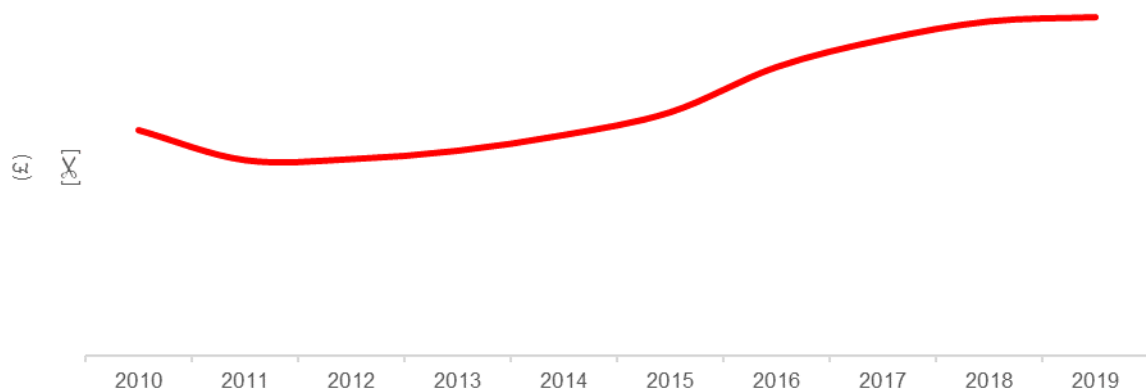
Figure Q.1: Total UK Google Search Revenue in real terms



Source: CMA analysis of Google data.

63. The increase in Google’s revenues is substantial and is in part explained by growth in the total number of searches. However, the increase in revenue has exceeded the growth in the number of searches.
64. Figure Q.2 shows that revenue per search has risen, increasing from a low of £[0.02-0.03] per search in 2011 to a high of £[0.04-0.05] per search in 2019.

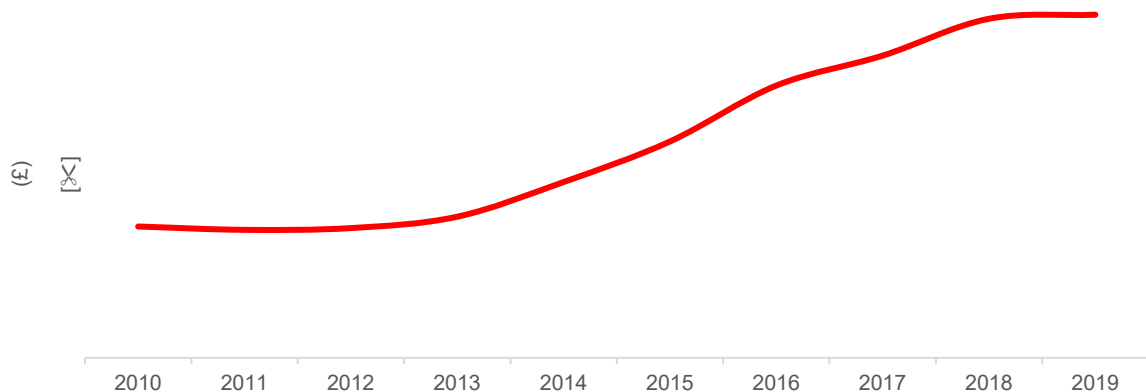
Figure Q.2: Total UK Google Search Revenue per search in real terms



Source: CMA analysis of Google data.

- 65. Figure Q.3 shows Google’s revenue per search for only those searches with ads.
- 66. Revenue per search with ads has increased by around [100%-200%] from 2010 to 2019. Over the past 10 years, Google’s revenue for searches with ads has increased at a faster rate than Google revenue per search overall. This suggests that Google’s monetisation is becoming focused on a smaller proportion of its overall searches over time.

Figure Q.3: UK Revenue per Search with ads in real terms



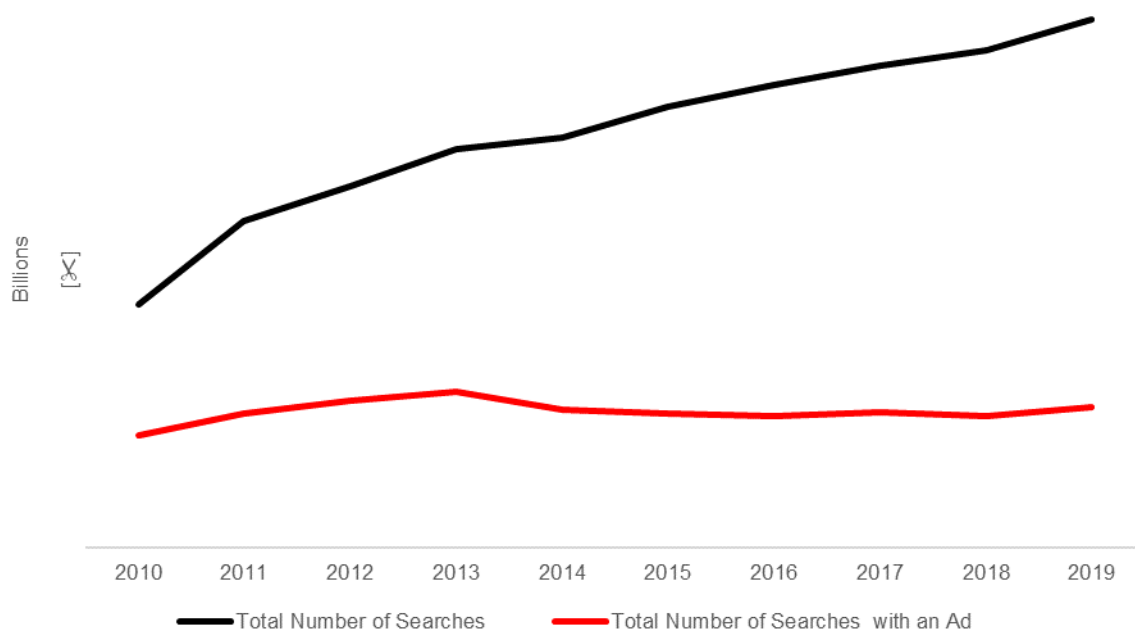
Source: CMA analysis of Google data.

- 67. There are several possible drivers of increased revenue per search, which we consider in more detail below. We look at different measures of ad load, total ad clicks, click-through rates and prices. Finally, we examine internal documents which cover internal analysis undertaken and used to make decisions over how to make changes to the ways in which ads are presented on Google search.

Ad load

68. There are a number of ways that ad load can be measured or assessed, and consequently it is possible to reach differing conclusions depending on the approach adopted.
69. One measure of ad load is the proportion of total searches for which ads are shown. This measure shows how the proportion of 'commercial' searches has evolved over time. Another measure of ad load is the number of impressions¹¹ for search where ads are shown. This shows the ad load for 'commercial' search queries. Looking at both these measures allows us to distinguish between the distribution of ad load across the entire population of Google's search queries and the 'depth' of ad load on those search queries that are 'commercial'.
70. Below we set out the evolution of the proportion of total searches on Google Search for which ads are shown, the total number of impressions and the average number of impressions per search for which ads are shown.
71. Figure Q.4 shows the total number of searches on Google Search from 2010 to 2019. The results are broken down between searches with an ad and searches without an ad.

Figure Q.4: Total UK Searches on Google Search

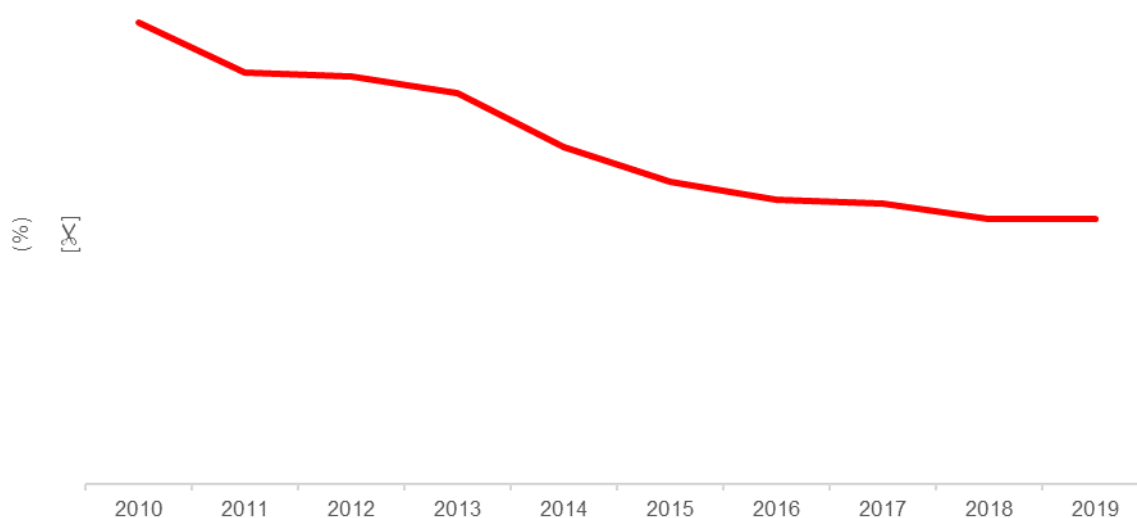


¹¹ Impressions measure the total quantity of ad inventory shown to users (regardless of whether users click on ads).

Source: CMA analysis of Google data.

72. Figure Q.4 shows that the total number of searches made on Google Search in the UK has increased substantially from [50-100] billion in 2010 to [150-200] billion in 2019. It also illustrates that the number of searches showing ads has remained relatively stable over the past 10 years. In 2010, there were [30-40] billion searches with an ad, which peaked in 2013 at [40-50] billion searches. Since then the number of searches with an ad has fallen slightly.
73. As illustrated further in Figure Q.5 below, the proportion of searches with an ad has fallen considerably, from over [40-50%] in 2010 to [20-30%] in 2019.

Figure Q.5: Proportion of searches with an ad



Source: CMA analysis of Google data.

