February 18, 2025

Cloud Services Market Investigation

AWS's response to the CMA's Provisional Decision Report

1. We appreciate the opportunity to comment on the CMA's Provisional Decision Report ("**PDR**")[1] and welcome the PDR's acknowledgement that competition in cloud services enables "*innovation, investment and improved productivity amongst all customers for the benefit of people, businesses and the UK economy*".[2] However, the PDR fails to reflect this reality in its provisional conclusions by recommending unwarranted intervention applicable to only two players in one of the most competitive, well-functioning, and fast-growing sectors of the UK economy. Its proposed interventions with respect to data transfer out ("**DTO**") fees and interoperability under the Digital Markets, Competition and Consumers Act 2024 ("**DMCC Act**") risk damaging the UK economy's broader prospects for growth, innovation, and productivity.

2. In particular, the PDR's reasoning suffers from a number of fundamental misconceptions, as a result of which key characteristics of the cloud industry are viewed as barriers rather than inherent, and indeed pro-competitive, features of a highly competitive space. Rather than inhibiting customer choice, the cloud has made switching between IT providers easier than ever before and has been a catalyst for the launch of innovative and diverse services. The PDR has not established an adverse effect on competition[3] ("**AEC**") regarding DTO fees or interoperability, as it offers no probative evidence to support its preliminary conclusions on these topics. Moreover, any intervention in this dynamic space risks unintentionally restricting or distorting competition, in particular if such intervention is not targeted at addressing identified concerns and is applied asymmetrically to only two companies. AWS's key concerns in respect of the PDR are summarised here.

3. **The PDR fails to accurately assess the competitive landscape relevant to cloud services.** There is a large body of evidence demonstrating that this sector is characterised by a rapid pace of innovation, declining prices, and fierce competition. AWS pioneered the on-demand delivery of IT services in 2006, for the first time enabling any potential customer with a credit card and online access to instantly use IT services on a pay-as-you-go basis, without upfront investment in infrastructure. Having started out with only 3 services, we today offer over 200 services which have opened the door to significant innovation and competition across a number of service areas, including databases, storage, networking, analytics, and security. New competition to offer on-demand IT services has grown rapidly; having started out as the only cloud services provider ("**CSP**"), AWS's share of supply has (on the PDR's own analysis) reduced substantially since launching in 2006. Meanwhile, competitors such as Google, Microsoft, Oracle, and numerous others have entered this space and are growing at a more rapid pace than AWS in percentage terms. Less than 15% of IT spend is on cloud services, whereas approximately 70% of IT workloads

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1 See the CMA's Cloud Infrastructure Services Provisional Decision Report published on 28 January 2025, available at https://assets.publishing.service.gov.uk/media/679907f2d4f0d327e7707150/cloud_mi_provisional_decision_report1.pdf.

2 PDR, paragraph 2.

3 Enterprise Act 2002, section 134.

are on-premises.[4] This means there is much left to play for, and competition remains fierce from new entrants capitalising on this opportunity, as well as from on-premises IT providers. This high level of competition is evident from the declining prices in the sector (AWS has reduced prices at least 151 times since launch, and other providers have similarly reduced prices over time), high degree of innovation (just in the last year, AWS introduced 6 new services and thousands of new features[5]), and significant investment (AWS recently announced an £8 billion investment in the UK,[6] while there has reportedly been an average of £200 million in private sector investment *per day* into the UK's AI sector since July 2024[7]). Recent developments continue to confirm that this is a highly competitive, dynamic, innovative, and rapidly changing space – now more than ever before. The reactions of market participants to DeepSeek's release of its R1 foundation model ("**FM**"), for instance, have shown that the provision of IT services continues to grow even more competitive due to the constant pressure to innovate to meet customer expectations. It is impossible to predict what this space will look like in one or two years, never mind five, meaning that any intervention risks materially distorting the development of a nascent sector.

4. **The PDR wrongly assumes that customers are unable to switch and multi-cloud as much as they would like.** The PDR fails to establish an appropriate benchmark against which to compare whether the levels of multi-clouding and switching it observes are high or low.[8] Incredibly, the PDR asserts that no such benchmark is "*necessary*" or "*appropriate*".[9] Rather, the PDR implicitly assumes that, in a "*more competitive"* sector, many (if not all) customers would choose to constantly multi-cloud and switch and it concludes that the observed levels are low for a "well-functioning" sector on this basis. This approach is concerning, not only because the PDR provides no basis for what a "*more competitive*" sector could involve, but also because the assumption that customers would constantly multi-cloud and switch in such an environment is unfounded and contradictory to customer feedback. It simply does not reflect how customers use complex IT services to build resilient, secure, and mission critical applications. As with any technical services used by a business, constant jumping between different providers may not always be in the best interest of customers. Businesses rely on a variety of services to streamline their operations and enhance productivity. They may therefore choose to use the same human resources software, travel booking system, accounting software, or email provider for years at a time on the basis that this may be more efficient, more secure, and more reliable than regularly changing technology. This is especially true if the technology provider is innovating, reducing costs, and providing

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4 See https://www.gartner.com/en/newsroom/press-releases/2024-04-16-gartner-forecast-worldwide-it-spending-to-grow-8-percent-in-2024, https://www.gartner.com/en/newsroom/press-releases/11-13-2023-gartner-forecasts-worldwide-public-cloud-end-user-spending-to-reach-679-billion-in-20240 and https://www.goldmansachs.com/insights/articles/cloud-revenues-poised-to-reach-2-trillion-by-2030-amid-ai-rollout.

5 See https://aws.amazon.com/about-aws/whats-new/2024/?whats-new-content-all.sort-by=item.additionalFields.postDateTime&whats-new-content-all.sort-order=desc&awsf.whats-new-categories=*all.

6 See https://www.gov.uk/government/news/chancellor-announces-8-billion-amazon-web-services-investment-as-she-vows-to-make-every-part-of-britain-better-off.

7 As reported by the Secretary of State for Science, Technology, and Innovation. See https://www.gov.uk/government/news/uk-ai-sector-attracts-200-million-a-day-in-private-investment-since-july.

8 See PDR paragraphs 3.366, 3.337, and 3.378, in which it omits any clear benchmark against which to measure its assertions (*e.g.*, around "overall prevalence" of multi-cloud and switching). This is similar the CMA's assessment in its Competitive Landscape Working Paper published on 23 May 2024.

9 PDR, paragraph 3.360(a).

excellent service – all of which AWS does. This does not mean that there is a lack of competition between providers of such services, but rather reflects customers' choice.

5. **There is no interoperability problem in cloud services, and the PDR presents no evidence to support its concerns.** AWS does not impose technical barriers that prevent customers from switching or multi-clouding, and the PDR has not established any evidence to that effect. Indeed, the PDR has not identified any specific interoperability concerns in respect of any AWS services. The PDR's suggestion that we impose technical barriers to "trap" existing customers is false, contrary to evidence, and flies in the face of our commercial incentives and common sense. We attract and retain customers by building our services to industry-leading standards of security, availability, durability, and by offering interoperability with third-party services or applications. We have therefore invested heavily to ensure that customers have the ability to choose the IT services and technologies that best suit their needs, including the ability to switch providers and multi-cloud where desired. Our core services (*i.e.*, compute, storage, database, analytics, and networking), which are the main services customers use, and which make up the vast majority of our revenues, enable customers to build fully interoperable and transportable solutions, which are cloud agnostic. They all use open protocols, interfaces, application programming interfaces ("**APIs**"), and data formats, allowing customers to use the optimal technologies for their specific use-cases. It is true that our services include differentiated technology and innovations as compared to those of other providers, but this is simply evidence of strong and effective competition delivering innovation and is equally applicable to our competitors. Microsoft, Google, Oracle, and other CSPs have all developed services using differentiated technology which they market as competitive advantages. For example, Google has achieved significant success in respect of its "Big Data" analytics tools, precisely because they offer capabilities that distinguish them from comparable services that do not offer customers the same advantages. It would be absurd to introduce interventions which would disincentivise this type of innovation in favour of homogenous, stagnant services. While common standards may be appropriate in mature, slow-moving markets, attempting to introduce such measures in a rapidly evolving and differentiated sector would not only be extremely complex (as it would need to consider hundreds of individual features and functionalities), but would risk substantially distorting or preventing competition and innovation. This is particularly the case if, as proposed, these limitations are placed only on two providers, thereby putting them (and their customers) at a disadvantage, while also failing to address any hypothetical sectoral concern in respect of significant competitors including Google, Oracle, Nvidia, and others.

6. **DTO fees do not hinder switching and multi-clouding, and – again – the PDR presents no credible evidence in support of its concerns.** AWS charges DTO fees based on customer usage of our network, regardless of the purpose for which customers are transferring data. Such fees do not target switching or multi-clouding, and customer survey evidence demonstrates that customers do not consider them to be a barrier. Rather, DTO fees reflect the cost of building and maintaining a premium network, which customers value for its superior speed, security and reliability. In any event, these fees have fallen continuously as a result of both AWS's investments in improving efficiency to reduce costs, and significant competitive pressure. For example, AWS's fees for transferring data out to the Internet fell by almost 40% globally between 2018 and 2023. AWS

moreover significantly expanded its free tier for DTO to 100 gigabytes per month in November 2021, resulting in over 90% of our global customers which incur DTO usage not paying for DTO at all, and, as of March 2024, eliminated DTO fees globally for customers switching away from AWS. In properly functioning markets, providers should be rewarded for their investments and innovation, rather than being prohibited from charging for their services and recovering their costs. Crucially, not being able to charge anything for a service that requires significant investment to provide, necessarily reduces a firm's incentives to invest in the service in the first place. The proposed intervention would be entirely artificial, and any small hypothetical monetary benefits for a minority of customers would be achieved at the expense of clunky regulation that leaves the vast majority of customers worse off, either through an increase in the price of other services (meaning that smaller customers would subsidise the network usage of larger customers), or a reduction in network quality for UK customers, or both. It would be unprecedented to impose such an intervention absent appropriate safeguards to mitigate the obvious risks to innovation and investment, as well as the inefficient use of expensive resources.

