Recent Developments at the CMA: 2021–22

Adam Cellan-Jones1 · Hussein Farook1 · Riccardo Ferrari1 · Maxwell Harris1 · Alex Rutt1 · Mike Walker1

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Abstract
This article discusses three important pieces of work that the Competition and Markets Authority has completed over the last year. The first two are market studies: The Mobile Ecosystems Market Study was launched over concerns that Apple and Google have too much control over operating systems (iOS and Android), app stores (App Store and Play Store), and web browsers (Safari and Chrome) that together form their ‘ecosystems’; the Electric Vehicles Charging Market Study took actions and provided recommendations in a nascent but critically important market. The final piece of work is “State of Competition”: a research project that assesses the evolution of competition in the UK over the past two decades.

Keywords Competition authority · Market study · State of competition

1 Introduction

The Competition and Markets Authority (CMA) is the UK’s leading competition and consumer authority, and its primary duty is to promote competition, both within and outside the UK, for the benefit of consumers. The CMA has a wide range of tools to use in addressing competition and consumer problems including carrying out investigations into mergers and markets, enforcing competition and consumer law, and working with sector regulators. In this article, we provide a brief overview of three projects which the CMA completed in the past year.
2 Mobile Ecosystems Market Study

2.1 Introduction

In June 2022, the CMA published the final report of its market study of mobile ecosystems.\textsuperscript{1} The study was a wide-ranging investigation into the ecosystems that Apple and Google have built around their iOS and Android operating systems for mobile devices, which encompass: operating systems; app stores; and mobile browsers.\textsuperscript{2} It considered the market power of Apple and Google in each of these gateways—that is, the extent of their ability to sustain higher prices or worse terms for these services than would be possible in competitive markets—and how this market power affects competition in these markets and in the many other digital markets that rely on them.

The market study is part of the CMA’s wide portfolio of cases that examines competition and consumer concerns that arise from digital markets, which include the previous study into Online Platforms and Digital Advertising.\textsuperscript{3} The conclusions of the mobile ecosystems study are contributing towards a broader programme of work, which includes the establishment of a new pro-competition regulatory regime for digital markets in the UK, and the CMA’s active competition and consumer enforcement work.\textsuperscript{4}

The study was scoped broadly, so as to enable the CMA to investigate the wide range of concerns in related markets and also to provide the CMA with a holistic perspective of how each of the components of mobile ecosystems interrelate. This allowed the CMA to explore how—despite similarities in the range of products and services that they provide—Apple and Google have different business models and differing incentives as well as differences in how tightly they control their ecosystems.

In this context, the rest of this section first considers: how ‘open’ and ‘closed’ each ecosystem is; whether this led to differences in outcomes; and, if not, the reasons for this. We then consider the effects of the market power that the CMA found that Apple and Google held in mobile operating systems and app stores before

\textsuperscript{1} See Mobile ecosystems market study—GOV.UK (www.gov.uk).

\textsuperscript{2} In the study the CMA used: (i) “mobile devices” to refer to portable electronic devices that can be held easily in the hand—including smartphones and tablets—and that can connect to the internet; (ii) “mobile operating systems” to refer to the pre-installed system software powering mobile devices; (iii) “app stores” to refer to marketplaces for users to discover and download native apps on their mobile devices; and (iv) mobile browsers to refer to apps that are used to access the web. ‘Native’ apps are apps that are written to run on a specific operating system and, as such, interact directly with elements of the operating systems in order to provide relevant features and functionality.

\textsuperscript{3} See Online platforms and digital advertising market study—GOV.UK (www.gov.uk).

\textsuperscript{4} The UK government consulted on a new pro-competition regulatory regime for digital markets in July 2021 (see A new pro-competition regime for digital markets (publishing.service.gov.uk)) and published its response to the consultation in May 2022 (see Government response to the consultation on a new pro-competition regime for digital markets (publishing.service.gov.uk)).
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setting out some concluding remarks.\textsuperscript{5} We do this based on the relevant findings as set out in the CMA’s report and do not seek to report on all of the issues that are covered by the market study.

2.2 Open and Closed Ecosystems

2.2.1 Apple

Apple’s mobile ecosystem is tightly integrated and widely referred to as being closed.

First, Apple does not license iOS (its operating system) to other device manufacturers, nor does it allow alternative operating systems on its devices.\textsuperscript{6} This means iOS is available only on iPhones/iPads and vice-versa. Apple can then use this position to control both the apps and services that are pre-installed on Apple devices and control the main gateways (app stores and browsers) through which online content can be accessed by and delivered to users.

Second, Apple allows native iOS apps to be downloaded only from its own proprietary app store—the App Store. Users cannot download native iOS apps directly from developers’ websites nor can they access alternative app stores. This means that the App Store does not face a competitive constraint from these alternatives; and this—alongside the limited constraint from other alternatives that are available to users and app developers\textsuperscript{7}—means that Apple is able to determine the ‘rules of the game’ for app developers that seek to distribute apps on iOS as outlined in the next sub-section.

Third, Apple pre-installs its own mobile browser—Safari—on all iOS devices and sets it as the default browser—its share on iOS devices is 90%.\textsuperscript{8} Although browsers are free to users, browser developers receive a share of the search advertising revenue when they set a search engine as default, and therefore developers have an incentive to compete to ensure their browser is used by consumers. While users can download and use alternative mobile browsers and set them as the default, all browsers on iOS devices must be built upon Apple’s WebKit browser engine. Browser engines are the critical technology that enables browsers to load and display content on a web page and are fundamental to the performance (e.g., speed and reliability) and capability of a browser.\textsuperscript{9} By restricting all browsers on iOS to use the WebKit

\textsuperscript{5} The CMA also found that Apple and Google have substantial market power in mobile browsers and browser engines. As outlined below, the CMA is consulting on a market investigation into mobile browsers and cloud gaming.

