

Appendix D: profitability of Google and Facebook

Introduction

1. As part of the market study, we have undertaken an analysis into the financial performance of Alphabet Group (Google) and Facebook (this includes Instagram, WhatsApp and Messenger).
2. We have undertaken financial analysis for both companies to enable us to establish whether their platforms are generating returns persistently higher than if they were operating in a more competitive market.
3. We have undertaken analysis of the following elements of financial performance for Google and Facebook:
 - the overall financial performance, including a review of profits, return on capital, and certain other measures reflecting trends in monetisation; and
 - the returns earned relative to benchmarks, including the relationship between their returns on investment and their cost of capital.

Alphabet Group

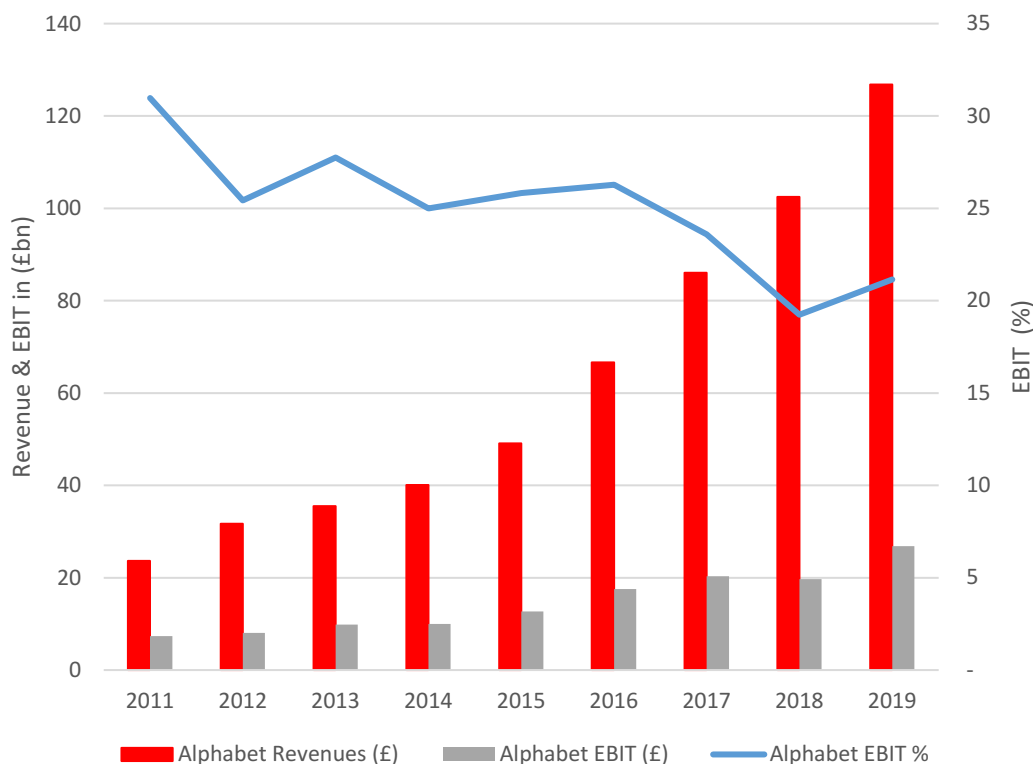
Financial performance of the Group

4. In assessing Google's financial performance, we have started with Google's group financial statements. In October 2015, Google established a new parent company, Alphabet Inc. Alphabet splits its reported performance into two operating segments for US financial reporting purposes:
 - Google; and
 - Other Bets.
5. Our market study is interested in the performance of businesses within the Google segment, and this appendix seeks to understand the level of profitability of the search business, in particular. The businesses most relevant to our study form the great majority of the Google segment by revenue including search, YouTube, Maps, Android, digital advertising, Chrome and Google Play. Many of the 'business units' in the Google segment are not directly monetised. Brands such as Android, Chrome and Gmail are monetised largely through their role in developing what is often referred to as an 'ecosystem' within which Google is the default search provider, allowing Google to monetise these activities through digital advertising.

6. In its published financial statements Alphabet historically provided no separation of the results within the Google segment, although in its latest 2019 10-K form Alphabet disclosed the revenue from Google cloud for the first time. We have begun our assessment by considering the profitability of the business that can be directly observed from the financial statements. We then set out estimates of the profitability of the search business, using submissions obtained from Google.

7. Alphabet has been profitable for at least the last 15 years, since its IPO in 2004, and its revenues have grown significantly in every year since. Figure D.1 demonstrates Alphabet Group's level of profitability for the last nine years. Its percentage profit margins, measured as EBIT (earnings before income and tax) have remained consistently high and although on a declining trajectory the profit margin before the effect of European Commission fines (see Table D.1) has not fallen below 20%.

Figure D.1: Alphabet Group Revenue and Profit between 2011 and 2019



Source: CMA analysis of Alphabet 10-K forms.

Table D.1: Alphabet Group revised profitability excluding EU Commission fines 2017 to 2019

<i>Alphabet Profitability</i> £ billions	2017	2018	2019
Actual profitability	20.3	19.7	26.8
EU fines	2.1	3.8	1.3
<i>Adjusted profit</i>	<i>22.4</i>	<i>23.5</i>	<i>28.1</i>
Actual EBIT %	24%	19%	21%
<i>Adjusted EBIT %</i>	<i>26%</i>	<i>23%</i>	<i>22%</i>

Source: CMA analysis of Alphabet 10-K forms.

Alphabet Group Return on Capital Employed (ROCE)

Introduction: Why we use ROCE as a measure of profit

8. As set out in our Guidelines for market investigations,¹ we normally measure profitability using rates of return on capital employed (ROCE), derived using accounting profits which are then adjusted to arrive at an ‘economically meaningful measure of profitability’. In a competitive market we would expect firms to ‘earn no more than a “normal” rate of profit’, at least on average over time. ROCE is calculated by dividing EBIT, shown in Figure D.1, by the value of capital that is employed in the relevant business. For our purposes, we consider the actual investment in capital (ie the cash spent on buying assets used to generate revenue). The principles and methodology set out in this section apply equally to Google and Facebook.
9. ROCE is a good measure to test where profits for a particular firm or sector are high, because it can be compared against an objective benchmark, the weighted average cost of capital (WACC). Another way of looking at this is that while all companies need to earn positive margins to be sustainable, margins themselves do not provide any information about whether this is higher than might be expected in a market that is working well: some sectors with high asset investment and low operating costs will tend to have high margins. ROCE also has the benefit that it can be compared against what profit a company would require to recover the cost of investments made in the past.
10. A finding that ROCE is higher than the WACC is not in itself indicative of a competition problem. A firm that innovates and gains a competitive advantage may earn higher ROCE for the period that it is able to sustain that competitive advantage. In a market characterised by effective competition, any excess of returns above the WACC would then be expected to be eroded over time. However, our guidance indicates that a finding that ‘profitability of firms which represent a substantial part of the market has exceeded the cost of capital

¹ Market investigation [Guidelines](#), (CC3 Revised), parag.115, Annex A paragraph 9.

over a sustained period could be an indication of limitations in the competitive process.²

11. ROCE can also be illustrative of the profits that might be earned by a competitor in a similar financial position. If ROCE is consistently very high, we normally would expect to see entry, as a new entrant which can replicate the performance of the firm could earn well above its cost of capital. For example, in search and social media, there are a number of potential entrants, and if Google and Facebook earn well above their cost of capital, this would normally be a signal to potential competitors to enter and expand.
12. Capital can be spent on tangible assets, such as buildings and physical infrastructure, or intangible assets, where firms invest in building or buying in technical capabilities which can then be monetised over several years. Google and Facebook have been making large capital investments in recent years and investors will expect sufficient profit to compensate them for providing this capital. The cost of financial capital investment is not reflected in margin analysis, which is why a ROCE assessment is more complete for businesses with sufficient assets to make the measure of capital meaningful. Potential entrants may also need to invest in developing the technical capability to deliver the services.
13. Measurement of the value of assets can be a challenge. In some cases, the current value (known as replacement cost) of the assets owned by the firm may be different from historical costs and may justify an adjustment to the capital employed value. We have sought to address this challenge through a bottom-up review of the asset investments incurred by Google and Facebook, and compared them to the investments made by third parties. As illustrated below, both Google and Facebook have invested significantly in assets as their businesses have grown.
14. Frontier Economics have challenged the period we have selected for review stating the period selected to be 'arbitrary' and not capturing a 'full business cycle'. In our view, the choice of the most recent nine years is both sufficiently long to represent a suitable period for analysis, and also reflects a period during which both Google and Facebook's core businesses have been in a more stable market position, with consistently high market shares.
15. We have also undertaken a review of Alphabet's Google segment and Facebook's ROCE for the entire period that was available to us, but we

² Market investigation [Guidelines](#), (CC3 Revised), parag.118

consider that the last nine years better represent the ‘maturity stage’ for both firms³. In addition, we used the following three aspects as guidance:

- existing general guidance in relation to market studies and market investigations;
 - precedents from other historical cases;⁴ and
 - choice of a relevant period to achieve the objectives of the market study.
16. The CMA’s Market investigation Guidelines⁵ state that in the financial sector as well as other sectors a five-year period (or similar) was considered when carrying out profitability analysis.
17. The Energy Market and the Movies on Pay-TV investigations represent two examples where we have departed from the Guidelines and extended the period for the profitability analysis. A seven/eight-year period was used in the Energy Market investigation and a fifteen-year period was used in the Movies on Pay-TV market investigation. While the Movies on Pay TV investigation carried out the analysis over a longer period of time than the guidelines to ensure that variability in profitability was reflected in the analysis⁶, the focus was on the most recent five year period, as Sky had maintained consistent profits in that period. As demonstrated by Figure D.1, Google has generated consistently high profits over the last nine years.
18. In summary, we have aimed to examine trends in profitability over a full business cycle to ensure that the reflection of the profitability levels is not distorted by unusual macroeconomic conditions or one-off events. Both Google and Facebook have had a large market share and have been highly profitable for a number of years. The risks associated with the business model of investment in a search engine or social media platform were addressed many years ago. In that context, a period of nine years is long enough to address the risk that the data may reflect a short-term deviation from longer-term trends.

³ For example, A paper by [M. Acquaah and T. Chi](#) “[A longitudinal analysis of the impact of firm resources and industry characteristics on firm-specific profitability](#)” (2007) states that “Increasing concentration [in an industry] is likely to be prompted by an industry’s movement toward maturity...” based on Nelson and Winter’s (1982) model. Both search and social media have been highly concentrated during the period of our analysis.

⁴ [Energy market investigation](#) – as part of the investigation the relevant period was considered to be 2007 to 2013/14.

Movies on pay-TV market investigation involved the Competition Commission reviewing Oxera’s and PWC’s report on Sky’s profitability over a period of 15 years between 1995 and 2009.

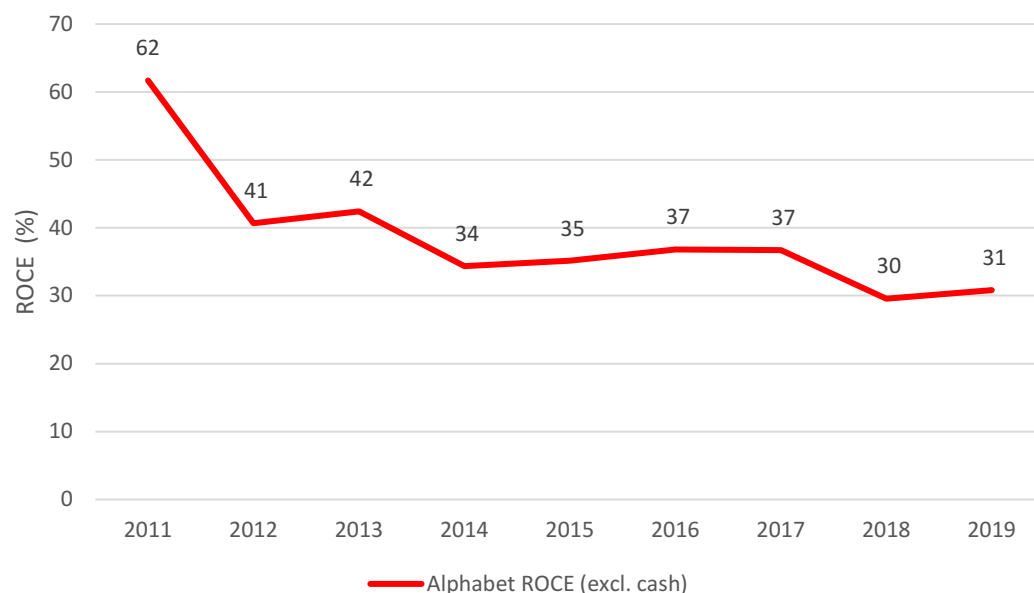
⁵ [Competition Commission Guidelines](#) for market investigations: Their role, procedures, assessment and remedies 2013 Annex A p.88

⁶ [Movies on Pay TV market investigation](#) parag. 269

Actual ROCE of Google's overall business (now Alphabet)

19. We have considered Alphabet's ROCE, measured as EBIT (earnings before income and tax) divided by capital employed (calculated as total assets excluding cash and marketable securities⁷ minus current liabilities) based on published asset values in the accounts.

