International Center for Law & Economics

Comments of the International Center for Law & Economics

CMA's Provisional Findings on the Cloud Services Market

18 February 2025

Authored by:

Geoffrey A. Manne (President and Founder, International Center for Law & Economics)

Brian Albrecht (Chief Economist, International Center for Law & Economics)

Dirk Auer (Director of Competition Policy, International Center for Law & Economics)

Lazar Radic (Senior Scholar, International Center for Law & Economics; Assistant Professor of Law, IE Law School)

Mario A. Zúñiga (Senior Scholar, International Center for Law & Economics)

Introduction

We appreciate the opportunity to respond to the Competition and Markets Authority's (CMA) provisional findings in its investigation of the cloud-services market.[1] We urge the CMA not to finalize these findings in their current form, or at least to revise them, for the reasons set forth below.

As our comments explain, several aspects of the market and the analysis thereof warrant reconsideration. Among these, we would highlight that market concentration alone is a poor proxy for competitive harm; the cloud sector is characterized by dynamic competition and innovation that a static analysis overlooks; high profitability does not equate to an absence of competition in a contestable market; and the provisional concerns over egress fees and technical barriers may undervalue legitimate business justifications and competitive context. Finally, we caution that the proposed remedies—particularly, the choice to designate certain firms as holding strategic market status (SMS)—appear to be disproportionate and unsupported by the evidence, and potentially to harm the very competition and innovation the CMA seeks to protect.

I. Market Concentration Is Not a Reliable Proxy for Expected Competitive Harm

The CMA's provisional report emphasizes the high concentration in UK cloud-infrastructure services—a "two-horse race" dominated by Amazon Web Services Inc. (AWS) and Microsoft Corp. Even if these presumptive market shares were accurate, concentration metrics are not by themselves evidence of competitive harm or consumer detriment. Market share and Herfindahl-Hirschman Index (HHI) figures offer, at best, a starting point for analysis, not a conclusion. High concentration can arise for pro-competitive reasons—*e.g.*, a firm offering a superior product or greater efficiency—and market structure is not outcome-determinative. In other words, a concentrated market can still be vigorously competitive, and conversely, a less-concentrated market could be uncompetitive due to tacit coordination or other factors.

The assumption that "too much" concentration is harmful assumes both that a market's structure is what determines economic outcomes, and that it is possible to know what the "right" amount of concentration is. As economists have understood since at least the 1970s (and despite an extremely vigorous, but futile, effort to show otherwise), market structure does not determine economic outcomes.[2]

> Once perfect knowledge of technology and price is abandoned, [competitive intensity] may increase, decrease, or remain unchanged as the number of firms in the market is

[1] CMA *Cloud Services Market Investigation Provisional Findings*, COMPET. MARK. AUTH. (28 January 2025), [*hereinafter:* "CMA Provisional Findings"].

[2] *See* Harold Demsetz, *Industry Structure, Market Rivalry, and Public Policy*, 16 J.L. & ECON. 1 (1973).

> increased.... [I]t is presumptuous to conclude... that markets populated by fewer firms perform less well or offer competition that is less intense.[3]

This view is well-supported and is held by scholars across the political spectrum.[4] The absence of correlation between increased concentration and either anticompetitive causes or deleterious economic effects is also demonstrated by a recent influential empirical paper from Sharat Ganapati. Ganapati finds that the increase in industry concentration in U.S. non-manufacturing sectors between 1972 and 2012 was "related to an offsetting and positive force—these oligopolies are likely due to technical innovation or scale economies. [The] data suggests that national oligopolies are strongly correlated with innovations in productivity".[5] In the end, Ganapati found, increased concentration resulted from beneficial growth in firm size in productive industries that "expand[s] real output and hold[s] down prices, raising consumer welfare, while maintaining or reducing [these firms'] workforces".[6] Sam Peltzman's research on increasing concentration in manufacturing finds that it has, on average, been associated with both increased productivity growth and widening margins of price over input costs. These two effects offset each other, leading to "trivial" net price effects.

