Appendix T: Licensing analysis

Introduction

T.1 This appendix presents the methodology for and results of the following two analyses:

(a) our SPLA input cost analysis;[1] and

(b) our comparison of the prices that Microsoft charges Azure customers for Windows Server and SQL Server with the prices that it charges AWS and Google.

T.2 Our SPLA input cost analysis provides an estimate of what Microsoft's Windows Server and SQL Server licensing input costs would be if it paid the same input prices that it charges AWS and Google via their respective SPLA contracts. It then expresses these hypothetical input costs as a proportion of customer spend to give an indication of the significance of the licensing input in competing for cloud customers.

T.3 For our comparison of the prices that Microsoft charges Azure customers with the prices it charges AWS and Google, we estimated what Microsoft's Windows Server and SQL Server licensing input costs would be if Microsoft paid the same input prices that it charges AWS and Google. We then calculated the difference between these hypothetical input costs to serve each Azure customer and each Azure customer's actual spend on Windows Server and SQL Server licensing IP. The difference between these figures serves as an indicator of the scale of the difference between Microsoft's customer-facing prices for each product and the input prices that it charges AWS and Google.

T.4 Both analyses use the same data set. Therefore, this appendix first sets out the variables of interest for each analysis and the adjustments we have made to overcome certain data limitations. We then present the full methodology for and results of each analysis in turn.

[1] As outlined in (Description of the software licensing practices), AWS and Google can resell Windows Server and SQL Server as part of their own cloud solutions subject to the terms of the Service Level Provider Agreements (SPLAs) they have with Microsoft.

Data

T.5 Across both analyses, we used a data set containing annual data on each Azure UK customer in 2024. We used 2024 data as this was the most recent year for which complete annual data was available.

(a) For the purposes of our SPLA input cost analysis, the main variables of interest were:

(i) total Windows Server usage in vcore hours;[2] and

(ii) PAYG usage of SQL Server in vcore hours, excluding SQL Server PaaS usage.

(b) For our comparison of the prices that Microsoft charges Azure customers for Windows Server and SQL Server with the prices that it charges AWS and Google the main variables of interest were:

(i) usage of Windows Server licences deployed using the AHB, measured in 'vcore hours';[3]

(ii) PAYG usage of SQL Server measured in vcore hours, excluding SQL Server PaaS usage;

(iii) Windows Server AHB licensing IP spend; and

(iv) SQL Server PAYG licensing IP spend.

T.6 For the billing metrics and input prices that Microsoft charges AWS and Google we used information from AWS' and Google's SPLA contracts with Microsoft.

T.7 We explain below these data points and the adjustments we made to overcome certain data limitations.

Utilisation rates

T.8 Microsoft's usage data is based on billing data, which rounds up the volumes of usage up to the nearest vcore-hour. However, AWS and Google pay for Windows Server and SQL Server by the [✂] and [✂] respectively. Therefore, to accurately estimate how much it would cost Microsoft to host its customers' Windows Server and SQL Server usage if it were subject to AWS' and Google's SPLA terms, we have adjusted the Microsoft data according to the average utilisation rate of Windows Server VMs, ie the proportion of billed hours that customers actually use

[2] Virtual core hours (vcore hours) are hours of usage normalised for the number of virtual core processing units included in the instance being used. For example, an hour of usage of a VM with four vCPUs constitutes four vcore hours.
[3] As described below, the Azure Hybrid Benefit (AHB) allows eligible customers to effectively deploy their existing on-premises Windows Server and SQL Server licences on Azure for no additional licensing cost.

Windows Server VMs on Azure for. Microsoft submitted that the average utilisation rate is [✂]%, so we have multiplied the Microsoft usage volumes data by [✂]% for the purposes of this analysis.

T.9 As noted below, our analysis focuses on SQL Server IaaS usage on VMs (ie as installed on a VM). We understand that the majority of SQL Server IaaS usage occurs on Windows Server VMs (eg [80-90]% [✂] on Azure). In addition, SQL Server IaaS usage can only occur on Windows Server VMs on GCP.[4] Therefore, we considered that the same adjustment is appropriate for both products.