7. **The proposed remedies are entirely unwarranted and unprecedented, and, if imposed, would permanently undermine competition to the detriment of UK businesses.** As explained above, the PDR fails to demonstrate that there is any AEC to be addressed in respect of either interoperability or DTO fees. It is not clear how handing decisions on these issues to yet another decision maker, when the evidence of customer harm is so lacking, could lead to a positive outcome for the IT services sector. Moreover, the remedies considered would not only distort competition by creating asymmetric obligations for AWS and Microsoft, as compared to significant technology companies such as Google, Oracle, and Nvidia, but would also reduce incentives to invest and innovate on behalf of UK businesses. Such action would be entirely disproportionate, and would make the UK a global outlier, by arbitrarily picking winners and losers on an *ex-ante* basis, ignoring the competitive dynamics in the IT industry.

8. This response sets out further details on these points, and a number of others. It does not address each of the CMA's provisional findings. Therefore, to the extent that this response does not cover every aspect of the PDR, it should not be read as AWS agreeing with the CMA's provisional views.

Competitive Landscape, Role of AI, and Barriers to Entry

AWS operates within a dynamic, competitive landscape which is constantly and rapidly evolving

9. The PDR claims that "*the cloud services sector is highly concentrated*".[10] It finds that AWS holds shares of supply of approximately [40-50]% and [20-30]% in overly narrow frames of reference for each of "*Infrastructure as a Service*" ("**IaaS**") and "*Platform as a Service*" ("**PaaS**"), respectively.[11] It then suggests, without a robust basis, that "*forward looking metrics suggest this market structure and outcomes are likely to endure*".[12]

10. This analysis fails to recognise the dynamic nature of the competitive environment in which AWS operates. Looking at "IaaS" and "PaaS" in isolation, as distinct from each other and from rival IT models – including on-premises and private cloud – is entirely divorced from how competition works in this space. Customers are typically looking to solve a specific IT need; they are rarely, if ever, looking simply to use "the cloud" as an end in itself. Similarly, customers don't tend to think about whether they should use "IaaS" or "PaaS" to solve their IT needs. The solution for a particular IT need may involve one or more different services, such as compute, storage, and networking, working together in a specific way. Each of these components can be deployed on the customer's premises, in a co-located environment, online, and/or adopting a hybrid approach using a combination of these options. Within each of these environments, customers have scores of choices and often opt to use multiple providers and solutions for their various IT needs – as confirmed by Ofcom's and the CMA's own market research.[13]

11. By narrowing its focus to "IaaS" and "PaaS", the PDR fails to adequately consider competitive constraints posed on large public cloud providers by new and growing CSPs, on-premises IT providers, and private cloud providers. This omission is particularly stark with respect to on-premises IT providers, given that less than 15% of IT spend is on cloud services, whereas approximately 70% of IT workloads are on-premises.[14] This means that CSPs are for the most part competing for new customers and workloads, and competition remains fierce from new entrants capitalising on this opportunity, as well as from on-premises IT providers. For example, Tesla has reportedly built an on-premises data centre to train its self-driving vehicle systems, while Mistral recently announced that it is building its own on-premises data centre.[15]

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10 PDR, paragraph 3.206.

11 PDR, paragraphs 3.145(a) and 3.156(a).

12 PDR, paragraph 3.504.

13 See, *e.g.*, PDR paragraphs 3.361 to 3.363 and Appendix I, and Ofcom's Final Report in the cloud services market study published on 5 October 2023 ("**Ofcom's Final Report**"), paragraph 4.54.

14 See https://www.gartner.com/en/newsroom/press-releases/2024-04-16-gartner-forecast-worldwide-it-spending-to-grow-8-percent-in-2024, https://www.gartner.com/en/newsroom/press-releases/11-13-2023-gartner-forecasts-worldwide-public-cloud-end-user-spending-to-reach-679-billion-in-20240 and https://www.goldmansachs.com/insights/articles/cloud-revenues-poised-to-reach-2-trillion-by-2030-amid-ai-rollout.

15 See https://www.datacenterdynamics.com/en/news/tesla-is-building-a-dojo-data-center-at-hq-in-austin-texas/ and https://www.datacenterdynamics.com/en/news/g42-and-dataone-to-establish-ai-data-center-in-france/.

12. Notwithstanding the above, the PDR observes that expenditure on "*cloud services*" has been growing "*by over 30% per year*"[16] and that there is still new business to be won by smaller providers.[17] This overall growth means that even if a particular provider's relative share were to decrease or remain static, there is still an upside for them and their investors to invest in a growing industry. It also means that there are significant opportunities for new providers to enter and existing providers to expand.[18]

13. In practice, shares of supply have been far from static. AWS was the first provider to offer cloud services in 2006, and, since then, its shares of supply have steadily dropped as competitors continue to enter and grow in this space. By the PDR's analysis, AWS is growing at a slower pace than the reported percentage growth rate of the "*cloud services sector*",[19] and our shares decreased between 2020 and 2023.[20] By contrast, companies like Google and Oracle are growing more rapidly, in percentage terms, than AWS[21] and have gained ground, with an increase of shares over the same period.[22] This trend will only continue as well-resourced players are investing heavily in IT services, and directly contradicts the CMA's finding that the market structure is and will remain static.[23]

14. Industry-wide efforts to develop and deploy FMs are one example demonstrating that there is intense competition and constant disruption in IT services.[24] AI has accelerated new entry and expansion and increased incentives for IT services providers to enable interoperability, innovate, and reduce costs for customers. As a result, FM developers, like other customers, can procure IT services from a range of IT providers and several FM developers use multiple IT providers, as the PDR recognises.[25]

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16 PDR, paragraph 1.

17 PDR, paragraph 3.208.

18 See, *e.g.*, paragraph 15 below.

19 Based on the PDR's definition of "IaaS" and "PaaS", combined (see PDR, paragraph 3.155).

20 PDR, paragraph 3.156(a).

21 Google's cloud division recently posted a 30% increase in revenue to almost $12 billion, with Google expecting to invest approximately $75 billion in capital expenditure in 2025, up 42% from $53 billion in 2024 (see https://www.crn.com/news/cloud/2025/aws-vs-microsoft-vs-google-cloud-earnings-q4-2024-face-off?page=1). This is confirmed by IDC data, which shows that (i) Google's share of supply in cloud infrastructure has increased by more than 40% between 2019 H1 and 2024 H1; and (ii) Google's cloud infrastructure revenues have grown at a compounded annual rate of 40%, far exceeding that of the market. Similarly, Oracle's infrastructure revenue grew by 52% in Q2 2025, "*a much higher growth rate than any of [their] hyperscale cloud infrastructure competitors*," according to Oracle's CEO (see https://investor.oracle.com/investor-news/news-details/2024/Oracle-Announces-Fiscal-2025-Second-Quarter-Financial-Results/).

22 PDR, paragraphs 3.178 and 3.156. For instance, Ofcom's Final Report noted that Google "*is growing rapidly and leading the chasing pack by some way, and competes closely with Microsoft and AWS*" and "*is similar to Microsoft and AWS when considering factors […]*" (see Ofcom's Final Report, paragraph 3.61).

23 For example, Oracle has "*has worked aggressively to expand its range of AI and machine learning products*", while Google has made significant investments into a global fibre-optic-software-defined infrastructure network and its AI capabilities (see, *e.g.*, PDR, paragraphs 2.31, 4.65(b), and 5.433(d)).

24 See paragraph 15 below.

25 The PDR recognises that FM developers access compute services from a range of CSPs, including numerous smaller providers, on-premises IT providers, and public supercomputers, and where customers using more than one IT provider, this is due to switching and/or a multi-cloud approach (see PDR, paragraphs 3.388,3.390, Table 3.12, and footnote 580).

15. For example, numerous smaller CSPs have already entered or expanded to offer compute for AI workloads.[26,27] Emerging "neocloud" companies such as CoreWeave, Lambda Labs, Vultr, and Nebius provide compelling alternatives to larger IT providers and reportedly raised billions of dollars in 2024, with CoreWeave's valuation increasing from $2 billion to $19 billion in 18 months.[28] In addition, Nscale, CoreWeave, CloudHQ, CyrusOne, and ServiceNow have all announced major investments into UK data centres worth in total around £8 billion.[29] In addition, Blackrock, SoftBank, Nvidia, and Oracle are all examples of large players who have recently invested to build data centres and offer AI and/or other IT services.[30] While Nvidia is currently the leading provider of computer chips optimised for data centre AI workloads, many companies such as Arm, Intel, AMD, Qualcomm, Apple, Meta, Samsung, Google, Microsoft, IBM, and AWS, as well as start-ups such as Cerebras, Groq, SambaNova, Tenstorrent, and OpenAI, are investing significant resources to develop additional chip options that can be used for AI workloads.

