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 platforms to enable us to establish whether the 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.

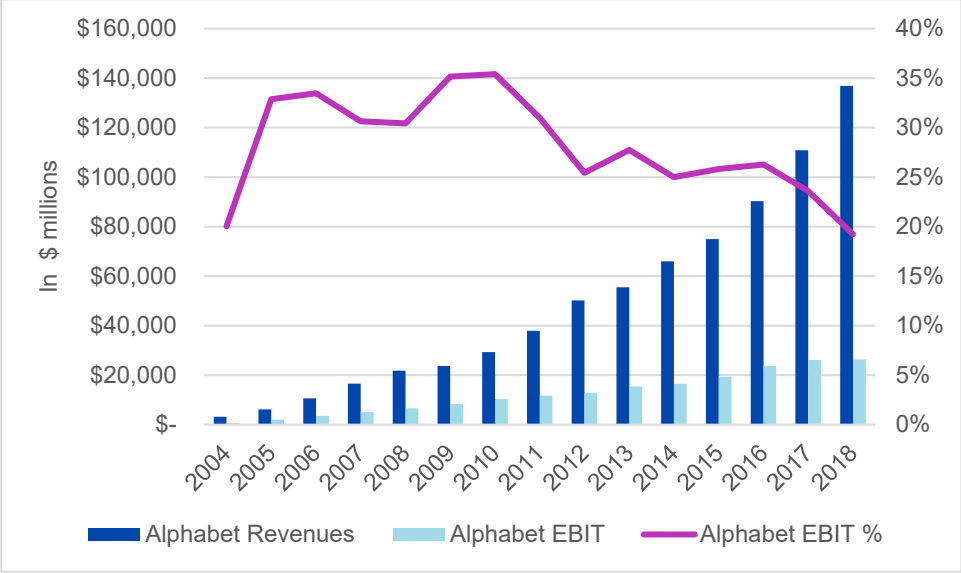
5. Our market study is interested in the performance of businesses within the Google segment, and this appendix seeks to understand the level of profitability of the search business, in particular. The businesses most relevant to our study form the great majority of the Google segment by revenue including 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 provides no separation of the results within the Google segment. 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 (see Figure D.1 below), and its revenues have grown exponentially during this period. Its percentage profit margins, measured as EBIT (earnings before income and tax) have remained consistently high, although they started to decline as a percentage of revenue in 2011 and fell below 20% for the first time in 2018.

8. In addition to exceptional items, such as fines from the European Commission of $2 billion and $5 billion in 2017 and 2018 respectively, results in 2018 were also affected by a higher growth rate in costs relative to revenues (revenue in 2018 increased by 23%, whereas total costs, including costs of sales, research and development, sales and marketing and administrative expenses, increased by 30%).

Figure D.1: Alphabet Group Revenue and Profit between 2004 and 2018



Source: CMA analysis of Alphabet 10-K

Alphabet Group Return on Capital Employed (ROCE)

Introduction: Why we use ROCE as a measure of profit

9. 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.

10. 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.

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

12. 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

[1] Market investigation Guidelines, (CC3 Revised), parag.115, Annex A parag.9
[2] Market investigation Guidelines, (CC3 Revised), parag.118

Google and Facebook earn well above their cost of capital, this would normally be a signal to potential competitors to enter and expand.

13. 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 a number of 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.

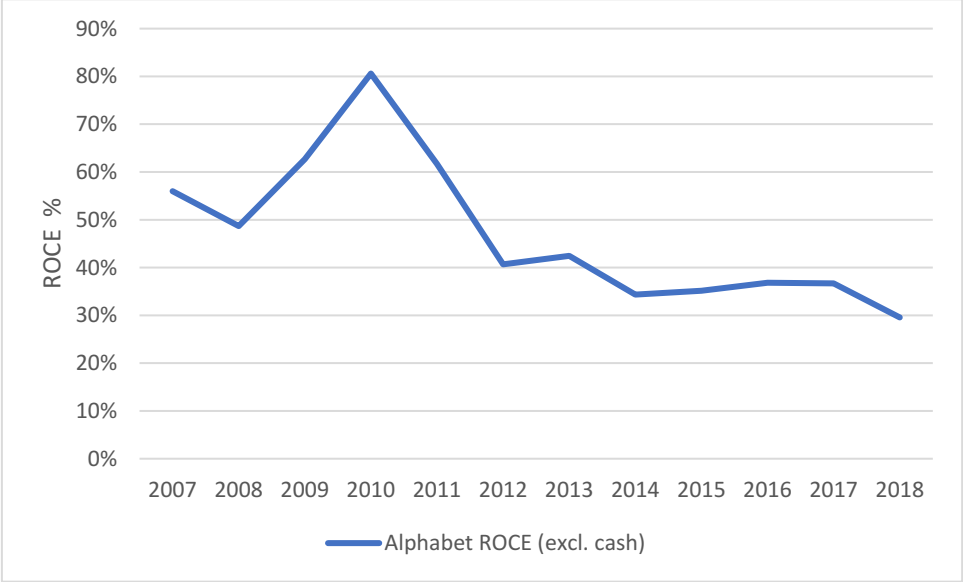
14. Measurement of the value of assets can be a challenge. In some cases, the current value (known as replacement cost) of the assets owned by the firm may be different from historical costs and may justify require an adjustment to the capital employed value. We have sought to address this challenge 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.