\textsuperscript{6} This is similar to Apple’s approach in desktop and laptop computers, where it has never licensed its MacOS operating system to other manufacturers.

\textsuperscript{7} Other alternatives considered included alternatives on Apple’s devices—e.g., web-based alternatives—and alternatives outside of Apple’s devices: e.g., switching to app stores on mobile devices that use Android, such as the Play Store.

\textsuperscript{8} See Final report (http://publishing.service.gov.uk), Table 5.2.

\textsuperscript{9} Specifically, a browser engine transforms web page source code into web pages that users can see on their screens and engage with.
browser engine, Apple limits the potential for rival browsers to differentiate themselves from Safari on factors such as speed and functionality—which means that Apple faces less competition. It also limits the functionality of web apps, which raises developers’ costs, deprives consumers of innovative apps, and limits the competitive constraint web apps could have on native apps.

### 2.2.2 Google

Google’s approach is more open with regard to some aspects of its ecosystem. For example:

- The Android operating system is open source, and device manufacturers can either license Google’s version of Android or create their own operating system with the use of the Android Open Source Project code (as Amazon has done with its Fire OS operating system).
- Users of Android devices have greater freedom to access and download native Android apps either from alternative app stores or directly from developers’ websites.
- Users are able to access other browsers on Android, which are free to be built on any browser engine.

Despite these differences the CMA found that Google is able to achieve similar outcomes to Apple. Virtually all Android smartphones use Google’s version of Android, and on Android devices the Play Store accounts for over 90% of downloads and Google Chrome has a browser share of 74%.

These outcomes in the Android ecosystem are supported by Google’s practices and contractual and financial agreements with device manufacturers. In particular, Google has agreements with and makes payments to device manufacturers that promote the use of Google’s version of Android, the Play Store, and Google Chrome. These include:

- Significant payments—such as a share of net ad revenue—that are conditional on the use of Google’s version of Android and the pre-installation and prominent placement of the Play Store and that also provide strong incentives to pre-

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10 Web apps, which can be regarded as an alternative to native apps, are applications that are built using common standards that are based on the open web, and are designed to operate through a web browser (rather than being specific to an operating system).

11 The CMA also considered differences in the interoperability of apps, services and connected devices. The majority of Apple’s apps and services are available only on its devices—with Apple Music as a notable exception. The CMA understands that there are some limitations on the compatibility of Apple’s connected devices—e.g., Apple Watch—with non-Apple devices. Most of Google’s apps and services are available on and its connected devices are compatible with Apple’s devices.

12 See Final report (http://publishing.service.gov.uk), Fig. 4.2 and Table 5.2.

13 In some cases a manufacturer can also receive a share of Google’s net revenue from Play Store transactions if it meets additional requirements: such as the Play Store being the only pre-installed app store.
install Chrome (and Google Search) on Android devices. Due to its position in search engines and search advertising, Google is better able to monetise and can profitability make significant payments to manufacturers that new entrants are unlikely to be able to replicate.

- Agreements that mean that access to Google’s popular apps and a number of APIs—on which many native Android apps rely to function—are conditional on the use of Google’s version of Android and the pre-installation and prominent placement of the Play Store.

The CMA’s assessment of these agreements and Google’s wider practices showed that, while Google has fewer explicit restrictions, it still holds a significant amount of control within its ecosystem.

Ultimately, the CMA found that both Apple and Google have market power in relation to each of these key gateways—which puts both of them in a strong position to influence how competition works in all of the markets that rely on their ecosystems. To a certain extent, Apple and Google are incentivised to ensure that these complementary markets work well for their users, as doing so makes their ecosystems more attractive for consumers. However, the CMA found that, while there are benefits from the ongoing stewardship roles that Apple and Google play in their respective ecosystems, there are clear risks that these companies face conflicts of interests when taking this rule setting and oversight role, as their own profit-driven incentives may not always be fully aligned with those of their users. We explore some of these concerns in the next sub-section.

### 2.3 Effects of Apple and Google’s Market Power

The CMA found that although both Apple and Google have market power in their operating systems and app stores, there are significant differences in the way that they use this market power and how this affects competition; these differences are influenced by their different business models that shape their incentives in different ways.

#### 2.3.1 Apple

Apple makes the vast majority of its global revenues—around 80%—from sales of devices. However, there are now more limited opportunities for further growth in numbers of devices. This has led Apple to shift focus to generate more revenues

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14 Device manufacturers can access payments under Placement Agreements if they pre-install the Chrome app and fulfil certain placement obligations on the user’s device. They can all access payments under Revenue Share Agreements in return for certain placement and promotion of Chrome (as well as other requirements).

15 See Final report (http://publishing.service.gov.uk), Fig. 2.6.

16 For example, due to high ownership rates in countries such as the UK and increases in the length of time that users are retaining their devices.
from its existing user base; and since 2015 Apple’s revenue growth has been driven primarily by revenues from services, which accounted for 10% of total revenues in 2015 rising to 19% by 2021.\textsuperscript{17} Services are even more important to Apple in profitability terms, with gross margins for services that are almost double those for devices (69.7% compared to 35.3% in 2021).\textsuperscript{18}

Apple’s market power in its ecosystem has helped to support the growth of its services revenues in various ways: First, it directly exploits its market power in native app distribution through the commission fees that it charges to app developers for its app distribution services. Apple generally charges a 30% commission fee on payments that occur through its IAP payment system, which it requires developers to use for sales of digital content within their apps—and has required since the launch of the App Store.\textsuperscript{19} While it has made some discounts available in specific circumstances (such as for the second year of subscriptions or for smaller developers), the CMA found that this has resulted in only a small decrease in the average commission rate—which remains between 25 and 30%.\textsuperscript{20} The CMA considered that this commission rate was higher than would be expected in a competitive market, based on the lack of constraint faced by Apple and high App Store margins and overall profitability.\textsuperscript{21}