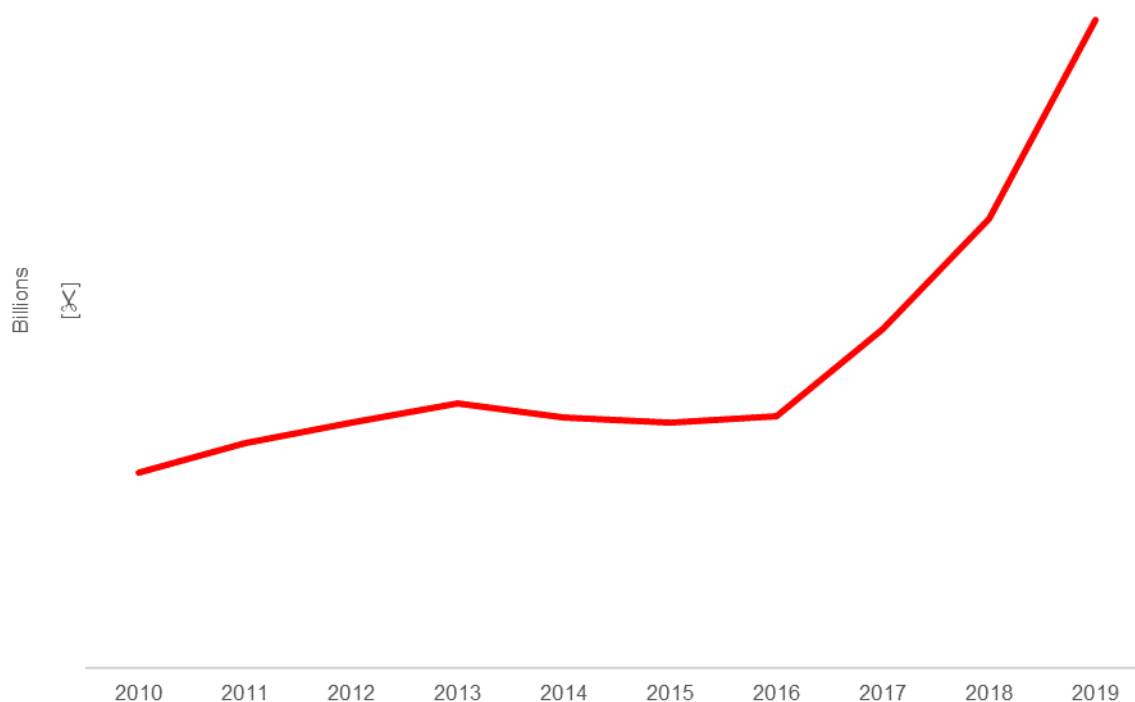
74. Figure Q.6 shows the total number of PLA and text impressions that have been shown to users from 2010 to 2019. Despite a fairly constant number of searches with ads, the number of impressions (including non-text ads¹², both viewed and unviewed¹³) steadily increased from [X] billion in 2010 to [X] billion in 2016. After 2016, the growth in the number of impressions accelerated significantly, reaching [X] billion in 2019. We have been able to break down number of impressions by device type for the past three years. This breakdown shows that the trend has been driven by a particular growth in mobile impressions. We note that Google submitted data which shows that,

¹² For example, Google Shopping Ads.

¹³ These are impressions that were selected for a page but were never seen because the user did not take the action that would've been required to see them, for example ads included in the horizontally scrollable carousel for PLA even if the user did not scroll to actually view all of the results.

when broken down between PLA and text ads, the increase since 2017 has been primarily driven by an increase in PLA ads.

Figure Q.6: Total UK Impressions on Google Search, including non-text ads, both viewed and unviewed

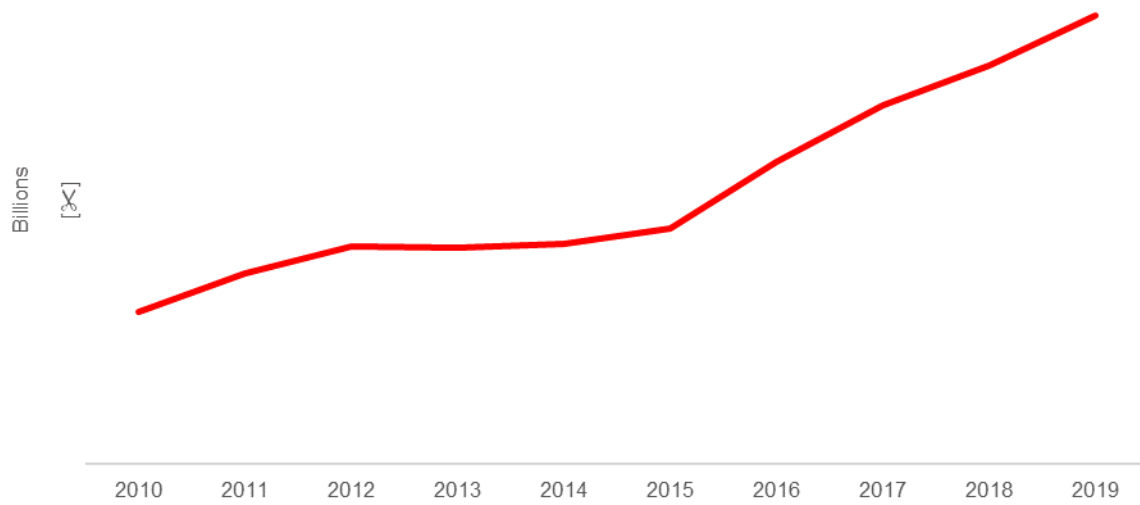


Source: CMA analysis of Google data.

Ad Clicks and Click Through Rate

75. Google predominately uses a cost per click pricing structure to sell its inventory. To understand how impressions lead to increased revenue, we have looked at the extent to which impressions result in clicks, we measure this both in absolute terms, and as a proportion of searches with an ad. The higher this proportion is, the more searches result in ad clicks.
76. Figure Q.7 shows that ad clicks on Google search in 2019 ([300% billion) were around 300% of the 2010 value ([10 billion). We have been able to break down the total number of clicks by device type for the past three years. This breakdown shows that the trend has been driven by a particular growth in mobile clicks.

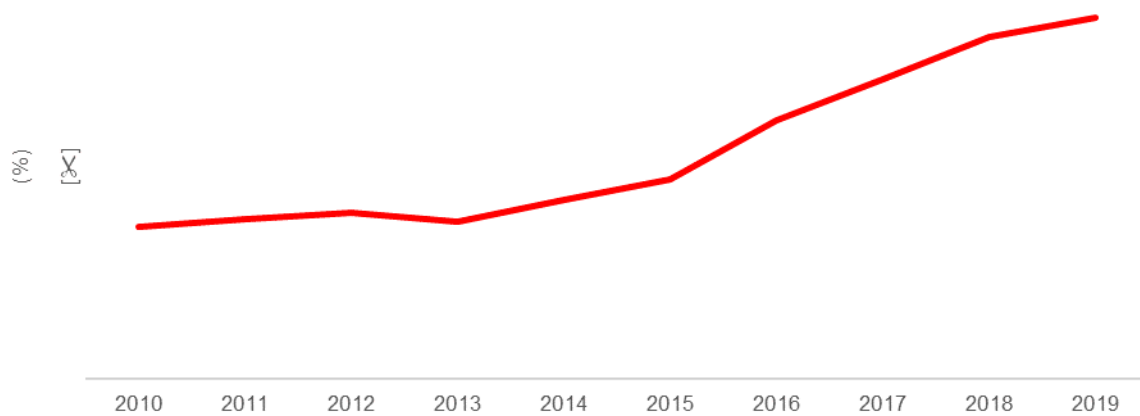
Figure Q.7: Total UK Ad clicks on Google Search



Source: CMA analysis of Google data.

77. Figure Q.8 below shows total ad clicks relative to the total number of searches with ads. It shows that the click-through rate has increased substantially since 2010.

Figure Q.8: Total UK Ad Clicks as proportion of searches with ads¹⁴



Source: CMA analysis of Google data.

78. Table Q.1 shows the average page click-through rates of text ads for 2019, split by the number of text ads shown.

¹⁴ Measured as the proportion of total clicks divided by the total number of searches with ads

Table Q.1: UK Ad page click-through rates on Google Search across all device types, 2019

	Number of text ads shown						
	1	2	3	4	5	6	7
Click-through rate of top ad	[<]	[<]	[<]	[<]	[<]	[<]	[<]
Cumulative Click-through rate of all text ads ¹⁵	[<] [20-30%]	[<] [20-30%]	[<] [20-30%]	[<] [30-40%]	[<] [30-40%]	[<] [30-40%]	[<] [50-60%]

Source: CMA analysis of Google data.

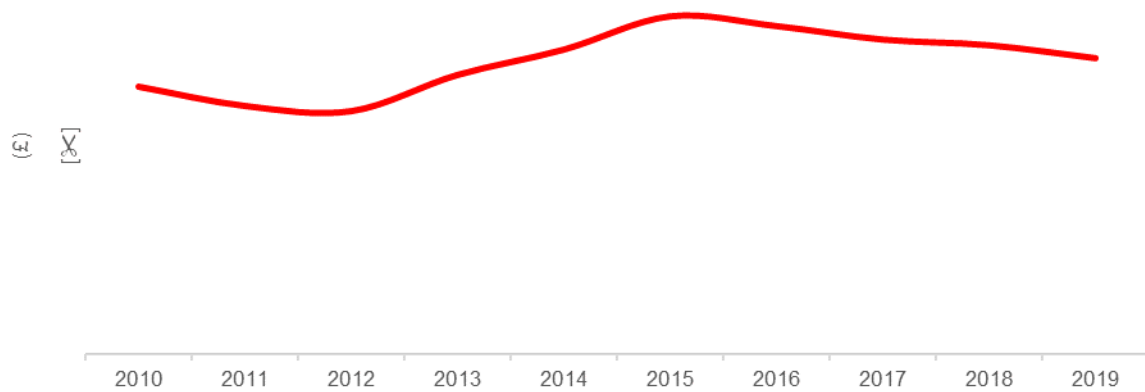
79. Table Q.1 shows that as the number of ads shown per search increases, the page click-through rate increases, from [20-30]% when only one ad is shown to [50-60]% when seven ads are shown. This may be in part explained by the ‘crowding out’ effect mentioned above, as an increased number of ads may increase propensity for users to clicks on ads rather than organic links. However, it is important to note that this relationship is likely to be endogenous (circular) as there is also an incentive for Google to show more ads where the propensity for users to click on ads is higher. For example, the propensity for users to click on ads may be inherently higher for more ‘commercial’ search queries (eg ‘cheap insurance’), where ads are likely to be more relevant to users than for less commercial searches.
80. The endogenous relationship between the number of ads and the page click-through rate makes it difficult to isolate empirically the extent to which there is a crowding out effect.

Prices

81. Figure Q.9 shows the cost per click from 2010 to 2019 in real terms. Cost per click has been fairly stable, but has increased somewhat over time, from a low point in 2012 and reaching its peak in 2015. [<].

¹⁵ Calculated as the sum of individual click-through rates (the page click-through rate)

Figure Q.9: UK Cost per Click



Source: CMA analysis of Google data.