Further, the presence of harmful effects in industries with increased concentration cannot be readily extrapolated to other industries. Thus, while some studies have plausibly shown that an increase in concentration in a particular case has led to higher prices (which has been found true in only a minority of the relevant literature), assuming the same result from an increase in concentration in other industries or other contexts is simply not justified:

> The most plausible competitive or efficiency theory of any particular industry's structure and business practices is as likely to be idiosyncratic to that industry as the most plausible strategic theory with market power.[7]

As Chad Syverson aptly summarized:

> Perhaps the deepest conceptual problem with concentration as a measure of market power is that it is an outcome, not an immutable core determinant of how competitive an industry or market is... As a result, concentration is worse than just a noisy barometer

---

[3] Harold Demsetz, *The Intensity and Dimensionality of Competition*, in HAROLD DEMSETZ, THE ECONOMICS OF THE BUSINESS FIRM: SEVEN CRITICAL COMMENTARIES 137, 140-41 (1995).

[4] *See, e.g.*, Richard Schmalensee, *Inter-Industry Studies of Structure and Performance*, in 2 HANDBOOK OF INDUSTRIAL ORGANIZATION 951-1009 (RICHARD SCHMALENSEE & ROBERT WILLIG, eds., 1989); William N. Evans, Luke M. Froeb, & Gregory J. Werden, *Endogeneity in the Concentration-Price Relationship: Causes, Consequences, and Cures*, 41 J. INDUS. ECON. 431 (1993); Steven Berry, *Market Structure and Competition, Redux*, FTC MICRO CONFERENCE (November 2017), *available at* https://www.ftc.gov/system/files/documents/public_events/1208143/22_-_steven_berry_keynote.pdf; Nathan Miller *et al.*, *On the Misuse of Regressions of Price on the HHI in Merger Review*, 10 J. ANTITRUST ENFORCEMENT 248 (2022).

[5] Sharat Ganapati, *Growing Oligopolies, Prices, Output, and Productivity*, 13(3) AM. ECON. J. MICROECON. 309-327, 324 (August 2021).

[6] *Id.*, at 309.

[7] Timothy F. Bresnahan, *Empirical Studies of Industries with Market Power*, in HANDBOOK OF INDUSTRIAL ORGANIZATION, 1011, 1053-54 (RICHARD SCHMALENSEE & ROBERT WILLIG, eds., 1989).

> of market power. Instead, we cannot even generally know which way the barometer is oriented.[8]

In other words, depending on the nature and dynamics of the market in question, competition may well be protected under conditions that preserve a certain number of competitors in the relevant market. But competition may also be protected under conditions in which a single winner takes all on the merits of their business.[9] It is reductive (and bad policy) to presume that a certain number of competitors is always and everywhere conducive to better economic outcomes, or indicative of anti-competitive harm.

None of this means that concentration measures have no use in competition policy. Instead, it demonstrates that market concentration is often unrelated to competition because it may arise from factors endogenous to each industry.

This body of literature suggests that the CMA should not presume harm to competition merely from AWS and Microsoft holding large market shares. Instead, the more pertinent question is whether those shares stem from exclusionary conduct or from superior efficiency, innovation, and investment.

II. Dynamic Competition in Cloud Services (A Static View Misses the Mark)

One misconception about cloud computing is that it is a novel technology dominated by the "big three" companies of Amazon, Google, and Microsoft, or even more narrowly in the CMA's findings, as a "two-horse race" dominated by AWS and Microsoft. In fact, cloud computing is merely one component of information-technology (IT) services, which used to be provided exclusively on-premises. Investments in cloud computing still represent a small portion of global IT spending, with one report putting the total at 7%,[10] while another suggests it might be as much as 12%.[11] Whatever the precise figure, there clearly remains a sizeable opportunity for the sector to grow.

It is also important to remember that, before the advent of cloud computing, the IT landscape was dominated by an entirely different set of players, some of which—including IBM, Hewlett-Packard, and Oracle—remain prominent today. It is therefore critical to acknowledge that cloud services have

---

[8] Chad Syverson, *Macroeconomics and Market Power: Context, Implications, and Open Questions*, 33(3) J. ECON. PERSPECT. 23-43, 26 (2019).

[9] Nicolas Petit & Lazar Radic, *The Necessity of the Consumer Welfare Standard in Antitrust Analysis*, PROMARKET (18 December 2023), https://www.promarket.org/2023/12/18/the-necessity-of-a-consumer-welfare-standard-in-antitrust-analysis.