Figure D.2: Alphabet return on capital employed 2011 to 2019⁸



Source: CMA analysis of Alphabet 10-K forms.

20. Figure D.2 above demonstrates that over the last nine years, Alphabet Group has been able to generate an average ROCE of 39%. ROCE has declined from 62% in 2011 to 31% in 2019 as Alphabet has invested more in assets and R&D.
21. As described above, we compare ROCE to the benchmark return of the WACC, in assessing whether profits are higher than they might be expected to be in more competitive markets. We have estimated WACC for the Alphabet Group to be around 9%. Our estimate of WACC is based on a comparison with other companies listed on the NASDAQ that fall within the same sector as Alphabet Group.⁹ We have summarised the approach to estimating the WACC in the Annex at the end of this document.

⁷ Assets have been defined as Total assets less current liabilities, less cash and marketable securities, which have been excluded in order to reflect the asset base attributable to the business, rather than the choice of financing policy.

⁸ The ROCE presented in the figure has been calculated using EBIT net of the EU fines presented in Table D.1.

⁹ We also reviewed a selection of analysts' reports which suggested a similar range for the WACC from 9%-10%.

22. On the basis that the actual ROCE for Google's total business has been around 30% or above for at least nine years, we therefore conclude that ROCE is and has been consistently higher than the benchmark WACC.

Google's submissions on our ROCE calculations

23. We have received a report from The Brattle Group ('Brattle') on behalf of Alphabet (Google) which suggests that our analysis of Google's profitability does not demonstrate that Google is exploiting market power. Brattle's submission includes the following analysis of the CMA's approach in respect of the following conclusions:
- first, Brattle suggests that the utilisation of accounting measures (ROCE specifically) may not be a reliable way of identifying possible exploitation of market power, for example because of the selection bias ('survivorship' bias) incorporated into the comparator group; and
 - second, that benchmarking evidence of Alphabet's ROCE compared to its peer group suggests that Alphabet's ROCE is consistent with other tech firms, and therefore does not demonstrate market power.
24. This section will set out the key challenges raised by Brattle on behalf of Google in terms of the profitability analysis undertaken in this appendix. It will also include remarks to address the put forward challenges and how these do not affect the preliminary view that CMA had established at the interim stage of the market study.

Suitability of ROCE to measure profitability

25. The first challenge put forward to the analysis detailed in this appendix related to the use of Google's realised ROCE and comparing it to the expected cost of capital (WACC). The critique is specifically pointed at the measurement of ROCE and its lack of applicability to the information and communication technology (ICT) industry, claiming that:
- returns in the industry are uncertain therefore demand a higher return;
 - large R&D investments distort the measure, as they increase level of ROCE.
26. We agree that the returns in the ICT industry can be uncertain and the companies operating in this sector are required to make risky investments and therefore should be rewarded for that risk. We also expect that if an industry displays high levels of return this should stimulate entry into the market which should over time erode the excess returns to levels closer to that of cost of capital. The sectors in which Google and Facebook operate are well-

established, and the initial risks associated with demonstrating the technical and commercial viability of search and social media businesses have been reduced over time.

27. This point was also addressed in our initial analysis when we carried out sensitivity analysis using investment levels made by close competitors as an indication of possible understatement of Google's asset base. The result of this analysis did not change the levels of returns to a great extent.
28. In response to the points made by Brattle, and also by Frontier on behalf of Facebook about the distortions to ROCE caused by large R&D investments, we performed sensitivity analysis to assess whether the treatment of R&D in our analysis was resulting in an unreasonably high measure of ROCE. We considered a number of scenarios¹⁰ where we capitalised much of the firms' actual R&D spend, which could be the appropriate approach where this spend is creating intangible assets for the firm.
29. We found that this sensitivity analysis has very little effect on ROCE. Google and Facebook have significantly increased investment in R&D in recent years. For firms with increasing levels of R&D, an approach of capitalising actual R&D both increases intangible assets and also EBIT.¹¹ We therefore have maintained our approach of following the standard approach of assuming R&D to be within current costs in the analysis below, on the basis that any alternative treatment would not change the conclusions.

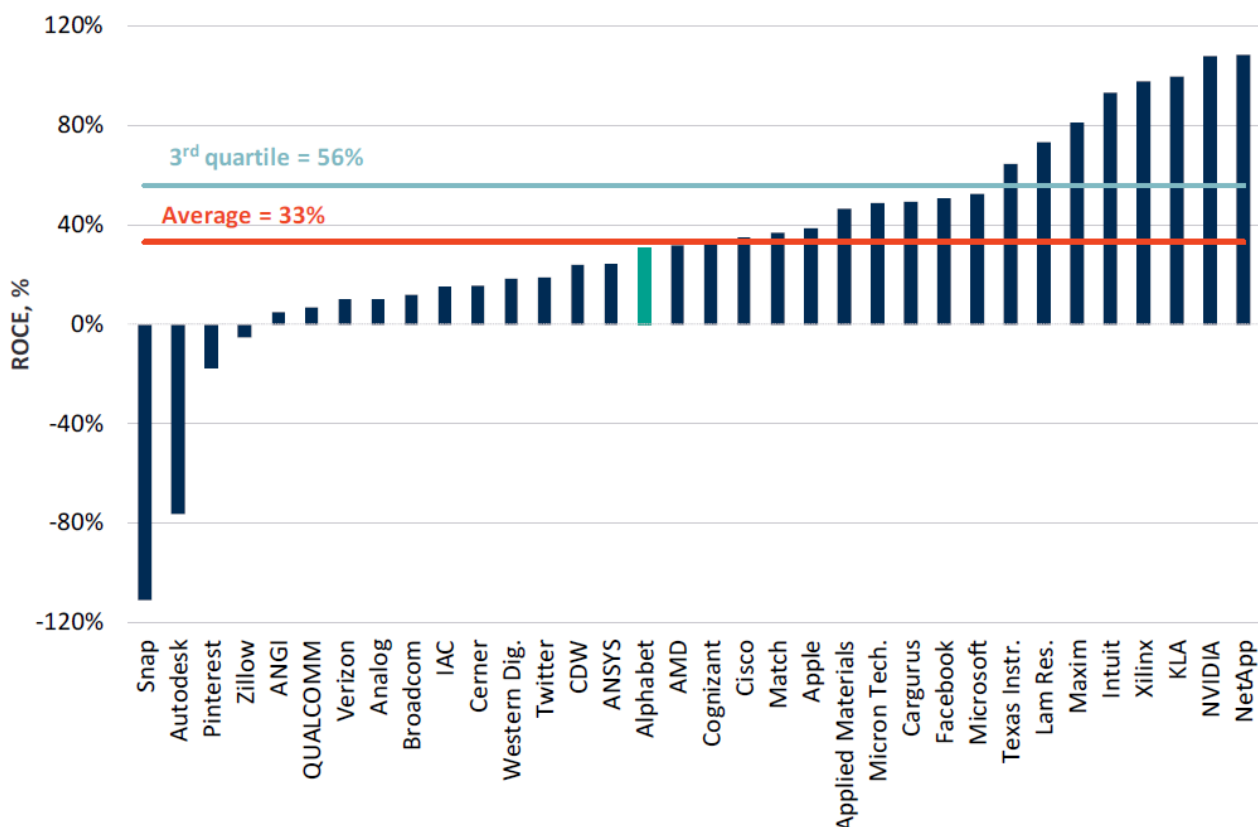
Comparator firms

30. Below we consider the evidence provided by Brattle in respect of comparable firms to Google. Brattle provided the comparator analysis in Figure D.3 as an assessment of whether Google's ROCE% is actually high or indicative of market power. Brattle's analysis was focussed on Alphabet, and as discussed below, we also found that Google Search has a higher ROCE than Alphabet.

¹⁰ The sensitivity analysis carried out for Google used confidential information supplied by Google and therefore has not been published. The ranges that we found for ROCE for Google based on this analysis were similar to those used for Facebook, presented in Figure D.14 below in this appendix.

¹¹ If we also assume that the capitalisation of this intangible asset investment offsets the need for the sensitivity we discuss in 70-71 below of increasing the asset base to reflect an entrant's cost of developing comparable investments in technology, then ROCE is higher when R&D is capitalised than under our base case of expensing R&D.

Figure D.3: 2018 ROCEs of Alphabet and comparable firms



Source: The Brattle Group submission on behalf of Google.

31. We also reviewed and categorised comparator firms used by Brattle in their analysis (Figure D.3) as presented in the Table D.2 below. We have reviewed only those comparators whose ROCE was above Alphabet’s level. We do not comment on the suitability of the firms which were included by Brattle whose ROCE is below that of Alphabet Group.

Table D.2: Brattle Group comparator firm classification by CMA

Comparators ROCE > Alphabet	Firms' ROCE < Alphabet	Firms deemed not to be comparable to Alphabet/Google >>	Semi-conductor firms & equipment manufacturers	Advisory	Asset-light firms
Microsoft Corp	Snapchat		Micron technology Inc	Cognizant	NetApp Inc
Facebook Inc	Autodesk Inc		Applied materials Inc		Cargurus, Inc
Apple Inc	Pinterest		Texas instruments Inc		
NVIDIA Corp	Zillow		Lam research Corp		
Match group, Inc.	ANGI		Intuit Inc		
	QUALCOMM		Advanced Micro Devices Inc		
	Verizon		Cisco Systems Inc		
	Analog		Maxim		
	Broadcom		Xilinx		
	IAC		KLA		
	Cerner				
	Western Dig.				
	Twitter				
	CDW				
	ANSYS				

Source: CMA analysis.

32. Out of the 18 firms included in Figure D.3 above as generating a ROCE% higher than Alphabet’s, only five were found to be in comparable sectors to

Alphabet Group (presented in the far-left column in Table D.2), and of these five firms, three are within the GAFAM¹² group of firms generally considered as having particular scale and likely to have market power in digital markets.

33. Of the remaining firms with higher ROCE using a measurement approach comparable to that we applied to Google:
- a) Cognizant, is an advisory firm, where capital is not a particularly relevant measure of investment;
 - b) NetApp Inc and Cargurus Inc are ‘asset-light’ businesses, for which ROCE % calculation can present misleadingly high results. As described in our analysis below, neither Google, Facebook, or the other GAFAM firms, are ‘asset-light’; and
 - c) The other firms were semi-conductor firms, or other firms involved in manufacturing of equipment (Cisco). Whilst it is surprising that so many of these firms have had such a high ROCE, the sectors are very different, and it is hard to read across any conclusion from the high profitability of manufacturers of semi-conductors into Google or Facebook.
34. We also compared the list of comparable firms presented by Brattle to the original list of firms which we included in the sample firms when performing the WACC estimate calculations – we did not include any of the firms presented in columns four through to six in Table D.2 above.
35. We therefore do not accept that Brattle’s analysis indicates that Alphabet’s profitability is consistent with industry averages. Brattle’s analysis indicates that GAFAM firms have unusually high ROCE, particularly given that these firms are not asset-light.
36. Brattle’s analysis also indicates that semi-conductor firms have had very high ROCE, but these are not in the scope of this study.¹³ There may be a number of further considerations which may affect the profitability of these equipment firms, which form part of a wider supply chain.
37. Overall, after review of the information and data presented, we concluded that the arguments put forward by Brattle did not provide evidence to change our original findings.