Presentation of search

82. Google submitted that over the past 10 years from 2011 to 2020, it has made several significant changes to the way it presents ads on Google Search. A detailed description of each of these changes is available in the annex to this document.
83. The changes have affected the position and characteristics of the ads on both mobile and desktop.
84. The most recent major changes were:
- In 2016, Google removed right-hand side ads and increased from three to four the number of ads eligible to appear above the organic search results.
 - Later in 2016, Google introduced ‘Expanded Text Ads’,¹⁶ which allows advertisers to enhance their creative with a third headline and a second description.
 - In 2019, Google altered visual elements of ads for mobile and in 2020 for desktop.¹⁷
85. A detailed timeline of the changes made to the way ads were presented can be found in the annex to this appendix. In addition, Appendix P sets out

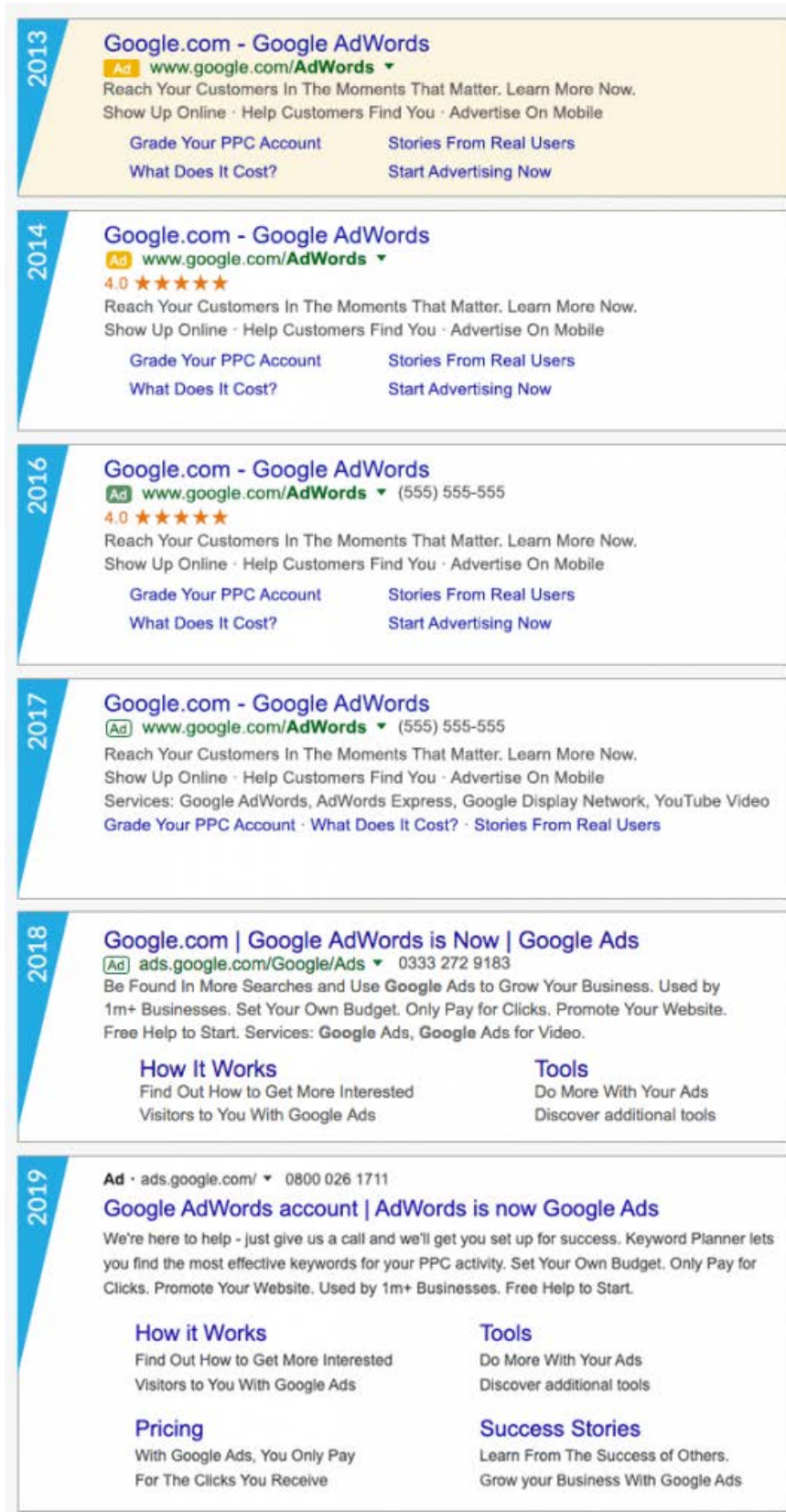
¹⁶ [Google ETA blog update](#).

¹⁷ The position of the title and website URL were flipped. The URL was made smaller and its colour changed from green to black. The changes to how ads were presented was accompanied by the introduction of a favicon to organic results. The favicon this is a small picture placed to the top left-hand side of organic results. The favicon was subsequently removed in 2020.

evidence received from specialised search providers about how the presentation of Google's paid ads has changed over time.

86. Google submitted internal documents used to decide on changes made to the presentation of ads and ad load. These documents contain analysis of the user impact based on the outcomes of live experimentation by Google. We have analysed them to understand Google's rationale for each of the major changes.
87. Internal documents discussing the '[X]' changes in 2016 show that Google considered [X]. Google first considered the impact of [X]. This narrowed down the possible options to a single candidate for live experimentation. Google looked at a range of metrics in this experimentation, including [X]. The result of these changes was an [X]. The change in revenue per impression occurred alongside [X].
88. This illustrates that Google has [X].
89. The Expanded Text Ads changes were approved based on internal analysis which showed that [X]. Google's analysis assumed that [X].
90. Google's analysis of the [X] changes showed that these would increase revenue by around [X]% post user learning on mobile. On desktop, revenue and ad clicks increased as a result of the change.
91. Both the Expanded Text Ads and [X] changes illustrate that Google is able to generate significant additional revenues through apparently minor changes to presentation that have a significant effect on click-through rates.
92. Several advertisers, including both specialised search providers and other advertisers, submitted to us that recent changes to Google's policies on ad load and the presentation of search advertising had the effect of increasing the propensity for users to click on ads. This resulted in the crowding out organic traffic and an increase in the overall cost of accessing user traffic. Most advertisers submitted that the effects were particularly pronounced in mobile.
93. The effects of Google's changes to the presentation of search ads is something that has been analysed by advertisers. In particular, the effects have been estimated by some of the largest advertisers who are active in specialised search.
94. A travel search provider provided an illustration of how text search ads changed from 2013 to 2019. This is shown in shown in Figure Q.10.

Figure Q.10: Illustration of changes to presentation over time



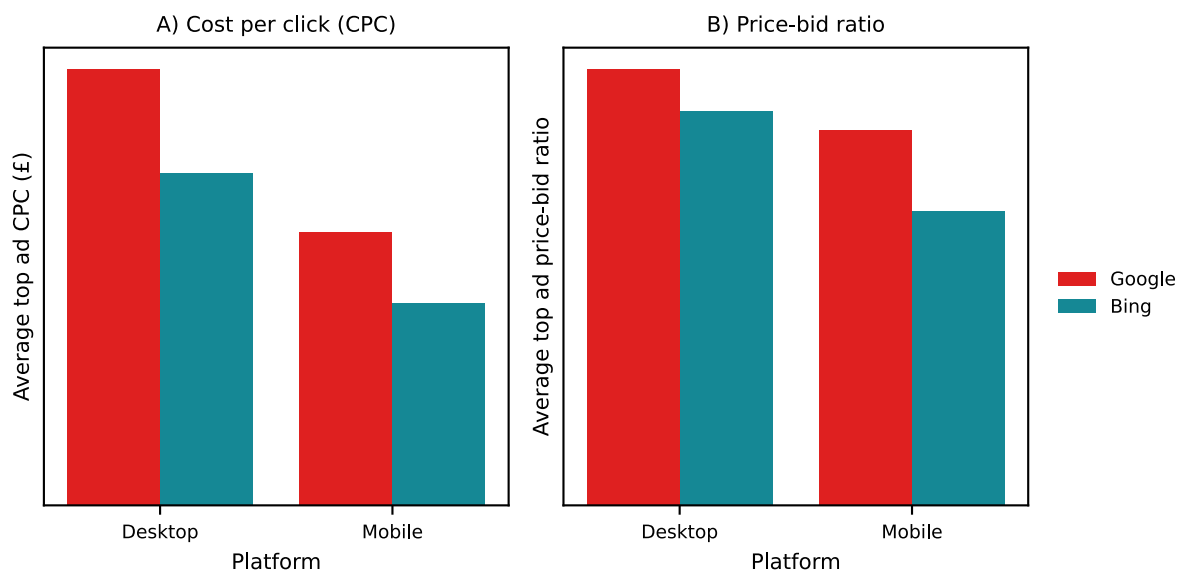
Source: [3<]

95. The changes identified correspond to all of the major changes Google identified. However, it also includes a change between 2016 and 2017 where the fill of the ad label was changed to match the white background.
96. A specialised search provider submitted internal analysis of the impact of the introduction of a fourth text ad at the top of the SERP for certain queries in February 2016. It reported a drop of organic traffic for all its product categories and an overall drop of 5% the day after the update.
97. Another specialised search provider submitted analysis of two Google SERP updates that have impacted its business:
 - a) The first update involved the inclusion of three instead of two text ads at the top of the mobile SERP for some queries in August 2015. Its analysis concluded that on average it lost 13,937 organic sessions per day in the UK, which was around 7.24% of total organic sessions at the time due to the change.
 - b) The second update involved a series of changes to the mobile SERP in May 2019: a change in the 'Ad' icon next to the result, a change to organic results so that they included the website's icon next to the result, and a change in both result types so that the URL/breadcrumb was moved above the listing. The specialised search provider found that there was a statistically significant drop of 13.28% in CTRs for its organic results on mobile in the UK following Google's update.
98. In Appendix P, we set out additional evidence on how these changes have affected specialised search providers, increasing their costs of accessing user traffic.

Bing comparison

99. This section compares outcomes across Google and Bing based on matching like-for-like search queries, based on data we collected on all the search queries submitted to Google and Bing in the UK in a single week in 2020 (several billion queries in total). The comparison is primarily focused on prices. A detailed breakdown of these outcomes and description of our methodology can be found in appendix C which covers CTR and ad load.
100. Panel A of Figure Q.11 shows cost per click of top ads for overlapping queries.

Figure Q.11: Average cost-per-click for top ad cost per click on Google and Bing



Source: CMA analysis of parties' data.