[10] Bill Whyman, *Secrets from Cloud Computing's First Stage: An Action Agenda for Government and Industry*, INF. TECHNOL. INNOV. FOUND. (1 June 2021), https://itif.org/publications/2021/06/01/secrets-cloud-computings-first-stage-action-agenda-government-and-industry.

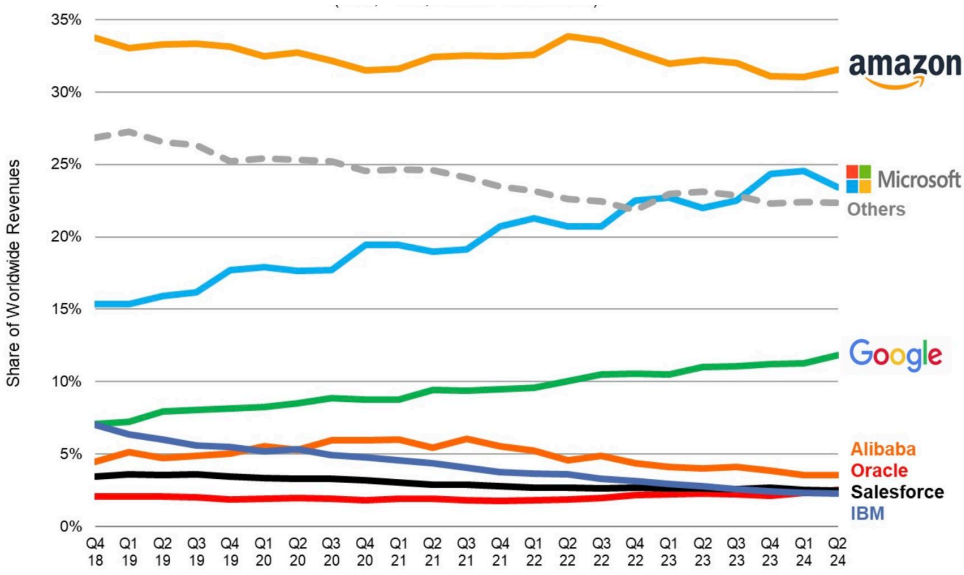
[11] Glenn Solomon, *The Cloud Is Still a Multibillion-Dollar Opportunity. Here's Why*, FORBES (4 January 2023), https://www.forbes.com/sites/glennsolomon/2023/01/04/the-cloud-is-still-a-multibillion-dollar-opportunity-heres-why.

not replaced these entities but have instead expanded the market and introduced new competitors and service offerings.

If we narrow our focus from all cloud-computing services to one of its three layers—such as infrastructure as a service (IaaS), we can see that the sector is teeming with competition. Numerous competitors—including Amazon, Google, Alibaba, Microsoft, IBM, OVHcloud, Digital Ocean, Oracle, Deutsche Telekom, Huawei, and others—all vie for consumers. According to industry reports, in 2021 alone, these competitors showcased remarkable growth, with Microsoft growing by 51%, Alibaba by 42%, Google by 64%, and Huawei by 56%.[12]

Amid this robust competition, the dominance of established players like AWS has been declining. According to Gartner data for IaaS, AWS' market share dipped from 45% in 2019[13] to 39% in 2021,[14] signalling a continuing evolution in the industry's competitive dynamics. If we expand the market and look at IaaS, platform as a service (PaaS), and hosted private-cloud services (a subset of IaaS), Amazon's market share has been steady, while Microsoft and Google have made huge gains in the past few years (see Figure 1 below).[15]

FIGURE 1: Cloud Provider Share of Worldwide Revenues Trend (IaaS, PaaS, Hosted Private Cloud)



SOURCE: *Synergy Research Group*

[12] Press Release, *Gartner Says Worldwide IaaS Public Cloud Services Market Grew 41.4% in 2021*, GARTNER (2 June 2022), https://www.gartner.com/en/newsroom/press-releases/2022-06-02-gartner-says-worldwide-iaas-public-cloud-services-market-grew-41-percent-in-2021.