Second, Apple has launched several services that are targeted at users of its devices that are monetised in most cases through subscriptions—ranging from music streaming (Apple Music) to file storage (iCloud) to payment services (Apple Pay).\textsuperscript{22} These services compete with third parties that rely on iOS and the App Store to reach customers: this puts Apple in a dual role and creates potential conflicts of interest as Apple both controls its operating system and app store and also competes with other businesses within its ecosystem. Some have observed that this ‘dual role’ is by no means unique to digital platforms, as traditional retailers such as supermarkets also frequently sell their own ‘private label’ products alongside third-party products.\textsuperscript{23} However, the potential for conflicts of interest deserves greater examination here; the range of ways that Apple can influence competition between apps, along with the dependence of developers on Apple to reach consumers as a result of Apple’s market power, mean that Apple’s ability to influence competitive outcomes in a range of downstream markets is much greater than that of a supermarket.

The CMA found that Apple’s position gives it an ability to give its own services competitive advantages over rivals in a variety of ways: it can set the boundaries on what rival apps are capable of doing and thereby reserve critical capabilities for its

\begin{footnotesize}
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\item See Final report (http://publishing.service.gov.uk), paragraph 2.37. Apple’s services revenue includes revenues from its app store, from services that are sold directly to consumers, and from advertising.
\item Apple 10-K, 2021.
\item There are some limited exceptions: most notably, ‘reader’ apps that can disable IAP within their apps and allow users to access content that they have paid for outside of the app.
\item See Final report (http://publishing.service.gov.uk), paragraph 4.189.
\item The CMA also considered several potential benchmarks that have been put forward by Apple and/or Google, including: each other; other Android app stores; console games stores; and PC games stores.
\item Apple Pay is monetised by charging a fee to card issuers rather than charging users directly.
\item See for example Padilla et al. (2020), Bourne & Subramaniam (2022).
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own services; for example, it has made Apple Pay the only payment service that can use the “near field communication” (NFC) chip to allow users to make contactless payments with their iPhones. Further, its own apps generally come pre-installed on its devices, and it can use defaults, prompts, and other aspects of choice architecture to encourage their use; third party apps, meanwhile, must be downloaded through the App Store, where Apple determines the search ranking algorithm and chooses which apps to feature in editorial content—in both cases with limited transparency. And third parties face costs that Apple’s own services do not: not only through paying commission fees, but also facing an opaque app review process—which has been described by some app developers as ‘arbitrary’ or ‘Kafkaesque’—which can increase development costs and cause delays.

While some of these practices could have benefits to consumers—such as the convenience of having pre-installed apps—they are also likely to protect Apple’s services from competition and could deter or prevent entry and innovation by Apple’s competitors in these downstream markets.

Finally, Apple uses its rule-setting power to shape its ecosystem to its own advantage in broader ways, beyond advantaging individual apps. For example, Apple’s introduction of its new privacy framework, ATT—while providing genuine privacy benefits to users—allowed Apple unilaterally to undermine the use of mobile advertising within its ecosystem. The CMA found that Apple implemented ATT in a way that benefited its own advertising business and undermined the use of mobile advertising both as a means for developers to find customers for their apps outside of the App Store, and as a way to monetise their apps without paying a commission to Apple. Apple has also been able to use its position to hold back different, potentially disruptive models of app distribution that could threaten its market power; this has diminished the competitive threat from web apps through the browser restrictions discussed above, and prevented the release of cloud gaming apps, which offer a different way for users to discover and access games, through restrictive App Store rules.

2.3.2 Google

Unlike Apple, Google makes a very small proportion of its revenues from device sales, as almost all mobile devices in the Android ecosystem are sold by other manufacturers. It also generally provides its services to consumers for free rather than charging. Instead, it makes the vast majority of its revenues (around 90%) from digital advertising, and in particular from search advertising.24 The CMA’s earlier market study into online platforms and digital advertising25 found that Google has more than a 90% share of the UK search advertising market, and is protected by such strong incumbency advantages that potential rivals cannot compete effectively. As a result of this weak competition, Google is extremely profitable, with its return

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24 See Final report (http://publishing.service.gov.uk), paragraph 2.41.
25 Final report, Online platforms and digital advertising market study, 2020. See also Havell et al. (2020).
on capital employed (ROCE) remaining far in excess of any reasonable competitive benchmark for many years.

Likely driven by Google’s different business model and incentives, Google’s use of its market power has differed in several important ways from that of Apple. One area of similarity is Google’s direct exploitation of market power in the app store through charging commission rates that are above the competitive level. Similarly to Apple, despite the introduction of a number of specific discounts, Google charges an average commission rate of 25–30%, and profits from the Play Store have been growing in importance for Google’s business: In 2021, the Play Store was the second largest contributor to Google’s global operating income, after Search advertising.

However, the CMA found far less evidence of Google self-preferencing its own apps, despite Google’s occupying the same dual role as Apple with several of its own apps competing with third parties that rely on its app store, and being in a similar position of power to set the ‘rules of the game’ for app developers. While some concerns remained, as compared to Apple, Google is less restrictive about the capabilities of third-party apps; Google pre-installs fewer of its own apps; it enables defaults to be changed in more cases; and its review process raised significantly fewer developer concerns.

Instead, the CMA found that Google’s main use of its market power from its mobile ecosystem is to reinforce its market power in search. It does this largely through its network of agreements with manufacturers as described above. In particular, Google has Placement Agreements through which it makes payments to manufacturers that pre-install and meet certain placement conditions for its Search and/or Chrome apps, and Revenue Share Agreements where it pays some manufacturers a proportion of its net ad revenue from specific search access points on their devices in return for meeting a number of placement and promotion requirements: such as setting Google as the default search engine on all preloaded manufacturer browsers.