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

15. 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 securities[3] minus current liabilities) based on published asset values in the accounts.

[3] 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.

Figure D.2: Alphabet return on capital employed 2007 to 2018



Source: CMA analysis of Alphabet 10-K

16. Figure D.2 above demonstrates that over the last 12 years, Alphabet Group has been able to generate an average ROCE of 47%. ROCE has declined from 81% in 2010 to 30% in 2018 as Alphabet has chosen to invest more in assets and R&D.

17. 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.[4] We have summarised the approach to estimating the WACC in the Annex at the end of this document.

18. On the basis that the actual ROCE for Google's total business has been around 30% or above for at least 10 years, we therefore conclude that ROCE is and has been consistently higher than the benchmark WACC.

Google Search

19. 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

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

shares that Google has maintained in Search for a number of 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'

20. As described above, Google reports an integrated set of results for the 'Google Segment' separate to 'Other Bets'.

21. 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. These businesses are all related in some way to Google's core search and digital advertising businesses.

22. 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).

23. The Other Bets segment has relatively low revenue 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 $82.5 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.

24. 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).

25. 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 $36,517 million[5] (or $31,446 million including the EC fine) which was divided by the asset base of $82,520 million; and
- this gave us ROCE of 44% (excluding the European Commission fine) or 38% including it.

26. 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

27. Google was founded in 1998 with the intention of creating a search engine for the Internet.[6] 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.

28. 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.

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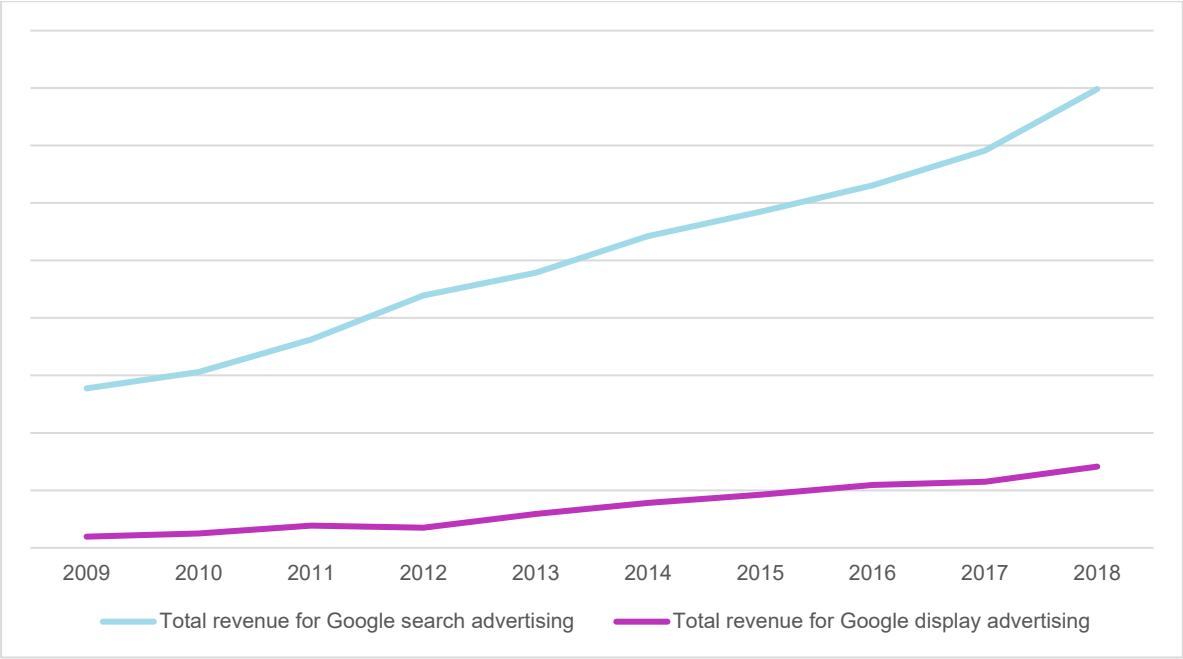
[5] Alphabet Inc 2018 10-K p.81
[6] See "our story" on Google website.

29. Google is not an 'asset-light' business. In 2018 Google invested over $25 billion[7] into property and equipment. Google also invested $21 billion into research and development[8], a $5 billion increase on the previous year. As described above, it has around $80 billion of assets, including $62 billion of tangible assets.

30. 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.3 below illustrates the trends in search and display advertising for Google in the last ten years.

Figure D.3: Google search and display advertising in the UK 2009 to 2018[9]



Source: CMA analysis of Google submissions

31. 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.