101. This figure shows that for the same search queries, Google has higher prices than Bing on average. Google's prices are on average [30-40]% higher on desktop and [30-40]% higher on mobile for the sample of queries we collected. This would be consistent with Google exploiting market power through its search auctions, as described above. It is also consistent with Google benefiting from data or scale advantages arising from its market power on the user side.
102. We have also compared the price-bid ratio across Google and Bing. The price-bid ratio measures the difference between the winning bid and the price paid. It therefore gives an indication of the efficiency of the auction from the platform's perspective – ie its ability to extract revenues from advertisers. The price-bid ratio should also help to control for any difference in the value of a click to an advertiser on Google as opposed to Bing.
103. Panel B of Figure Q.11 shows the difference in price-bid ratio between Google and Bing for top ads. It shows Google has a higher price-bid ratio for like-for-like queries on average, by [10-20]% on desktop and [20-30]% on mobile for the sample of queries that we analysed.
104. Google's higher average price-bid ratio suggests that Google is able to extract more advertiser revenues than Bing. This could be caused by Google exercising market power. It could also be a result of greater bid density, arising from the propensity for some advertisers to single-home on Google.
105. Our comparison between Google and Bing also shows that, compared to Bing, Google has a lower ad load both in terms of the number of search

events which show a text ad and the number of text ads shown on each of these events. This comparison does not include other specialised search adverts, such as Google Shopping ads, which contribute to Google's overall ad load. This suggests that there is currently little competition between Google and Bing to attract users via setting lower ad loads.

106. However, we note that when comparing Google and Bing we are not observing the competitive counterfactual. Bing's higher ad load may reflect that it has little incentive to attract customers through setting lower ad load, given the large scale and quality differential between Google and Bing discussed in Chapter 3. In practice it appears that Bing's ability to attract customers may be more closely associated with its defaults on desktop devices rather than its perceived quality. We still consider that Google's ability to increase its ad load over time, including specialised search ads, is an indicator of its market power.

Other practices that exploit market power

107. We have heard a range of concerns from Google's customers about practices that are consistent with the exploitation of Google's market power.
108. Specialised search providers told us about other ways in which Google may exploit market power over its advertiser customers. These concerns are discussed in more detail in Appendix P, but summarised below:
- Several specialised search providers expressed the concern that Google had incentives to encourage 'brand bidding',¹⁸ because increased competition between advertisers in its auctions results in higher prices and advertising revenues. Google may have the ability to influence the outcomes from brand bidding through the way it weights quality in its search auctions and its policies towards ad copy.
 - We heard that Google had recently changed the way its 'Exact Match' keyword matching algorithm worked, now no longer requiring the keyword to exactly match with the search term but also allowing for 'close variants'. Advertisers told us that this limited their ability to determine which auctions to bid into and their ability to optimise bidding across multiple keywords. The result may be that advertisers end up participating in auctions for search terms where their ads are less relevant and have a reduced quality weighting, resulting in increased prices.

¹⁸ Brand bidding' in search advertising refers to bidding by advertisers on branded keywords, either the advertiser's own brand or the brand of a rival.

- Several specialised search providers expressed the concern that Google had reduced the transparency of reporting of certain outcomes in its search advertising auctions. These concerns related in particular to Google deciding to no longer provide information to advertisers on the average position in which their ads were shown in search auctions. This made it more difficult for advertisers to implement bidding strategies focusing on lower ad positions.
 - Several specialised search providers expressed the concern that changes to the autocomplete function in Chrome’s ‘Omnibar’ had the effect of diverting user traffic to Google’s search engine results instead of directly to the advertiser’s website. This may have the effect of increasing the proportion of user traffic that accesses websites via ads rather than directly.
109. In addition, we heard several concerns relating to Google enforcing its policies on ad and site content in an arbitrary way. We received similar submissions from several advertisers that Google’s policies are not clearly formulated, and that ads or accounts were often suspended for reasons that were unclear, arbitrary or inconsistent. They told us that Google often refused to elaborate on the details behind specific issues. Given Google’s market power in search, all advertisers raising these concerns also submitted that they had little choice to advertise on alternative platforms despite these issues severely impacting their businesses.

Evidence from survey and review of choice architecture

110. Choice architecture can be used to take advantage of the advertisers’ natural behavioural biases and help reinforce market power. As set out in Appendix N, we have identified several defaults which may have this effect, including the ‘Search Network’ and ‘Display Network’ checkboxes and the use of Broad Match as the default matching algorithm, as well as other options which are set to the broadest options by default.
111. For example, if the advertiser chooses to un-select the Search and Display Network options, persuasive text appears to attempt to keep these options selected. Considering that Google has submitted¹⁹ that many advertisers unselect these defaults, and around 90% of advertisers unselect the Display Network option in particular during setup, it is unclear why this is pre-selected by default.

¹⁹ Google response to RFI dated 07 April 2020. See Appendix N for further discussion of this.

112. Some advertisers contacted during qualitative research said that the advertising interface defaults did not match the objectives or needs of the advertisers, thereby producing less relevant results and wasting the advertiser's money. The default options were also seen as more expensive than non-defaults, with some advertisers expressing the sentiment that they viewed this as a deliberate strategy by Google to get the advertisers to spend more.

Google's views

113. Google submitted²⁰ that the provisional finding in our interim report that concentration in search advertising may lead to higher prices for users across the economy is not consistent with the evidence, making the following points:
- a) First, the price of digital advertising has fallen by more than 40% since 2010.²¹ No other medium has seen such a large drop. The result is that expenditure on advertising as a fraction of GDP has never been lower.
 - b) Second, as the interim report itself acknowledges, it is inherently difficult to compare Google's prices with those of third parties on a like-for-like basis. A full profitability analysis would have to disentangle those revenues that arise from market power from those which arise from genuine value-adds and competition on the merits.
 - c) Third, any transmission mechanism between alleged concentration in search and the price of final products is likely to be complex given the two-sided nature of the market, the fact that advertisers pay for search ads on a per-click basis and the existence of an auction among advertisers. The interim report does not sufficiently explain this transmission mechanism, or present evidence that a less concentrated search market would be likely to result in reduced prices for advertising.
114. In relation to these submissions, we note that the evidence of falling digital advertising prices since 2010 relates to the United States and is not limited to Google's search advertising. As such, it has little bearing on Google's market power. As set out above, our analysis of Google's actual UK prices shows that they have increased somewhat since 2010. We acknowledge the conceptual challenges in comparing prices across Google and Bing and have discussed these above. We have set out the transmission mechanism for how competition may affect the incentives for a search engine to use the 'levers' at

²⁰ Google response to our interim report 12/02 2020

²¹ See 'The Declining Price of Advertising: Policy Implications' available at: [progressivepolicy.org](https://www.progressivepolicy.org)

its disposal to generate additional revenues at the expense of higher advertising costs above.

115. Google further said that the concerns expressed in our interim report that Google has the incentive to apply various 'levers' to exploit its market power is unfounded. In this regard, Google submits that it is not plausible for it to use market power to increase the number of search ads shown on its search engine results page. Google notes that it already applies an eight-ad limit for text search ads on its SERP, but it is quite rare that it ever shows the maximum number of text ads. In fact, most search queries return no ads at all. This is because Google only show ads when they meet its strict relevance criteria and quality thresholds. In addition, Google argues that if it 'crowded out' organic search results with less-relevant ads, it would degrade the quality of its search service, harm user experience and trust, and damage the ad ecosystem as a whole. Similarly, Google submits that it does not have an incentive to reduce its relevance thresholds to show more ads or lower-quality ads in order to generate more short-term revenues, because these changes would compromise the quality of Google's SERPs and not be in its long-term commercial interest
116. In our view these arguments are inconsistent with the evidence we have reviewed both from Google and third parties. In a more competitive market consumers would have greater ability to switch to alternative search engines based on quality, resulting in a constraint on Google from increasing ad load. This same logic applies to the various other levers Google has at its disposal to increase revenues. With regard to prices, our analysis shows that Google charges significantly higher prices than Bing for overlapping search queries.

Conclusion on exploitation of market power in search

117. We have identified several levers which allows Google to generate additional revenue from its search advertising auctions. Allowing greater ad load or presenting ads in a way that attracts greater consumer attention can increase the click-through rate on ads at the expense of organic search. Control over certain aspects of the auction process, including reserve prices, keyword matching and automated bidding allows Google to influence prices both directly and indirectly.
118. We have also considered Google's incentives to exploit market power using these levers. Relative to a more competitive market we would expect Google could:
- set higher ad load or reduce the weighting of bids by relevance, as it would face less competitive constraint from users switching; and

- indirectly influence higher ad prices, via the 'levers' described above, including the setting of reserve prices, keyword generation and matching and automated bidding
119. Both of these mechanisms would result in higher advertising costs. In the case of ad load, this is because a higher ad load increases the CTR for advertising inventory at the expense of organic traffic. These advertising costs would be likely to ultimately be passed on to consumers in the form of higher prices for the products and services sold by advertisers. In addition, higher ad load or reduced weighting of bids by relevance will result directly in lower quality for users.
120. There is evidence that Google uses these levers in practice. We note that Google's prices are on average [30-40]% higher than Bing's on desktop and [30-40]% higher on mobile. This is consistent with Google exploiting market power through its search auctions. It is also consistent with Google benefiting from data or scale advantages arising from its market power on the user side.
121. Our analysis of the drivers of Google's revenues over time shows that over the last decade Google has been able to significantly increase its search advertising revenues. Google appears to have achieved this in part by increasing ad load and changing the way ads are shown alongside organic results, driving higher click-through rates on ads.
122. Evidence from third parties supports these findings and that this has resulted in higher advertising costs. It also provides some indication that Google may be applying other levers, such as changing the way its 'Exact Match' keyword matching algorithm works, in a way likely to result in higher advertising prices.

Display

123. In this section we set out:
- a) how display platforms maximise revenues when selling advertising;
 - b) the ability of display platforms to influence market outcomes;
 - c) how competition affects the incentives to influence market outcomes; and
 - d) evidence of Facebook's actual behaviour and how it has affected market outcomes in practice.

How display advertising platforms maximise revenues

Basic characteristics of display advertising

124. Display advertising inventory takes the form of advertising impressions shown to users on the platform and interspersed with other organic content. In the case of Facebook, most advertising inventory is shown in the Newsfeed or the equivalent on mobile, the Mobile Feed.
125. Display advertising inventory can be sold according to similar payment structures as search advertising. Advertisers can pay directly for impressions (CPM) or can pay for clicks (CPC) or for other actions, such as website visits or conversions (CPA). Compared to search advertising, a relatively greater proportion of advertising inventory is sold by impression, as a greater proportion of advertisers buying display advertising inventory are aiming to achieve brand awareness rather than directly target clicks or conversions.
126. Advertisers select inventory to bid for based on targeting specific audiences using user data. This data may be provided by the platform, the advertiser or a third party (or a combination thereof).
127. Display advertising inventory is sold according to auction processes that are triggered for individual impression 'events', where the platform identifies an opportunity to display advertising to a user. For Facebook, similar second-price auction processes are used as for search advertising inventory, where the price paid by the advertiser that wins the auction is determined in part by the value of the next highest bid. Facebook's auctions are denser (ie more bidders) than search advertising auctions. This is because auction eligibility is determined more broadly than for search - by the selection, among other things, of audience targeting, rather than through the choice of specific keywords that are matched to search queries. Without targeting, the default is for advertisers to be eligible to bid in auctions for all advertising inventory available on the platform.
128. Similar to search advertising auctions, Facebook's display advertising auctions also account for relevance and quality. Facebook assesses the quality of the ad based on objective factors, such as whether the ad is verbose or has received negative feedback in the past. This may also include user-specific signals [X]. Quality and relevance scores have a direct bearing on an advertiser's Total Value. Higher quality will mean Facebook places greater weight on the advertiser's bid, with the result that its advertising is more likely to appear and at a lower price. The price paid by the winning advertiser is equivalent to the bid that would have been required to match the second-highest bid, given the relative relevance and quality weighting of the

two bids. An estimated 'action rate'²² is also taken into account in the Total Value determined by Facebook's ad auction mechanism. [8].