¹² GAFAM – Google, Amazon, Facebook, Apple and Microsoft.

¹³ There are two other firms with high ROCE which appear to be comparators: Match Group which is a market leader in internet dating, and NVIDIA which has had very high R&D investments in recent years.

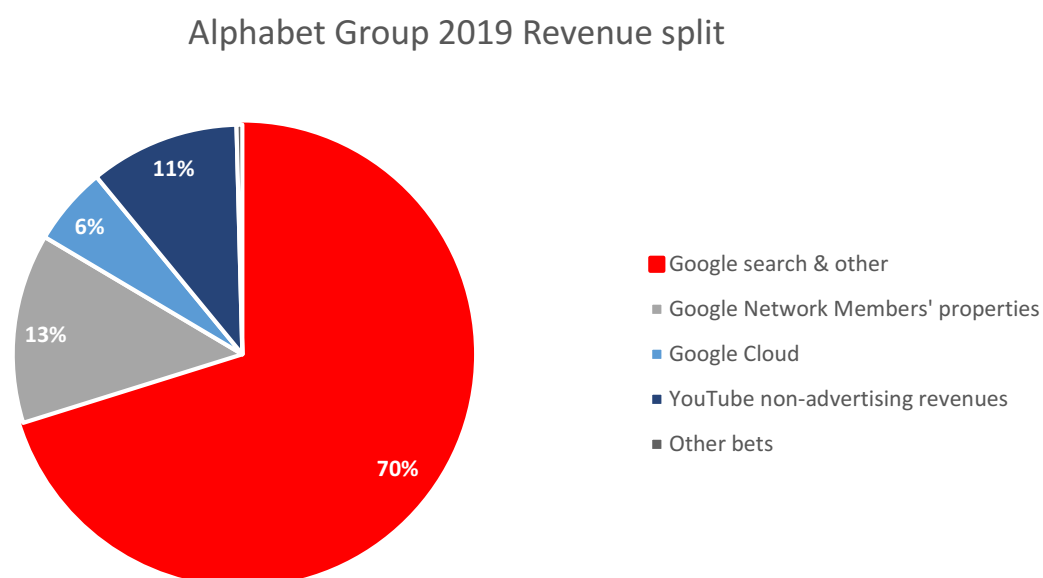
Google Search

38. In this section, we summarise the analysis we have performed of the returns earned by Google from its search business, which is the subject of our market analysis in Chapter 3. Our objective is to understand whether Google would still make returns well above the WACC, if it only owned a search business. This may help us understand the consequences of the very high market shares that Google has maintained in search for several years, and whether they have resulted in higher prices and profits than might be expected under a more competitive search market. Google does not publicly report what it earns from search, and therefore the outputs presented in this section have been informed by using Google submissions to the market study.

The 'Google Segment'

39. As described above, Google reports an integrated set of results for the 'Google Segment' separate to 'Other Bets'.
40. The Google segment includes businesses such as Search, Android, Gmail, Chrome, Google's digital advertising businesses as well as hardware such as Pixel phones and Google Home, and Google cloud. These businesses are all related in some way to Google's core search and digital advertising businesses and represented 83% of Alphabet's total revenue earned in 2019 as shown in Figure D.4 below.

Figure D.4: Alphabet Group Revenue split 2019



Source: CMA analysis of Alphabet 2019 10-K

41. The Other Bets segment includes businesses at different stages of development such as Access, Calico, CapitalG, GV, Verily, Waymo and X. Revenue from this segment are primarily earned through the sales of internet, TV services, licensing and R&D services. The range of industries and expertise covered by these companies spans from biotech (Calico), high-speed broadband (Access), robotics (CapitalG) to self-driving cars (Waymo).
42. The Other Bets segment has relatively low revenue¹⁴ at present. The Google segment is therefore the main driver of Alphabet's profitability. Based on information provided in Google's 10-K, we have estimated the returns earned by the Google Segment. We have estimated the Google segment's profitability as follows:
- Revenues and costs were as reported in the filed 10-K form for 2018;
 - All assets and liabilities on the Balance Sheet are assumed to relate to the Google segment. This resulted in an asset base of £61.8 billion. This is likely to overstate the Google Segment asset base, to the extent that some of the 'Other Bets' may have invested in tangible assets.
43. Using this approach, we calculated a ROCE for 2018 for the Google segment of 38%. This increases to 44% if we exclude the European Commission fine which Alphabet accrued in its 2018 accounts. This is higher than Alphabet's ROCE of 30% in 2018, or 35% without the fine, and well above the benchmark of 9% (WACC).
44. To arrive at the ROCE for Google segment we took the following steps:
- we used Google segment reported revenue and direct costs as disclosed in the Alphabet Inc financial statements;
 - we calculated the overheads for Google segment based on the public reporting of the operating profit for the segment;
 - we allocated all of Alphabet's assets to Google segment assuming most assets are shared across Google's products and services;
 - reported operating profit for Google segment for 2018 was £27,354 million¹⁵ (or £23,555 million after the cost of the EC fine) which was divided by the asset base of £66,691 million; and

¹⁴ Revenue from Other bets in 2019 represented 0.4% or \$659 million.

¹⁵ Alphabet Inc 2018 10-K p.81.

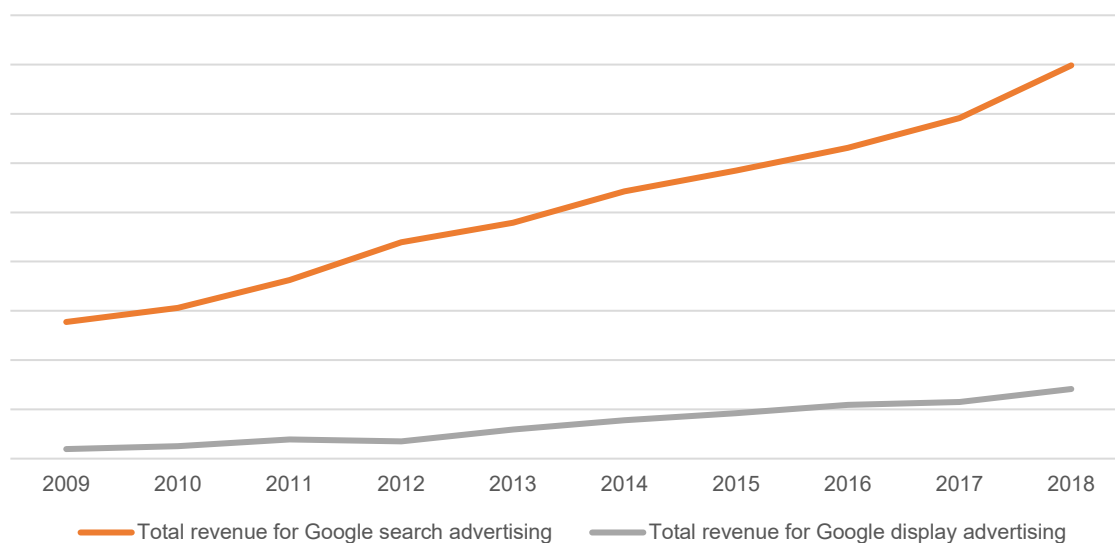
- this gave us ROCE of 44% (excluding the European Commission fine) or 38% including it.
45. The Google segment is reported as a single segment because Google says that it operates and reports these businesses together. Many of the businesses in the Google segment form part of its broader ecosystem. These businesses, such as Android, Chrome and Gmail, may contribute to why customers use Google search, but are not in themselves necessary to operate a search engine. For the purposes of our analysis of the profits earned from search, we are interested in the returns which Google would earn if it operated its search business separately. This analysis should be more reflective of the returns of a standalone search engine.

Google Search

46. Google was founded in 1998 with the intention of creating a search engine for the Internet.¹⁶ It was successful almost from the start and has been highly profitable for a large number of years. We can therefore assume that Google has generated sufficient funds to repay its original investors.
47. We have assessed the returns earned by Alphabet and its investors in 2018 from the search engine by comparing the profits earned from search to the actual investments made in assets acquired to operate the search engine. Any profits made above the cost of capital for the search business would indicate that Google is generating higher profits from search than would be expected in a more competitive search market.
48. Google is not an 'asset-light' business. In 2019 Google invested £18 billion into property and equipment (just under £19 billion in 2018). Google also invested £20 billion into research and development, a £4 billion increase on the previous year. As described above, it has just under £87 billion of assets (£67 billion in 2018), including £58 billion of tangible assets (£45 billion in 2018).
49. Google earns most of its revenue from advertising, and the revenue that it earns from search advertising has continued to grow over the years. Figure D.5 below illustrates the trends in search and display advertising for Google in the last ten years.

¹⁶ See "[our story](#)" on Google website.

Figure D.5: Google search and display advertising in the UK 2009 to 2018¹⁷



Source: CMA analysis of Google submissions.

50. We have measured the ROCE Google earns from its search business and compared the size of these returns against the WACC, based on a breakdown of Google's total costs and assets into those attributable to search, and other costs and assets not attributable to search. In some cases this cannot be done exactly, as both costs and assets are shared across businesses, and so we have made estimates. Our analysis is based on information provided by Google.
51. To complete this assessment, we have performed the following:
- measured the revenues attributable to Google's search business;
 - measured the direct costs, and estimated the operating costs attributable to the search business; and
 - estimated the relevant measure of Google's investment in building up its search engine.
52. Wherever we have had a choice of different assumptions, we have sought to identify at least a cautious scenario which may if anything understate the ROCE of search. The objective of our analysis is to test whether Google is earning well above the WACC from its investment in search, and therefore we have erred on the side of caution in coming to a lower estimate for the ROCE of the search business.

¹⁷ For confidentiality reasons we have omitted the scale and vertical axis from this graph.

Our approach to analysing the profitability of Google Search

53. Alphabet does not report separately on Google search profitability in its published accounts. Therefore, we established an approach to determine the level of ROCE for search using Google's submissions. We have focussed on 2018, the most recent year where data is available. As illustrated above, Google's profits were lower in relative terms in 2018 than in previous years.
54. In order to complete this analysis, we asked Google to provide information about the share of certain costs which relate to search. Where we do not have information or where we consider that costs are likely to be shared across different business areas, we have made assumptions which reflect our understanding of Google's business.

Revenues and direct costs

55. We asked Google to break down its revenues and gross profit into its different businesses, and also geographically. Our market study is focusing on the UK business. However, in understanding ROCE, we have taken into account that the company operates globally, with many of Google's costs being incurred for the purpose of serving the whole of the global search business. Our analysis is based on this global search business.
56. We have also reviewed data that indicates that Google's revenues in the UK follow a similar pattern to the company globally and reflect a high reliance on search with a majority of the revenue in 2018 derived from search advertising. Using Google's submissions in relation to its UK search advertising revenue, we were able to derive Google's revenue per user in the UK from its search advertising for 2018 to be around £100 per individual.¹⁸ Although Google records some costs which are directly attributable to this UK revenue, we have not attempted to estimate ROCE associated with the UK business separately, as it forms part of Google's integrated search business.
57. Google submitted direct costs which it describes as traffic acquisition costs (TAC). TAC are amounts paid by Google to its distribution partners in exchange for making Google Search available, usually as the default, on their web browsers (these are discussed further in Chapter 3 of the main report). The amounts paid are typically based on a revenue sharing basis and as such, vary directly with the revenue generated by search. We have recognised these expenses as direct costs. Despite inclusion of these costs in our ROCE calculation we note that these costs (or at least a high proportion of

¹⁸ 'Individual' refers to the estimation of number of adults that have used search in the last 12 months which may have used Google in the UK based on Google's total market share in the UK and the UK population in 2018.

these costs) may not be strictly required for the operation of the search engine if markets were more competitive and therefore our calculation could overestimate the costs required to operate such a business.