[13] *Id.*

[14] *Id.*

[15] *Cloud Spending Growth Rate Slows But Q4 Still Up By $10 Billion from 2021; Microsoft Gains Market Share*, SYNERGY RES. GROUP (6 February 2023), https://www.srgresearch.com/articles/cloud-spending-growth-rate-slows-but-q4-still-up-by-10-billion-from-2021-microsoft-gains-market-share.

This is exactly the sort of dynamics we would expect from a vibrant industry: some firms succeed in one part of the market but not in another, while precise market shares shift around.

It is important to note that these "shares" are for the broad, colloquial sense of "a market", and not for a relevant market in the antitrust sense. But even assuming, for the sake of argument, that it was a relevant market, concentration would not appear to be a concern. According to Synergy Group's Q1 2023 numbers for IaaS: Amazon had 32% market share, with Microsoft at 23%, Google at 10%, Alibaba at 4%, and IBM at 3%.[16]

If we consider all other firms in the market to be a single entity, the highest possible HHI for this market (a proxy for all cloud computing) would be 2,462. Even though that is a large overestimate of the true market concentration, it still produces an HHI that is in the "moderately concentrated" range, according to the 2010 U.S. Merger Guidelines,[17] although the CMA's guidance puts that as "highly concentrated".[18] If the remaining 28% of the market were divided up among 28 firms, the HHI would drop to 1,706. But neither of these figures account for the vast swath of IT spending that occurs outside the cloud, which suggests that competition in the market is far more vigorous than the HHI would imply.

These simple calculations differ slightly from the CMA's, which suggest higher concentration. According to the CMA's provisional findings, AWS held a market share of 40% to 50% in the IaaS segment, while Microsoft accounted for 30% to 40% and Google for 5% to 10%.[19] The highest possible HHI for this market—assuming all "other" providers were a single entity—would exceed 3,000, classifying the market as "highly concentrated" under the CMA's guidelines.

By contrast, it is difficult even to conceive of the software-as-a-service (SaaS) layer of cloud computing as a "market" in any meaningful sense. SaaS comprises an extremely varied set of productivity and collaboration tools, such as Microsoft Office 365, Google Workspace (formerly G Suite), and Slack; content-management systems (CMS) like WordPress, Wix, and Squarespace; video-conferencing and communication platforms, such as Zoom, Microsoft Teams, and Slack; and cloud-gaming platforms like Microsoft xCloud and PlayStation Now. Like IaaS, SaaS has experienced dramatic expansion, with more than 30,000 providers in operation. Major players include most of the already-mentioned companies, as well as industry giants like Cisco, Dell, Salesforce, Databricks, Heroku, Snowflake, Adobe, and Atlassian, among others.

Furthermore, customers are not locked into a single provider in the way the static model assumes. In practice, businesses adopt multi-cloud and hybrid-cloud strategies to optimize cost, performance,

---

[16] Felix Richter, *Big Three Dominate the Global Cloud Market*, STATISTA (28 April 2023), https://www.statista.com/chart/18819/worldwide-market-share-of-leading-cloud-infrastructure-service-providers.

[17] Horizontal Merger Guidelines, §5.3, U.S. DEP. JUSTICE & FED. TRADE COMM. (2010).

[18] CC3 (Revised), *Guidelines for Market Investigations: Their Role, Procedures, Assessment, and Remedies* (CC3, Annex A, paragraph 7).

[19] CMA Provisional Findings, *supra* note 1 at Table 3.1.

and resilience. According to industry surveys, 70% of cloud-using companies rely on multiple cloud providers simultaneously.[20] This ability to "multi-home"—to spread workloads across AWS, Azure, Google Cloud, and others—mitigates the risk of any one provider holding customers captive.

The competitive dynamics extend beyond market share to innovations in the fundamental infrastructure. Cloud providers compete vigorously through custom silicon development, with companies investing heavily in proprietary chips optimized for specific workloads. This hardware-level competition drives performance improvements and cost efficiencies that benefit customers, while continuing to allow for multi-cloud strategies that prevent lock-in.[21]

Indeed, the ease of multi-homing and switching among providers indicates that compatibility issues and switching costs, while not zero, are not insurmountable barriers in practice. Many cloud services adhere to common standards (*e.g.*, Linux environments, containerization, open-source databases), enabling customers to migrate or balance workloads flexibly. The CMA's static analysis underestimates how these dynamic competitive pressures discipline even the largest providers. A cloud firm that attempts to raise prices or degrade quality risks encouraging its customers to shift more workloads to rivals—a process made easier by the industry's interoperability tools and multi-cloud management practices.