32. To complete this assessment, we have done the following:

[7] Alphabet 2018 10-K report p.50 Cash flow statement
[8] Alphabet 2018 10-K report p.47 Consolidated Statements of Income
[9] For confidentiality reasons we have omitted the scale and vertical axis from this graph.

- 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.

33. 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.

Our approach to analysing the profitability of Google Search

34. 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.

35. 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

36. 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.

37. 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.[10,] 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.

38. 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. 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.

39. 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

40. 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.

41. Google makes large investments into R&D in order to '…accurately anticipate technology development and deliver innovative, relevant and useful products…'.[11] Between 2014 and 2018, the Alphabet Group invested over $74 billion[12] 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.

42. 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

[10] '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.
[11] Alphabet 2018 10-K form p.7
[12] Alphabet 10-K forms 2014 - 2018

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.[13] 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.

43. 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.[14] 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.

44. 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.

45. 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; and
- Incur indirect costs significantly higher than those which Google has indicated are directly related to the provision of the search engine.

[13] Alphabet 2018 10-K form p.3
[14] 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.

Summary of our approach to revenues and costs

46. 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.1:

Table D.1: Lower and upper estimates for EBIT attributable to search

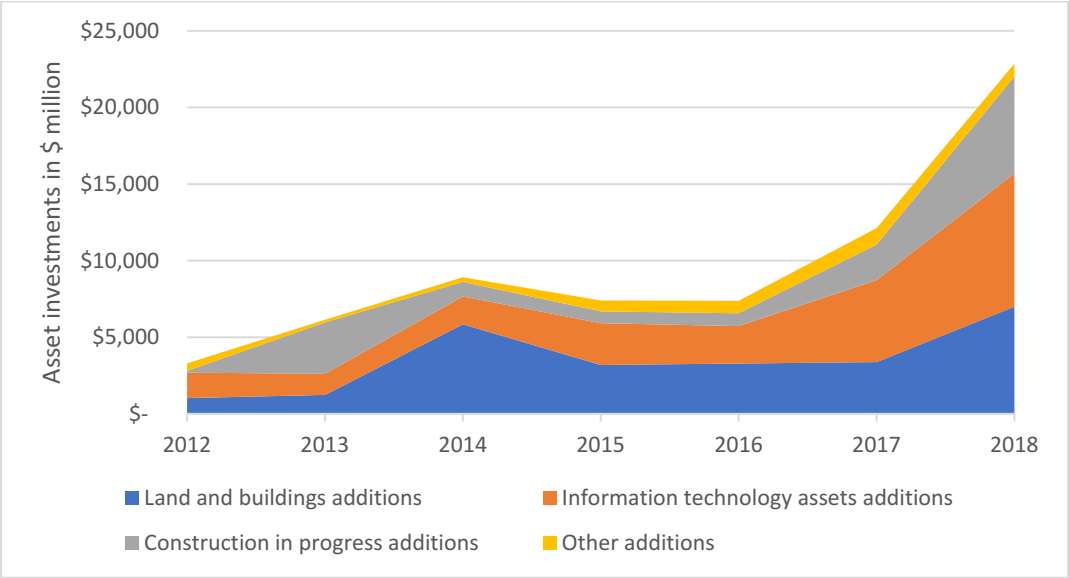
Input	Upper estimate	Lower estimate
Revenue	Search revenue, as provided by Google	No change
Direct costs ('Traffic Acquisition Costs')	Search TAC, as provided by Google	No change
Other Direct costs (expenses associated with data centres, depreciation, energy and compensation expenses)	All costs associated 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.

Asset base assumptions

47. 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 $3 billion of assets classified as other non-current assets.

48. Taking these together provided us with an asset base for search of $61 billion. The majority of these assets are physical and technical infrastructure. As indicated in Figure D.4 below, Google has invested significantly in these tangible assets in recent years.

Figure D.4: Google's asset investment 2012 - 2018



Source: CMA analysis of Alphabet 10-K

49. 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.

50. 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 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.