58. Google identified some other direct costs relating to search. These include data centres and engineering costs and represented a small proportion of the other costs of revenue reported by Google in 2018.

Indirect costs

59. Indirect costs are those which are not directly attributable to products but are shared across some or all products and services that Google offers. Indirect costs include research and development (R&D), sales and marketing and general and administrative costs.
60. Google makes large investments into R&D in order to ‘...accurately anticipate technology development and deliver innovative, relevant and useful products...’.¹⁹ Between 2014 and 2018, the Alphabet Group invested almost £45 billion²⁰ in R&D. However, Google's submissions show that the proportion of its R&D expenditure that it spends on search is significantly lower than the proportion of Google's total revenue that is generated through its search business. This was also the case for Google's other indirect costs, such as sales and marketing. Consequently, the operating profit margin (as a percentage of revenue) of Google's search business would be expected to be higher than the comparable profit margin of its other businesses which incur a greater proportion of these indirect costs.
61. We note that identifying the revenues and costs associated with a standalone search business requires a number of assumptions, and Google's search functions will have benefitted from some of its investments in associated businesses, such as through improved machine learning and artificial intelligence. Google disclosed in its latest filed 10-K form for 2018 that investments made over the last decade have enabled it to develop the Google Assistant capability, introduce the translate feature of web pages and has also improved the energy efficiency of the company's data centres.²¹ All of these improvements are likely to have had a direct effect (Google Assistant and translation) and an indirect effect (data centre efficiency) on Google's search business.

¹⁹ Alphabet 2018 10-K form p.7

²⁰ Alphabet 10-K forms 2014 to 2018

²¹ Alphabet 2018 10-K form p.3.

62. For these parts of the business where there is an estimate of costs associated with search, but that some of Google's costs are likely to be shared across its business, we have therefore run two scenarios for the costs of search. Our 'lower estimate' for ROCE is based upon the assumption that a proportion of overhead costs (sales and marketing, general and administrative) should be attributed to search based on the share of revenues of search. This would assume that search indirectly benefits from these shared costs equally with other revenue streams.²² Our 'upper estimate' for ROCE is based on data directly provided by Google about the indirect costs which are measured internally as being related to the search engine. As described above, Google's estimate of the indirect costs related to search are lower than the share of revenues from search.
63. In both scenarios we have also assumed that all costs attributable to the technical infrastructure of the Google business are allocated to search. As the largest business in the Google segment, we could assume that the cost of technical infrastructure will be determined by the needs of the search engine, and a standalone search business would incur similar costs of technical infrastructure. Although it is somewhat cautious to assume this even in an upper estimate, this has a relatively small effect on total costs.
64. Taking these assumptions together, we expect that our "lower estimate" will therefore underestimate the profit attributable to search, potentially significantly, as it assumes that a standalone search engine would:
- Incur the same technical infrastructure costs as Google;
 - Incur the same levels of traffic acquisition costs (TAC); and
 - Incur indirect costs significantly higher than those which Google has indicated are directly related to the provision of the search engine.

Summary of our approach to revenues and costs

65. On this basis, we have calculated an 'upper estimate' and 'lower estimate' for the profits earned by search. Our approach to revenues and costs is summarised in Table D.3:

²² The CMA does not normally use revenue as a way to allocate costs as revenues may be distorted by competition problems. However, we consider it is reasonable for the purposes of creating a 'lower estimate' for the profits earned from search.

Table D.3: Lower and upper estimates for EBIT attributable to search

<i>Input</i>	<i>Upper estimate</i>	<i>Lower estimate</i>
Revenue	Search revenue, as provided by Google	No change
Direct costs ('Traffic Acquisition Costs')	Search TAC, as provided by Google	No change
Other Direct costs (expenses associated with data centres, depreciation, energy and compensation expenses)	All costs associated with technical infrastructure assumed to be attributable to search. Other direct costs based on data provided by Google.	All costs associated with technical infrastructure assumed to be attributable to search. Other direct costs attributable to search based on share of monetisation.
R&D costs	Search & Maps R&D costs, as provided by Google	No change
Other overheads	Overheads attributable to search, as provided by Google, excluding the EC fine.	Other direct costs attributable to search based on share of monetisation, excluding the EC fine.

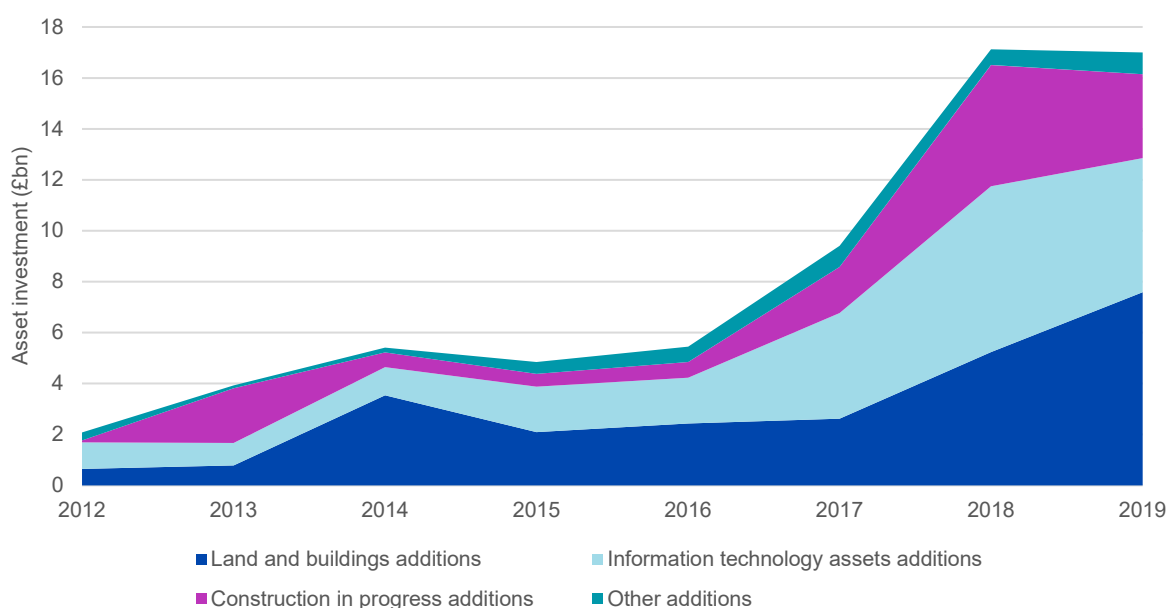
Source: CMA.

Asset base assumptions

66. In estimating the value of the asset base which directly relates to search we used publicly available information from financial statements. Our assumption for the asset value of search reflects all of Alphabet's fixed assets with the exception of goodwill relating to businesses which are not engaged in activities relating to search, and also approximately £2 billion of assets classified as other non-current assets.

67. Taking these together provided us with an asset base for search of £46 billion. The majority of these assets are physical and technical infrastructure. As indicated in Figure D.6 below, Google has invested significantly in these tangible assets in recent years.

Figure D.6: Google's asset investment 2012 - 2019



Source: CMA analysis of Alphabet 10-K forms.

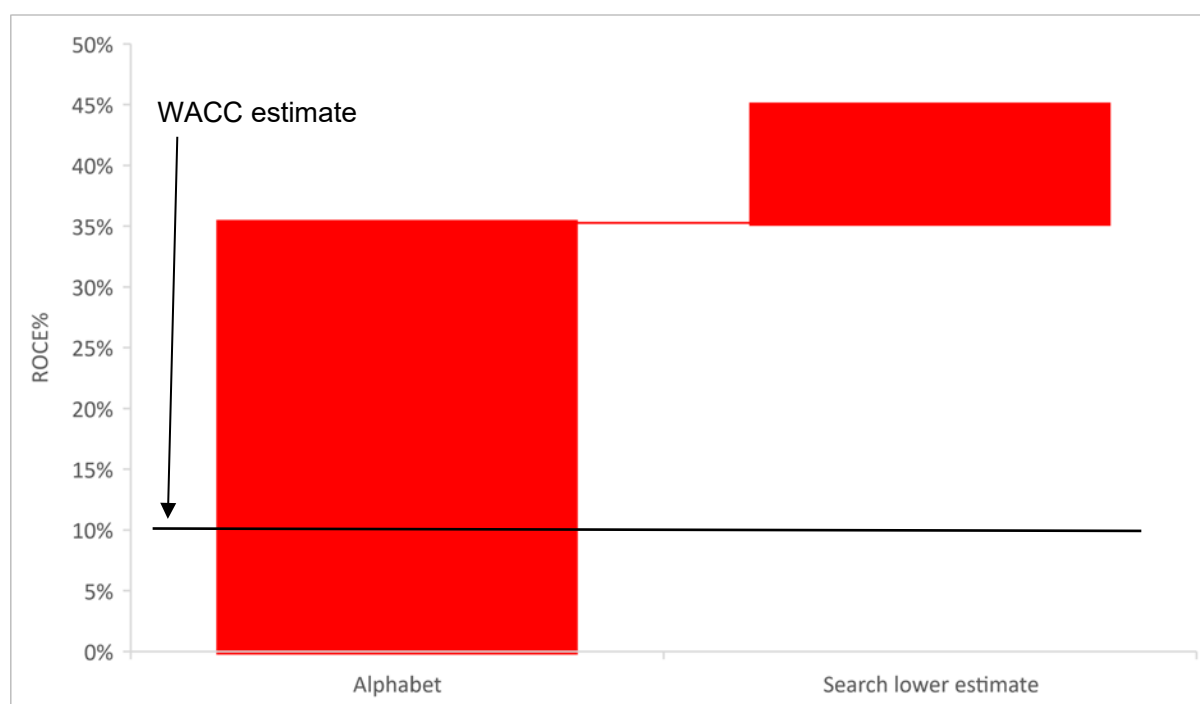
68. The assets are largely buildings and physical assets linked to providing Google's digital services, the largest of which is the search engine. We have therefore assumed that all assets are shared and therefore assumed to be necessary to replicate the search function, unless we have evidence that they are clearly separable from the search engine such as non-marketable securities and unrelated goodwill. We therefore use as a base case that all of Google's other assets are required to operate the search engine. This is a conservative approach and is consistent with our approach to operating costs associated with the technical operations of the search business above.
69. In our lower estimate, we have also added an additional figure which seeks to represent the replacement cost that a competitor would incur if it sought to replicate Google's search engine. The competitor would need to acquire tangible assets and might need to make additional investment in intangible capital and/or start-up costs to build up the capability to replicate Google's products, over and above the ongoing costs. We have estimated these costs based on a review of data provided by Google, Microsoft and other search engines. On this basis we estimate that it could cost between \$10 to \$30 billion (equivalent of £7.5 to £22.5 billion) to create the technology to develop a search engine of comparable scale to Google, and to fund operating and development costs prior to reaching sufficient scale to be profitable.
70. This is a wide range and shows that any analysis of the difference between actual investment cost and replacement cost is somewhat speculative. Nonetheless, the evidence provided indicates that this range represents the broad scale of additional development costs that might be required for an entrant to replicate Google's search business at scale, in addition to tangible asset investments. We have included a figure within the \$10 to \$30 billion range to the asset base in our lower estimate, but the overall findings from this section are unaffected by the choice of estimate from this range. As discussed below, in practice some smaller search engines have been able to make money without spending as much as this estimate, either through focussing on a narrower scale of business, or through buying 'syndicated' search results from Bing or Google.

Our analysis and findings of Google segment ROCE in relation to Google Search ROCE

71. We have run a number of sensitivities associated with Google Search's returns, based on the assumptions described above. We find that the ROCE of a standalone search business would be higher than the 35% ROCE earned by the Alphabet Group in 2018, excluding the European Commission's fine.

72. Although we have assumed that the replacement cost of search might be higher than Google’s investment, this is offset by the higher profits earned by a standalone search business. In other words, we find that Google invests in its broader ecosystem, in part funded by profits earned from its search business.
73. Our range of estimates for the returns associated with search is wide: we have ROCE scenarios ranging from around 40% to a much higher estimate if we only attribute to search those costs directly identified as being required for the search business. We have not tried to refine these estimates further at this stage. Our intention was to identify whether any interventions which reduce barriers to entry would provide incentives for competitors to enter profitably and might result in lower prices for advertisers.
74. The results of the above sensitivities are summarised in Figure D.7.