In sum, the cloud-services market is dynamically competitive, with constant entry, expansion, and technological leaps. Market shares today do not guarantee market shares tomorrow. The CMA's provisional findings, however, seem to give more weight to static concentration measures than to the "rapidly evolving cloud market" characterized by product differentiation, innovation, and new startups entering the fray. We urge the CMA to incorporate a dynamic analysis: one that recognizes the recent dramatic fall in prices for cloud services, alongside an explosion in offerings; the exponential growth of the SaaS layer, with tens of thousands of providers; and the ongoing race among firms to provide better, more specialized services. This dynamic competition is delivering real benefits to customers and is likely to continue to do so without heavy-handed intervention.

III. Profitability Above Cost of Capital Does Not Equate to a Lack of Competition

The provisional report notes that the leading providers (AWS and Microsoft) have returns on capital employed (ROCE) consistently above their weighted average cost of capital (WACC), implying sustained "excess" profits.[22] While this observation is factually correct, we caution against interpreting it as evidence of an enduring competition problem. Profitability alone—even robust profitability—is not proof of market power in a dynamic, contestable market. There are several reasons why a high

---

[20] *2023 State of the Cloud Report*, FLEXERA, https://info.flexera.com/CM-REPORT-State-of-the-Cloud#view-report (*last visited* 17 February 2025).

[21] See *infra* Section V.

[22] CMA Provisional Findings, *supra* note 1 at ¶ 3.246.

ROCE versus WACC could be observed even in a competitive environment, especially in technology markets:

1. *Recovery of sunk investments*: Cloud providers have invested tens of billions of dollars in data centres, network infrastructure, and R&D for new services. If they succeed in providing valued services, they must earn returns above the cost of capital to justify those risky, upfront investments. A period of returns above WACC can simply indicate that a firm is recouping its past investment and compensating for the risk undertaken, not that it faces no competition.
2. *Innovation and transient advantage*: In a dynamic market, a firm that innovates successfully may enjoy a transient competitive advantage—a reward for innovation—until rivals catch up. Economic theory recognizes that competitive markets eventually drive profits toward the cost of capital, but it provides little guidance on how long profits might persist in dynamic industries in which economic profits are needed to induce firms to invest in risky innovation. In cloud services, new innovations (*e.g.*, AI-as-a-service, advanced databases, edge computing) can generate returns for the innovator, but these returns invite entry or imitation, eroding the advantage over time.
3. *Contestable market pressures*: Even if AWS and Microsoft currently earn large margins, the threat of entry or expansion can constrain their behaviour. Cloud computing has low customer lock-in (as noted, many customers multi-home) and enormous growth potential, which attracts ongoing entry by firms like Oracle, IBM, and niche players. In a contestable market, "deep-pocketed investors will finance entrants and compete away profits" if incumbents start earning monopoly rents.[23] The presence of high profits is as much a sign of a healthy, innovation-driven market as it is a cause for concern.

Crucially, there is no direct line from "ROCE > WACC" to "consumer harm". Even the CMA's past analyses have acknowledged that "a finding that ROCE is higher than the WACC is not in itself indicative of a competition problem" and that an innovative firm may earn higher returns for the period that it maintains a competitive edge.[24] We believe that principle applies here. The cloud market's growth and falling prices suggest that high returns are a reward for efficiency and innovation, not the result of exploiting consumers. Notably, cloud customers (from startups to large enterprises) have seen tremendous value. In many cases, cloud services have reduced their IT costs or enabled new functionality that was not possible before. These consumer benefits are hard to square with a narrative of harm.

Finally, we note that the CMA's reliance on a textbook ROCE vs. WACC analysis may be ill-suited for a rapidly evolving technology sector. Treating cloud firms' profitability as one would a utility's returns fails to reflect dynamic competition. Such an approach might be appropriate for mature industries like energy or water but is off the mark for a market driven by innovation and continual

---

[23] Laurits Christensen *et al.*, *The Challenges of Using Return on Capital as an Indicator of Monopoly Power*, ANAL. GROUP (9 December 2020), https://www.analysisgroup.com/Insights/publishing/the-challenges-of-using-return-on-capital-as-an-indicator-of-monopoly-power.