51. 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

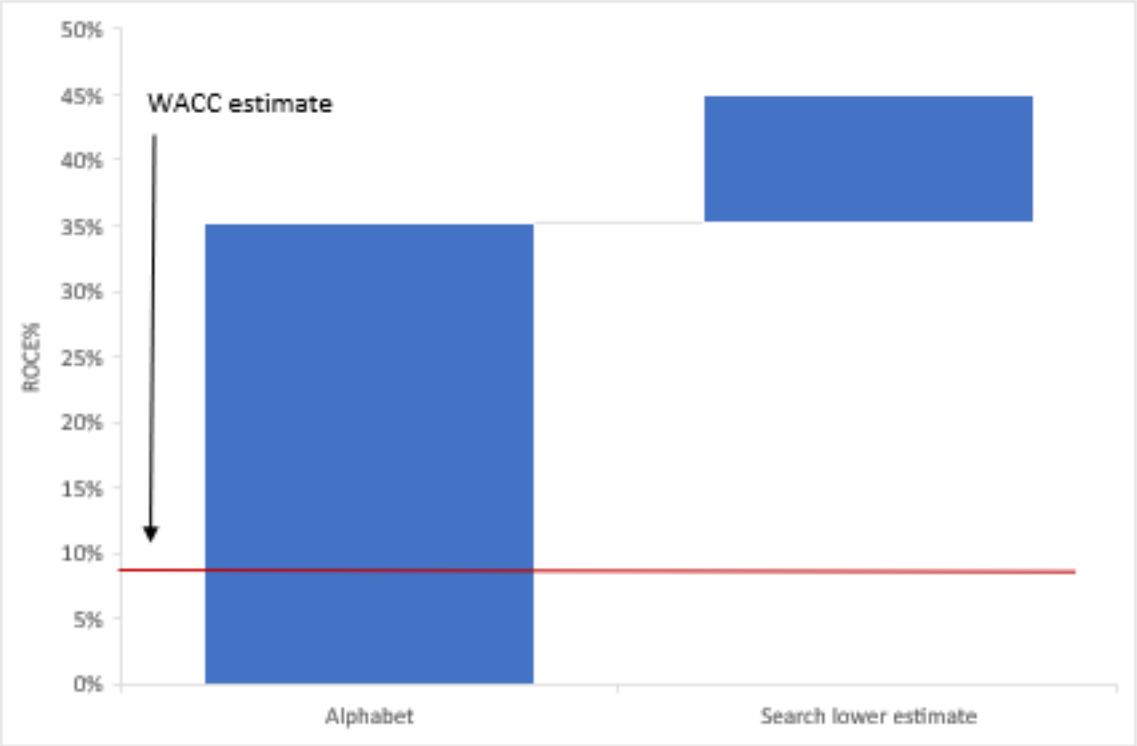
52. We have run a number of sensitivities associated with Google Search's returns, based on the assumptions described above. We find that the ROCE of a standalone search business would be higher than the 35% ROCE earned by the Alphabet Group in 2018, excluding the European Commission's fine.

53. 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.

54. 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.

55. The results of the above sensitivities are summarised in Figure D.5.

Figure D.5: ROCE comparison across Alphabet and Google Search for 2018



Source: CMA analysis of Google submissions

56. 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 earn a very high ROCE, and we would also expect the process of competition to result in either lower prices or enhanced services.

57. 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.

58. 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.

59. However, as we discuss in Chapter 3, 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 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.

60. 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

61. 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.

62. 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 profitable[15] in 2016 despite having a less than 5% share of supply in general search over that period.[16]

63. In some non-English speaking countries, there are other competitors available. Seznam – a popular search engine in Czech Republic which has just under 12%[17] share of the market in desktop search has operated in Czech Republic profitably and in the latest financial statements reported £56 million EBIT[18] (equivalent of 40% EBIT) for 2017.

64. Yandex[19] – a large search engine which operates in predominantly Russian-speaking countries, but also has presence in Turkey and some English-

[15] Microsoft earnings call transcript 2016 Q1
[16] Market share taken from StatCounter.
[17] Market share taken from StatCounter.
[18] The financial results were translated from Czech koruna into British Pounds using exchange rate of 29 koruna to £1
[19] Yandex is made up of a number of business units such as Taxi, Classifieds, E-commerce as well as search.

speaking countries, is also a profitable firm. In 2018, Yandex reported EBIT of £254 million[20] (equivalent of 16% EBIT) for 2018.

65. As part of the work undertaken, we have also learnt that some other search engines, which do not have their own search crawling abilities and algorithms,[21] such as Ecosia, are also able to operate profitably. These search engines use syndication models.

66. 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. Our analysis suggests that there are no insurmountable cost-related barriers to entry - entrants should be able to earn positive returns without needing to be as large as Google. This supports a finding that barriers to entry relate more to demand-side factors and network effects, as set out in Chapter 3. If these barriers were addressed through appropriate remedies, our analysis suggests that the market could profitability sustain competition between a number of search providers.

Facebook Inc

67. 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.