Windows Server AHB IP spend

T.10 As described in (chapter 7, Differences between using Microsoft software products on Azure compared to on non-Azure clouds via SPLA), customers with existing on-premises Windows Server or SQL Server licences and Software Assurance subscriptions or qualifying subscription licences, qualify for the AHB, which allows them to effectively migrate these licences to Azure without paying any additional licensing fees. Alternatively, customers that are not eligible for the AHB can purchase a licence-included service and thereby pay for the Windows Server and/or SQL Server software IP on a PAYG basis.

T.11 As noted above, our price differential analysis aims to compare the prices that Microsoft charges its own customers with the prices it charges AWS and Google. As such, we requested data on Azure customers' spend on Windows Server and SQL Server software IP as separate from the underlying compute costs. Microsoft submitted that it cannot provide separate IP spend data for Windows Server PAYG usage, as [✂].[5] However, Microsoft did provide IP spend data relating to AHB usage. As such, our analysis for Windows Server focuses on the difference in customer-facing and input prices relating to AHB usage only.

T.12 The Windows Server AHB IP spend data that Microsoft provided is [✂].[6] Microsoft submitted that this data may not be a reliable estimate of Azure customers' IP spend relating to AHB usage for the following reasons:

(a) [✂].

(b) there may be missing observations. In particular, if a customer purchased an on-premises licence and Software Assurance [✂].[7]

(c) Microsoft added that the AHB IP spend data [✂].

[4] [✂] response to the CMA's information request [✂].
[5] Microsoft's response to the CMA's information request [✂].
[6] Microsoft's response to the CMA's information request [✂].
[7] Microsoft's response to the CMA's information request [✂].

(d) Microsoft also submitted that a more reliable measure of the IP spend for AHB-benefitting customers would be the list price for on-premises Windows Server licences and Software Assurance.

T.13 First, we consider that comparing [✂] to the SPLA input costs relating to the same volumes of usage is the analytically correct approach. Our analysis effectively analyses the options available to a customer that either has an on-premises licence and is deciding whether to use Azure or whether to use AWS or GCP or is purchasing an on-premises licence with a view to later using it on the cloud. For a customer in either of these scenarios, [✂], and the price AWS or Google pays for that customer to use that software on their respective cloud is the SPLA input cost. These are therefore relevant comparators.[8]

T.14 Second, we have inspected the data and found that in some cases customers show up in the data set as [✂]. Out of all spend by customers with positive Windows Server AHB usage, [10-20]% of that spend was by customers with zero Windows Server AHB IP spend in the data. This missing data is disproportionately concentrated among customers in lower revenue brackets.[9] To address this limitation, we have dropped all customers with positive Windows Server AHB usage and zero Windows Server AHB IP spend for the purposes of our analysis relating to Windows Server. As noted below, we have also excluded customers with less than $10,000 spend from our analyses completely, which were disproportionately impacted by this limitation. This means that our analysis still includes a significant proportion of Windows Server AHB customers in the $10,000-1million revenue bracket and almost all Windows Server AHB customers in the four highest brackets.

T.15 Third, although [✂], we have not seen any reason to treat it as inaccurate.

T.16 Fourth, a cloud provider conducted an analysis of the average difference in Azure customers' Software Assurance spend and its Windows Server input costs as a proportion of VM infrastructure costs (see appendix S). This analysis is almost equivalent to ours except that it uses the list prices for Software Assurance to estimate the numerator, as Microsoft suggests above. The differences in price as a proportion of VM compute costs that this cloud provider's analysis finds are consistent with the results of our analysis below. This suggests that the Windows Server AHB IP spend data that we have used provides a reliable measure of customer spend, once we have dropped customers that are affected by the data limitation described above.

[8] Microsoft also submitted that our analysis creates a meaningless comparison as the smallest unit of demand that a customer can compare the prices for across cloud providers is a Windows Server licence and the underlying VM. Our a
[9] 99.9% of the customers affected are in the 3 lowest revenue brackets, and 97.3% are in the 2 lowest brackets. CMA analysis of Microsoft's submission to the CMA [✂].

SQL Server Editions

T.17 There are three editions of SQL Server that are available to license via the SPLAs: SQL Server Enterprise; SQL Server Standard; and SQL Server Web Edition.[10]

T.18 According to Microsoft's website, Enterprise Edition delivers 'high-end data center capabilities' for 'mission-critical workloads', Standard Edition delivers 'basic data management' for 'departments and small organisations'; and Web Edition is a low-cost option that provides 'scalability, affordability and manageability capabilities for small to large-scale Web properties'.[11]

T.19 Enterprise Edition is significantly more expensive than Standard Edition which is significantly more expensive than Web Edition. The proportion of usage that we assign to each edition substantially therefore impacts our estimates of the SPLA input costs for SQL Server.