16. The PDR finds an unduly narrow market for "*IaaS based on accelerated compute infrastructure*" distinct from "*IaaS based on standard compute infrastructure*".[31] This fails to account for the fact that the development and deployment of FMs has created significant opportunities for many types of IT providers to enter and expand which go beyond "*IaaS based on accelerated compute infrastructure*". For example, the meaning of "*accelerated compute*" is quickly expanding with new players and innovations, the infrastructure required to supply "*IaaS based on accelerated compute*" overlaps in many ways with "*IaaS based on standard compute*", and there are a wide variety of specifications and suitability for different AI and machine learning ("**ML**") use cases within each of "*accelerated compute*" and "*standard compute*", particularly for inference and deployment of

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26 PDR, paragraph 3.402 and 3.403.

27 For example, Fluidstack (headquartered in the UK), CoreWeave, Lambda Labs, San Francisco Compute, Civo, Genesis Cloud, OVHcloud, Scaleway, Denvr Dataworks, G42, Omniva, Cirrascale, Yotta Data Services, Gcore, Voltage Park, Crusoe Cloud, JarvisLabs.ai, Evroc, TensorWave, Aligned, RunPod, Supermicro, Paperspace, Akash Network, Foundry, Together AI, Vultr, Inference.ai, Soluna, Reka, Recogni, Telefónica, DataCrunch, and many others.

28 See https://www.ft.com/content/41bfacb8-4d1e-4f25-bc60-75bf557f1f21 and https://www.investors.com/news/technology/nvidia-stock-ai-cloud-data-centers-neoclouds-microsoft-amazon/. The Financial Times reported in November 2024 that Wall Street's largest financial institutions had loaned more than $11 billion to "neocloud" groups. In addition, in December 2024, Vultr raised $333 million, giving it a valuation of $3.5 billion (see https://www.ft.com/content/946069f6-e03b-44ff-816a-5e2c778c67db); in April 2024, Lambda Labs, secured a "special purpose financing vehicle" of up to $500 million months after closing a $320 million Series C round (see https://www.datacenterdynamics.com/en/news/lambda-labs-raises-500m-to-expand-on-demand-cloud-offering/); and in March 2024, Together AI, landed $106 million in a Salesforce-led round (see https://techcrunch.com/2023/11/29/together-lands-102-5m-investment-to-grow-its-cloud-for-training-generative-ai/).

29 See https://www.gov.uk/government/news/tech-secretary-welcomes-foreign-investment-in-uk-data-centres-which-will-spur-economic-growth-and-ai-innovation-in-britain and https://www.nscale.com/press-releases/ai-hyperscaler-nscale-to-invest-gbp-2-billion-in-the-uk-data-centre-industry?utm_source=chatgpt.com.

30 For example, on 21 January 2025, OpenAI, SoftBank, Oracle, and the MGX announced Project Stargate, a joint venture to invest up to $500 billion in AI infrastructure across the United States by 2029 (see https://www.reuters.com/technology/oracle-shares-rise-9-after-trump-unveils-500-bln-ai-plan-2025-01-22/). In September 2024, BlackRock, Global Infrastructure Partners, Microsoft, and MGX announced a new AI partnership to invest $100 billion in data centres and supporting power infrastructure (see https://ir.blackrock.com/news-and-events/press-releases/press-releases-details/2024/BlackRock-Global-Infrastructure-Partners-Microsoft-and-MGX-Launch-New-AI-Partnership-to-Invest-in-Data-Centers-and-Supporting-Power-Infrastructure/default.aspx). See also https://www.investors.com/news/technology/nvidia-stock-ai-cloud-data-centers-neoclouds-microsoft-amazon/.

31 PDR, paragraph 5.

smaller/more efficient models.[32] Moreover, with the advance of small and more efficient models, such as DeepSeek's R1 FMs, consumers are increasingly able to deploy FMs on devices and personal computers using consumer grade chips.[33]

17. This dynamic competition across all parameters – including innovation, quality, price, and choice[34] – indicates that the industry is working well for customers.[35] Overall, the evidence demonstrates that the market positions of all players in the IT services industry are far from entrenched. Rather, there is dynamic competition based on innovation and investment in the industry from many different players, with substantial entry of new providers.[36] This directly contradicts the PDR's provisional assessment that such investments present "*significant barriers to entry*".[37] As such, intervention under the DMCC Act is unwarranted and could result in the CMA inadvertently distorting competition by imposing asymmetric restrictions on two dynamic players in this fast moving sector.

The PDR's profitability and pricing analyses rely on flawed assumptions and lead to the incorrect conclusion that prices, quality, and innovation could be better in a hypothetical, "more competitive" environment[38]

18. The PDR places significant evidential weight on the CMA's profitability analysis to imply that the sector is not functioning as well as it could be.[39] However, the PDR draws incorrect conclusions from this analysis and relies on flawed assumptions.

19. AWS rejects the PDR's contention that profitability alone can indicate whether competition in a sector is effective.[40] Significant levels of profitability are expected even in the presence of fierce competition in a dynamic industry, where profits are uncertain, and where firms compete through innovation.[41] These features apply to the cloud sector. Moreover, comparator analyses with other CSPs clearly show that AWS's returns and margins are in line with those of its competitors,

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32 For example, AWS's Graviton-based C8g instance is suitable for "CPU-based" ML inference (see https://aws.amazon.com/ec2/instance-types/c8g/) and customers can use AWS's Graviton instances to run models without an "accelerator" chip (see https://aws.amazon.com/blogs/machine-learning/run-machine-learning-inference-workloads-on-aws-graviton-based-instances-with-amazon-sagemaker/).

33 See, *e.g.*, https://www.tomshardware.com/tech-industry/artificial-intelligence/amd-released-instructions-for-running-deepseek-on-ryzen-ai-cpus-and-radeon-gpus.

34 See, *e.g.*, PDR, paragraphs 3.423 to 3.425, 3.463, 3.646, and 7.62(c).

35 The PDR cites numerous examples of customers recognising that the competitive landscape is dynamic and/or driven by innovation (see, *e.g.*, PDR, paragraphs 3.463 and 3.646; Cloud Services Market Investigation Qualitative Customer Research conducted by Jigsaw (2024) ("**Jigsaw Report**"), paragraph 8.1.6).

36 See paragraph 15 above.

37 PDR, paragraphs 12 and 3.447(e).

38 PDR, paragraphs 3.218 to 3.223, 3.375, and 3.505.

39 PDR, paragraphs 3.301 and 3.276.

40 PDR, paragraphs 3.301 and 3.276.

41 See paragraph 17 above. Against this backdrop, the PDR's assignment of "*greater evidential weight to [its] assessment of the providers' profitability than the analysis of quality and innovation indicators*" (PDR, paragraph 3.301) is not based on sound economic reasoning.

including smaller providers.[42] This is fully consistent with a competitive market in which there are firms of different sizes competing and innovating.

20. Furthermore, AWS rejects the PDR's contention that prices could have been "*more consistently competitive*" in a "*more competitive*" environment.[43] This is a speculative statement, and the PDR fails to provide any basis for this conclusion. In fact, since its launch AWS has reduced prices at least 151 times, and other providers have similarly introduced price reductions over time.

21. The PDR profitability and pricing analyses are based on a number of methodological flaws and do not provide any evidence that the segment is not characterised by "normal", well-functioning competition. We will continue to engage with the CMA to make this clear.

AWS is incentivised to ensure that customers who choose to multi-cloud or switch are able to do so

22. Customers generally seek the best tool for each of their IT needs and this means that they want the ability to select IT providers and services on a workload-by-workload basis. For example, a company designing a personal fitness app might require a development platform, data storage, computer processing, databases to store users' exercise history, networking so data can flow between the user and the company, a way to process payments, and data security. Each of these components could come from a range of CSPs, on-premises solutions, or other IT providers, and customers can pick and choose which provider or combination of providers they want to meet their specific needs.

23. As a customer-obsessed company, it is in our DNA to always work backwards from what the customer wants. This ensures that we remain competitive. We therefore work to continually *increase* interoperability, not limit it, so that our customers are able to multi-cloud and switch if, and when, they wish to do so. We are incentivised to do this, because many customers might otherwise choose another provider for a particular IT need.

24. FM development and supporting their deployment further sharpens existing incentives to enable interoperability. Indeed, the Jigsaw Report finds that AI is a potential reason why organisations "*may wish to move to a more integrated multi-cloud model*".[44] For example, a customer building an AI application might seek access to FMs, a secure and private environment to customise these models with their data, tools with which to build and deploy new applications on top of these models, and infrastructure with which to run these applications, each of which may be sourced from different providers. The fact that companies like Mistral[45] are investing in building their own data centre capacity to provide for AI workloads demonstrates the competitiveness in this space,

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42 AWS estimated Return on Capital Employed and profit margins for different CSPs based on public data. On both measures, AWS ranks in the middle of the CSP distribution.

43 PDR, paragraph 3.505.

44 PDR, paragraph 3.473.

45 See https://www.datacenterdynamics.com/en/news/g42-and-dataone-to-establish-ai-data-center-in-france/.

and that customers will continue to have a growing choice of multiple providers to meet their IT needs.

The PDR's analysis on the prevalence of multi-clouding and switching fails to establish that multi-clouding and switching would be more widespread in a "more competitive" environment

25. Against this backdrop, all evidence points to the fact that customers can, and do, multi-cloud and switch. The PDR acknowledges that "*multi-cloud[ing] is not uncommon among larger customers*",[46] yet it still considers that multi-clouding and switching *could* be more common in a "*more competitive*" sector. However, its analyses suffer from significant flaws and its conclusions remain speculative, containing no compelling evidence that customers who want to switch or multi-cloud are unable to do so.