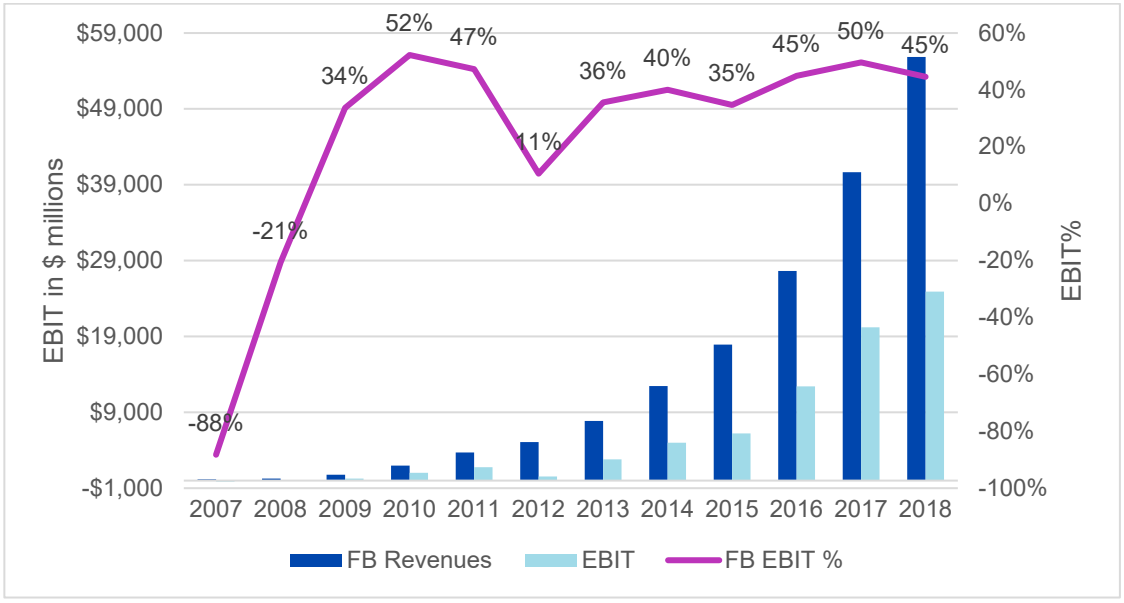
68. Facebook was incorporated in July 2004 and completed its initial public offering in May 2012, with the company's stock being listed on the NASDAQ stock exchange. Our market study is particularly focused on the social network platforms within Facebook, in particular, Facebook and Instagram.

[20] The financial results were translated from Rubles into British Pounds using exchange rate of 82 Rubles per £1.
[21] Microsoft, Yandex and Seznam all have built their own web index and operate own algorithms.

Financial performance of the Group

69. Figure D.6 illustrates Facebook's profits over the period of 2007 to 2018, over which comparable data was readily available to us. The data illustrates that, since 2009 Facebook has been consistently profitable whilst growing its business in terms of revenue.

Figure D.6: Facebook's revenue and profit from 2007 to 2018



Source: CMA analysis of Facebook Inc 10-K

70. 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.

71. At this point Facebook also increased its investment into R&D (the level of investment increased from $388 million in 2011 to $1.4 billion in 2012), sales and marketing (from $393 million to $896 million) and administrative expenses ($500 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.[22]

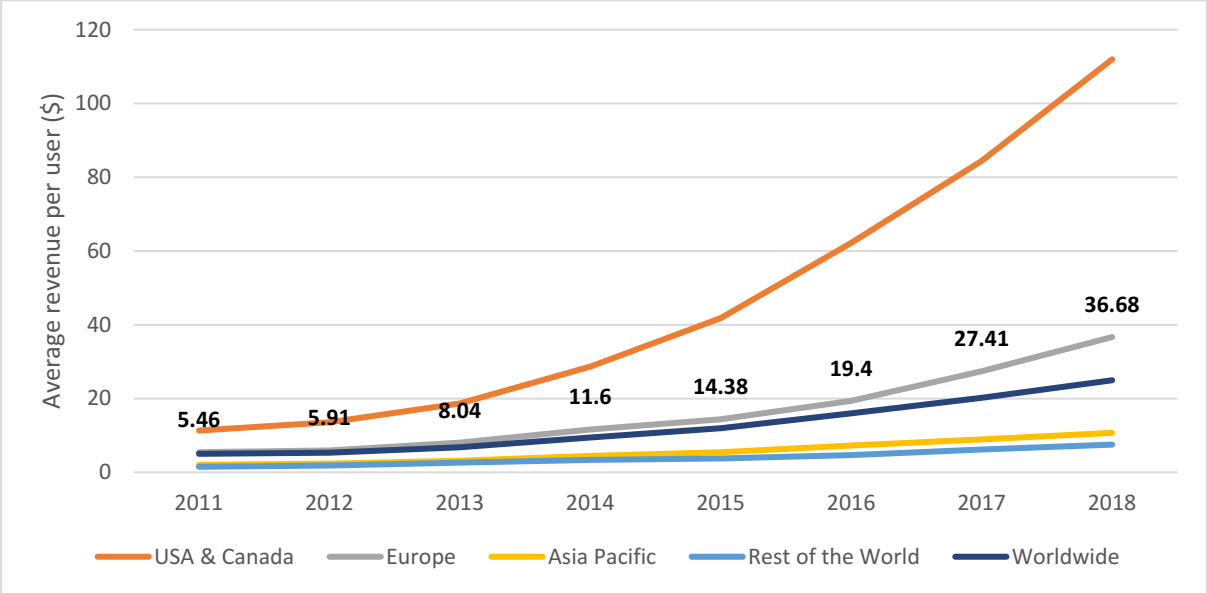
72. Digital advertising represented 84% of Facebook's total revenue in 2012 – this increased to 99% in 2018.[23] This trend demonstrates Facebook's successful

[22] Facebook Inc 10-K 2012
[23] 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 2.32 billion[24] of monthly active users, and engaged daily users of 1.52 billion as at 2018.[25]

73. 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.7 below).