T.20 Microsoft provided an estimate of its relative usage data for these editions on SQL PAYG by conducting a normalisation exercise of VM hours by number of cores ([✂]).[12] We use these estimates in our analysis.

SPLA terms

T.21 As noted above, we used information from AWS' and Google's SPLA contracts with Microsoft to estimate how much it would cost to host Azure customers' Windows Server and SQL Server usage according to the terms of their respective SPLAs.

T.22 We set out below our approach to this data, which has been informed by the terms of their respective SPLAs.

SQL Server PAYG

T.23 According to AWS' and Google's SPLA terms, SQL Server, but not Windows Server, is eligible for BYOL on Listed Provider clouds (ie across Azure, AWS and GCP). This means AWS and Google would not incur any input costs to host SQL Server workloads where customers have brought their own on-premises SQL Server licences to Azure. Accordingly, we have estimated the SQL Server licensing input costs using SQL Server pay-as-you-go (PAYG) usage data only. We have estimated the Windows Server licensing input costs using all Windows Server usage.

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[10] [✂] response to the CMA's information request [✂].
[11] Editions and supported features of SQL Server 2022 - SQL Server, accessed 27, November 2024.
[12] Microsoft's response to the CMA's PDR dated 28 January 2025, page 68, footnote 52. Microsoft submitted this is not recorded in the ordinary course of business.

SQL PaaS

T.24 We used data on usage of Windows Server and SQL Server on VMs (ie, IaaS usage) only. This means that SQL PaaS products are not included in the estimates. SQL PaaS products such as Azure's SQL Database are among the most popular cloud services, see (distribution of cloud use by spend in chapter 7). Therefore, our SPLA input cost analysis likely understates the significance of the SQL Server input as a proportion of customer spend on all cloud services. Additionally, our price differential analysis likely understates the price disadvantage that AWS and Google face in competing for customers that demand SQL PaaS, particularly relative to total spend.

Customers with less than $10,000 Azure spend

T.25 We have excluded customers with less than $10,000 spend from both analyses presented below. As noted above, the limitation relating to the Windows Server AHB IP spend data point disproportionately affects these customers. This means that once we have excluded all customers affected from our analysis, only a small minority of Windows Server AHB customers with less than $10,000 spend remain.

T.26 Customers with less than $10,000 spend account for a [✂] minority ([✂]) of total Azure spend. Therefore, our analyses still cover the [✂] majority of Azure spend.

SPLA input cost analysis

Methodology

T.27 As outlined above, we estimated the licensing input costs that Microsoft would incur to host its customers' Windows Server and SQL Server usage if it paid the same input prices that it charges AWS and Google. To do this, we multiplied each Azure customer's total 2024 vcore hours of usage of each product by the respective per-vcore hour price for each product in each of AWS' and Google's SPLAs. We then took these hypothetical licensing input costs as a proportion of the customer spend denominators outlined below.

T.28 We present the mean average licensing input costs as a proportion of each denominator for customers in each of five revenue brackets to give an indication of how the significance of the input may vary in relation to customers of different sizes.[13]

[13] We have calculated the unweighted average in order to consider the impact of the average customer from each revenue bracket. Using unweighted averages ensures that smaller customers are represented equally in the analysis, while the use of revenue brackets still allows us to consider any effects on larger customers.

T.29 For SQL Server, we also present the median results to control for the substantial variance in the results for customers in the lowest revenue brackets, which encompass a broad range of heterogenous customers and for which we suspect the SQL Server data may be less reliable.

T.30 For SQL Server, we also present the median results to account for the fact that some revenue brackets encompass a broad range of heterogenous customers. In particular, the lower brackets include a high concentration of customers at the bottom end of the spend distribution and a long tail of customers with significantly higher spend. As noted above, larger customers are more likely to use more expensive versions of SQL Server. This means that the mean SQL Server input cost proportions may be less representative of the majority of the customers within these brackets.[14]

The denominators

T.31 As discussed in (Significance in the cost base of AWS and Google), the most appropriate denominator to compare the licensing costs to depends on the level of aggregation at which customers make decisions about where to deploy their cloud workloads.