Maximising revenue

129. Similar to search, most of the costs faced by a display advertising platform are fixed in the short term. A profit maximising display advertising platform will therefore need to consider how to maximise the revenue it generates. The total revenue a display advertising platform makes from advertising is the product of the following three outcomes:
- a) the total amount of user time spent on the platform;
 - b) the number of ads shown per user time spent; and
 - c) the price per ad.²³
130. Display platforms can influence the total amount of user time spent either through attracting new users or by influencing existing users to spend more time on the platform. In practice, display platforms are likely to face trade-offs in taking actions that increase the revenue per user time spent, such as increasing the ad load, but decrease the total user time spent.
131. Showing a greater number of ads will increase total revenues all else equal. The number of ads shown can also affect prices – a greater supply of ad inventory may reduce overall market prices. However, the number of ads shown is also constrained by the response of users, as showing too many ads can reduce the quality of the platform to users leading them to switch to alternative platforms or simply spend less time on the platform.
132. Advertising prices are an outcome of the advertising auctions used and vary across the inventory shown to different users. At a high level, prices are determined by the supply of homogenous or similar inventory available (both on the platform and more widely across the market) and the advertiser demand for that inventory. Inventory is differentiated primarily according to the extent data can be used to target specific audiences. Better data on more specific audiences available on one platform can increase advertiser willingness to pay and thus increase prices.

²² The likelihood of the user performing the action that the advertiser is paying for eg impression, click or conversion.

²³ This is under the CPM pricing model most commonly used for display advertising.

Ability to influence outcomes

133. To the extent that display platforms, such as Facebook, are able to influence the user time spent on the platform, the ad load or prices, they are able to increase the revenues they earn. This section discusses the various possible 'levers' at their disposal to do so, including:
- ad load and presentation;
 - relevance and quality scoring;
 - auction mechanisms and bid prices
 - influence over advertiser campaign choices.
134. For each lever, we discuss below the mechanism through which it may affect outcomes (prices, quantities and the amount of user time spent on the platform) and consequently revenues. Each lever may affect more than one outcome and consequently the display platform may face trade-offs in their use.

Ad load and presentation

135. Display platforms can directly set the number of ads shown to users by determining the ad load – the proportion of advertising versus organic content users see when interacting with the platform. In practice, for its most common NewsFeed and Mobile Feed advertising formats, Facebook does this by, among other things, determining the ad gap (ie the number of non-ad pieces of content between each ad).
136. In order to determine ad load for each user, Facebook looks at various factors relating to specific users. This means that the changes to ad load do not apply consistently to all users but are tailored to each user's behaviour on the platform.
137. As noted above, increasing ad load will directly lead to higher revenues. However, it may also reduce prices if the increase in ad load is significant relative to the overall supply of similar advertising inventory for the market as a whole. Greater ad load can also reduce the quality of the platform to users, leading them to switch to alternative platforms or simply spend less time on the platform.
138. As for search engines, the presentation of advertising can influence the propensity for users to engage with it, for example by affecting the click-

through rate. Greater user engagement may improve the performance of the advertising and its value to advertisers, increasing advertising prices.

Relevance and quality scoring

139. As noted above, the relevance and quality scores have a direct bearing on the prices paid by advertisers. At an aggregate level, Facebook has discretion over how much weight to put on quality and relevance compared to advertiser bids in general when determining auction outcomes. This is likely to result in a trade-off. A higher weight on quality and relevance scoring compared to advertiser bids is likely to improve quality to users, while a lower weight is likely to result in higher prices and generate more revenue in the shorter term.

Auction mechanisms and bid prices

140. The use of auction mechanisms allows display advertising platforms to exercise market power automatically. As display advertising platforms sell differentiated inventory, advertiser bids will be driven by the substitutability of alternatives available on other platforms. Where a display advertising platform has market power, the lack of substitutable alternatives will mean that advertiser bids in its auctions are higher, resulting in higher prices.
141. Unlike search advertising, reserve prices set by display advertising platforms appear not to play a material role in determining advertising prices in practice. This is because auction eligibility is determined more broadly for display advertising auctions (ie according to audience targeting rather than by search queries). This results in denser auctions where prices tend to be set in practice by second-highest bids rather than by reserve prices.
142. Facebook submitted that the function of its reserve prices [§<].
143. Facebook estimates that less than [0-5]% of winning ads are priced based on reserve prices in practice.
144. With automated bidding, advertisers provide the platform with a performance goal and then allow the search engine to use algorithms to dynamically set bids to meet this goal.
145. Automated bidding has the potential to substantially improve advertising performance on behalf of advertisers. However, as for search advertising, automated bidding has the potential to be implemented in a way that results in outcomes that are worse for advertisers, eg with higher prices, but generate more revenue for the platform.

146. Facebook has an auto-bidding feature which does not have a price control. It is possible that advertisers who use this feature may in certain circumstances pay for advertising where the cost is higher than the amount they are prepared to pay. [90-100]% of UK advertisers on Facebook keep the default auto-bidding feature.
147. Facebook also has an automated 'pacing' system, which sets bids on behalf of advertisers, which is turned on by default. Facebook submitted that the pacing system seeks to maximise the value an advertiser receives from each ad and ensure that an advertiser's budget is spent evenly over the duration of its ad campaign. For example, it might apply discounts to the advertiser's bids to allow the advertiser to buy inventory at lower prices at later points within the duration of the ad campaign. Facebook submits that the essential process underpinning pacing is as follows:
- a) [X]
 - b) [X]
 - c) [X]
 - d) [X]
148. Based on Facebook's description of how its pacing system works, it may often result in outcomes that are in the individual advertiser's best interest. However, there also may be the potential for Facebook to allocate bids through its auto-bidding and pacing features in a way that inflates the prices paid by other advertisers. While we do not have evidence that this is the case in practice, the complex and opaque nature of this process makes this difficult to verify.

Influence over advertiser campaign choices

149. In order to create display ads on Facebook, advertisers access the Facebook Ads interface where they can choose the objectives they intend to meet with the ad campaign, the audience they want to target and how to optimise their campaigns. These choices determine the density of the auctions that, among other factors, influence prices paid by advertisers.
150. As explained in Appendix N, we have found that there are ways in which Facebook can influence advertisers' choices when setting up and running campaigns on Facebook Ads, for example through default settings. For example, we note that [90-100]% of UK advertisers on Facebook keep the

default auto-bidding feature which does not have a price control.²⁴ In principle, this may allow Facebook to influence advertiser choices in a way that results in greater revenue for Facebook at the expense of higher costs for advertisers. Moreover, small advertisers who spend relatively little on platforms are likely to be less sophisticated in their bidding strategies and more inclined to stick to default and pre-settings. We note that, as set out in Appendix N, the vast majority of advertisers on Facebook are small advertisers, although they account for the minority of Facebook's revenue.

How competition affects incentives to influence outcomes

151. Display advertising platforms are two-sided platforms that compete for both consumers and advertisers. They compete for consumer attention and then monetise this attention by offering the opportunity for advertisers to display advertising.
152. Below we discuss how the competitive constraints on display platforms from users and advertisers may affect incentives to use the 'levers' described in the previous section to generate revenue.

Competition for users

153. Competition in display advertising differs from competition in search advertising in that while display advertising platforms may compete directly for advertisers, they do not necessarily compete directly for user attention. Display advertising platforms operate in a range of user markets.
154. The largest of these platforms, such as Facebook, typically provide various differentiated types of social media and use this to generate advertising inventory. In the open display market, many publishers of smaller scale (for example, suppliers of news media and app providers) also attract consumer attention through providing content and use this to generate advertising inventory. However, they sell this inventory in an open market in competition with other publishers using a complex chain of intermediaries.
155. As set out in Chapter 3, social media platforms compete for user attention across a range of parameters, including innovation, size and type of user base, content featured, ad load and quality of advertising, price, privacy and platform 'governance'.
156. As with search advertising, an important constraint on the ability of display platforms to generate revenue comes from users responding to increased ad

²⁴ CMA calculations based on Facebook data

load by spending less time on the platform or switching to alternatives, where quality is perceived to be higher. This means that the quantity and presentation of advertising is a key parameter of competition on the user side.

157. Network effects on the user side play an important role in the strength of the competitive constraint that users impose on the ability of display platforms to set higher ad load. The need to compete aggressively for users to build scale and benefit from user side network effects means that the competitive constraint from users is likely to be substantially greater for platforms that are yet to achieve the scale of larger platforms like Facebook. As noted in Chapter 3, Facebook has submitted that its early success in competing with Myspace was due to Myspace's focus on maximising advertising revenue, to the detriment of the consumer experience. By contrast, Facebook has now reached a much larger scale of users and consequently benefited to a greater extent from consumer-side network effects.
158. In addition to generating network effects, scale on the user side is also important when selling advertising inventory for several reasons. First, attracting user attention also allows display platforms to gather valuable data which can be used to target specific audiences, increasing the value of advertising inventory to advertisers. Second, many advertisers value the ability of the platform to reach a broad population of users or to have sufficient coverage to target large enough numbers of very specific audiences. Third, scale on the user side may allow the platform to attract higher bid density in its auctions, making it possible for these auctions to more efficiently extract rents from advertisers. These scale advantages may allow the platform to sell inventory at higher prices. They also create an additional incentive for display platforms to focus primarily on growing their user base before attempting to monetise with higher ad load.
159. In relation to the other revenue-generating levers described in the previous section, competition on the user side may also act as a constraint on the presentation of advertising and creates an incentive to weight advertising auctions by quality and relevance.

Competition for advertisers

160. While display platforms do not all compete directly with one another on the user side, they compete more directly when selling advertising inventory. However, there is also a significant degree of differentiation on the advertiser side. As set out in Appendix N, display advertising platforms compete for advertisers across various dimensions, including price, data and targeting capabilities, reach and coverage and quality of interface.