Figure D.7: Facebook average revenue per user (ARPU) Worldwide 2011 to 2018



Source: CMA analysis of Facebook Inc 10-K

74. Facebook's most profitable region, on a per-user basis, has always been USA and Canada, at just under $112 earned on average per user in 2018.[26] Europe is the next highest region at $36.68 ARPU in 2018.[27] Facebook explains the higher ARPU rates as a reflection of the size and maturity of online and mobile advertising markets.[28]

Return on capital employed

75. 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.

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[24] Facebook Inc 10-K 2018 p.35
[25] Facebook Inc 10-K 2018 p.35
[26] Facebook Inc 10-K 2018 p.39
[27] Facebook Inc 10-K 2018 p.39
[28] Facebook Inc 10-K 2018 p.38

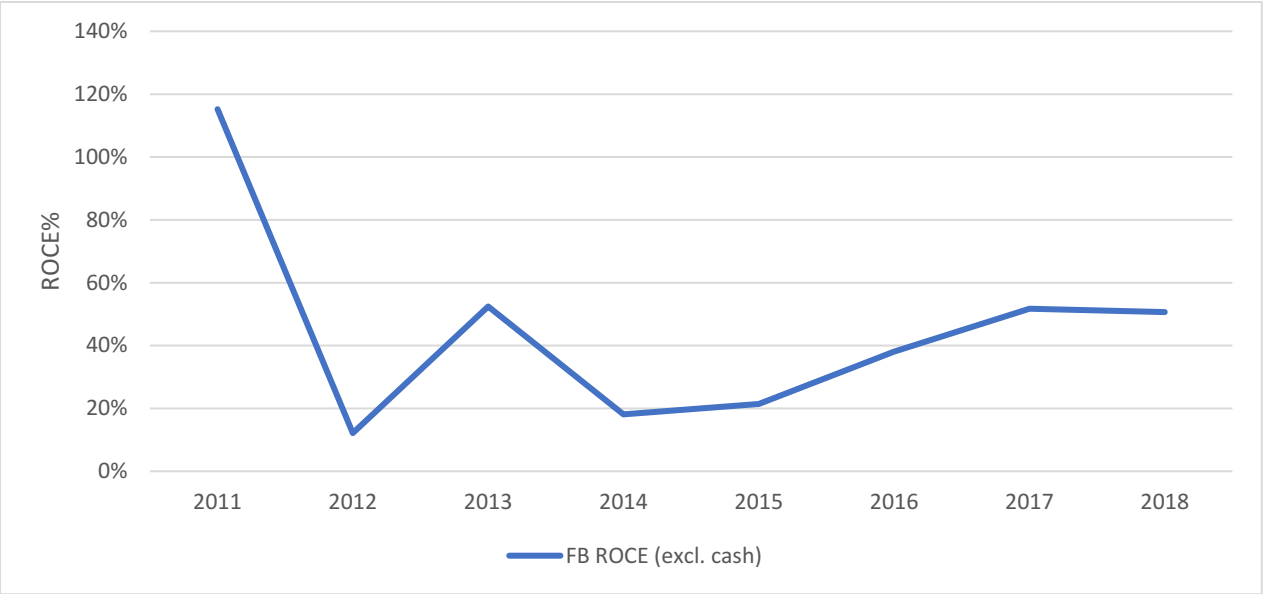
76. As with Google, Facebook is an integrated business, operating globally. The large majority of Facebook's revenues relate to the core Facebook platform, with Instagram providing the majority of other revenues and profits. In chapter 3 we have analysed the market outcomes for Facebook and Instagram 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.

77. 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.

78. Figure D.8 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.

79. 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 $49.2 billion.