The CMA found that Google’s agreements create significant financial incentives for manufacturers not only to pre-install Google Search and Chrome, but also to grant those apps prominent placement and default status. In the online platforms and digital advertising market study, the CMA had found that Google’s extensive default positions—in particular on mobile devices—act as a barrier to expansion for other search engines. In addition, the CMA found in that study that the user data that Google is able to gather from users of Android devices contribute to its significant

26 See Final report (http://publishing.service.gov.uk), paragraph 4.189.
27 Google also makes significant payments to Apple to make Google the default search engine on Safari on iOS devices – in 2021, Google’s estimated payments to Apple were £[1–1.5] billion. This is an area of alignment between Apple’s and Google’s incentives, as both are incentivized to direct users of Apple devices to Google Search.
28 Although, following the ruling in the European Commission’s Android investigation (Case AT.40099), Google no longer sets Google search as the default search engine on Chrome on Android and instead presents users in the UK and the EEA with a choice screen, the CMA found that in practice almost all (90–100%) users in the UK choose Google.
data advantages over rival search engines—which act as a barrier to those rivals competing effectively.

Google’s practices create a “virtuous circle” between its market power in its Android ecosystem and its market power in search: Using its mobile ecosystem to extend its market power in search allows Google to make higher search revenues, which strengthens the incentive it can create through revenue-sharing agreements for manufacturers to continue to use Google’s version of Android—which further entrenches its position in operating systems.

2.4 Conclusion

The CMA took a holistic approach and deliberately scoped the market study widely. This was important in gaining an understanding of the different elements of each mobile ecosystem and of how they interact; the CMA’s approach ultimately allowed a better understanding of the incentives at play and the benefits and concerns that might arise from different practices. For example, this holistic approach allowed the CMA to consider Google’s agreements with and payments to device manufacturers and how, while Google has fewer explicit restrictions in some respects, it still holds a significant amount of control within its ecosystem. This highlights the benefits of having a broadly scoped study that can capture how actions in one area may be facilitated by or affect positions in another area.

The CMA found that both Apple and Google have undoubtedly played an important role in driving the overall growth and development of these digital markets—with many consumers and businesses alike valuing and benefitting from their products and services. Benefits include: products that work seamlessly together; innovations in improving products and services; creating general confidence and trust amongst users; funding a number of free services that are valued by users; and creating a new series of markets that benefit many businesses—including smaller app developers.

However, as was set out above, the CMA also identified problems in the study and considered that those problems are entrenched and will not disappear unless appropriate steps are taken. The study identified a wide range of changes that would: open up competition in browsers and native app distribution; remove or revise unnecessary restrictions; and introduce new safeguards that should be aimed at ensuring fair and reasonable treatment of app developers. In doing this the CMA considered, in broad terms, some of the benefits, costs, and risks—including the impact of any potential interventions on the current benefits to consumers and businesses—as well as other implementation challenges.

The CMA is also acting now to tackle concerns where possible using its existing powers, as part of a wide portfolio of digital cases that are already underway. It is:

29 For example, on a 0 to 10 scale, 52% of Apple owners and 51% of Samsung owners indicated a degree of satisfaction between 9 and 10 and 74% and 73% respectively, 8 to 10. See research conducted by Accent, Consumer purchasing behaviour in the UK smartphone market—CMA research report (publishing.service.gov.uk), June 2022, Page 26.
• Consulting on a market investigation into mobile browsers and cloud gaming—both of which involve restrictions that hold back potentially disruptive innovation.\textsuperscript{30}

• Taking further enforcement action that include opening a new investigation into Google’s app store payment practices, alongside a similar investigation into Apple; and the CMA will be launching further digital cases beyond the study.\textsuperscript{31}

However, there are no easy or quick fixes for many of the issues that we have identified. A new ex ante regulatory approach is required to oversee powerful tech firms such as these and support the UK’s innovative tech sector. The CMA welcomed the government’s commitment to establish a new regime with tailored powers to tackle these problems.\textsuperscript{32}

3 Electric Vehicles Charging Market Study

3.1 Introduction

The UK has committed to reducing greenhouse gas emissions by 78\% by 2035 compared to 1990 levels and moving to net zero by 2050 (UK Government, 2021). Supporting this transition is a strategic focus for the CMA. Transport—in particular cars—is a large source of UK emissions (accounting for 27\% of UK emissions in 2019) (Department for Business, Energy & Industrial Strategy, 2021).\textsuperscript{33} Transitioning from petrol and diesel cars to electric vehicles (EVs) is therefore key to reducing emissions and meeting Net Zero. Reflecting this, the UK Government has committed to end the sale of new petrol and diesel cars/vans from 2030.

Carbon emissions are a well-known example of an economic externality (see, for example, Rezai et al., 2012). As the social costs of carbon are not paid by drivers of petrol and diesel cars/vans, emissions will be overproduced by the market relative to the social optimum. EVs can be charged from renewable energy sources that do not produce equivalent externalities, which creates a strong case for state intervention to facilitate the transition to EVs to address the market’s failure to price emissions correctly. There is a risk that such interventions weaken competition; but if properly executed, state intervention can be used to deliver competitive outcomes that improve consumer welfare.

The market for EVs exhibits indirect network effects, as EV chargepoints increase the usefulness of EVs, and vice versa (Li et al., 2017). This creates a ‘chicken and egg’ problem for the EV transition: The commercial viability of EVs depends on a

\textsuperscript{30} See Mobile browsers and cloud gaming—GOV.UK (www.gov.uk).