161. As mentioned above, competition over some of these parameters, such as data and reach, is directly linked to the ability of display platforms to attract more users. Other parameters, such as the quality of interface, involve competing more directly for advertisers.
162. Relative prices are a key driver for advertisers' choice of display advertising platform. Advertisers are likely to divert expenditure to platforms where the cost is lower or the return on investment greater, all else equal. As set out in the previous section, the use of auctions allows display advertising platforms to exercise market power automatically. In addition, as noted above market power on the user side may lead to scale advantages which indirectly affect prices on the advertiser side.
163. Prices may also be affected indirectly by ad load, to the extent that the overall supply of similar ad inventory affects overall market prices. Platforms of sufficient scale relative to other platforms may have an incentive to exploit market power through limiting the overall quantity of advertising inventory they supply, thus increasing overall market prices.
164. This means that increased competition can create two opposing incentives for platforms when setting ad load. On the advertising side, increased competition results in an incentive for platforms to increase ad load, while on the user side, increased competition results in an incentive to reduce ad load. Overall, it appears that competition on the user side is the more important driver for differences in the ad load set by display platforms in practice. This is because of the importance of benefits deriving from scale on the user side, such as user side network effects.

Summary of how market power affects outcomes

165. Based on the above discussion, relative to a more competitive market we would expect a display platform with market power to:
- set higher ad load or reduce the weighting of bids by relevance, as it would face less competitive constraint from users switching; and
 - charge higher ad prices, as a result of the scale advantages derived from market power on the user side, including greater data, reach and bid density.
166. Higher ad load or reduced weighting of bids by relevance will result directly in lower quality for users. Higher advertising prices would be likely to ultimately be passed on to consumers in the form of higher prices for the products and services sold by advertisers.

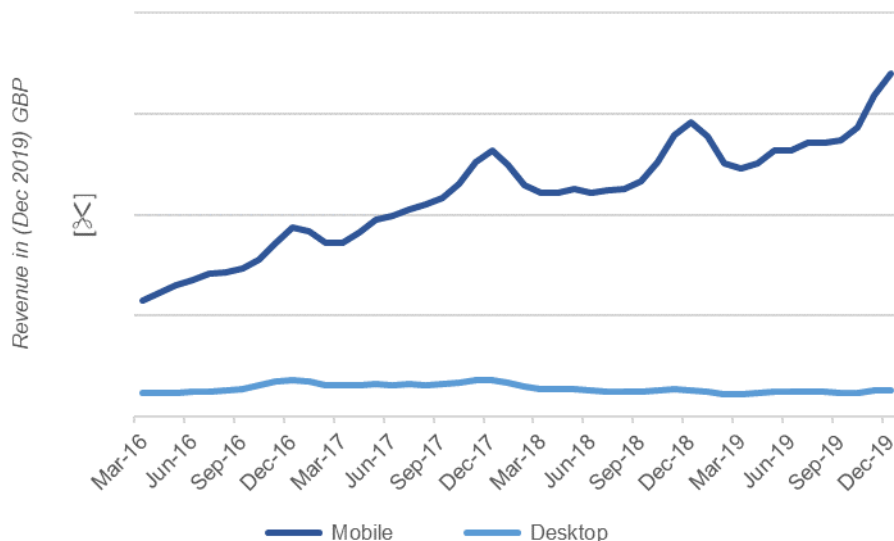
Evidence of Facebook’s behaviour and market outcomes

167. In this section we set out our analysis of Facebook’s actual behaviour over the past few years in relation to the various ways it may be able to exploit market power as discussed above.
168. This analysis first sets out Facebook’s UK display advertising revenue since 2011 and then breaks it down according to its drivers, including the user time spent on the platform, the ad load, the presentation of ads, relevance and quality scoring and finally prices.

Revenue

169. Facebook’s revenue is significantly higher than that of other social media platforms and has steadily increased in the past nine years (see Appendix C). Over this time Facebook’s UK revenues have increased from [£98] million in 2011 to more than [£2] billion in 2019.
170. As set out in Appendix C, this increase in revenues has been driven predominately by Facebook’s mobile ad formats which account for a large and increasing proportion of its total advertising revenues.

Figure Q.12: Facebook monthly UK revenue by device, 2016-2019



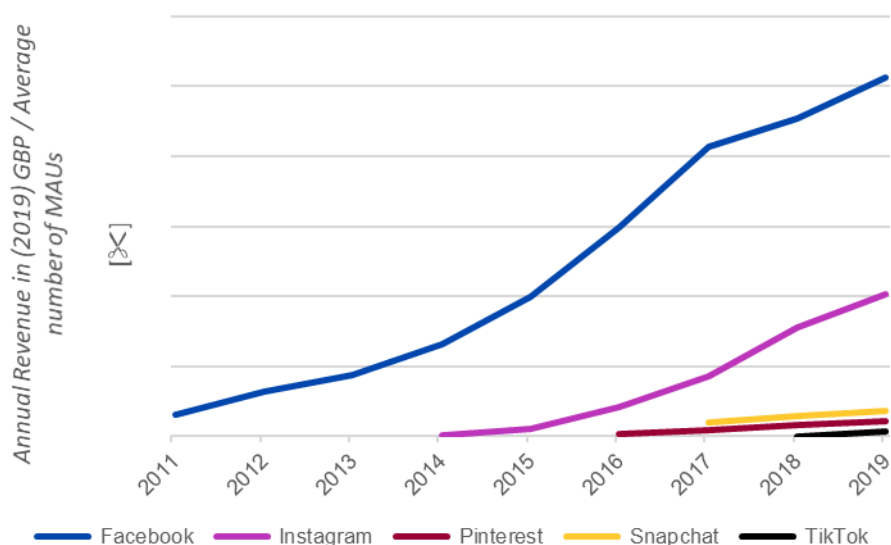
Source: CMA analysis of Facebook data.

Notes: Figures presented in real terms. Three-month moving average shown in the charts for confidentiality reasons.

171. This has translated into a steep rise in the revenue that Facebook has been able to generate from its user base. As shown in the figure below, Facebook annual revenue per user has increased from about £[0-5] in an early growth stage in 2011 to £[50-60] in 2019 and is significantly higher than that of its competitors. Our comparison with other social media platforms suggests that it is now more than ten times higher than those competitors for which we have

been able to obtain robust UK data.²⁵ The revenue per user for Instagram (owned by Facebook) is lower than that of Facebook but has also risen rapidly since the introduction of ads in the UK in 2014.

Figure Q.13: Average annual UK revenue per user for selected platforms, 2011-2019



Source: CMA analysis.

Note: Figures presented in real terms and on the basis of monthly average users.

172. In the following sections we describe the potential drivers of Facebook’s ability to generate very high and increasing revenues. In doing so, we draw on the analysis of market outcomes, Facebook’s internal documents and our review of Facebook advertising interface, Facebook Ads.

User numbers and behaviour

173. The total number of users on Facebook is much higher than other social media platforms and has increased significantly from [10-20] million in 2011 to [40-50] million in 2019.

174. These users spend lots of time on Facebook, as shown in figure Q.14 below. Although this has been largely flat in the past decade, the time that users spend on Facebook is greater than that spent on rival platforms, with the exception of YouTube (see Appendix C).

²⁵ As noted in Appendix C, we have not presented revenue per user hour for LinkedIn and Twitter as their revenues were attributed to the UK on the basis of (believed) advertiser location, while user numbers are recorded on the basis of user location.

Figure Q.14: Total time spent on Facebook, 2016-2019



Source: CMA analysis of Facebook data.

Notes: Three-month moving average shown in the chart for confidentiality reasons.

175. Facebook’s increasing revenue can be partly explained by an increased number of users who, alongside other legacy users, spend many hours on the platform. However, Facebook has been able to almost double the rate at which it monetizes user attention over the past three years.

Ad load

176. Another driver of the revenue figures we observe is the number of ads served to users. Ad load, the number of impressions served per hour, on Facebook has increased from [40-50] in 2016 to [50-60] in 2019.

177. This notable increase in the number of ads served has been realised through a number of incremental changes over time:²⁶

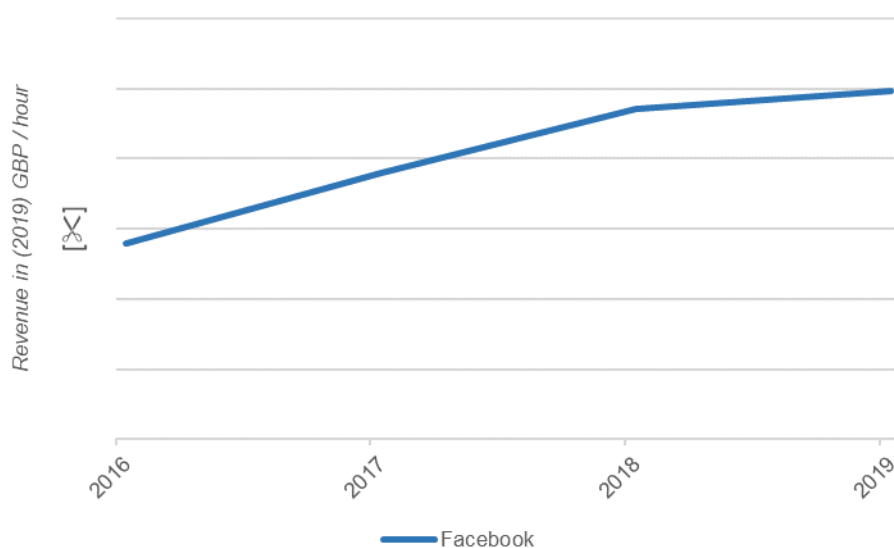
- a) In the summer of 2016 Facebook changed its minimum ad gap²⁷ [X].
- b) In 2017 Facebook removed its rule that less active users always have a static ad gap of [X] and further reduced ad gap from [X].
- c) In 2018 it introduced Time-Based Ad Insertion (TBAI) which allows Facebook to reduce the ad gaps for users based on the user’s organic video consumption on News Feed. [X].

²⁶ Facebook said that these changes have been largely similar on mobile and desktop.

²⁷ Ad gap is the number of non-ad pieces of content between each ad.

- d) In February 2020 Facebook further reduced ad gaps from [X] for users who engage with ads more frequently.
178. In an internal document, Facebook says that it expected the latest change in ad gaps to [X]. This shows that Facebook conducts experiments on the impact of changes to ad load, including whether one of the impacts would be to increase its revenue and that it continues to explore ways to do so.
179. Partly as a result of high and increasing ad load, Facebook's revenue per hour is greater than other platforms and have increased in the past four years.

Figure Q.15: Facebook revenue per hour, 2016-2019



Source: CMA analysis of Facebook data.

180. The increase in Facebook's revenue per hour has been primarily driven by increasing monetisation of user time on mobile relative to other formats. The revenue per user hour on mobile and desktop formats has increased overall over time (barring the RHS banner format, for which monetisation has declined) (more details in Appendix C).