Figure D.8: Facebook Inc Return on Capital Employed 2011 to 2018

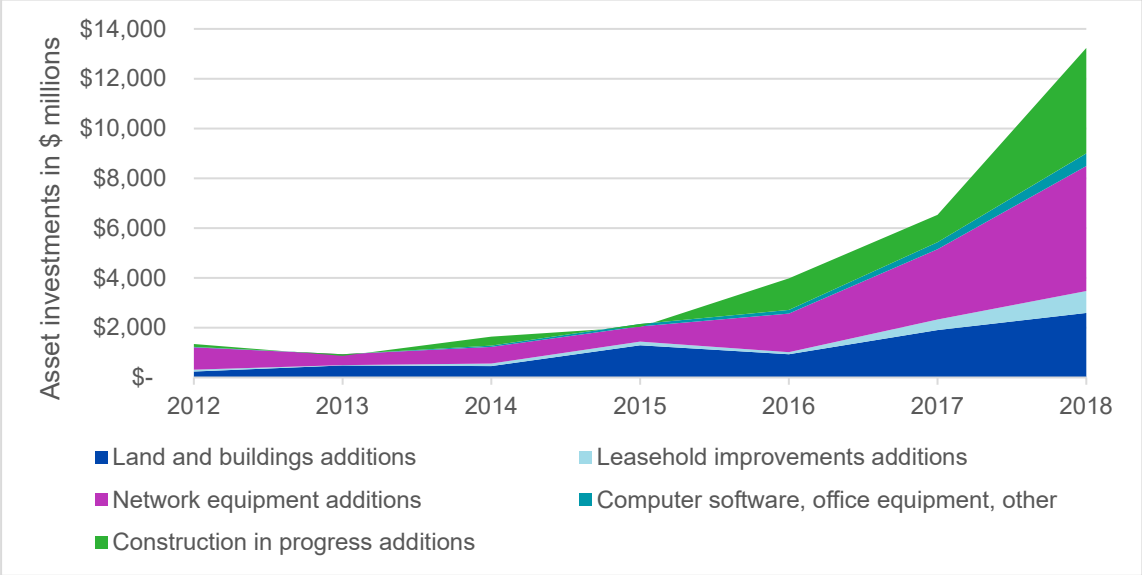


Source: CMA analysis of Facebook Inc 10-K

80. 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.

81. As with Google, Facebook is not an 'asset-light' business. Facebook has invested in growing its fixed asset base in recent years. Figure D.9 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.9: Facebook's asset investments since 2012



Source: CMA analysis of Facebook Inc 10-K

82. 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.

Sensitivity Analysis

Revenue, costs and asset base

83. 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.

84. 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.

85. 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.

86. 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 in social media 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.

87. 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 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.

88. However, we are also aware that Facebook's asset base includes $15 billion of goodwill that Facebook has on its balance sheet as a result of the purchase of WhatsApp.[29] 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 $5 to $10 billion estimate of the investment required to create the core functionality of a social media network, the net impact would be to increase ROCE.

89. In addition, between 2014 and 2018, Facebook Inc. invested over $31 billion[30] 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. One example of the R&D expenditure that has not been allocated to its consumer-facing platforms in this sensitivity is its investment in Libra, its proposed new cryptocurrency.

90. Therefore, a sensitised estimate of Facebook's ROCE that reflected this adjustment would have result in a higher ROCE for Facebook's social media platforms.

91. 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 on social media 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.

92. We discussed in respect of Google that it is not, in our view, a 'natural monopoly'. The same appears to apply to Facebook, in terms of its costs. The evidence from the figures above suggest that Facebook's costs have also increased in line with its increasing scale. A successful smaller social media firm should be able to operate profitably with lower market share than Facebook.

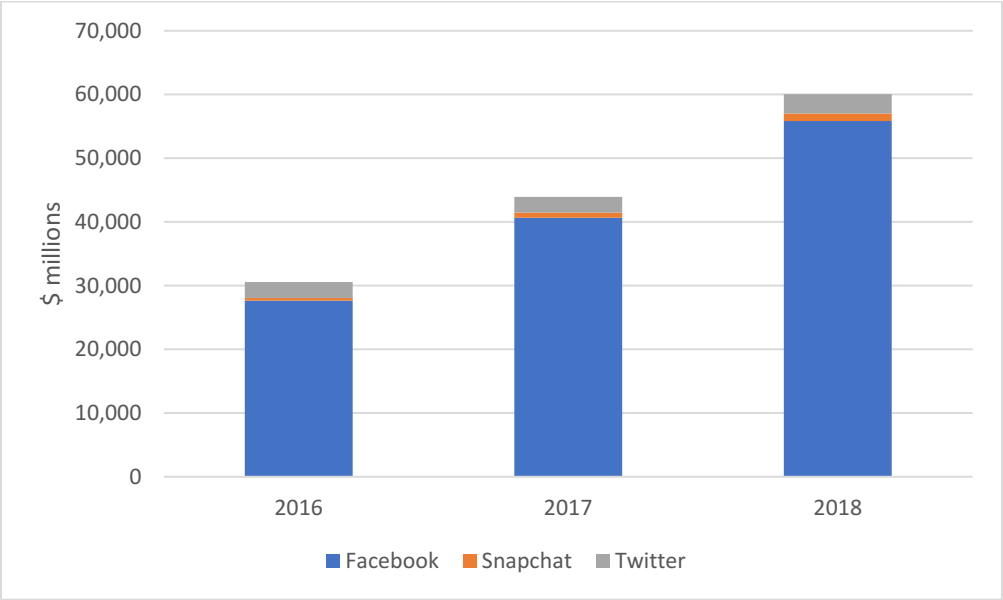
Entrants and other smaller competitors

93. As described above, Facebook does face competition from other social media firms. Both Twitter and Snap are publicly quoted firms where data is available

[29] See page 69 of Facebook's 2014 annual report.
[30] Facebook Inc 10-K forms 2015 to 2018.