\textsuperscript{31} See Investigation into suspected anti-competitive conduct by Google—GOV.UK (www.gov.uk) and Investigation into Apple AppStore—GOV.UK (www.gov.uk).

\textsuperscript{32} See Government response to the consultation on a new pro-competition regime for digital markets (publishing.service.gov.uk).

\textsuperscript{33} Since 2020, transport emissions have been unusually low as a result of the COVID-19 pandemic.
widespread charging network being in place; but the commercial case for building that network is also dependent on the number of EVs on the road.

The CMA recently carried out a seven-month market study that investigated the EV charging sector in the UK. The CMA found that some parts of the sector are working well: For example, consumers are able to choose among home chargers that are sold on a healthy, competitive market; and competition is working well in rapid charging at destinations such as shopping centres and supermarkets where retailers compete to offer convenient EV charging. This section focuses on two areas in which the CMA found concerns: en-route charging (especially along the motorways); and on-street charging.

A market study into a nascent sector such as EV charging presents novel challenges: Many uncertainties about the shape of the future market cannot be resolved; and there is a risk that interventions that are based on faulty predictions may do more harm than good. However, forward-looking market studies such as this one can allow policy makers to intervene in a targeted way so as to improve long-term competition and prevent market failures from growing and becoming embedded in the sector.

### 3.2 En-Route Charging

Being able to recharge as quickly as possible on longer journeys (en-route charging) is crucial to persuade drivers to switch to EVs. The CMA assessed the effectiveness of competition in en-route charging and the ways in which this might be improved.

#### 3.2.1 Weak Competition in En-Route Charging

The CMA identified several reasons to believe that, in general, chargepoints at en-route locations often face weak competition from chargepoints at other locations:

- EVs typically have shorter ranges than do petrol/diesel vehicles, and consequently detours are particularly unattractive for EV drivers. As a result, the geographic markets in which EV chargepoints compete are likely to be small.
- EV charging companies’ internal documents reflected the view that to be an attractive en-route charging option, a charging site must be close to a driver’s route and must have amenities such as cafes and toilets (en-route charging typically takes 20 min to an hour). Such locations are uncommon.
- En-route chargepoints require rapid chargers (since drivers want to continue their journey promptly). Installing rapid chargers often necessitates an expensive upgrade to the electricity grid.

These issues are at their most acute on the motorway network. In the UK, motorway service areas (MSAs) are privately operated locations; they are typically located every 12–28 miles along the motorway, and provide drivers with opportunities to park, buy, refreshments and refuel. They are therefore well-situated and are forecast to carry out the majority of en-route charging. While there are some other locations
that are close to the motorway that can install EV chargepoints, they rarely offer the same combination of convenience and amenities; and in general there are fewer possible charging locations along the motorway than on other parts of the road network.

The CMA found that as a result of the above factors competition within MSAs—among different EV charging operators on the same site—is likely to be more effective, in principle, than competition between MSAs. However, the CMA’s study found that at most MSAs there was just one chargepoint operator—the Electric Highway—which had the exclusive right to install chargepoints.

In fact, the Electric Highway had an 80% share of chargepoints at MSAs in 2019, which limited the extent of competition between sites. Across all chargepoints within a half mile of the motorway—including sites that offer a much smaller range of amenities such as hotels—the Electric Highway’s share of supply in 2019 was still 59%.\(^{34}\)

The CMA investigated the extent to which weak competition had led to worse outcomes. Despite increasing demand for EV charging, the Electric Highway had made few recent investments before the CMA’s market study; most of its hardware had been in place since September 2013. The CMA found that this aging hardware had very poor reliability. A survey that was carried out by ZapMap (a UK EV charging analytics firm) found that the Electric Highway had the lowest customer satisfaction score among EV charging operators.

3.2.2 Two Key Barriers to Competition

While some of the causes of weak competition were intractable—for example, the scarcity of MSAs—the CMA identified two interrelated barriers to competition which might be remedied: (i) the cost of electricity grid upgrades; and (ii) the existence of long-term exclusive contracts between the Electric Highway and MSA operators.

The CMA found that that the cost of network connections was one of the main barriers to expansion that are faced by chargepoint operators—especially at MSAs. Charging in these locations involves particularly high-power demands during peak periods; this is driven by the need to minimise stop-off times and serve many drivers during rush-hour traffic, which increases the demand for rapid charging. Furthermore, the costs of the network upgrades that are needed at MSAs are particularly high, as they tend to be in locations that are further away from the existing electricity distribution network. The CMA reviewed detailed estimates, which indicated that the average cost of upgrading network connections at each MSA to accommodate the electrification of all cars and vans will be around £7 million, and at some sites could be as high as £27 million. The cost would be even higher if upgrades were carried out iteratively (as there is a fixed cost that is involved in each upgrade).

The CMA also found concerns that the long-term exclusivity agreements between the Electric Highway and three MSA operators (Roadchef, MOTO, and Extra) might foreclose competitors from supplying chargepoints at MSAs. The agreements

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\(^{34}\) Based on data from Zap-Map, which maintains a database of UK chargepoints.
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covered around two-thirds of service stations and were to last between 10 and 15 years since the contracts were entered into, with several years remaining. Several competitors told the CMA they would look to enter and compete at MSAs but were prevented by these agreements.

The CMA recognised that some period of exclusivity might be justified by the need for significant investments in charging hardware (including grid upgrades) before the demand for charging rose, and by the risky nature of the investments (elevated by uncertainties around future charging demand). However, the demand models and financial estimates that the CMA studied suggested that this would not justify the full length of the Electric Highway’s contracts, and the Government’s commitment to end the sale of new petrol and diesel cars/vans from 2030 reduced the riskiness of the Electric Highway’s investments.