Presentation of ads

181. Facebook has conducted experiments on the impact of changes to ad presentation, including whether the way it presents ads to users will result in, amongst other things, any increase in ad revenue.
182. Another lever that Facebook can use to generate additional revenues is the way it presents ads to users.
183. In the past five years Facebook has introduced new types of ads such as slideshow video ad format, click to Messenger ads in Newsfeed, Facebook

Marketplace and ads in Stories. In addition, Facebook can change different features of its ads such as height, dimensions of buttons and text and image aspect ratio.

184. Documents discussing research assessing the impacts of these changes show that, even minimal and indiscernible changes, may have a significant impact on ad performance and revenue. [§<]

Relevance and quality scoring

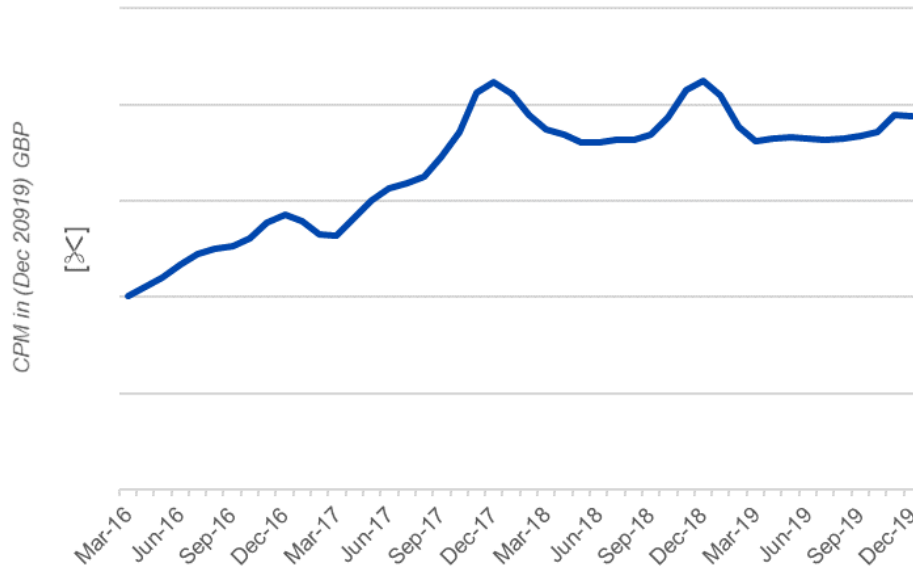
185. On the advertising side, as explained above, the relevance and quality scores have a direct bearing on the prices paid by advertisers. Facebook has discretion over how much weight to put on quality and relevance of ads for users compared to advertiser bids in general when determining auction outcomes.
186. Facebook said that it places considerable importance on the interests of users in order to determine which advertisers win the ad placements. To do so, Facebook's auctions rank eligible ads by its 'total value' that it determines on the basis of the advertiser bid and user's estimated action rate (so called advertiser value) and relevance and quality of ads for users (so called user value).

Prices

187. The main way that Facebook's market power could manifest itself on the advertising side is through high and/or increasing prices to advertisers. As explained above, prices are determined by the outcomes of second-price auctions where advertisers bid to win impressions and show their ads. However, even if prices are not directly set, Facebook has the ability to influence them by changing factors, such as the number of impressions available and nudging advertiser's campaign choices, that ultimately determine the supply and demand for ads and therefore prices. In addition, advantages derived from Facebook's market power on the user side of the market, including greater access to user data and scale advantages from greater reach and denser advertiser auction, may also lead to Facebook being able to charge higher prices.
188. We have analysed the evolution of platforms' display advertising prices over time and, where possible, compared Facebook's prices with those of other platforms. Because of the high degree of differentiation between platforms, the ability to compare prices on a like-for like basis is limited. These comparisons are discussed in more detail in Appendix C.

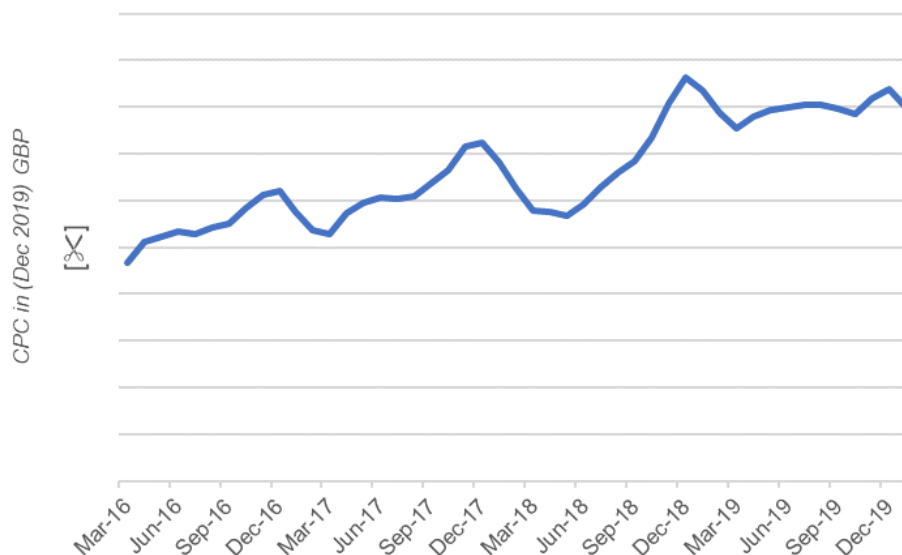
189. As shown in the figure below, Facebook’s cost-per-impression (CPM) and cost-per-click (CPC) has increased over the last four years. Moreover, Facebook’s CPM is higher than those of most platforms over the same period (with the exception of Twitter).

Figure Q.16: Facebook CPM, 2016-2019



Source: CMA analysis of Facebook data.
Notes: Three-month moving average shown in the charts for confidentiality reasons.

Figure Q.17: Facebook CPC, 2016-2019

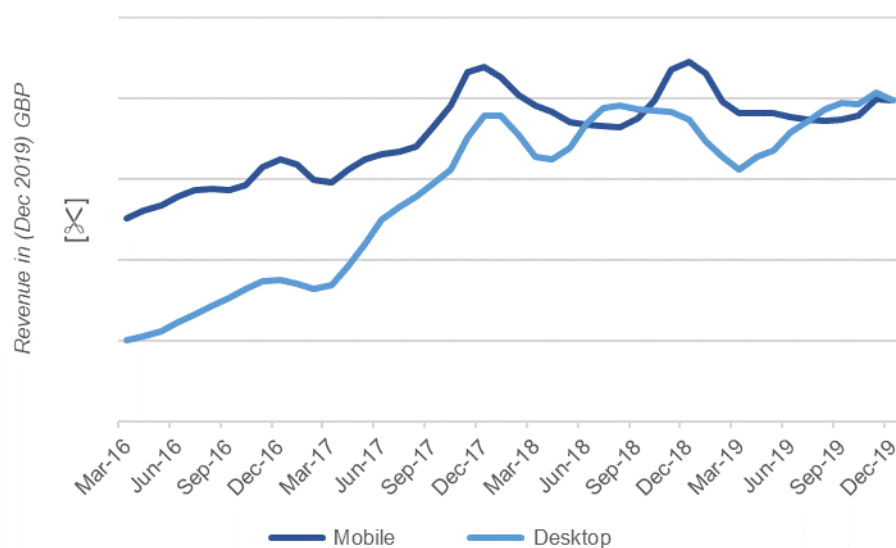


Source: CMA analysis of Facebook data.
Notes: Three-month moving average shown in the charts for confidentiality reasons.

190. The average prices above conceal differences in price trends and the proportion of ads shown across channels (mobile and desktop) and types of

ads (video and non-video and other ad types). These are shown in the chart below.

Figure Q.18: Facebook average monthly CPM by device, 2016-2019



Source: CMA analysis of Facebook data.

Notes: Three-month moving average shown in the chart for confidentiality reasons.

191. When looking at Facebook’s cost-per-acquisition (CPA) for the most important action-based objectives in 2019, the picture is more mixed. For example, the price per action of ‘offsite conversions’ has decreased over the past four years, whereas the CPA for ‘offsite clicks’ have increased.
192. Facebook submitted that CPM is not the appropriate measure of price to consider as it does not accurately capture advertiser’s returns on investment (ROI) that is the objective that advertisers ultimately care about. It said that a good proxy for measuring the direct impacts of ads on sales is CPA and, when considering this as the appropriate measure of price, Facebook says that prices have not been increasing. In any case, Facebook argues that CPM changes have been driven by increased quality of its advertising offering through the introduction, among other things, of optimisation tools for advertisers. As a result, it claims that increases in prices reflect a higher quality service offered to advertisers, rather than its increased ability to exploit market power.²⁸
193. In our view, one of the main reasons why Facebook has likely to be able to improve the performance of its advertising over time and relative to rivals, resulting in higher CPM, is likely due to the greater extent of user data it has available. As discussed in Appendix F, we have found that data is an important determinant of platforms’ ability to target digital advertising and

²⁸ Facebook also provided data showing an increasingly high adoption of its optimization tools from advertisers.

provide verification, measurement and attribution services to advertisers. Therefore, Facebook increased ability to track users and their actions is likely the result of the extensive user data that Facebook collects from its own user-facing services and third-party properties. This advantage is derived from Facebook's market power on the user side.

194. In addition, other advantages derived from market power on the user side, including reach and bid density may also lead to Facebook's prices being higher than prices on other display platforms.
195. We note that the qualitative research report found that advertisers believe that their ROI on Facebook has been falling over time and that to achieve the same results they need to increase their spending on Facebook compared to the previous year.²⁹ This suggests that prices have increased without corresponding increases in ROI for, at least, some advertisers.

Conclusions on exploitation of market power in display

196. We have identified several ways in which Facebook can generate greater revenues from its advertising auctions. Facebook can directly increase revenues by increasing the ad load. In addition, it can reduce the weighting on quality and relevance placed on bids in its auctions. Scale and data advantages may also allow it to sell inventory at higher prices. Facebook controls several auction parameters which can affect prices. These include setting bid prices on bidders' behalf through automated bidding tools such as pacing. Further, Facebook's influence over advertisers' choices when setting up and running campaigns on Facebook Ads, for example through default settings, may allow it to increase revenue particularly for smaller, less sophisticated advertisers. Facebook's ability to use reserve prices to directly influence the prices resulting from advertising auctions appears more limited.
197. We have considered Facebook's incentives to exploit market power using these levers. Relative to a more competitive market we would expect Facebook to:
 - set higher ad load or reduce the weighting of bids by relevance, as it would face less competitive constraint from users switching; and
 - charge higher ad prices, as a result of the advantages derived from market power on the user side, including greater data, reach and bid density and ability to influence auction outcomes.

²⁹ The qualitative research report will be published on the Online Platforms Market Study CMA page.