26. In particular, the PDR fails to establish an appropriate benchmark against which to compare whether the levels of multi-clouding and switching it observes are high or low[47] asserting that no such benchmark is "*necessary*" or "*appropriate*".[48] Rather, the PDR implicitly assumes that, in a "*more competitive*" sector, many (if not all) customers would choose to constantly multi-cloud and switch and it concludes that the observed levels are low for a "well-functioning" competitive sector on this basis. For the reasons explained above,[49] this approach is concerning because the assumption that customers would constantly multi-cloud and switch is unfounded and contradictory to customer feedback. Customers may choose to use the same service without regularly changing, not because there is a lack of competition but because this reflects customers' choice. The same is true for customers choosing to use services from the same CSP for a period of time. The CMA has not presented any robust evidence to suggest that customer loyalty to a given cloud provider for a specific workload is anything other than a good engineering decision.

The IT services industry, including cloud services, is characterised by intense competition which delivers access, diversity, and choice for customers

27. The weight of evidence at the CMA's disposal shows that competition in the global supply of IT services, including cloud services, is functioning well. The landscape is highly dynamic and intensely competitive. IT providers are investing heavily to anticipate and meet customer demands for innovation, and, where demand exists, for multi-clouding and switching between CSPs. The evidence shows that there is access, diversity, and choice across the IT services industry.[50]

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46 PDR, paragraph 3.366(b).

47 See PDR paragraphs 3.366, 3.337, and 3.378, in which it omits any clear benchmark against which to measure its assertions (*e.g.*, around "overall prevalence" of multi-cloud and switching). This is similar the CMA's assessment in its Competitive Landscape Working Paper published on 23 May 2024.

48 PDR, paragraph 3.360(a).

49 See paragraph 4 above.

50 See, *e.g.,* PDR, paragraphs 3.510 to 3.511, referring to the CMA's competition and consumer protection principles for FM development and deployment as set out at Figure 3 in the CMA's AI Foundation Models Update paper published on 11 April 2024, available at https://assets.publishing.service.gov.uk/media/661941a6c1d297c6ad1dfeed/Update_Paper__1_.pdf.

28. The PDR sensibly recognises that, given the pace of change in AI development and FM-related areas, intervention in this nascent and evolving space is unwarranted.[51] The same recognition should apply to the broader competitive landscape of IT services, including cloud services, which is equally as dynamic; after all, many AI services are IT services provided over the Internet and, therefore, "cloud" services. There is no doubt that the development and deployment of FMs will disrupt and transform how cloud services are provided and consumed, and the CMA's reasoning with respect to AI should therefore naturally apply also to the wider cloud sector. Not only is intervention unwarranted, but it would distort well-functioning competitive dynamics and jeopardise continued innovation and growth across the industry, including indirectly in FM-related areas, to the detriment of UK business and consumers.

[51] PDR, paragraph 3.512.

Technical Barriers

The PDR's analysis of technical barriers to switching and multi-clouding is based on several misconceptions

29. The PDR has not established that any existing inherent technical differentiation across services prevents customers from switching or multi-clouding in any way that is capable of harming competition, meaning that there is no AEC. The PDR is wrong in provisionally concluding that customers are locked into their initial choice of CSP and are restricted from responding to attractive offers or accessing innovative new services from other CSPs.[52] The PDR's view that there are substantial technical "*barriers*" to switching and multi-clouding that harm competition is based on several misconceptions culminating in a flawed analytical framework and provisional conclusion.[53]

30. First, the PDR assumes that there is a lack of interoperability among cloud services but is unable to point to any specific AWS service creating barriers to switching or multi-clouding. In fact, our core services (*i.e.*, compute, storage, database and analytics, and networking) enable customers to build fully interoperable and transportable solutions, which are cloud agnostic. They all use open protocols, interfaces, APIs, and data formats.[54] These are the main services that our customers use, making up the vast majority of our revenues. In addition, we make a comprehensive suite of software development kits ("**SDKs**") available under open-source licences, enabling anyone to write interoperable applications against our APIs, and actively contribute to several open-source projects that customers can use with Amazon EC2, thereby enhancing interoperability across different cloud environments.

31. Technical differentiation across services does exist and is inherently pro-competitive. This heterogeneity is an expression of intense competition, as IT services providers take different innovative approaches to meeting customer needs. We compete with other IT services providers by seeking the best way to offer a service or feature to our customers, or by introducing features that our competitors do not have. This desire to be unique and better than the competition drives innovation, quality, and customer choice.

32. Our core database service, Amazon Relational Database Service ("**Amazon RDS**"), is a good example of this.

    a. AWS offers customers complete flexibility in how they run databases: they can choose to set up entirely self-managed databases using AWS infrastructure and leveraging the standard protocols and open-source software that they prefer (*e.g.*, by running MySQL on

52 PDR, paragraph 8.51.

53 PDR, paragraphs 5.286 to 5.290 and 8.27 to 8.37.

54 We also refer to our response of 25 June 2024 to the CMA's updated issues statement and working papers, paragraph 66, and AWS's Response of 31 July 2024 to the CMA's Technical Barriers Working Paper published on 6 June 2024 ("**TB Working Paper Response**"), paragraphs 54 and 55, which provide a detailed overview of the services and tools we offer customers to enable and facilitate switching and multi-clouding.

EC2), or they can instead choose to use a managed database service like Amazon RDS. While a customer running a self-managed database is responsible for managing the EC2 instance, managing the database on that host, optimising queries and managing customer data, a managed service such as Amazon RDS shifts much of the administrative burden to AWS by taking care of the installing and configuring of both the EC2 instance and the database, and providing systems for patching, maintenance, failover, backups, and downtime troubleshooting. This is preferable for many customers, as it enables them to focus on tuning the specific aspects of the workloads they are most interested in, namely the relational database itself.

b. As CSPs compete on features, we have developed significant innovations on Amazon RDS to make the service more powerful and easier for our customers to use, helping us compete with established database providers. For example, one of the key differentiators of Amazon RDS is that it handles extensive automation for routine database management tasks, such as provisioning, patching, backup, recovery, failure detection, and repair. It further offers automated backup features enabling point-in-time recovery for database instances. These innovations stem from fundamental architectural improvements that are deeply embedded in the core technical design of the service, *i.e.*, how data is stored, moved, and accessed. These enhancements go well beyond standard interfaces and protocols; they are part of the "managed" aspects of RDS that AWS has developed as fundamental improvements to database operation that benefit customers.

c. These differentiated features are unique to Amazon RDS and reflective of the fierce competition in this space, driving AWS and other CSPs to offer customers innovative features. They do not mean less interoperability, or that customers are locked-in: (i) RDS databases can be accessed using standard database protocols/languages (*e.g.*, SQL); (ii) customers can run both open-source database engines (such as MySQL, PostgreSQL, and MariaDB) or third-party proprietary database engines (including Oracle Database and IBM Db2) on Amazon RDS; (iii) customers can move data from RDS to other databases, whether they are running on Amazon EC2 or other environments, using widely-adopted tools; and (iv) third-party analytics tools can connect to RDS.

33. Second, the PDR's provisional finding that technical differentiation across services acts as a "*barrier*" to switching and multi-clouding is not supported by the evidence. In fact, the evidence suggests that:

a. Customers are already empowered to choose the level of portability and interoperability that suits their needs. The Jigsaw Report found that many customers struggled to identify specific technical challenges that would have to be overcome to achieve a smooth switching experience and/or an effective multi-clouding infrastructure.[55] As explained above, we offer customers a range of services for any given use-case, some of which are highly interoperable (such as our core services which are the main services customers use),

[55] PDR, paragraph 5.49.

and some of which contain proprietary technology or unique design components. This is a function of innovating at pace, whereby we work backwards from customer needs and necessarily launch services and features which are unique. However, as mentioned in the PDR,[56] customers decide which services they wish to employ for any given workloads, and consciously balance their desire for interoperability against their desire to use a specific proprietary function. This trade-off is not a competitive anomaly, rather it is a feature of a highly competitive market, where customers are able to choose the solutions that work best for them.

b. Customers switch between CSPs and multi-cloud primarily to benefit from this heterogeneity that rapid innovation and technical differentiation brings about.[57] For example, most CSPs offer data storage services. All these services meet the same basic customer need, namely storing data. However, customers are looking for cost-effective storage options and high availability and data durability, among other needs, so this is where CSPs try to differentiate themselves by offering innovative features or strength in a particular type of storage. For instance, Google offers sub-10 millisecond retrieval times from certain archival storage products as an advantage vis-à-vis our equivalent products, whereas we offer a low-cost bulk retrieval option from our own archival storage products that Google does not have. Wasabi specialises in object storage and seeks to differentiate itself by advertising as "80% cheaper" than our S3 Standard product.

34. Third, the PDR's assumption that customers would want or choose to switch and multi-cloud more in a "more competitive" sector is unsubstantiated and overlooks important survey evidence on whether and why customers choose to switch and multi-cloud in the first place. For example, the PDR itself acknowledges that customers expressed differing views on the benefits of multi-clouding, noting that "*not all customers will see value in integrated multi-cloud approaches.*"[58] Even where "*customers, professional service firms and cloud providers all recognised that […] there are benefits to adopting a multi-cloud architecture,*" they specifically qualified this as applying to "*particular circumstances*"[59] – indicating that these benefits are relevant only for specific use cases and business needs, rather than being universal or broadly applicable. Indeed, customers running an application across multiple CSPs may face operational challenges, such as lower availability (*i.e.*, the interrupted provision of cloud services), security, and resiliency.