The CMA was also concerned that the agreements would undermine government funding to address the high cost of upgrading the electricity grid: either (i) the benefits of the government’s investment would risk capture by the exclusive EV charging operator; or (ii) the funding would include pro-competitive requirements (such as a requirement that multiple chargepoint operators compete at each site) that would prevent the majority of MSAs from applying for funding, since they were subject to the exclusive agreements.

3.2.3 Improving Competition in En-Route Charging

The CMA sought to reduce barriers to competition in the supply of en-route charging through a combination of its own legal powers and its advice to government.

As a result of the market study, the CMA launched an antitrust investigation into the agreements between the Electric Highway and three MSA operators. Gridserve (which purchased the Electric Highway in June 2021) offered commitments to address the CMA’s concerns. The commitments, which were accepted in March 2022, reduced the length of the exclusive agreements, and thereby ensured that exclusivity would end in November 2026 at the latest and carved out an exception to the exclusivity where the Rapid Charging Fund (see below) enabled new grid capacity.

Prior to the CMA’s market study the UK Government announced a £950 million Rapid Charging Fund (RCF) to fund important grid upgrades in England. The CMA recommended that the Government attach conditions to this funding to enable competition between chargepoint operators within each MSA site, including: no exclusivity in the future; open tenders for access to the network capacity that is provided by the RCF; and access should be made available only to chargepoint operators with open networks that are interoperable with all EVs.

3.3 On-Street Charging

There is a significant proportion of drivers in the UK who will not be able to install a home chargepoint—e.g., those in houses without off-street parking or who live in flats—and who will rely on public or workplace charging. For these drivers in
particular, on-street chargepoints that are located on the kerbside, sometimes imme-
diately outside a driver’s home, could be a primary charging method—and if on-
street chargepoints are not available, these drivers could be slow to transition to
EVs.\textsuperscript{35}

Generally, on-street chargepoints can charge an EV overnight and are installed on
existing lampposts, bollards, or dedicated charging posts along a residential street.

The CMA found that demand for on-street charging is highly localised, as driv-
ers prefer to park close to their homes. While on-street chargepoints are less expen-
sive than rapid chargepoints,\textsuperscript{36} the cost of installing on-street chargepoints close to
residents’ homes means the roll-out is reliant on government subsidies. Furthermore,
there are economies of density in the supply of on-street chargepoints, as it is
cheaper to upgrade the ground infrastructure to multiple chargepoints on a street at
once, and it is cheaper to maintain chargepoints in a concentrated area. As a result,
on-street competition (where a driver has a choice between different operators) is
often not commercially feasible. The CMA therefore found that there is a risk that
local monopolies could develop in the supply of on-street charging.

Currently, the local government organisations (local authorities, [LAs]) that are
responsible for delivering on-street charging mitigate this through tenders ‘for the
market’. However, in order to maximise competition in such tenders, LAs need to
design, assess, and award tenders in a way that attracts and enables chargepoint
operators that have the most competitive proposition: e.g., in terms of price and
quality of service. Beyond the initial tender, it is also important to ensure that com-
petitive tension can be sustained at re-tendering. This requires long-term planning
by LAs to avoid tying them to an incumbent provider and, where possible, anticipat-
ing and planning for the competitive introduction of new technologies in the future.
However, the CMA found that many LAs do not have sufficient resources to maxim-
ise competition in this context, and some favour working with a single chargepoint
operator for convenience. This risks weakening competition in future tenders, which
will ultimately lead to worse quality or prices for residents.

The CMA identified a ‘split-infrastructure’ model as a promising alternative
approach to funding on-street charging. This funding model would split longer-life
below-ground infrastructure from above ground components, with long-term con-
tracts for below-ground infrastructure (which could be funded using a traditional
Regulated Asset Base model, as is common for other electricity networks) but
greater scope for competition in the chargepoints above ground. The CMA recom-
mented that this approach be trialled.

\textsuperscript{35} Survey evidence that was reviewed by the CMA suggested that on-street charging will be important
for convincing drivers to switch to EVs; for example, a survey by one chargepoint operator found that
the majority (67\%) of existing EV driver respondents would not have bought an EV if they did not have
access to overnight charging at home.

\textsuperscript{36} While home charging is the cheapest form of charging (with an average cost of £31 per month for
a typical driver), on-street charging is the next cheapest (£38 per month), with rapid charging around
30\% more expensive (£48 per month). This cost difference is driven by the higher capital costs that are
involved in installing rapid chargepoints.
The UK Government has increased its support for LAs—both by funding their delivery of EV charging investment and by developing guidance for LAs with the Institute of Engineering & Technology—so as to support their decision-making. Following the CMA’s market study, the Government announced a £10 million pilot of the Local EV Infrastructure Fund to test delivery mechanisms and business models.37

3.4 Conclusion

The CMA’s Electric Vehicle Charging Market Study found that exclusive agreements on the motorway were inhibiting public and private investment in EV charging. The CMA’s intervention allowed Government investment in the electricity grid to proceed as intended; the CMA also identified ways in which this funding could be used to encourage competition in EV charging on the motorway.

The CMA found that the way in which on-street charging is being delivered, especially in urban areas, risks creating competition issues in the future. There is a danger that less wealthy consumers could be excluded from access to competitively priced charging, as a result.

The CMA’s market study demonstrated that competition policy and public funding to support the transition to net zero can be mutually supportive. The UK Government responded positively to the CMA’s recommendations, and the CMA’s report is informing the Government’s planned EV charging infrastructure spending—such as the £950 million Rapid Charging Fund and the Government’s funding for local authorities (Department for Transport, 2022).

4 State of Competition 2022

4.1 Introduction

In April 2022, the CMA published the second report on the State of Competition in the UK. It comes after the publication of the first report in November 2020. The central aim of this work is to measure and understand better the state of competition in the UK now and in the future. This matters because competition can directly benefit individual consumers and the economy as a whole.