Figure D.7: ROCE comparison across Alphabet and Google Search for 2018



Source: CMA analysis of Google submissions.

75. For confidentiality reasons, we have chosen not to disclose our upper estimate of Google profitability in search. However, even without this data point, our analysis indicates that Google’s search activities are highly profitable. Normally we would expect to see entry and expansion in a market where existing market participants are able to earn a very high ROCE, and we would also expect the process of competition to result in either lower prices or enhanced services.

76. The exception would be if Google's high ROCE reflected that there were very significant economies of scale, such that a smaller competitor would not be able to operate profitably as it would incur similar costs to Google, but earn much less revenue. This would be if search were a 'natural monopoly' more comparable to regulated sectors such as energy and water. In these sectors it would be likely to be inefficient and result in higher costs for consumers to have multiple networks. These sectors are normally regulated and often prices are capped by regulation, not competition.
77. We do not see evidence that the market conditions which would indicate a natural monopoly apply to search. We discuss briefly below, but the evidence from the figures above illustrates that Google's operating costs and asset investments have both increased in line with its increasing scale. A smaller search engine therefore would not need to reach the same scale as Google to operate profitably.
78. However, as we discuss in Chapter 3 and Appendix I, in practice, there are significant barriers to entry for an English-speaking search engine seeking to compete directly with Google to operate profitably. In particular, the scale effects in click-and-query data, cost-based economies of scale in web-indexing and Google's extensive default positions make it more difficult for other search engines to improve their search quality and get their products in front of potential users to monetise their operations.
79. The analysis in this section indicates that, if these barriers to entry could be addressed through our proposed interventions, then there could be scope for profitable entry by competitors, including those with a smaller market share. In the next section we provide some supporting evidence based on the reported profitability of those competitors which have managed to enter the search market to date.

Entrants and other smaller competitors

80. As part of a wider analysis into the profitability of the search market we also undertook a review of the profits and investments made by other search engines. We used this as a cross-check to our findings.
81. We found that, even recognising the potential for significant investment costs, the potential benefits appear to be large. Currently, Bing is Google's largest competitor in the search market in the UK and in English-speaking search globally. Within Microsoft's financial statements, Bing is reported as part of the

Online Services Division and Bing reportedly became profitable²³ in 2016 despite having a less than 5% share of supply in general search over that period.²⁴

82. It also appears to be profitable to operate a search engine that does not generate its own organic links and instead accesses these through syndication agreements, such as Ecosia. Ecosia is roughly ten years old and attracts ten million monthly users. It is a 'purpose' company which means it is not allowed to be sold and is restricted to using its profits for the sole purpose of planting trees. For the last three financial years (up to 2018), Ecosia has been able to generate an equivalent to an operating profit margin of 54%,²⁵ before tree-planting expenditure is taken into account.
83. Despite the positive financial performance of Ecosia and also DuckDuckGo their services have provided only fringe competition to Google search. In the UK, at the end of 2019 both Ecosia's and DuckDuckGo's market shares were below 1%.²⁶
84. In addition, it is not clear that companies that do not crawl and index the web at-scale and produce their own organic links can be directly compared to those that do and as noted in Chapter 3, reliance of these smaller competitors on Google and Bing restrict the competitive role these competitors may have in the market.
85. In some non-English speaking countries, there are other competitors available. Seznam – a popular search engine in Czech Republic which has just under 12%²⁷ share of the market in desktop search has operated in Czech Republic profitably and in the latest financial statements reported £56 million EBIT²⁸ (equivalent of 40% EBIT) for 2017.
86. Yandex²⁹ – a large search engine which operates in predominantly Russian-speaking countries, but also has presence in Turkey and some English-speaking countries, is also a profitable firm. In 2018, Yandex Search and

²³ [Microsoft earnings call transcript 2016 Q1](#)

²⁴ Market share taken from [StatCounter](#).

²⁵ EBIT% arrived at by using financial statements provided for 2018 (utilising the Profit before tax of €970,266) and adding back the amount spent on tree planting in that year of €4,145,097 as provided in the email dated 14 April 2020.

²⁶ DuckDuckGo market share 0.57% and Ecosia's market share 0.35% [StatCounter](#)

²⁷ Market share taken from [StatCounter](#).

²⁸ The financial results were translated from Czech koruna into British Pounds using exchange rate of 29 koruna to £1.

²⁹ Yandex is made up of a number of business units such as Taxi, Classifieds, E-commerce as well as search.

Portal division reported adjusted operating income of £415 million³⁰ (equivalent of 40% of revenues) for 2018.

87. Yandex was used as a comparator to Google's levels of investment into R&D for the search function in non-English market. Yandex's market share in Russia of the search market is in excess of 40% and demonstrates its position as a credible competitor in a different language. From Yandex's submissions we have learnt that it invested between [30% and 50%] of its operating profit from its Search and Portal division into R&D in 2017 and 2018³¹.
88. In summary, the analysis above indicates that Google continues to earn very high returns on its actual investment costs (including in our sensitivity scenarios). This would normally be expected to attract entry by potential competitors. If the barriers to entry we have identified in this study were addressed through appropriate remedies, our analysis suggests that the market could profitability sustain competition between a number of search providers.

Facebook Inc

89. We applied the same approach taken with Google to analyse Facebook's historical financial performance, using evidence from its 10-K forms. Facebook reports its results at a high level across all of its services and does not separate out individual products, which currently are:
- Facebook;
 - Instagram;
 - Messenger;
 - WhatsApp; and
 - Oculus.
90. Facebook was incorporated in July 2004 and completed its initial public offering in May 2012, with the company's stock being listed on the NASDAQ stock exchange. Our market study is particularly focused on the social network platforms within Facebook, in particular, Facebook and Instagram.

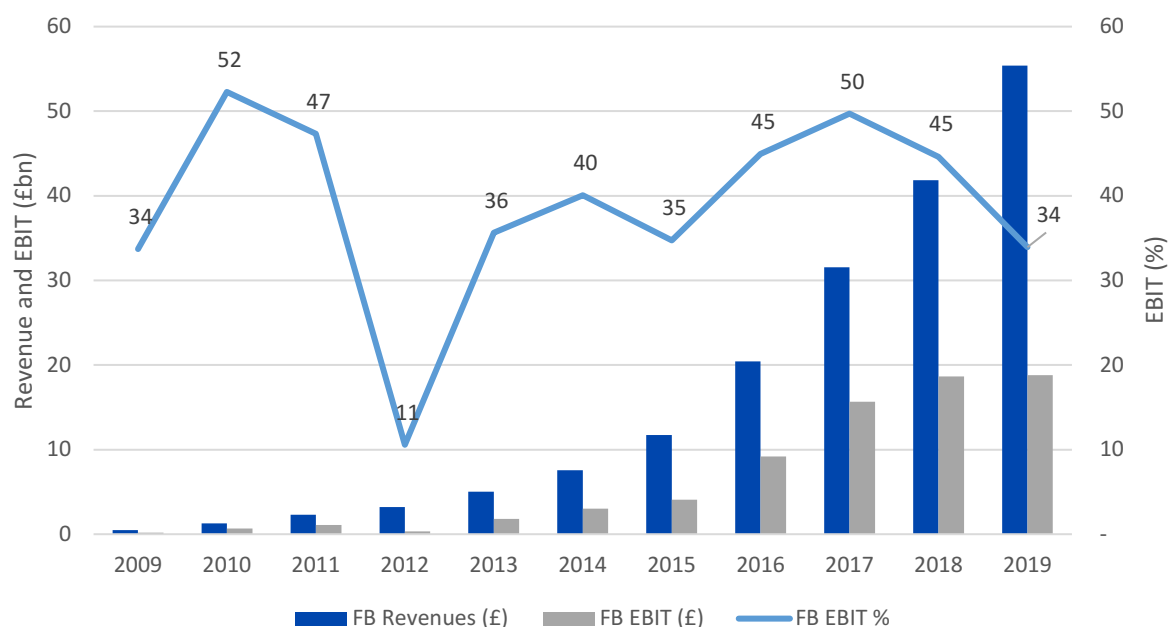
³⁰ Search and Portal division's operating profit has been translated into British pounds using exchange rate of £1 to \$1.3350.

³¹ Yandex's product development costs have been taken as an indicator of possible R&D costs incurred but CMA acknowledges these are not precise comparatives.

Financial performance of the Group

91. Figure D.8 illustrates Facebook's profits over the period of 2009 to 2019. The data illustrates that, since 2009 Facebook has been consistently profitable whilst growing its business in terms of revenue.

Figure D.8: Facebook's revenue and profit from 2009 to 2019



Source: CMA analysis of Facebook Inc 10-K.

92. The only exception to Facebook's consistent growth in margins was 2012, in which a number of exceptional events took place, such as an IPO and acquisition of Instagram. During that year, Facebook also introduced a new feature – the ability to include ads in users' News Feed on both desktop and mobiles – that improved advertisers' ability to reach consumers and for Facebook to monetise their operations.
93. At this point Facebook also increased its investment into R&D (the level of investment increased from £242 million in 2011 to £883 million in 2012), sales and marketing (from £245 million to £565 million) and administrative expenses (£400 million more compared to the prior year). Facebook's investments, particularly into R&D up to 2012 have been followed by a return to a stable rate of EBIT averaging over 40% since 2014.³²
94. Digital advertising represented 84% of Facebook's total revenue in 2012 – this increased to 99% in 2018.³³ This trend demonstrates Facebook's successful

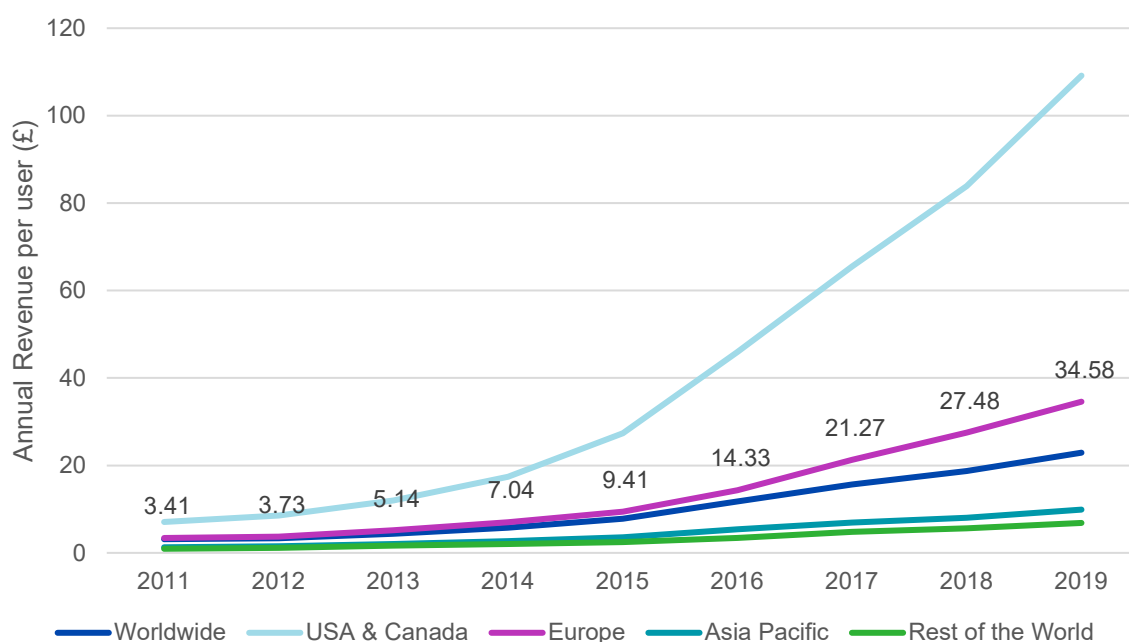
³² Facebook Inc 10-K 2012

³³ Facebook Inc 10-K 2018 and 2012

delivery of ads for advertisers that choose it as a platform to reach Facebook’s global audience of 2.5 billion³⁴ of monthly active users, and engaged daily users of 1.66 billion as at 2019.³⁵

95. The success in monetising its platform is demonstrated by the growth in the average revenue per user (ARPU) that Facebook is able to generate (see Figure D.9 below).