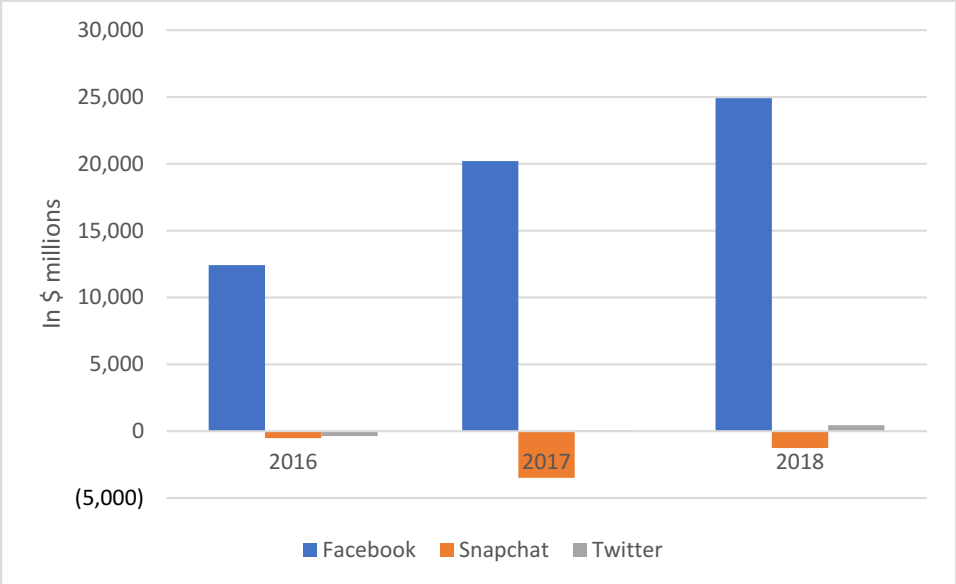
on their comparable revenue and profit. Figures D.10 and D.11 compares revenue and costs for these firms with Facebook.

Figure D.10: Global revenue generated between 2016 and 2018 by Facebook, Snapchat and Twitter



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

Figure D.11: Global profitability generated between 2016 and 2018 by Facebook, Snapchat and Twitter



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

94. 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

operations[31] and Twitter[32] reporting its first profit before interest and tax in 2017 and first net profit in 2018.

95. Based on the publicly available information on cost of revenues[33] 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 Snap. A comparison for ROCE is not meaningful for Twitter and Snap because they are continuing to make losses.

96. 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.

97. 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.

98. Our analysis suggests that there are no insurmountable cost-related barriers to entry - entrants should be able to earn positive returns without needing to be as large as Facebook. This supports a finding that barriers to entry relate more to demand-side factors and network effects, as set out in Chapter 3. If these barriers were addressed through appropriate remedies, our analysis suggests that the market could profitability sustain competition between social media platforms competing more directly with one another.

Conclusion

Google

99. 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

[31] Snapchat launched in 2012.
[32] Twitter was founded in 2006.
[33] Cost of Revenues = Cost of Goods Sold (COGS)

likely to be well over 40% from search, even, after allowing for a potentially higher asset value on a replacement cost basis. We have estimated a range of potential sensitivities which indicate that it is likely that Google's actual ROCE from search is significantly higher even than 40%.

100. Google's returns are high enough, that an entrant with a competitive search offering should be able to enter the market profitably, given that many of Google's costs have increased with scale. Our analysis indicates that search can be profitable for an entrant with a much smaller market share than Google, and is supportive of our finding that there are currently high barriers to entry and expansion in search.

Facebook

101. 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%.

102. 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 would still result in a ROCE well above the cost of capital.

103. Facebook's returns are high enough that a competitor which is able to attract enough users should be able to enter profitably. As with Google, we find that the evidence of the scale of Facebook's profitability is consistent with our finding that there are high barriers to entry, and high barriers to profitable expansion, for those social networks which are currently competing with Facebook using differentiated services.

Consultation questions

104. We are seeking views on the approach that we have adopted to calculate ROCE for Google search and Facebook. In particular, we have the following questions:

D.1 Does the overall approach to our ROCE calculations seem reasonable?

D.2 Should the approach be different for Google Search and Facebook, and whether any assumptions and inputs should be reviewed?

D.3 Should other considerations be taken into account when calculating ROCE?

D.4 Do you agree with the interpretation of the ROCE analysis?

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:

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

(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).[34] We used a range of between 0.15% and 0.20%;

[34] 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 a number of sources of evidence including the DMS publication[35] and Gregory (2011)[36] paper;

- Consumer Price Index (CPI) was used from the Bureau of Labor Statistics[37]. 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.2 indicates the WACC calculations that result from this set of assumptions:

Table D.2 Breakdown of the cost of capital for Google and Facebook

	Low	*High*
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%

[35] 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.
[36] Gregory (2001), The Expected Cost of Equity and the Expected Risk Premium in the UK
[37] US Department of Labour, Consumer Price Index, November 2019

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 WACC[38] to be applied to EBIT. We consider 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%[39] 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.

[38] 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.
[39] WACC has been estimated for the entire firm (Alphabet and Facebook) therefore US input data was used and not UK data.