In the latest edition, the CMA updated the analysis that was done in 2020 on concentration, mark-ups, profitability, and persistence with more recent data. The report also benefitted from the Consumer Protection Study, which made use of survey techniques to evaluate consumer detriment (defined as the monetised, emotional and wellbeing impacts/consequences of detriment incidents experienced by consumers) in the year to April 2021.

37 See Government response to the CMA’s electric vehicle charging market study - GOV.UK (https://www.gov.uk/).
We also undertook a new analysis that includes a study of the relationship between concentration and income distribution, and two analyses that attempt to adjust concentration measures for common ownership and international trade.

The sub-sections below describe: the overall findings on baseline measures of concentration, mark-ups, profitability, and persistence; our work on concentration and income distribution; the analysis that was carried out to adjust concentration by accounting for common ownership; the adjustments that are required to adjust concentration to account for international trade; and some concluding remarks.

4.2 Concentration and Profits

The advantage of having a recurring report on the State of Competition in the UK is that key competition metrics are kept under scrutiny. We used data from the Office of National Statistics (ONS) and Bureau Van Dijk to estimate concentration and profitability indicators at a national level. These data have the great advantage of providing readily-available and consistent business information across most of the UK firms.

However, the data has also some major drawbacks that one must carefully account for when considering and interpreting the findings. Probably the biggest limitation of the data is the reliance on the standard industry classification (SIC). This represents a categorisation of companies in discrete industries, which often do not describe business activities accurately. For example:

(a) SIC codes were last updated in 2007. The economy has changed dramatically since then, and several businesses are unlikely to fit the categories that were defined then;
(b) Most companies are assigned to only one SIC code. This means that, for example, all revenues of a multi-product company will be associated with only one industry;
(c) SIC codes are unlikely to match what the CMA would define as antitrust markets. For example, SIC codes are defined at a national level, whereas the CMA might define markets at a regional, local, or even international level.

Despite these limitations, our concentration analysis provides some interesting high-level insights. We have used data from the ONS to build several measures of concentration from 1998 to 2021. Concentration can be seen as a simple indicator of competition in a market. Higher concentration means a smaller number of firms account for a larger share of the market, which may lead to weaker competitive pressures and greater market power.

We considered two main measures of concentration: The first is concentration ratios, which sum the market shares of largest five (C5) or ten (C10) firms in an industry, defined at a 4-digit SIC level. The second is the Herfindahl-Hirschman Index (HHI), which sums the square of markets shares of all firms in an industry. After computing these measures, we averaged them at a national level using firms’ revenues as weights.
The results for C5 are visible in Fig. 1: There was a marked increase in concentration in the years immediately after the 2008 financial crisis. Since then, concentration has fallen; but it still remains above levels that prevailed prior to 2008. The results are consistent across both concentration ratios and HHI.

We also updated our analysis of mark-ups and profitability with the data from Bureau Van Dijk. We focused on three measures in particular:

(a) First, mark-ups: These are defined as the ratio of the price charged for a good or service to the incremental cost to produce or provide it. This is often considered as the most direct measure of a firm’s product market power.

(b) Second, EBIT margin: This is a profitability measure that is directly available from companies’ accounts. It is defined as the ratio of earnings before income and tax (EBIT) to revenues.

(c) Third, ROCE: The return on capital employed divides the EBIT margin by capital employed (measured as total assets minus current liabilities, or equivalently, equity plus long-term liabilities). This has the advantage to account also for capitalised expenditures.

Based on these metrics, we found (see Fig. 2) that the mean mark-up (averaged at a national level using firms’ revenues as weights) has risen from 1.22 to 1.34 over the last two decades. This change is driven mostly by a sharper increase in the top decile: the most profitable 10% firms in our sample. This is a finding that is broadly consistent with both the UK and international evidence. In comparison, mean EBIT margins have remained broadly stable in the past 20 years, while the average ROCE has declined at a slower rate than the decline in the cost of capital, as proxied by the yield on investment-grade debt.

Our last update involved measures of persistence. If a company is able to maintain high market shares or high profits over time, this might be a sign that the market lacks competitive dynamics. To examine this, we looked at rank persistence and profits persistence:

(a) Rank persistence represents the likelihood of the very top firms in an industry (in terms of turnover) remaining the top firms. This metric focuses on a much smaller group of the most economically significant firms in the economy. In practice, we examined the top ten firms in each industry (defined as 4-digit SIC codes) by turnover and checked, for each year, how many of them were also in the top ten three years previously.

(b) Profits persistence examines mark-ups, EBIT margins, and ROCE and estimates the extent to which the same firms are persistently in the top 10% for each metric. To do this we have considered the proportion of companies in the top 10% in a given year that were also in the top 10% three years earlier.

Most of our persistence metrics have increased over time, as can be seen in Fig. 3. This suggests that the largest and most profitable firms are able to sustain their strong position for longer than was previously true.
4.3 Concentration and Income Distribution

One of the newer pieces of analysis within this year’s report examines the relationship between competition and inequality and draws heavily on the work of Davies and Mariuzzo (2022).

Previous analyses of the effects of competition on inequality have found that lower-income households on average spend a greater proportion of their income on consumption and are therefore more exposed to relatively higher prices. Other papers (Baker & Salop, 2015; Comanor & Smiley, 1975; Creedy & Dixon, 1998; Ennis et al., 2019; Furman & Orszag, 2018) also note that wealthier households tend to gain proportionately more from monopoly profits and by inference from weaker competition.

The focus of the analysis in the State of Competition report focuses on the empirical evidence that lower-income households consume disproportionately more in markets in which firms have more market power. It does this by creating an income-weighted HHI for households, which represents the average level of market concentration that households in a particular income decile face, based on the proportion of income that they spend on goods and services and the level of concentration within these markets.