Figure D.9: Facebook average revenue per user (ARPU) Worldwide 2011 to 2019



Source: CMA analysis of Facebook Inc 10-K.

96. Facebook’s most profitable region, on a per-user basis, has always been USA and Canada, at £109 earned on average per user in 2019.³⁶ Europe is the next highest region at £35 ARPU in 2019.³⁷ Facebook explains the higher ARPU rates as a reflection of the size and maturity of online and mobile advertising markets.³⁸

Return on capital employed

97. In this section we consider the ROCE for Facebook in more detail and in particular the ROCE for its core Facebook business, to understand the extent to which its strong market position is allowing it to earn profits above its cost of capital.

³⁴ Facebook Inc 10-K 2019 p.46

³⁵ Ibid p.46

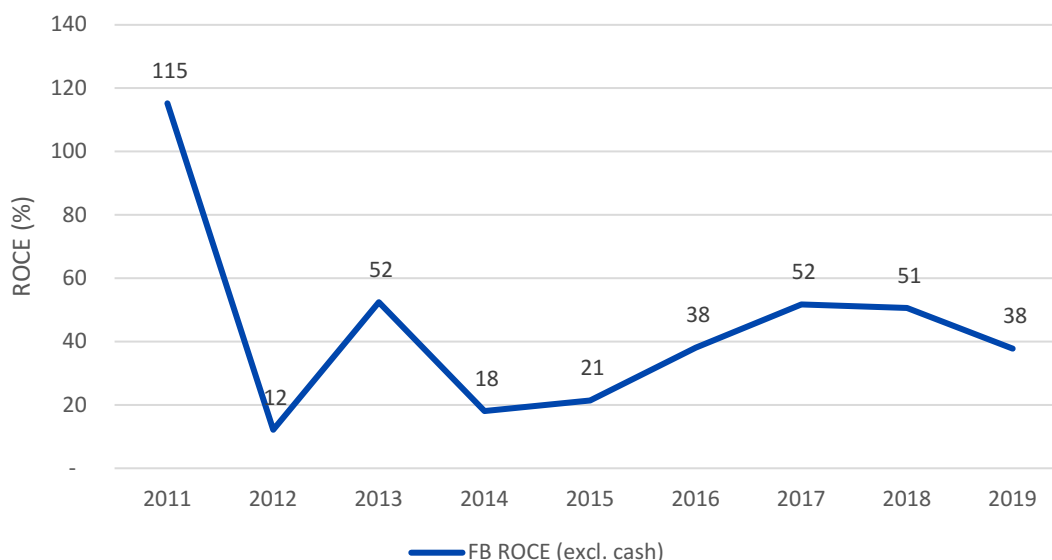
³⁶ Facebook Inc 10-K 2019 p.47.

³⁷ Ibid p.47.

³⁸ Facebook Inc 10-K 2018 p.38.

98. As with Google, Facebook is an integrated business, operating globally. The large majority of Facebook's revenues relate to the core Facebook platform, with Instagram providing the majority of other revenues and profits. In Chapter 3, we have analysed many of the market outcomes for Facebook and Instagram separately. However, whilst Facebook operates these as distinct consumer-facing businesses, it is not necessarily meaningful to split Facebook's shared operating costs in respect of these different social media platforms. We were not provided with a split of these costs on a UK or global basis and we understand that much of the costs incurred by Facebook relate to shared technical infrastructure costs and overheads.
99. Given that Facebook's business is so dominated by its digital advertising business, we consider that the ROCE of the overall business is a strong indicator of Facebook's actual ROCE from its core social media services and the associated digital advertising.
100. Figure D.10 illustrates the ROCE of Facebook over the period. We have calculated ROCE using Facebook's publicly available data. For profit, we have assumed the EBIT taken from Facebook's reported accounts.
101. For capital employed, we have also used data taken from Facebook's reported balance sheet. As with Google, we adjusted for cash and marketable securities, which are not required to operate a social media network. Facebook's fixed asset base in 2018 was £36.9 billion.

Figure D.10: Facebook Inc Return on Capital Employed 2011 to 2019³⁹

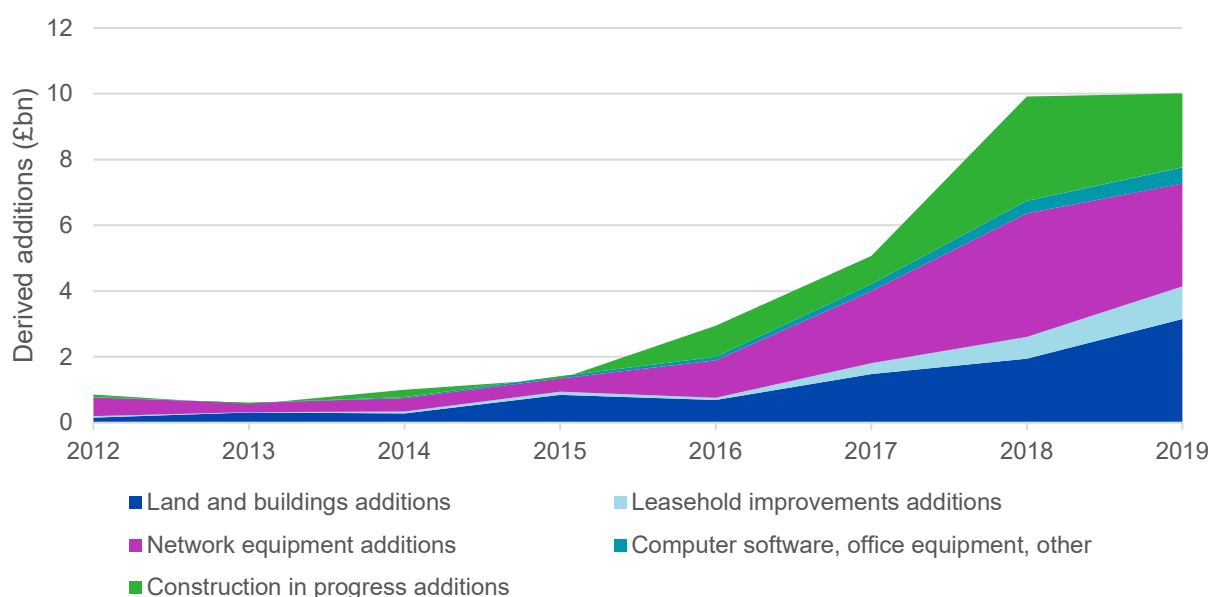


Source: CMA analysis of Facebook Inc 10-K

³⁹ In February 2014 Facebook completed the purchase of WhatsApp which had an impact (increase) in its asset base that is reflected in the drop in ROCE in 2014 and 2015.

102. Facebook's ROCE has been consistently high, with ROCE not dropping below 20% since 2015. Since 2015, ROCE has been increasing. Facebook's revenue has grown faster than its investment in assets, with revenue growth registering above 40% since 2015.
103. As with Google, Facebook is not an 'asset-light' business. Facebook has invested in growing its fixed asset base in recent years. Figure D.11 illustrates the scale of increases in Facebook's asset base. Again, as with Google, the relatively recent increase in the asset base suggests that the balance sheet value of Facebook's assets should be a reasonable estimate of the cost of purchasing those assets today.

Figure D.11: Facebook's asset investments between 2012⁴⁰ and 2019



Source: CMA analysis of Facebook Inc 10-K forms.

104. We have estimated the WACC for the large digital platforms at around 9%. Facebook's ROCE in 2018 of 51% therefore indicates that Facebook has been generating profits comfortably in excess of its cost of capital. Although Facebook operates other businesses, nearly all of its revenues and profits are earned from digital advertising on its social media platforms and our analysis shows that Facebook Inc. earned nearly enough profit in 2018 to repay all its investment in these tangible assets in one year.

⁴⁰ Equivalent data on estimated investments made in tangible assets was only available from 2012 onwards and therefore 2011 is not included in this figure.

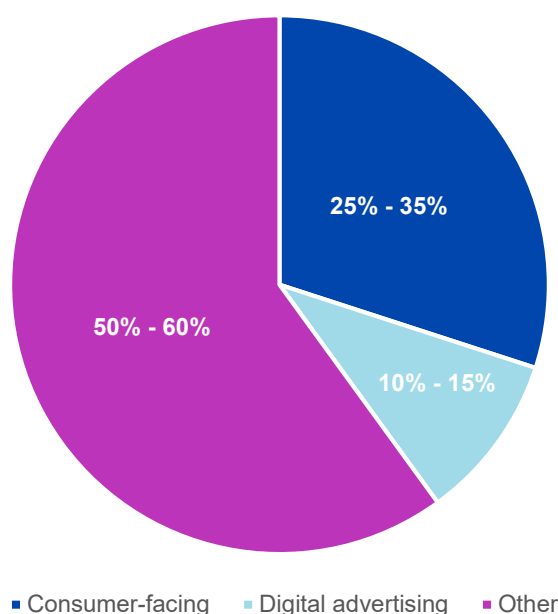
Sensitivity Analysis

Revenue, costs and asset base

105. The large majority of Facebook's revenues relate to the core Facebook platform, with Instagram providing most of its other revenues and profits. As discussed above, we have not sought to perform sensitivities that would estimate the profitability of each of Facebook's individual social media platforms.
106. However, we have considered sensitivities to Facebook's asset base, used to calculate ROCE, to assess whether its returns would be more aligned with its cost of capital if the asset base was to include the potential replacement cost for an entrant seeking to develop a social network. We considered the following adjustments:
- We made no adjustments to revenues or direct costs, which are assumed to all relate to social media.
 - In respect of indirect costs, we asked Facebook for information about the proportion of its R&D costs which do not relate to its social media and related digital advertising businesses.
 - As with Google, we considered the additional investment costs an entrant might incur to replicate Facebook's assets.
 - As with Google, we excluded actual investment costs incurred by Facebook which were directly incurred in developing businesses which would not necessarily be incurred by an alternative social media platform to develop their services.
107. As described above in respect of Google, we have considered the replacement cost of Facebook's assets, which is a better measure of asset value for the purpose of assessing ROCE against a benchmark of the WACC. We have sought information from competitors to estimate the total investment cost required by an entrant to develop the technology required to operate a social network.
108. The emergence of other social media platforms has meant that there is more information available to us about the potential scale of investment to develop a social media platform. As with search, a potential competitor to Facebook might need to acquire tangible assets, and also to make additional investment in intangible capital and/or start-up costs to build up the capability to build its own social network.

109. We have estimated these costs based on a review of available data including public data on costs incurred by Twitter and Snap. On this basis we estimate that it could cost as much as \$5 to \$10 billion (equivalent of £3.7 to £7.5 billion) to create the technology to develop a competitive social network, and to fund operating and development costs prior to reaching sufficient scale to be profitable.
110. However, we are also aware that Facebook’s asset base includes £11 billion of goodwill that Facebook has on its balance sheet as a result of the purchase of WhatsApp.⁴¹ We do not consider that this acquisition was necessary to operate a social media platform and therefore this balance has been excluded from our analysis. Given that this exceeds the £3.7 to £7.5 billion estimates of the investment required to create the core functionality of a social media network, the net impact would be to increase ROCE.
111. In addition, between 2014 and 2018, Facebook Inc. invested over £22 billion⁴² in R&D. Facebook’s submissions show that the proportion of its R&D expenditure that it spends on consumer-facing platforms (which include Facebook, Instagram and WhatsApp) is lower than the 99% of Facebook’s revenue that is generated through its social media platforms.

Figure D.12: Facebook Inc R&D investments split 2018⁴³



Source: CMA analysis from Facebook submissions.