[24] *Online Platforms and Digital Advertising Market Study, Appendix D10*, COMPET. MARK. AUTH. (1 July 2020), https://www.gov.uk/cma-cases/online-platforms-and-digital-advertising-market-study.

change. High accounting profits in cloud services should invite further inquiry, not presumptions about the presence of anticompetitive harms. The key question should be whether those profits are sustained by excluding competition or by delivering a superior service in a competitive race. The evidence favours the latter interpretation.

IV. Egress Fees and Technical Barriers in Context

The CMA's provisional findings raise concerns that certain practices by the leading providers—notably, data-egress fees (charges for transferring data out of a cloud) and technical frictions—function as barriers to switching, thereby harming competition. We agree that switching costs deserve scrutiny but urge the CMA to consider the broader context and justifications for such practices, as well as the evidence that customers frequently mitigate switching costs through multi-cloud strategies.

Egress fees are often portrayed as "extraction" mechanisms to lock in customers, but they have a cost basis and a competitive function. Neither Amazon,[25] nor Google,[26] nor Microsoft[27] charge anything for data ingress (uploading data into the cloud)—even though accepting and storing incoming data is not free for them. Cloud providers instead recoup the costs of moving data through egress fees, including fees for moving within one provider or to somewhere else on the internet.

Beyond explicit egress charges for switching providers, policymakers may be concerned about other compatibility costs that could generate consumer lock-in. This is not a significant issue for pure data storage or computing power. The major cloud providers allow users to run programs on open-source Linux instances. As one moves further from the commodity-like products of storage and computing, however, the switching costs become more real, depending on which precise services customers use.

For example, for video editing, whether one is using editing software on one's local machine or through cloud services, all the major editing software will input and output standardized files. If you are in the middle of an edit, however, that file format is often unique. Is that a switching cost? Probably not in any sense that is relevant to the CMA, but it is on par with the switching costs experienced once one enters a grocery store. The competitive pressures are to attract customers to enter the store, or to start using the software.

For less-trivial examples, one could worry about the costs to a large company of switching from one cloud SQL-database (part of the PaaS layer) provider to another—*e.g.*, from Amazon RDS to Microsoft Azure. SQL itself is not "open source" in the way that a software application or operating system might be. There are, however, numerous database systems that utilize SQL, and many of these are open source. Examples include MySQL, PostgreSQL, and SQLite; all are open-source relational database-management systems that use SQL as their standard language. Conversely, there are also proprietary, closed-source database systems that use SQL, such as Microsoft SQL Server and

---

[25] *Amazon S3 pricing*, AMAZON, https://aws.amazon.com/s3/pricing (*last visited* 13 February 2025).

[26] *Bandwidth Pricing*, AZURE, https://azure.microsoft.com/en-us/pricing/details/bandwidth (*last visited* 13 February 2025).

[27] *All Network Pricing*, GOOGLE CLOUD, https://cloud.google.com/vpc/network-pricing (*last visited* 13 February 2025).

Oracle Database. Again, no matter the system, changing providers is not as easy as flipping a light switch or dragging and dropping files on Google Drive.

Technical compatibility and data portability are also important considerations. The CMA's provisional findings suggest that proprietary technologies and complex architectures can make it difficult for customers to switch between clouds, thus reinforcing incumbents' market positions.[28] There is truth to the notion that moving a complex application from one cloud platform to another is not trivial. This must, however, be viewed within the proper context: switching core cloud functions is far easier than in the pre-cloud era, and many industry standards and open-source tools exist to minimize lock-in.

But we must always ask, compared to what? Changes to major IT operations have always been costly. Transferring substantial troves of data is costly, as noted above. That is why companies have dedicated, full-time IT staff to handle such issues. Putting something on the cloud does not magically make it free to do whatever one wants, but cloud computing does expand the number of choices for any product available to customers.