35. Similarly, the levels of switching put forward in the PDR are to a large extent the result of customers being satisfied with the offerings of their current CSPs rather than being locked-in due to technical or commercial barriers. Many customers see limited value in switching and can achieve their desired outcome by using a different consumption model, such as multi-clouding or hybrid clouding (as many of the larger customers choose to do). This is exactly what you would expect to see in a competitive market.

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56 PDR, paragraphs 5.250 to 5.252.
57 PDR, paragraphs 2.69, 2.71, 5.88, 5.115, 5.250, 5.252, and 5.261.
58 PDR, paragraph 5.94.
59 PDR, paragraph 5.93.

36. Fourth, the PDR does not properly assess the reasons underlying the technical "barriers" it observes, disregarding that technical differentiation between CSPs is almost always inherent to IT services and often reflective of a healthy level of competition, as they indicate high levels of innovation, service differentiation, and customer choice. We refer to our TB Working Paper Response for a detailed explanation on why the technical limitations with respect to core services, ancillary services and tools, latency, skills, and transparency are inherent to IT services and cannot be resolved through regulatory intervention.[60]

37. Customers who multi-cloud may incur some degree of higher costs than customers using a single cloud due to the inherent technical costs of integrating multiple IT environments. However, this is neither evidence of, nor a contributing factor to, a non-competitive market. Customers are willing to incur these inherent costs if it allows them to take advantage of the "best in breed" IT services across different IT services providers. For example, a particular customer may perceive that one CSP is best at storage, and another is better at data analytics, so that customer may prefer to use both. While using both CSPs may come at an additional, inherent technical cost, it allows customers to achieve their desired outcome. In fact, as acknowledged by the PDR, multi-clouding is already today "*not uncommon*" among larger customers.[61]

38. The mere existence of challenges with integration across services is therefore not sufficient to find any AEC. It is necessary to question *why* these technical differences exist, whether (and if so, how) they could be reduced, and what the effect of such reduction would be on competition. Only *artificial* barriers that do not contribute to the price, quality, or innovation of services could potentially cause an AEC and be subject to remedies. Microsoft's deliberate commercial decisions with respect to its software licences is an example of such an artificial barrier, designed to restrict interoperability. However, the PDR has not identified any other such artificial barriers with respect to cloud services and, notably, it has not called out any specific AWS service or feature creating barriers to switching or multi-clouding, and therefore requiring intervention. Despite this, the PDR concludes – without any evidentiary basis – that there is a problem to solve here, and that the way to solve it is to regulate only AWS and Microsoft. This provisional finding is extraordinary and perplexing. The PDR's approach of proposing remedies based on the total perceived impact of all hypothetical technical barriers, rather than focusing on a subset of identified artificial technical barriers that could potentially be addressed through regulatory intervention (if any), significantly increases the risk of disproportionate or counterproductive remedies and distortion of competition. It moreover creates significant uncertainty for businesses operating in and considering investment in the UK.

AWS invests heavily in innovating on behalf of customers and responding to their interoperability needs

39. Customers want the ability to use multiple clouds and to switch workloads among them and other IT environments, where it makes sense for them to do so from a technical and commercial

60 TB Working Paper Response, paragraphs 12 to 53.

61 PDR, paragraph 3.366(b).

perspective. In fact, a key consideration for customers moving to the cloud is ensuring interoperability with existing IT solutions, and this factors into customers' decisions about which IT providers to use. AWS and other CSPs therefore have, and will continue to have, strong commercial incentives to reduce technical limitations across differentiated systems and support interoperability. The PDR fails to take account of these incentives:

a. The PDR exaggerates the cost of losing customers by enabling easier switching and multi-clouding capabilities, while undervaluing the potential costs of not promoting interoperability.[62] CSPs need to enable switching and multi-clouding, because this flexibility is something that many customers prioritise. Indeed, IT services providers are more likely to lose actual and prospective customers if they do not support interoperability, because IT services providers compete on a workload-by-workload basis. If a customer cannot host a third-party service on AWS or cannot have an AWS service interoperate successfully with a third-party service it wishes to use, the customer will simply switch the workload away from AWS to another IT services provider or choose another IT services provider for the specific workload in the first place. Ensuring interoperability is therefore essential for CSPs, both large and small, who wish to attract new workloads and maintain existing ones.

b. The PDR is also wrong in claiming that smaller CSPs necessarily have stronger incentives to promote interoperability than larger CSPs.[63] From an economic point of view, there can be no *presumed* relationship between a firm's size and its incentives to support or degrade interoperability. For example, newer entrants in cloud services may still be large or have important presence in the sector with legacy 'must have' products or proprietary software that they do not necessarily want to make interoperable. For instance, the newest versions of Oracle's database software are restricted to its proprietary Oracle Cloud Infrastructure as the only place where they can be run in the cloud.

c. The PDR acknowledges that multi-clouding is "*not uncommon*" amongst large customers.[64] Given that such large customers are key drivers of competition, even the PDR's reasoning supports the conclusion that CSPs are strongly incentivised to enable multi-clouding. The growth of cloud computing both in itself and as a proportion of the IT services industry means that competition for new workloads is a key consideration and CSPs cannot maintain their share of the segment if they do not compete fiercely for this new business, coming both from established firms with existing IT infrastructure and new start-ups (*e.g.*, in AI[65]).

40. AWS and other CSPs make considerable efforts and investments to support interoperability, but it is impossible to completely remove all technical differentiation across services and, even if it were possible, doing so would require all services to be equivalent. This would eliminate any incentive

62 PDR, paragraphs 5.13, 5.14, and 5.22.
63 PDR, paragraph 5.15.
64 PDR, paragraph 3.366(b).
65 See paragraph 15 above.

to innovate as a new feature or service would need to be shared with and replicated by competitors. Therefore, any requirement to have equivalent services would lead to IT services providers offering the lowest common denominator service, thereby harming customers.

41. If we were forced to standardise and remove any technical differentiation across our services, such as the differentiation described with respect to Amazon RDS,[66] we would need to fundamentally redesign our services, eliminating the very features that customers value and choose AWS for in the first place. Such an obligation would also severely limit our ability to offer any new innovations similar to the ones described above in the future, to the detriment of UK customers.

The risks associated with the proposed remedies far outweigh any potential benefits, including when imposed under the DMCC Act

42. Regulatory intervention to address perceived technical barriers to switching and multi-clouding is unwarranted and inappropriate. The CMA has not identified any artificial barriers that require regulatory intervention with respect to any specific AWS services. We design our services to ensure that customers are able to choose the solution that best suit their needs. To the extent there are inherent technical limitations across differentiated systems these cannot be resolved through regulatory intervention. The potential remedies considered in Appendix W to the PDR ("**Appendix W**") would therefore be ineffective. Moreover, they would severely harm innovation and customer choice.[67] The PDR itself acknowledges the material risks associated with these remedies, as well as their questionable effectiveness.[68] We therefore support the CMA's provisional decision not to proceed with these remedies under the market investigation regime.

43. However, we strongly disagree with the PDR's provisional findings that (i) the remedies identified in Appendix W could form part of an effective and comprehensive solution if implemented under the DMCC Act;[69] and (ii) the CMA's ability to test and trial remedies, as well as to iterate remedies over time, would likely address many (if not all) of the major risks associated with these remedies.[70] In fact, the risks and practical problems the PDR identifies under the market investigation regime would equally apply, and would still need to be resolved, under the DMCC Act.

44. For example, while the DMCC Act would allow the Digital Markets Unit ("**DMU**") to take a more long-term and flexible approach, the host of problems and risks associated with the proposed standardisation remedies identified in the PDR – what cloud services to standardise, what standards to use, how to develop these standards, how to adapt and maintain these standards, how to monitor and enforce these standards, how to balance the risk of distorting innovation and

66 See paragraph 32 above.

67 Please see the TB Working Paper Response, paragraphs 76 to 87, for a detailed explanation on why the standardisation remedies considered in Appendix W would severely harm innovation and customer choice.

68 PDR, paragraph 9.74.

69 PDR, paragraph 9.69.

70 PDR, paragraph 9.75.

customer choice, etc.[71] – would equally apply under the digital markets competition regime. Standards may serve well in highly mature markets where differentiation is limited, when providing some commodity requirements that need to be implemented across multiple end points. IT services provided over the Internet are the opposite of this. They are evolving at an incredible rate and not amenable to standard setting. Imposing standards would therefore risk harming innovation and result in certain versions of IT services, which may not necessarily be the optimal ones, becoming the applicable standard. The "cloud" moreover comprises hundreds of completely discrete, competing information technologies that cannot easily be made uniform through standardisation. For a standardisation remedy to work in this context, it would have to address each individual service independently.

45. In addition, the CMA's proposal to impose standardisation on "IaaS" is particularly problematic as it contradicts the PDR's own analysis. Appendix W proposes standardising "IaaS" based on a perceived lower risk of disrupting innovation and service differentiation.[72] However, this proposal directly conflicts with the CMA's own findings throughout the PDR acknowledging that lift-and-shift of customer applications using "IaaS" does not entail significant technical challenges, *i.e.*, implicitly confirming that using IaaS does not limit customers' ability to switch and multi-cloud. This approach appears to advocate standardisation for its own sake, simply because the CMA believes it can do so with less harm for "IaaS", rather than addressing any clearly identified barrier to competition or customer choice. This approach risks imposing unnecessary costs on IT services providers and ultimately customers, while solving a "problem" that the PDR's own evidence indicates does not exist.