198. Use of these levers may harm Facebook's users. Higher ad load or reduced weighting of bids by relevance will result directly in lower quality for users. Higher advertising prices would be likely to ultimately be passed on to consumers in the form of higher prices for the products and services sold by advertisers.
199. Our analysis of Facebook's behaviour and resulting market outcomes shows that it has increased the monetisation of its platform over time, including through increasing ad load, particularly for mobile formats. Facebook's prices have similarly risen and are on average higher than its rivals. This is likely due to advantages derived from Facebook's market power on the user side, including greater data, reach and bid density.

Annex

Timeline of Google Search ad presentation changes

200. Over the past 10 years from 2011 to 2020, Google has made several significant changes to the way it presents ads. The changes have affected mobile and desktop. The changes are part of a continual program to update the way ads are shown to users.
201. In 2011, Google introduced a new ad block below the organic search results.³⁰ Google also introduced longer headlines for certain ads where the first line of description is a complete sentence.³¹
202. In 2012, Google introduced Shopping Ads, known then as Product Listing Ads.³²
203. In 2013, Google moved away from a block approach to ad labelling where the entire ad block was background shaded. The replacement was a badge approach meaning each ad was individually distinguished. This change also reflected the US Federal Trade Commission's updated search engine guidance. Google also updated Ad Rank so that an advertiser's use of ad extensions and formats could influence their position on the SERP.³³
204. In 2015, Google allowed search ads on mobile devices to appear 'below the fold' (that is, below the viewport), such that users would sometimes need to scroll down to see all of the ads returned in response to their search query.
205. In 2016, Google introduced expanded text ads, which allow advertisers to enhance their creative with a third headline and a second description.³⁴

³⁰ [Google Adwords blog, new ad placements.](#)

³¹ [Google Adwords blog, longer headlines for select ads.](#)

³² [Google commerce blog, building better shopping experience.](#)

³³ See 'Improving Ad Rank to show more relevant ad extensions and formats' available at:

[Google Adwords blog, improving ad rank.](#) Ad extensions and formats are visual enhancements that advertisers can enable manually to improve their click-through

³⁴ [Google Products blog, ads and analytics innovations.](#)

Figure Q.19: 2016 Google Search Expanded Text Ad Changes

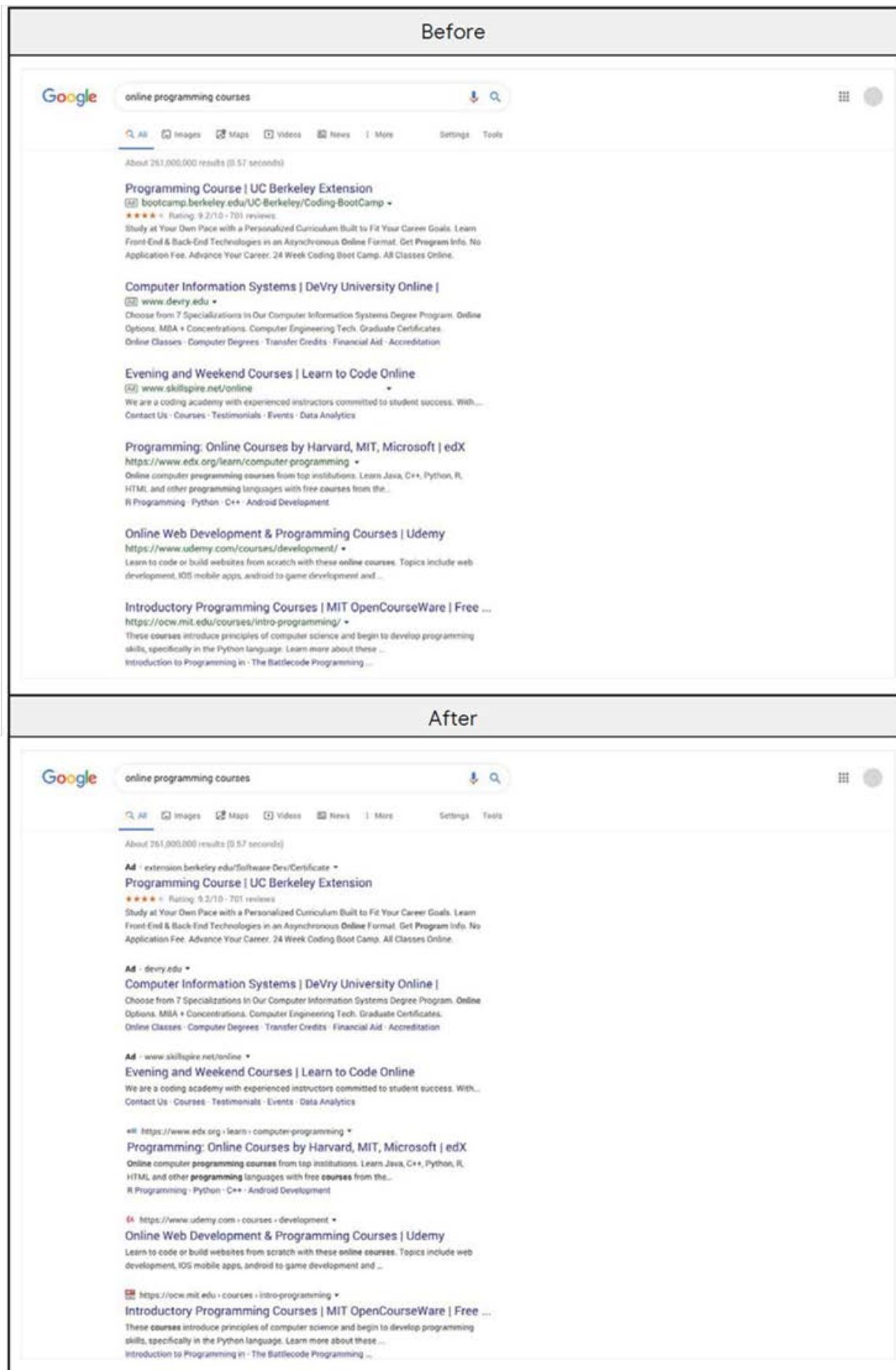
Upgraded ad components	Current	Available later this year
More prominent headlines	One 25-character headline	Two 30-character headlines
Longer description line	Two 35-character description lines	One consolidated 80-character description line
Relevant display URL	Manually entered display URL. Any mismatch between your display, final and landing page URLs will cause your ad to be disapproved.	Domain automatically extracted from your final URL to ensure accuracy. You can customize the URL path.

Source: [Google products blog, ads and analytics innovations](#)

206. In that same year, Google removed right-hand side ads and increased from three to four the number of ads eligible to appear above the organic search results.
207. Most recently, in 2020 for desktop and 2019 for mobile, the position of the title and website URL were flipped. The URL was made smaller and its colour changed from green to grey. The changes to how ads were presented was accompanied by the introduction of a favicon to organic results. The favicon this is a small picture placed to the top left-hand side of organic results.³⁵

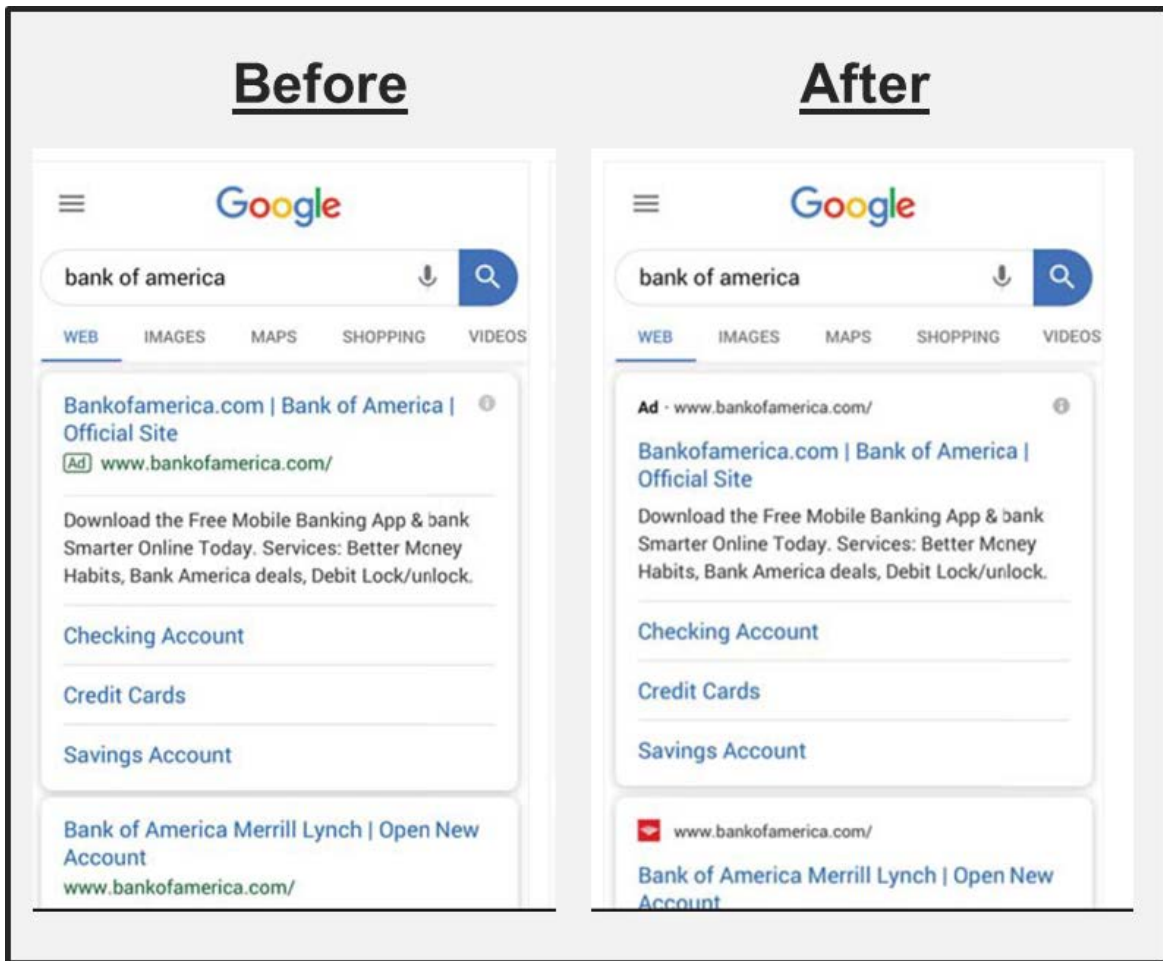
³⁵ The favicon was removed after its initial introduction in 2020.

Figure Q.20: 2020 Changes to Google Search Ad presentation on Desktop



Source: Google Internal documents, Annex 4.2

Figure Q.21: 2019 Changes to Google Search Ad presentation on mobile



Source: CMA presentation of Google Internal documents, RFI response