In the pre-cloud world, businesses running their own IT faced much higher switching costs—*e.g.*, changing one's internal IT architecture or migrating from one on-premises software vendor to another was often a multi-year project with huge costs. Cloud computing has, in many respects, lowered the barriers to switching by standardizing infrastructure and offering migration services. It is true that changing providers is not as easy as flipping a light switch, but it was never so simple in enterprise IT. The relevant question is whether today's leading cloud firms impose unreasonable or anti-competitive barriers, beyond the inherent complexities of technology transitions.

While the above discussion frames such questions as an either/or decision, many users "multi-home" or use multiple providers. According to one survey, 70% of companies that use cloud providers use multiple providers.[29] This flexibility allows customers to cherry-pick services from various providers and assign different providers for distinct workloads. Such an approach inherently amplifies the level of competition in the cloud industry. Again, it is worth contrasting this with on-premises IT services. The apparent ease of multi-homing suggests that other compatibility issues are not a major hindrance to competitive pressures, and that there is still robust competition for consumers.

Finally, we suggest the CMA consider the business and innovation rationale behind proprietary technologies. Many of the features that differentiate cloud providers (and deliver value to customers) come from technical innovations that inherently are not carbon copies of each other's offerings. One provider might offer an innovative AI toolkit or a unique database solution that others lack. These differences benefit customers (who can choose the service that best fits their needs), even where it means that switching those services might involve some retraining or data conversion. Over

---

[28] CMA Provisional Findings, *supra* note 1 at ¶ 8.51.

[29] *2023 State of the Cloud Report,* FLEXERA, https://info.flexera.com/CM-REPORT-State-of-the-Cloud#view-report (*last visited* 15 June 2023).

time, competing firms will tend to respond by developing similar capabilities or adopting interoperability standards once they emerge. Interventions in this area should be careful not to inadvertently stifle the incentive to develop improved cloud services. Mandating too much uniformity or zero switching costs could homogenize offerings and chill investment in differentiated features.

V. Proprietary Chips: A Dimension of Cloud Competition

The CMA's provisional findings suggest that certain "technical barriers", including proprietary hardware, may create switching costs that deter customers from migrating among cloud providers.[30] It also raises concerns that such features create the need for new skills in order to "plan, remap, rework and test workloads".[31] As the CMA acknowledges elsewhere, however, "[t]his custom approach enables systems-level optimisation and hence lowering of costs".[32] Where such differentiation occurs, it is just as likely a feature of competition, rather than an insurmountable lock-in mechanism.

Differentiated hardware, it should be noted, is not unique to cloud computing. It is, rather, a prevalent feature across a multitude of tech-driven industries. Industries ranging from consumer electronics to telecommunications routinely use proprietary chips to deliver enhanced functionality or efficiencies, rather than creating an insurmountable barrier that deters customers from switching. It is essential to recognize that, rather than invariably leading to anticompetitive outcomes, these hardware innovations spur rival firms to invest in research and development, aiming to keep pace with or surpass the latest performance benchmarks. Cloud customers, in turn, benefit from an ongoing arms race in which providers compete on metrics such as throughput, energy efficiency, and workload-optimized features. In other words, the existence of custom chips is often a manifestation of vigorous competition at the infrastructure level, rather than an indicator of insurmountable lock-in.

Moreover, multi-cloud and hybrid-cloud strategies undermine the assumption that proprietary chips create universal lock-in.[33] Enterprises often distribute workloads based on each provider's relative strengths. For instance, a firm may run standard workloads on a general-purpose CPU platform, while allocating AI-training jobs to whichever provider currently offers the best GPU or specialized accelerator. Because these strategies are becoming the norm, proprietary chips serve as a competitive differentiator, rather than a blanket barrier. When one provider's custom silicon proves superior or more cost-effective, businesses may place incremental workloads there, but they are not unavoidably trapped.

Finally, the dynamic, innovation-intensive nature of cloud computing further reduces the likelihood that proprietary hardware will entrench incumbents over the long run. As the CMA recognizes,

---

[30] CMA Provisional Findings, *supra* note 1 at Ch. 5 (discussing technical barriers and proprietary technology as potential impediments to competition).

[31] *Id.* at ¶ 5.112.

[32] *Id.* at ¶ 3.397.