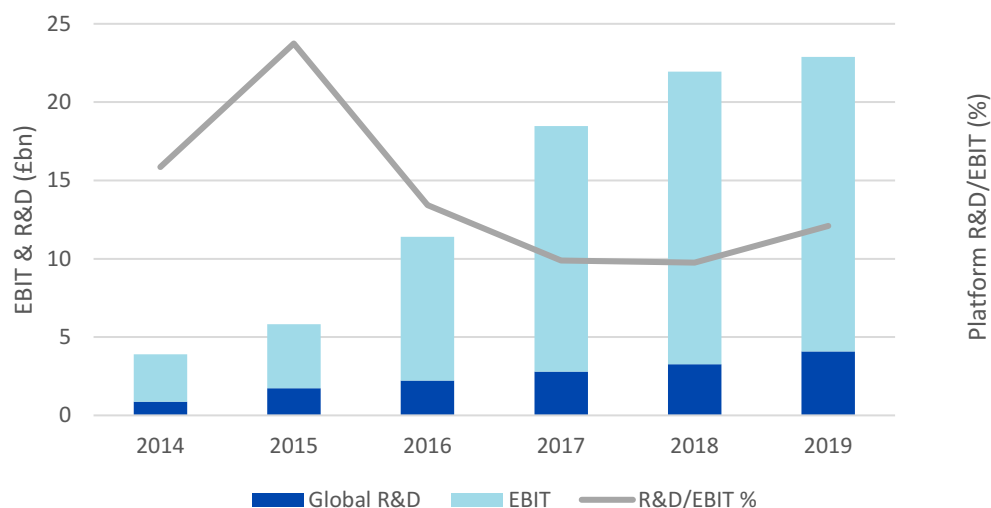
⁴¹ See page 69 of Facebook’s [2014 annual report](#).

⁴² Facebook Inc 10-K forms 2015 to 2018.

⁴³ Exact percentage split of R&D costs has not been disclosed for confidentiality reasons.

112. In 2018, Facebook told us that £ [0-5] billion (equivalent of [40% to 50%] of total R&D expenditure of £7.7 billion was spent on platforms such as Facebook, Instagram, Messenger and WhatsApp, including the digital advertising platform that Facebook maintains. The remainder of the expenditure was invested in other long-term (see Figure D.12) projects such as connectivity efforts, artificial intelligence and augmented reality, as disclosed by Facebook in their 2018 filed annual reports.
113. The analysis presented in Figures D.12 to D.13 were produced using submissions made by Facebook and included confidential information. Facebook disclosed that the allocation made between the three categories of expenditure as requested by CMA was the not the reporting approach adopted by Facebook itself and therefore required some subjective allocation of costs by employees which may not be a true reflection of the split. Despite the identified shortcoming of the submitted information, it is reasonable to assume that overall split between the three identified categories of expenditure is generally indicative of the actual split.
114. The large allocation of resources into 'other' areas outside of Facebook's core services is not a one-off occurrence in 2018. Since 2017, Facebook has been investing more than half of its research and development expenditure into 'other' projects, having spent closer to [40% to 50%] of total R&D expenditure on non-core services in the previous three years.
115. These R&D allocation decisions made by Facebook also help indicate the stage of the business cycle that Facebook may currently be operating in. Facebook is able to invest the majority of its R&D into new services beyond its core products, while maintaining and improving its return on capital employed.
116. Figure D.13 below demonstrates the proportion of R&D expenditure in relation to the earnings generated from operations in the relevant year. The trend displayed indicates that a peak in expenditure on consumer-facing services in 2015 which represented R&D expenditure as [35% to 45%] of Facebook's EBIT in that year was a one-off investment with more typical levels of investment averaging at around [20%-30%] over the six-year period.

Figure D.13: Facebook core platform R&D expenditure on consumer-facing services (including the digital advertising platform) in relation to EBIT 2014 to 2019⁴⁴



Source: CMA analysis from Facebook submissions and 10-K forms.

117. As with Google, our analysis therefore indicates that Facebook’s social network activities are highly profitable. Our analysis from Chapter 3 suggests that Facebook has a very high market share in time spent in social networking and in social media display advertising, and that there are currently significant barriers to entry. Normally we would expect to see entry and expansion in a market where existing market participants are able earn a very high ROCE, and we would also expect the process of competition to result in either lower prices or enhanced services.

Intangibles

118. Frontier Economics on behalf of Facebook Inc. raised a concern that in the work performed in this appendix to our interim report, we did not consider Facebook’s intangible assets, which were assessed in detail in the statutory audit services market investigation.

119. Intangible assets which were identified by Frontier Economics as not recognised on company’s Balance Sheet but contributing significantly to company’s profitability were:

- Brand;
- User base;
- Highly skilled workforce;

⁴⁴ Secondary Y axis on the chart has been removed for confidentiality reasons.

- Facebook’s technology, patents and trademarks;
 - Facebook’s customer relationships; and
 - Computer software.
120. In line with existing Guidance and past cases⁴⁵ these intangible assets were not included in the assessment of Facebook’s asset base. The CMA’s normal practice is that these investments in the day-to-day operations of a firm’s activities should not be included in capital for the purpose of calculating ROCE. For example, in the Movies on Pay-TV market investigation both Oxera and the Competition Commission did not include in the calculation of the asset base intangibles such as subscriber base (equivalent to user base in this case), brand, and skilled workforce.
121. In order to demonstrate that its costs related to investment in intangible assets which should be included in Facebook’s asset base, we would normally expect Facebook to provide detailed information about its investments in its intangible assets which met the criteria as set out in the guidelines:
- It must comprise a cost that has been incurred primarily to obtain earnings in the future;
 - This cost must be additional to costs necessarily incurred at the time in running the business; and
 - It must be identifiable as creating such an asset separate from any arising from the general running of the business.⁴⁶
122. However, in this case, we have undertaken a sensitivity analysis, in addition to the work initially performed, in order to reflect that the addition of the intangible asset base, which is not already reflected in the asset base, to the total assets considered in the ROCE calculation would not make a significant impact to the overall conclusions over the levels of profitability.
123. Absent the level of detailed information required from Facebook to determine levels of R&D and Sales and Marketing expenses which may fit the criteria of an intangible asset, we have undertaken a sensitivity analysis which capitalises a percentage of these expenses during the period of 2011 and 2019 and what the impact of this treatment of costs on the levels of profitability and ROCE it results in. The intangible assets that may fit the

⁴⁵ Competition Commission’s (CC) [Movies on Pay TV](#) p.336.

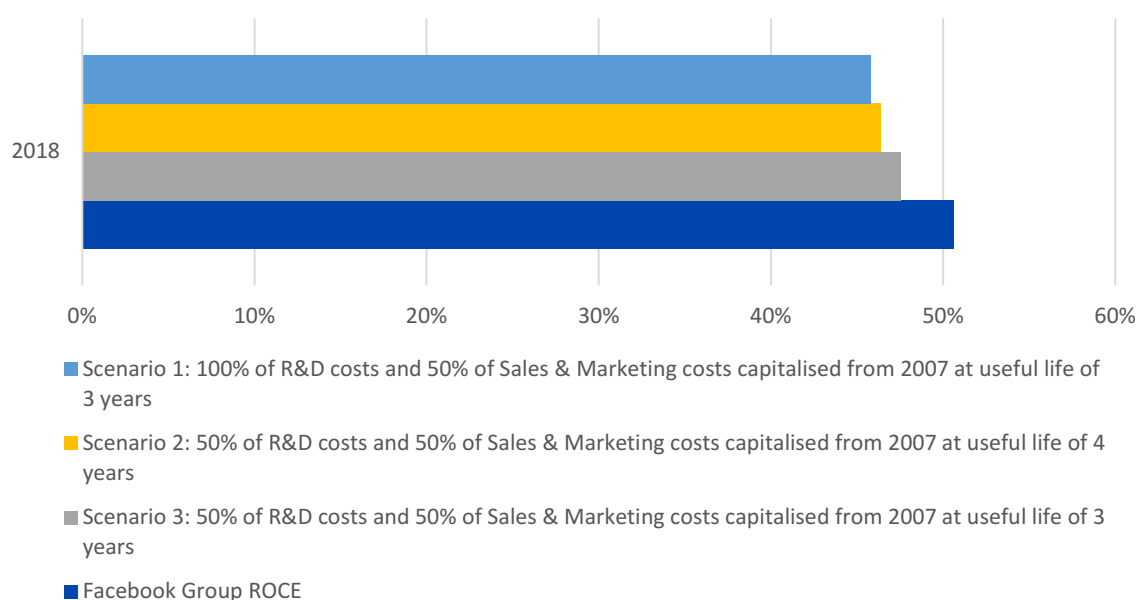
⁴⁶ [Competition Commission Guidelines](#) for market investigations: Their role, procedures, assessment and remedies 2013 Annex A p.89.

criteria as proposed by Frontier Economics are technology and computer software.

124. In line with Facebook’s depreciation policy for its computer software, office equipment and other of two to five years depreciation on a straight-line basis,⁴⁷ we have assumed in our assessment that R&D and sales and marketing expenditure would fall into this category. We have therefore recalculated the ROCE on the basis that these investments should be capitalised and should be amortised over two to five years.

125. We recognise that accounting useful life may not align with economic useful life and therefore acknowledge that a different timeframe could be applied to the amortisation of the intangible assets (see Figure D.14 below).

Figure D.14: Facebook’s ROCE % compared to a selection of sensitivity scenarios considered for 2018



Source: CMA analysis using Facebook 10-K forms

126. Results from this additional piece of analysis have confirmed our original conclusions around persistently high levels of ROCE margin earned by Facebook. Across a range of scenarios that we have developed to take into account varying useful lives (within the accounting useful life policy) and also varying capitalisation of R&D and Sales and Marketing expenses the results from this analysis delivered similarly high ROCE margin across the period range reviewed.

⁴⁷ Facebook 2019 10-K form.

127. It should be noted the sensitivities (presented in Figure D.14) present ROCE for the Group and these would be higher for the social network itself, when taking into account the platform-related asset base points discussed earlier in the appendix.

Entrants and other smaller competitors

128. Frontier Economics also raised another concern as part of their submission in response to our interim report, which relates to an apparent omission from our analysis of 'other existing players' when assessing Facebook's profitability. And rather than assessing Facebook's profitability, we should be looking at 'profitability of the entire market'.

129. Our interim report included a number of relevant findings which we have taken into account when reviewing Facebook's (and Google's) profitability. For instance, in our interim report we stated that Facebook (including Instagram) 'generated almost half of overall display advertising revenues in 2018'.⁴⁸ Facebook's large share of the display advertising market does not allow for reasonable comparison between itself and its competitors, as Facebook's share was roughly four times larger than its next competitor (excluding the open display channel) in display advertising, YouTube.⁴⁹

130. In February 2020, Facebook's audience represented 84% of the British online population, only being beaten by YouTube at 92%. The next closest competitors in the market were Instagram and WhatsApp with 54% of British online population, which are also owned by Facebook.⁵⁰

131. In addition to Facebook's ability to represent over half of display advertising market and attribute 84% of consumer audience in the UK, it has also maintained its ranking in relation to the greatest share of consumer time spent on social media (with 54%⁵¹ of time spent on social media being spent on Facebook) in the UK over the last four years (between 2015 and 2019).⁵² Facebook's next closest competitor, Snapchat captured 11% of consumer attention in the same period.

132. The factors relating to Facebook's advertising side of the platform as well as the consumer-facing platform indicates that Facebook has maintained a large share in both over a number of years. If the CMA were to perform further profitability analysis of those entrants that may have exited the market such

⁴⁸ [CMA Interim Report](#) parag.17.

⁴⁹ See Appendix C.

⁵⁰ See Appendix C .

⁵¹ As at February 2020

⁵² [CMA Interim Report](#) parag.3.115.

as MySpace, Google+, YikYak and Bebo, this would not make a sizeable change to the Facebook's ROCE over the nine years taken into account in our analysis.