46. If it is not possible to devise a comprehensive remedy following very thorough investigations by two different authorities (*i.e.*, Ofcom and CMA) spanning more than two years, it is not clear how a remedy to a non-existent problem could be crafted by handing this off to yet another agency. Another regulatory body is not more likely to either evidence a concern or to craft a functioning remedy that does not inadvertently harm the competitiveness and innovative nature of the industry as a whole. For example, the PDR states that the CMA has not been able to identify a suitable standard-setting body for the relevant cloud services, to assist with the implementation of standardisation remedies through a market investigation order.[73] Given that the CMA has been unable to do so following a thorough market investigation, it is not realistic to assume that the DMU would easily find or create a suitable standard-setting body under the DMCC Act. It is also questionable whether the DMU would be the right body to propose standards and monitor them, given the technical complexity involved and the fact that it takes experienced standard-setting bodies many years to develop standards.[74]

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71 PDR, Appendix W, paragraphs W.25 to W.60.

72 PDR, Appendix W, paragraph W.46.

73 PDR, Appendix W, paragraph W.51.

74 For example, ISO/IEC 19941:2017 on interoperability and portability, a standard developed by the International Organisation for Standardisation, was formally accepted as a new project on 19 August 2014 but was only published as an international standard on 30 November 2017. In other words, it took more than three years to develop. See https://www.iso.org/standard/66639.html#lifecycle.

47. Furthermore, the PDR is wrong to consider that there would be benefit in limiting the scope of the standardisation remedies to AWS and Microsoft. Any common standards should be applied to all IT services providers rather than targeting only AWS and Microsoft because:

    a. Applying the common standards selectively risks creating an artificial market fragmentation that could have harmful unintended consequences for competition and innovation. There is no guarantee that other CSPs would follow the same standards. Other CSPs may have no interest in altering their services to conform to these standards, because they have legacy software that they wish to preserve (*e.g.*, Oracle with respect to its database software), or they may be a newer entrant without the technical or financial capability to build standards compatibility into their innovative new service. Common standards will not work unless all CSPs adopt them.

    b. The CMA would risk becoming a global outlier by arbitrarily picking winners and losers on an *ex-ante* basis, ignoring the competitive dynamics in the cloud industry. Singling out AWS and Microsoft for designation under the DMCC Act and standardisation remedies would have the perverse effect of empowering some of the world's largest and extremely well-resourced IT companies (*e.g.*, Google, Oracle, IBM, Nvidia, HP, Tencent, etc.) to compete unconstrained.

    c. The PDR is wrong in claiming that larger CSPs have a greater incentive to maintain or increase technical barriers to switching and multi-clouding. As explained at paragraph 39.b above, there cannot be a presumed relationship between the size of a CSP and its incentives to support or degrade interoperability, and the PDR provides no evidence that it exists.

    d. The PDR considers that "smaller" CSPs (*e.g.*, Google, Oracle, IBM, Nvidia, HP, Tencent, etc.) should be consulted as part of the process to develop common standards for AWS and Microsoft. Involving *competitors* of AWS and Microsoft in the development of such standards clearly gives rise to a conflict of interest, especially since some of these competitors represent some of the world's largest IT companies and have a vested interest in pushing their own software through as a standard.

48. Common standards also require multi-national or global coordination, so it would not make sense to have specific standards for the UK. The PDR itself recognises that "*regulatory authorities in other jurisdictions could introduce and require cloud providers to follow particular standards*," *e.g.*, under the EU Data Act.[75] Therefore, introducing separate standards in the UK would lead to regulatory fragmentation, creating inconsistencies and contradictions in how standards are designed and implemented. For example, the PDR proposes standardising a range of services, including "IaaS" services,[76] whereas the EU Data Act excludes "IaaS" from its standardisation

[75] PDR, Appendix W, paragraph W.65.

[76] PDR, Appendix W, paragraphs W.28 and W.46.

requirements. Cloud services are made available by region, with no physical borders to pass through, and many customers utilise cloud services in multiple regions. It is difficult to see how CSPs would account for differing standards based on the location of the customer accessing those services or the region in which the services are being accessed. This would make things very complex, far outweighing any of the perceived benefits of the remedy. For example, CSPs may have to create a separate service for UK customers, constraining features and general availability in order to meet the UK-specific standards, thereby risking UK customers getting delayed access and/or missing out on new services and features developed elsewhere. Therefore, it would be more sensible to first monitor how the developments with respect to the EU Data Act unfold before taking any further action under the DMCC Act.

49. Finally, as the current switching and multi-clouding levels primarily reflect customer choice, remedies focused on reducing perceived technical barriers would impose costs on the industry while delivering limited benefits to customers who would rationally choose not to pursue multi-clouding strategies or switching due to their individual use cases, needs and priorities. At the same time, any regulatory interventions targeted at lowering inherent technical limitations would result in inefficiencies and risks resulting in a race to the bottom, where innovation is de-prioritised in favour of simple homogenous services.

DTO fees have no adverse effect on competition – the PDR seeks to solve a problem that does not exist

50. AWS does not charge "egress fees" targeting switching and multi-clouding. We charge customers for data transfers using our proprietary global network based only on the amount of data a customer chooses to transfer and the location to and from which the data is being transferred. Our fees are never based on the reason for the data transfer; indeed, our customers make hundreds of millions of data transfers each day, and we do not know if the data transferred out to the internet is a normal part of a customer's business (*e.g.*, a video streaming company sending a movie to one of its users) or a customer transferring data out to switch IT providers.

51. DTO fees are charged based on usage. The vast majority (over 90%) of AWS's global customers which incur DTO usage fall within the DTO free tier (which extends to data transfers of up to 100 gigabytes per month), and therefore do not pay anything for DTO. For our remaining customers, DTO fees are charged based on usage and reflect the cost of building and maintaining our premium network. AWS continuously invests in further improving our network to increase quality and reduce costs, and to pass these benefits or savings on to customers through lower DTO fees and improved quality network services. As a result of these investments, between 2019 and 2023, customers experienced a faster and more reliable network and more than a $0.01 reduction in prices for every $0.01 reduction in per unit DTO cost, which reflects a pass-on rate of over 100%. AWS's fees for transferring data out to the internet fell by almost 40% globally between 2018 and 2023. In sum, customers benefit from a higher quality service at a lower price. This significant reduction of DTO fees over time, coupled with AWS's continued investment in improving, innovating, and maintaining its DTO service, is irrefutable evidence of a competitive market in which regulatory intervention would be both unwarranted and harmful.

52. The PDR disregards this evidence of falling effective prices for DTO on the basis that one would expect costs to fall "*in a growing industry*" with alleged strong economies of scale.[77, 78] This reasoning fails to acknowledge that falling costs do not necessarily translate to falling prices for customers – instead of reducing customers' prices, providers could simply choose to keep such cost reductions as profits. However, AWS has lowered DTO prices for customers in proportions equal to our efficiency gains, which demonstrates the competitive pressure in the industry.

53. The PDR acknowledges that qualitative customer research within the Jigsaw Report confirms that in "*almost no cases*"[79] were DTO fees considered the main, or even one of the main, barriers to switching or multi-clouding. However, it then concludes that it is sufficient that the level of DTO fees is a relevant factor for "*a substantial minority of customers*" when deciding whether or not

77 PDR, paragraph 5.324.

78 For the avoidance of doubt, AWS does *not* agree with the PDR's finding that there are "strong" economies of scale, which the PDR fails to empirically demonstrate.

79 PDR, paragraph 5.405.

to switch or multi-cloud, in order for it to pose a threat to competition.[80] Neither the composition of this "*substantial minority of customers*", nor the basis on which their views sufficiently justify regulatory intervention, is made clear. It is hard to imagine a product or service, or indeed any market, where at least a minority of customers would not ask for lower prices – that alone cannot form a plausible basis for regulatory intervention. By failing to clearly set out the composition of the customers referenced and the rationale behind why their views sufficiently justify an intervention, the PDR fails to meet the requirement of "*fairness*" and transparency owed to AWS to allow us to adequately understand the analysis that affects our business.[81] Further, the PDR cannot justify intervention and all of its associated risks on the basis of the possibility of an undefined "*substantial minority of customers*"[82] being potentially affected by DTO fees. Such a conclusion would fall far below the "balance of probabilities" standard imposed on the CMA to find an AEC[83] when, by the PDR's own admission, in "*almost no cases*" were DTO fees considered the main or even one of the main barriers to switching, let alone responsible for reducing competition among CSPs.[84] Proposing intervention without meeting the evidentiary standard would exceed the CMA's legal authority and create uncertainty for businesses operating in and considering investment in the UK.