T.32 The extent to which customers make aggregated decisions varies significantly. To account for this apparent variation in the level of aggregation at which customers make these decisions, we have compared the Windows Server licensing input costs to:

(a) customer spend on Azure services, and

(b) spend on Windows Server VMs on Azure.

T.33 We have compared the SQL Server and combined Windows Server and SQL Server licensing input costs to:

(a) customer spend on Azure services, and

(b) spend on Windows Server VMs and SQL Server licensing IP on Azure.

T.34 Windows Server is used as an operating system on VMs. SQL Server is a software product that is installed on VMs, and predominantly Windows Server VMs. For example, [90-100]% of SQL Server usage on Azure (excluding SQL PaaS) occurred on Windows Server VMs in 2022.

T.35 We have found it is not possible, nor desirable to identify a specific set of services that comprises the relevant cost base for an assessment of the importance of the

[14] For Windows Server, the mean and median results are very similar.

input. As such, it is appropriate to consider values within the range, as these are likely to be more reliable as indicators of the importance of the Microsoft software as an input. Most customers are not at either extreme (that is, the relevant unit of their demand is not the costs of supplying all of the services they consume on Azure, nor is it individual products or services such as a Windows Server VM). Therefore, we have placed greater weight on values towards the middle of the range for the cost base.

Combined licensing costs

T.36 [20-30]% of Azure customers that used Windows Server in 2024 also used SQL Server on a PAYG basis, whereas [90-100]% of SQL Server PAYG customers also used Windows Server.[15] Customers that use both Windows Server and SQL Server PAYG account for [✂]% of total Azure revenue. Therefore, for many Windows Server customers, and almost all SQL Server PAYG customers, it is appropriate to consider the combined cost of licensing both products.

T.37 To account for this, we present the combined costs of hosting Azure customers' Windows Server and SQL Server PAYG usage as a proportion of spend for customers that use both Windows Server and SQL Server PAYG (in addition to presenting results for each product separately).

Results of our SPLA input cost analysis

T.38 This section presents the results of our SPLA input cost analysis.

T.39 Table T.1 below shows Microsoft's Windows Server licensing input costs if it paid the same input prices that it charges AWS. These costs are expressed as a share of customer spend across all services and Windows Server VM spend on average for Windows Server customers in each revenue bracket.

Table T.1: Windows Server input costs as a proportion of customer spend on all Azure services and Windows Server VM spend on Azure, AWS SPLA prices

Revenue bracket ($)	*Total Azure spend (%)*	*Windows Server VM spend (%)*
10k-1M	[10-20]	[60-70]
1M-5M	[5-10]	[50-60]
5M-10M	[5-10]	[50-60]
10M-20M	[5-10]	[60-70]
>20M	[5-10]	[70-80]

Source: CMA analysis of Microsoft's submission to the CMA [✂].

T.40 As discussed above, we consider that the significance of the input in competing for any single customer falls somewhere in the range of values presented for each

[15] Our analysis focuses on SQL Server PAYG usage as customers can BYOL to AWS and Google (ie BYOL usage is not subject to SPLA terms). CMA analysis of Microsoft's submission to the CMA [✂].

revenue bracket. Therefore, our analysis suggests that Windows Server accounts for at least [5-10]% and as much as [70-80]% of the relevant spend denominator for customers in across all brackets.

T.41 Table T.2 below shows Microsoft's SQL Server licensing input costs if it paid AWS' SPLA input prices. These costs are expressed as the mean average share of customer spend on all cloud services and spend on Windows Server VMs and SQL Server IP for SQL Server customers in each revenue bracket.

Table T.2: SQL Server input costs as a proportion of customer spend on all Azure services and spend on Windows Server VMs and SQL Server IP on Azure, AWS SPLA prices

Revenue bracket ($)	*As a proportion of all Azure spend (%)*	*As a proportion of Windows Server VM and SQL Server spend (%)*
10k-1M	[10-20]	[30-40]
1M-5M	[0-5]	[10-20]
5M-10M	[0-5]	[10-20]
10M-20M	[0-5]	[10-20]
>20M	[0-5]	[20-30]

Source: CMA analysis of Microsoft's submission to the CMA [✂].