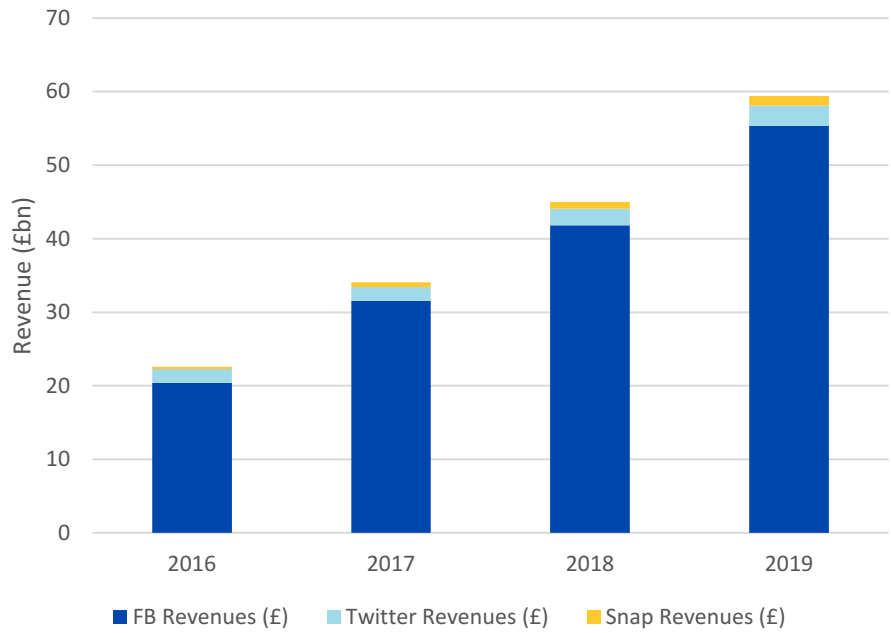
133. Any investments made by Facebook at the initial stage of establishing and setting up the platform back in 2007 would have been returned to its investors to a large extent relatively soon after the platform started to generate profits. The size of the investments made by the failed entrants do not reflect the level and nature of investments made by Facebook over the last nine years due to:
- the time when the failed entrants entered the market;⁵³
 - size of the user base achieved;⁵⁴
 - number of advertisers using the platform; and
 - changes in the advertising techniques.
134. As described above, Facebook does face competition from other social media firms. Both Twitter and Snap are publicly quoted firms where data is available on their comparable revenue and profit. Figures D.15 and D.16 compares revenue and costs for these firms with Facebook.

⁵³ MySpace entered the market in 2003, Bebo entered in 2005, Google+ in 2011 and YikYak in 2013.

⁵⁴ At the height of their popularity the social media networks had the following number of users:

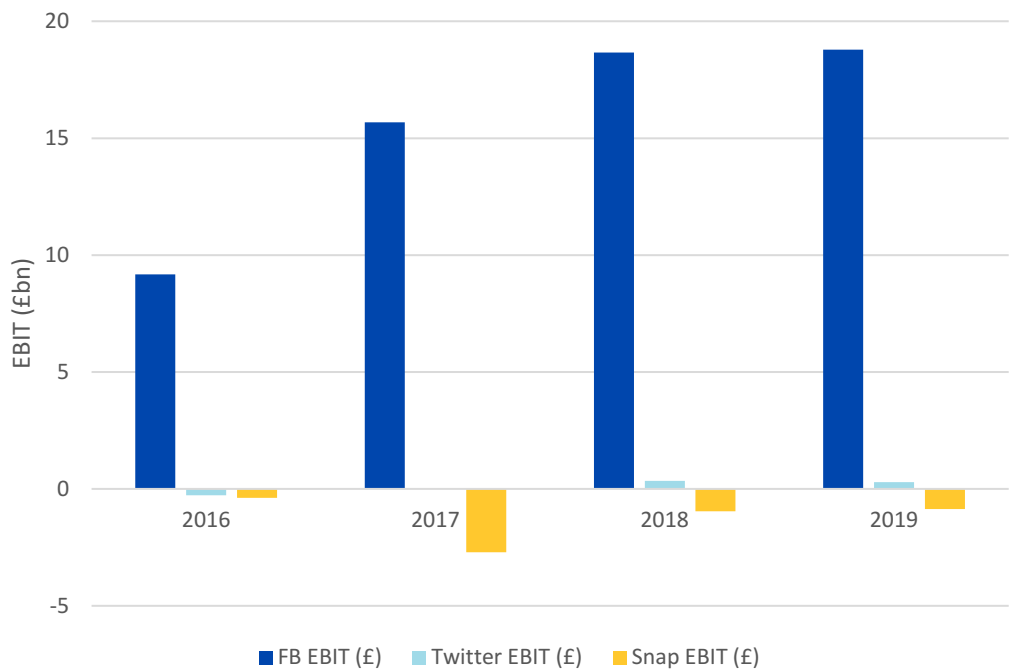
- MySpace – in excess of 100 million
- Bebo – around 40 million
- Google+ - 395 million
- YikYak - active at 1,000 colleges and universities.

Figure D.15: Global revenue generated between 2016 and 2019 by Facebook, Snap and Twitter



Source: CMA analysis of Facebook Inc, Snap Inc, and Twitter Inc.10-K forms.

Figure D.16: Global profitability/(loss) generated between 2016 and 2019 by Facebook, Snap and Twitter



Source: CMA analysis of Facebook Inc, Snap Inc, and Twitter Inc.10-K forms

135. In addition, both Twitter and Snap are yet to demonstrate their ability to generate consistent profits, with Snap yet to make a profit from its

operations⁵⁵ and Twitter⁵⁶ reporting its first profit before interest and tax in 2017 and first net profit in 2018.

136. Based on the publicly available information on cost of revenues⁵⁷ presented in the filed accounts by all three social media businesses, it would appear that Facebook is both bigger, but also much more effective at converting revenues into gross profits and therefore returns to investors than Twitter and Snapchat. A comparison for ROCE is not meaningful for Twitter and Snap because they are continuing to make losses.
137. This indicates that Facebook may be benefiting from the efficiencies which it enjoys due to its scale and its incumbent position in social media, and this is reflected in the high ROCE for the business of 51%, relative to its WACC of 9%. If competition was more effective, we would expect to see Facebook's ROCE to be eroded by competitors offering better value proposition to advertisers.
138. In summary, the analysis above indicates that Facebook continues to earn very high returns on its actual investment costs (including in our sensitivity scenarios). This would normally be expected to attract entry by potential competitors. However, the evidence that there are barriers to profitable expansion is supported by Twitter's and Snap's difficulties in generating profits, despite successfully growing their user base.

Conclusion

Google

139. Google's returns are above its cost of capital. Our analysis of Google's actual return on capital indicates that it is earning comfortably in excess of its benchmark cost of capital on any measure. We have undertaken a review of the cost of capital for Google and assess it is around 9%. Google's returns are likely to be well over 40% from search, even, after allowing for a potentially higher asset value on a replacement cost basis, or capitalising some of Google's R&D. We have estimated a range of potential sensitivities which indicate that it is likely that Google's actual ROCE from search is significantly higher than 40%.

⁵⁵ Snapchat launched in 2012.

⁵⁶ Twitter was founded in 2006.

⁵⁷ Cost of Revenues = Cost of Goods Sold (COGS).

Facebook

140. Facebook's returns are much higher than its cost of capital, similarly to our findings for Google. Facebook generated ROCE of 51% globally in 2018 with our estimate of WACC for the company being around 9%. As with Google, we observe that the level of ROCE is so high that adding an additional asset value to reflect the higher replacement cost for an entrant, or capitalising R&D, would still result in a ROCE well above the cost of capital.

Annex: CMA calculation of the platforms' cost of capital

1. This annex sets out how we have calculated the estimated Weighted Average Cost of Capital ('WACC') for Alphabet and Facebook for the purposes of this market study. We made our own calculations of WACC which we cross-checked against WACC disclosed by analysts using the latest available analysts' reports.
2. All WACC and interest figures presented in this Annex are nominal except where indicated.
3. The approach taken reflects the circumstances of this case – it should not be taken as an illustration of how the CMA might consider the cost of capital in a different sector and particularly where we are calculating the cost of capital for a different purpose.

We used the standard approach: the 'Capital Asset Pricing Model'

4. Our Guidelines for market investigations highlight that we generally use the CAPM when considering the cost of equity since this is a widely understood technique with strong theoretical foundations.
5. The CAPM relates the cost of equity (CoE) to the risk-free rate (RFR), the expected return on the market portfolio (TMR), and a firm-specific measure of investors' exposure to systematic risk (beta or β) as follows:

$$CoE = RFR + \beta \times (TMR - RFR)$$

(i) *Where:*

- a) RFR = the risk-free rate of return
 - b) β = the equity beta
 - c) TMR = the total market return
 - d) ERP = the equity risk premium
6. Our approach to these parameters was:
 - Daily Treasury Real Yield curve rates for 10 years were used as a proxy for the real risk-free rate (RFR).⁵⁸ We used a range of between 0.15% and 0.20%;

⁵⁸ US Department of Treasury, Daily Treasury Real Yield Curve [Rates](#).

- Total Market Return (TMR) in real terms was estimated using a range of 6.00% to 6.50%. There are a range of different views on TMR. For the purpose of this calculation, we used evidence from the DMS publication⁵⁹ (7.3%) and Gregory (2011)⁶⁰ (5.8%) paper to inform a range;
- Consumer Price Index (CPI) was used from the Bureau of Labor Statistics⁶¹. We used a range of 1.5%-2.0%;
- Equity beta was estimated from a range a comparator companies. We used two comparator groups:
 - (i) Sample 1: companies operating in the Internet Media sector, US domiciled and listed on NASDAQ index plus Twitter, Snapchat, Microsoft, Verizon and Pinterest.
 - (ii) Sample 2: companies operating in the Communications Equipment sector, US domiciled and listed on NASDAQ index plus companies meeting sample 1 criteria described above.
- Both samples indicated a fairly narrow range of betas which averaged just over 1. We used a range of 1.0-1.15, which included our estimates of betas for Google and Facebook.

7. Table D.4 indicates the WACC calculations that result from this set of assumptions:

Table D.4 Breakdown of the cost of capital for Google and Facebook

	<i>Low</i>	<i>High</i>
RFR	0.15%	0.20%
TMR	6.00%	6.50%
ERP	5.90%	6.30%
Equity beta	1.00	1.15
Real CoE	6.05%	7.45%
CPI	1.5%	2.0%
Cost of equity (nominal, after tax)	7.64%	9.59%

Source: CMA analysis

8. Google and Facebook's effective tax rate has varied in recent years, but has generally been below the statutory tax rate, including in 2018. We have used 9% in our analysis for the pre-tax WACC⁶² to be applied to EBIT. We consider

⁵⁹ Dimson Marsh and Staunton analysis was used to obtain historical ex-post estimates of TMR which were set against the Gregory (2011) results of the long-run ex-ante estimates.

⁶⁰ Gregory (2001), The Expected Cost of Equity and the Expected Risk Premium in the UK.

⁶¹ US Department of Labour, Consumer Price Index, November 2019.

⁶² For the purposes of this analysis WACC is equal to Cost of Equity due to Facebook having no debt as at 31 December 2018 and Alphabet Inc having a negligible (less than 1%) level of debt.

that a pre-tax value of 9% should be consistent with the post-tax range above based on the average tax rates in most of the recent years.

9. On this basis, we have applied 9%^{63,64} as a reasonable benchmark for comparing to actual ROCE as calculated on a pre-tax basis. We consider this figure is indicative of the scale of the WACC of the platforms, for the purpose of comparison to actual ROCE. We recognise that the underlying data could also support a level of WACC within a range around 9%, but we do not consider that the difference would be enough to change the broad conclusions outlined in the appendix.

⁶³ The analysis was performed in December 2019 as at the time of the publishing of the Interim Report. The work hasn't been revised as it wouldn't affect overall conclusions. WACC has been estimated for the entire firm (Alphabet and Facebook) therefore US input data was used and not UK data.

⁶⁴ The Brattle Group has submitted a report in which they arrive at a slightly higher estimate of WACC for Alphabet Group of 12% for 2018. We note Brattle's submission proposes a different comparator set, resulting in a WACC that is slightly higher. We have reviewed and concluded that Brattle's proposed comparators are not obviously more relevant than those used in our analysis above. However, in any case, we do not consider that this would change the overall findings of this section, that ROCE is higher than the WACC for both Google and Facebook.