The PDR disregards AWS's free switching programme without any evidence

54. As of March 2024, AWS has eliminated DTO fees globally for customers switching away from AWS, which effectively removes the PDR's concerns around DTO fees providing a barrier to switching. There has been low customer uptake of AWS's free switching programme so far, which corroborates the Jigsaw Report's findings that DTO fees do not and have not prevented customer switching. The fact that the programme does not appear to be driving significant changes in customer behaviour demonstrates our customers' satisfaction with the services they receive, because if DTO fees had been a barrier to switching, eliminating them would have resulted in significant switching. However, the PDR dismisses these facts and asserts, without evidence, that the "*uptake data on the free switching programme is inconclusive, as there could be other explanations for low uptake such as a lack of customer awareness of the programmes, or programme restrictions or uncertainty deterring uptake*".[85] This, despite the fact that AWS has publicised the programme through numerous AWS channels and the programme has received significant media coverage.[86]

55. The PDR also criticises legitimate free switching programme measures designed to prevent abuse, thereby displaying a lack of understanding of the commercial realities of transferring large quantities of data. These measures do not render these programmes ineffective; rather, they exist

80 PDR, paragraph 5.399.
81 Guidelines for market investigations: Their role, procedures, assessment and remedies, paragraph 42.
82 PDR, paragraph 5.320(b).
83 Guidelines for market investigations: Their role, procedures, assessment and remedies, paragraph 319.
84 PDR, paragraph 5.396.
85 PDR, paragraph 5.385.
86 See https://aws.amazon.com/blogs/aws/free-data-transfer-out-to-internet-when-moving-out-of-aws/ and https://aws.amazon.com/blogs/networking-and-content-delivery/promoting-customer-choice-aws-takes-another-step-to-lower-costs-for-customers-changing-it-providers/.

as protective measures to provide clarity and certainty to the business and to customers alike. Specifically, the PDR criticises AWS's requirement that a switch be effected within a 60-day timeframe (which can be extended), on the basis that customers may need longer to complete a switch.[87] However, this is double the EU Data Act's prescribed 30-day timeframe for a switch, as AWS considered 60 days to be more appropriate. The programme should not be criticised for giving customers more time than what is legally mandated under the EU Data Act.

56. The PDR also notes that "*AWS' free switching programme would not apply to multi-cloud architecture*".[88] Insofar as this is intended to address the fact that the free switching programme does not cover data transfers for the purposes of multi-clouding, that is correct; it is a programme aimed at switching and that is clearly messaged to customers. That said, customers are eligible to use the credits they receive under the programme for DTO across all services and all data types,[89] including, contrary to the PDR's inaccurate assertions,[90] for the purpose of effecting a multi-cloud strategy during the process of a partial or total switch from AWS.

The PDR's proposed remedy is radical and unprecedented and will permanently undermine competition

57. The PDR's proposal, which would impose a complete ban on AWS and Microsoft charging "cross-cloud" fees for switching and multi-clouding, is drastic and far exceeds the requirements of the EU Data Act, which itself was enacted in haste and without sufficient consultation to identify its consequences. Under the PDR's current proposal, AWS (and Microsoft) will be prohibited from charging customers for use of our network services both when switching and multi-clouding, despite the fact that the provision of these services comes at a great cost to our business and drives significant investments and innovations in network quality. By contrast, in the EU, data transfer charges are eliminated completely just for switching, and capped at cost for in parallel use of providers. It is unprecedented for a UK regulator to impose remedies requiring businesses to provide a service that requires significant investment at a price of zero to address unproven competition concerns.[91]

The PDR's proposed remedy would result in worse outcomes for UK customers

58. The application of this proposed remedy to AWS and Microsoft alone, rather than all CSPs, would distort the competitive landscape, to the detriment of UK customers.

87 PDR, paragraph 5.387(c)(i).

88 PDR, paragraph 5.379.

89 PDR, paragraph 5.386 incorrectly states that there are limits to the scope of the programmes in relation to service or data type eligibility restrictions.

90 PDR, paragraph 5.387(c) incorrectly states that AWS's programme terms preclude multi-clouding during switching.

91 There have been instances of UK regulators imposing regulated prices or price controls to remedy competition concerns, such as when Ofcom required Openreach to provide access to its network infrastructure to other telecommunications providers at regulated prices. However, enforcing the provision of a service that requires significant investment at a price of zero goes far beyond this.

a. First, it would create an uneven playing field whereby customers would likely choose to multi-cloud using only or predominantly AWS and Microsoft, given that multi-clouding would be free using these networks. Even if other CSPs followed suit and offered free multi-clouding (which cannot be assumed – see paragraph 58.b below), they would be under no legal obligation to do so and therefore customers would likely be drawn to AWS and Microsoft as the only guaranteed free option, to the detriment of other CSPs. This could create a bizarre situation whereby customers use AWS and Microsoft as vehicles to get reduced DTO while using other CSPs. For example, a customer wanting to transfer data from one part of a provider's network to another, might look to do so for free by transferring the data to AWS and then travelling across AWS's network simply to get to that other part of its original provider's network. This type of behaviour would not achieve the CMA's aim of promoting multi-clouding, and would put a strain on AWS's network at the expense of actual AWS customers.

b. Second, the PDR's assumption that a remedy targeting AWS and Microsoft would necessarily encourage other providers to offer DTO for free, without having any negative effect on network investments or innovation,[92] is an unsubstantiated prediction which cannot be assumed. While other CSPs may feel a need to similarly offer DTO for free in order effectively to compete with AWS and Microsoft, they may be less able to afford doing so while building and maintaining a good quality network given the significant costs involved. The effect of a DTO ban applied exclusively to AWS and Microsoft would therefore compel other CSPs to either:

    - offer DTO for free while offering lesser-quality networks overall. This would harm customer choice and result in such providers hosting greater quantities of data on fragile networks, with corresponding security risk to both companies and the broader economy; or

    - improve their networks for the benefit of customers but cheapen the cost of delivery by charging customers to fund those improvements, through price increases to DTO fees. This would lead to worse outcomes for UK customers, as they would face higher charges than European customers, because in Europe, no providers can charge fees for switching and all must offer reduced DTO fees for in-parallel use, whereas in the UK, the CMA's proposed ban on DTO charges would apply to AWS and Microsoft only.

59. More broadly, the PDR acknowledges that introducing an outright ban could lead to an increase in the prices of other services, to enable AWS and Microsoft to recoup their costs of "cross-cloud" DTO for switching and multi-clouding.[93] This cannot be the right outcome. It would mean banning a fair and economically justified usage-based pricing model, in favour of a structure that would effectively lead to smaller customers (with lower DTO usage) subsidising others. It is unfair and

92 PDR, Appendix W, W.170(b).

93 See, for example, Appendix W, W.196(a).

entirely unwarranted to place AWS in a position where AWS may have to raise prices to account for their costs, when AWS has always been a leader in reducing prices across the board.

60. In properly functioning markets, providers should be rewarded for their investments and innovation, rather than being prohibited from charging for their services and recovering their costs. By taking away certain providers' ability to charge for a service that requires significant investment to provide, the PDR's proposed intervention, which is unprecedented, necessarily *reduces* their incentives to invest in the service in the first place. Any small hypothetical monetary benefits for a "minority" of customers would be outweighed by regulation that leaves the vast majority of customers worse off, either through an increase in the price of services, or a reduction in network quality for UK customers, or both.

The PDR's proposed remedy would undermine UK investment, productivity, and growth

61. Cloud services contributed over £42 billion to the UK economy in 2023 alone. The £42 billion aggregate economic contribution of cloud to GDP is composed of the domestic revenues generated by CSPs, and the spillover effects of cloud services on the total economy – in other words, the enormous benefits generated by IT cost efficiencies, new product development, and support for start-up incubation, amongst others.[94] DTO fees charged to recoup costs form an important part of the revenue pot which enables AWS to make such significant investments – into both its cloud services but also wider UK investments (such as the recently announced £8 billion investment by AWS).[95] These investments will clearly yield dramatic benefits for consumers and the UK economy, including a contribution of £14 billion to the UK's GDP between 2024 and 2028.[96] In order to make the most of the digital opportunity, the UK will need further investment in digital infrastructure to support businesses' needs. However, by not allowing AWS to recoup its costs of providing a service, the PDR's proposed ban on DTO fees for switching and multi-clouding would inhibit AWS's incentives to innovate and invest in our network for the benefit of UK customers, at a time when the UK needs it most to support the nation's journey to become a global leader in digital transformation.

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94 See Table 4-1 and Table 4-2, Independent analysis by Telecom Advisory Services (March 2024), available at https://www.teleadvs.com/economic-impact-of-cloud-computing-in-the-united-kingdom/.

95 See paragraph 3.

96 Public First, "*Driving Digital Acceleration*" (2024), page 2, available at https://www.publicfirst.co.uk/driving-digital-acceleration.html.

Committed Spend Discounts ("CSDs")

The CMA has correctly identified that CSDs[97] *do not harm competition*

62. We welcome the PDR's conclusion that CSDs do not harm competition.[98] Based on a comprehensive analysis of substantial evidence, the PDR correctly acknowledges that CSDs do not lead to a weakening or marginalisation of AWS's rivals, "*or by extension, [have] any resulting impact in terms of worse price/discount deals for customers,*"[99] and therefore do not give rise to an AEC. All the evidence in the PDR, including its robust empirical analysis, shows that CSDs are pro-competitive. CSDs reflect healthy competition between IT providers and benefit customers who exercise their bargaining power to pay lower prices.

63. We are pleased that the PDR has empirically analysed whether CSDs reduce the ability or incentive of rivals to compete, departing from the purely descriptive approach previously taken in the CMA's Committed Spend Agreements Working Paper published on 23 May 2024 ("**CSA Working Paper**").[100] The PDR's robust analytical framework, based on a well-established price-cost test applied to AWS's data, delivers the clear, evidence-based conclusion that CSDs are pro-competitive and cannot foreclose rivals.