[33] Flexera, *supra* note 20.

cloud-service providers continually introduce new instance types and hardware generations.[34] Even if a particular chip confers a temporary advantage, competitors can respond by partnering with third-party chipmakers or creating their own designs. If any custom silicon fails to keep pace, customers can shift to a rival's more advanced hardware. The result is a race to innovate, benefiting consumers in the form of faster compute times, lower costs, and better energy efficiency.

In short, while custom silicon may indeed make some forms of switching more complex, it is primarily a hallmark of competition, rather than an insurmountable lock-in mechanism. Restricting the use or development of proprietary chips could inadvertently stifle the very innovation that has propelled cloud computing forward. We encourage the CMA to distinguish carefully in its final report between hardware-led differentiation that intensifies rivalry and any proven, artificial barriers to customer mobility. A policy approach that conflates all proprietary hardware with anticompetitive lock-in risks undermining future innovation—potentially to the detriment of UK businesses that rely on the cloud's evolving capabilities.

VI. Proportionality of Proposed Remedies

Most importantly, we urge the CMA to carefully evaluate whether the proposed remedies—in particular, designating certain providers as SMS under the Digital Markets, Competition and Consumers Act (DMCC) regime—are appropriate and proportionate to the issues identified. Even if one accepts that there are competition concerns in the UK cloud-services market, the remedies must be narrowly tailored and evidence-based. Imposing broad behavioural obligations or regulatory oversight via an SMS designation is a far-reaching step that could reshape the incentives in this dynamic sector.

We have two primary concerns regarding the provisional remedies:

1. *Risk of overregulation*: Labelling AWS and Microsoft as having "strategic market status" would trigger a set of pro-competitive conduct requirements. While ensuring fair play is important, an SMS designation would effectively treat these firms as enduring gatekeepers of a market "tipped" in their favour. We question whether that characterization is fully justified in the cloud-services context. As discussed, the cloud market is still evolving, and today's dominance might be eroded by tomorrow's innovation. Heavy-handed regulation of the leading firms could inadvertently slow the very innovation and price competition that has benefitted customers. The multitude of service options and strategies available to consumers mean that cloud providers are not absolute gatekeepers in the way that, say, a monopoly telecom operator might be. Treating them as such could lead to onerous rules (*e.g.*, strict controls on pricing, bundling, or interoperability) that may have unintended consequences. These could include raising compliance costs, discouraging experimentation with new business models, or even prompting providers to pull back from the UK market. Any remedy should be proportionate to demonstrated harms, not speculative ones.
2. *Targeted issues versus broad designation*: The CMA's own findings identify specific practices of concern—*e.g.*, egress fees, certain discount structures, and potential software-licensing restrictions. If these are, indeed, problematic under a competition lens, targeted interventions might be possible

[34] CMA Provisional Findings, *supra* note 1 at ¶ 3.399.

> without the need for an all-encompassing SMS designation. The principle of proportionality should lead the CMA to choose the least-intrusive remedy that effectively addresses the competitive concern. Given the robust competition and positive outcomes observed in cloud services (falling prices, expanding output, innovation), drastic measures like SMS designation appear difficult to justify.

It bears emphasizing that regulatory remedies are not without tradeoffs. An SMS designation and attendant rules could cement the positions of current leaders by making the market less attractive for challengers (who might prefer to compete in a lightly regulated environment). It could also constrain how the leading firms compete. For example, certain discounting practices or service integrations might be banned, even if they are beneficial to customers. We encourage the CMA to first consider less-interventionist approaches, allowing the market to self-correct or monitoring for a longer period, especially since cloud computing remains in a growth phase. Interventions into a market that is delivering a bright future of innovation and falling costs should be made only on compelling evidence of harm and with remedies likely to improve consumer welfare net of costs.

In summary, an SMS designation and similar measures under the DMCC are powerful tools intended for clear-cut cases of entrenched market power. The cloud-services market, in our view, does not present such a clear-cut case; it is competitive and evolving, not ossified. We respectfully submit that the CMA should either refrain from imposing the proposed SMS-based remedies or narrow their scope significantly. At minimum, before adopting such remedies, the CMA should ensure that the final report demonstrates, with rigorous evidence, that lighter-touch solutions would be insufficient and that the benefits of intervention outweigh the costs. As it stands, the provisional findings do not make that case convincingly.