The greater is the proportion of income that is spent in concentrated markets, the higher is the income-weighted HHI calculation and the more vulnerable may households be to the consequences of weaker competition.

The analysis found (see Fig. 4) that on average there was a clear inverse relationship between a household’s income and its weighted HHI, with lower-income households’ consuming disproportionately more from more concentrated markets.

This conclusion remained the same regardless of whether the concentration of goods and services was viewed from the perspective of the manufacturers of these goods and services or the sellers of these goods and services. The magnitude of the
differences are noteworthy, with the lowest-income households on average facing markets that have HHIs that are 30% higher than the markets that are faced by the richest households.

Alone these conclusions do not speak to the extent of market power or provide reasons for why industries that supply certain goods and services are likely to be more concentrated. Analysis of the distribution of consumption bundles illustrated
that the higher HHIs for the lowest income decile were driven by relatively more expenditure on fuel, power, food and housing. Some of these sectors are already regulated, which would suggest that whilst concentration metrics can be of interest, further research is needed to assess how vulnerable lower-income households may be to weaker competition.

The analysis does, however, present evidence for why the CMA should continue to consider particularly vulnerable consumers and the extent to which they are harmed by competition deficiencies.

### 4.4 Adjusting Concentration for Common Ownership

A key assumption that underlies the measures of concentration that were described in the previous sections is that each firm is considered as an independent entity: There are no ownership links across firms. In this sub-section, we relaxed this assumption. Our methodology is limited by the availability of suitable data; however, it represents a useful attempt to refine concentration measures.

Common ownership is usually defined as the ‘simultaneous ownership of shares in many firms active in the same market.’ Traditional economic thinking assumes that firms will act independently and compete with each other in order to maximise their own profits. Common ownership, however, challenges this assumption.

One of the implications of common ownership is that traditional measures under-estimate concentration, and therefore overstate the competitiveness of an industry. It is thus necessary to consider different metrics that account for this potential interdependence of firm behaviour.

We have done this by computing concentration measures that are based on a novel dataset that we created from two data sources: We linked administrative data

![Fig. 4](image-url) Sector spending weighted average HHI by household income decile

The graph shows the sector spending weighted average HHI by household income decile.
on ownership and control from Companies House (which is the UK’s registrar of companies) to the Inter-Departmental Business Register (IDBR), which is a register of the turnover and employment of all PAYE or VAT registered businesses in the UK in September 2021.

4.4.1 Advantages and Caveats

A major advantage of this new dataset is that it allows us to analyse almost the entire population of businesses that are active in the UK. In contrast, much of the academic research on common ownership has focused on a subset of large, publicly traded (listed) firms. However, there are two main drawbacks that are related to this dataset:

First, the data that are recorded by Companies House are based on the definition of Persons with Significant Control (PSC). These are defined as: ‘persons, both legal and natural who, directly or indirectly: (a) own more than 25% of the shares in a company; (b) control more than 25% of the voting rights in a company; (c) hold the right to appoint or remove the majority of the board of directors of the company; or (d) otherwise have the right to exercise, or actually exercise, significant influence or control.’ This means that it records only broad information on ‘large’ ownership and control stakes. For example, our data are unlikely to capture the effect of institutional investors with smaller stakes in multiple businesses on which much of the academic literature has focused. As a result, it will understate the extent of common ownership in the UK economy.

Second, businesses are deemed as belonging to the same common ownership group if they were part of a business chain that involves any significant control. Therefore, even a partial ownership of 25% would be considered as complete (100%) control in our analysis. As a sensitivity check, we relaxed this assumption and used a 50% threshold.

4.4.2 Results

According to our definition of common ownership, out of roughly 2.6 million businesses in our data, around 160,000 businesses are connected to a common ownership group with at least one other business. This means that approximately 6% of businesses in our data have connections through common ownership that would not be captured in the original data.  

38 Our results suggest that common ownership is more common among larger companies and in high-turnover industries.
We have, then, computed concentration metrics that are based on these newly defined common ownership groups, rather than single firms. We compute these for 4-digit SIC code industries and compute means using firms’ revenues as weights. The results are shown in Fig. 5. We find large changes in HHI in already highly concentrated sectors such as Manufacturing and Finance and insurance. However, we find large changes in HHI also in sectors with a lower standard HHI. For example, Mining and quarrying moves from the fifth-highest HHI sector to the third, while Information and communication moves from sixth to fourth.

The large changes in HHIs may be driven by either the size of the interconnected firms (common ownership among the largest firms leads to larger changes in the HHI), the size of the industries where common ownership is most present (industries are averaged using turnover as a weight), or the 25% common ownership threshold described above. Changing the latter to 50% substantially reduces the changes in HHI in most sectors. As a result, we acknowledge that more research in this area is needed to explore and consolidate these findings.

4.5 Conclusions

In a context where the Covid-19 pandemic, the UK’s changing trade relationship with the EU, disruptions to supply chains and shipping, and rising energy costs have all brought significant change and upheaval to the UK economy over the past few years, monitoring and supporting the competitive intensity across the UK economy is more important than ever.

Our work on the State of Competition shows an increase in concentration measures after the 2008 financial crisis. However, data limitations do not yet allow for the precise identification of problems in specific markets.
We also find a rise in companies’ mark-ups over the past two decades, which is mostly driven by the increase in mark-ups of the already most profitable firms. This, together with the rise in persistence metrics, suggests that the largest and most profitable firms are cementing their positions in the market.

Finally, we have carried out novel analyses that show that: (i) lower-income households face, on average, a higher level of concentration than higher-income households; and (ii) adjusting for common ownership may substantially increase concentration levels in some sectors.

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