64. Moreover, the CMA has applied an expansive version of the conventional price-cost test by considering both (i) whether less efficient rivals have the ability and incentive to compete; and (ii) whether rivals may hypothetically have an incentive to compete for only part of customers' incremental spend.[101] Applying this rigorous analysis, the PDR finds that AWS's rivals have the ability and incentive to compete in almost every single case.[102] This holds true even under the PDR's extremely conservative and incorrect assumptions.[103]

65. In addition to appreciating that a quantitative analysis is the relevant test for assessing whether CSDs harm competition, we are pleased that the PDR also recognises that qualitative features of AWS's CSDs – namely the proportion of customer demand covered by the commitment and the

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97 PDR, paragraph 7.1: "*Committed spend agreements or discounts (CSAs or CSDs) are agreements between a cloud provider and a customer in which the customer commits to spend a minimum amount across the cloud provider's cloud services over a period of years, and in return, receives a percentage discount on its spend with that provider during those same years.*" In this response, we use the term CSD.

98 PDR, paragraphs 27 and 7.128.

99 PDR, paragraph 7.69.

100 The analytical framework in the CSA Working Paper lacked an empirical test to distinguish between pro-competitive discounts and those exceptionally rare cases of discounts that could give rise to competition concerns through the foreclosure of rivals.

101 PDR, paragraph 7.84.

102 Specifically, the PDR finds that rivals as efficient as AWS have the ability and incentive to compete in over 99.6% of cases, and even significantly less efficient rivals have the ability and incentive to compete in 97.7% and 94.7% of cases respectively. See PDR, paragraph 7.107.

103 For example, the assumption that all existing spend on AWS is "sticky", which in the PDR means "non-contestable", is overly conservative, incorrect, and contradicted by the PDR's customer survey evidence which demonstrates that customers are willing and able to switch their demand away from AWS (see PDR, paragraphs 7.75 and 7.101).

length of CSD contracts – do not harm competition and/or customers either.[104] This supports the conclusion that CSDs do not raise competition issues, now or in the future.

66. The PDR recognises that discounts are beneficial to customers and IT providers in that they facilitate investment decisions.[105] This is correct. CSDs are pro-competitive precisely because they serve as a vehicle for price competition between suppliers, directly benefiting customers through lower prices. Unsurprisingly, the PDR recognises that customers view discounts positively.[106] CSDs also help IT providers better plan and acquire the necessary capacity and infrastructure, generating efficiencies across the industry. Revenue from CSDs helps mitigate the risks associated with forecasting demand and informs AWS's infrastructure investment decisions. This confidence and visibility into the future enables businesses to effectively plan capacity and invest in new projects. These efficiencies benefit all customers regardless of whether they have a CSD, and we pass them along as price reductions whenever possible. We are pleased to be able to continue delivering these benefits to UK customers.

CSDs do not raise any competition concerns now, nor will they in the future

67. The PDR departs from its robust framework of analysis when it suggests, without an evidentiary basis, that CSDs may lead to competitive concerns in the future.[107] Such speculative concerns are based on flawed assumptions, and we will engage with the CMA to address any remaining misconceptions ahead of its final report. Notably, the PDR itself acknowledges that such concerns are "*not likely to materialise in the foreseeable future*".[108]

The PDR's overall conclusion is the only plausible finding for the CMA's final decision report

68. We look forward to the CMA's final decision confirming the PDR's findings that CSDs do not harm competition or customers, allowing us to continue offering these pro-competitive CSDs to our UK customers. Through continued engagement with the CMA, we will reinforce the robust evidence of CSDs' competitive benefits, while addressing any speculative, future concerns. This will help ensure UK customers can continue to receive these important benefits both now and in the future.

104 PDR, paragraphs 7.115 and 7.127.
105 PDR, paragraph 7.124.
106 PDR, paragraph 7.25.
107 PDR, paragraphs 7.112 and 7.129.
108 PDR, paragraph 7.112.

Licensing

Microsoft's licensing restrictions foreclose AWS and Google and harm customers

69. We welcome the PDR's conclusion that Microsoft has "the ability and incentive to partially foreclose AWS and Google using the relevant Microsoft software products and that its conduct is harming competition in cloud services,"[109] and that this foreclosure should be remedied through the imposition of fair, reasonable and non-discriminatory requirements for pricing, functionality, and license transfer.[110] As our customers and the CMA have recognised, Microsoft's products remain critical for a discrete and significant portion of customers' workloads. Restricting the availability of these products on competing cloud services harms competition and customers.

70. Unlike other CSPs, Microsoft maintains a unique position as holding a "significant degree of market power in relation to Windows Server, SQL Server, Windows 10/11, Visual Studio and its productivity suites."[111] Microsoft has chosen to exploit this power by imposing arbitrary and unfair licensing terms on its software in order to reduce competition and drive customers to their own cloud service. Unlike other features of the industry considered in the PDR, Microsoft's licensing restrictions are purely the result of unfair licensing conditions. These conditions have no technical justification and are designed to drive customers to use Azure rather than other CSPs for Microsoft workloads, clearly distorting competition on the merits.

71. In finding that Microsoft has the ability and incentive to foreclose AWS, the PDR recognises the multi-faceted manner in which Microsoft's conduct harms competition for cloud services. Firstly, the PDR recognises that Microsoft's tactics have the effect of raising rivals' costs via Services Provider License Agreements ("**SPLAs**") input costs. The PDR finds that Windows Server SPLA licensing costs would account for 50-80% of Azure customers' total spend on Windows Virtual Machines,[112] and the combined Windows Server and SQL Server SPLA costs would account for 60-100% of customer spend on Windows Virtual Machines.[113] In other words, almost all of Azure's revenue for these workloads would be consumed by licensing fees if Azure was required to pay the same prices that Microsoft charges AWS and Google under the SPLA. By raising its rivals' costs to this degree, Microsoft has distorted the ability of its competitors to offer customers attractive prices for these must-have products and significantly reduced competition.

72. Microsoft's licensing restrictions have further distorted competition through the arbitrary restriction imposed on customers seeking to bringing their existing licenses ("**BYOL**") for certain Microsoft products onto AWS or Google. This restriction has no functional purpose, does not apply to customers seeking to use the same licenses on Azure, and has no reason for existing other than harming competitors. The PDR finds that this arbitrary licensing restriction has a significant foreclosure effect, showing the average percentage difference between the wholesale prices that

109 PDR, paragraph 25.
110 PDR, paragraph 9.78.
111 PDR, paragraph 6.236.
112 PDR, Table 6.3.
113 PDR, Table 6.6.

AWS pays for Windows Server is 1000-5000% greater than Microsoft's customer-facing prices relating to Windows Server Azure Hybrid Benefit usage.[114] This increased price affects not only direct customers of AWS but also prevents third-party independent software vendors from using AWS to offer products utilising Microsoft software to their own end-customers.

73. The CMA also recognises that Microsoft *arbitrarily* restricts the features and functionality of certain Microsoft software when it is run on non-Azure cloud environments. These feature restrictions impact directly on the cost of running Microsoft software for both AWS and for our customers. For example, customers are unable to use Amazon Workspaces to run Windows Desktop in multisession mode *i.e.*, the mode which allows more than one user to be logged onto the same hardware at the same time. This mode, which is available for Azure customers but not AWS customers, allows customers to simultaneously place multiple users on the same virtual instance, therefore lowering costs. Similarly, the restrictions on utilizing Microsoft 365 licenses on AWS and Google prevent many third-party VDI suppliers from offering their services to end customers using non-Azure cloud services. These non-pricing restrictions, as with BYOL, are imposed by way of simple contractual restrictions rather than out of any technical necessity. It is therefore important, as the PDR recognises,[115] that these non-pricing restrictions be addressed through remedies.

74. The PDR clearly demonstrates that Microsoft's anti-competitive conduct is effective in distorting competition and driving customers to its own cloud services rather than the CSP that customers would choose under competitive conditions. The finding that Microsoft product usage is higher on Azure than on AWS or Google by hundreds of percentage points, [116] and that the difference has increased "significantly" since the introduction of the licensing restrictions beginning in October 2019 is telling, and clearly indicates the effect of the licensing restrictions on Microsoft's customers and competitors, with no other event in that timeframe, which could have effected usage in the same way.

75. We welcome the CMA's recognition that remedies are necessary to combat the arbitrary and anti-competitive licensing restrictions that Microsoft imposed on software that grants it "*a significant degree of market power*".[117] In particular, we support the CMA's acknowledgement that any remedies should be part of a complete single package covering both pricing (including SPLA input costs and BYOL restrictions) and non-pricing restrictions.[118] This is because imposing a fair, reasonable, and non-discriminatory remedy without including feature parity and license mobility remedies would be wholly ineffective. We look forward to engaging with the DMU on the potential remedies outlined in the PDR on Microsoft's unfair licensing practices and are confident that implementing the remedies under consideration will help customers avoid unnecessary and arbitrary additional costs and be free to select the cloud provider of their choice.

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114 PDR, Table 6.7.
115 PDR, Appendix W, paragraph 293.
116 PDR, paragraphs 6.463-6.475.
117 PDR, paragraph 6.236.
118 PDR, Appendix W, paragraph 339.

Conclusion

76. As an important enabling technology, cloud services are a fundamental driver of productivity in the UK. The PDR's proposed remedy to address Microsoft's unfair licensing practices is necessary to ensure a well-functioning IT services sector. However, the PDR's proposed interventions to address unspecified and unsubstantiated barriers to switching and multi-clouding allegedly arising from DTO fees or interoperability could impact innovation and promote the costly and inefficient use of resources. Unfounded regulatory intervention will jeopardise the enormous potential of a well-functioning and highly dynamic IT sector and risks damaging the UK economy's broader prospects for growth, innovation, and productivity.