T.42 As discussed above, we consider that the significance of the input in competing for any single customer falls somewhere in the range that we present for each revenue bracket. Therefore, our analysis suggests that SQL Server accounts for at least [0-5]% and as much as [30-40]% of the relevant spend denominator across all brackets.

T.43 Table T.3 below shows Microsoft's SQL Server input costs if it paid AWS' SPLA input prices. These costs are expressed as the median share of customer spend on all Azure services and spend on Windows Server VMs and SQL Server IP spend for customers in each revenue bracket.

Table T.3: Median SQL Server input costs as a proportion of customer spend on all Azure services and spend on Windows Server VMs and SQL Server IP on Azure, AWS SPLA prices

Revenue bracket ($)	*As a proportion of all Azure spend (%)*	*As a proportion of Windows Server VM and SQL Server spend (%)*
10k-1M	[10-20]	[20-30]
1M-5M	[0-5]	[10-20]
5M-10M	[0-5]	[10-20]
10M-20M	[0-5]	[10-20]
>20M	[0-5]	[5-10]

Source: CMA analysis of Microsoft's submission to the CMA [✂].

T.44 The median results are generally lower than the means across the revenue brackets. However, these results suggest that the significance of the SQL Server input for any single customer falls within a similar range of proportions as the mean results presented above.

T.45 Table T.4 below shows Microsoft's combined Windows Server and SQL Server licensing input costs if it paid AWS' SPLA input prices. These costs are expressed as a share of customer spend across all Azure services and spend on Windows Server VMs and SQL Server IP on Azure on average for customers in each revenue bracket that use both products.

Table T.4: Combined Windows Server and SQL Server input costs as a proportion of customer spend on all Azure services and spend on Windows Server VMs and SQL Server IP on Azure, AWS SPLA prices

Revenue bracket ($)	*As a proportion of all Azure spend (%)*	*As a proportion of Windows Server VM and SQL Server spend (%)*
10k-1M	[20-30]	[70-80]
1M-5M	[10-20]	[70-80]
5M-10M	[10-20]	[80-90]
10M-20M	[5-10	[80-90]
>20M	[5-10]	[90-100]

Source: CMA analysis of Microsoft's submission to the CMA [✂].

T.46 As discussed above, we consider that the significance of the input in competing for any single customer falls somewhere in the range that we present for each revenue bracket. Therefore, our analysis suggests that Windows Server and SQL Server combined account for at least [5-10]% and as much as [90-100]% of the relevant spend denominator across all brackets.

T.47 Table T.5 below shows Microsoft's Windows Server licensing input costs if it paid the same input prices that it charges Google. These costs are expressed as a share of customer spend across all services and Windows Server VM spend on average for Windows Server customers in each revenue bracket.

Table T.5: Windows Server input costs as a proportion of customer spend on all Azure services and Windows Server VM spend on Azure, Google SPLA prices

Revenue bracket ($)	*ACR (%)*	*VM (%)*
10k-1M	[10-20]	[60-70]
1M-5M	[5-10]	[60-70]
5M-10M	[5-10]	[70-80]
10M-20M	[5-10]	[70-80]
>20M	[5-10]	[80-90]

Source: CMA analysis of Microsoft's submission to the CMA [✂].

T.48 As discussed above, we consider that the significance of the input in competing for any single customer falls somewhere in the range of values presented for each revenue bracket. Therefore, our analysis suggests that Windows Server accounts for at least [5-10]% and as much as [80-90]% of the relevant spend denominator for customers in across all brackets.

T.49 Table T.6 below shows Microsoft's SQL Server licensing input costs if paid Google's SPLA input prices. These costs are expressed as a share of customer

spend across all Azure services and separately spend on Windows Server VMs and SQL Server IP on Azure for SQL Server customers in each revenue bracket.

Table T.6: SQL Server input costs as a proportion of spend on all Azure services and spend on Windows Server VMs and SQL Server IP on Azure, Google SPLA prices

Revenue bracket ($)	*As a proportion of all Azure spend (%)*	*As a proportion of Windows Server VM and SQL Server spend (%)*
10k-1M	[10-20]	[30-40]
1M-5M	[0-5]	[10-20]
5M-10M	[0-5]	[10-20]
10M-20M	[0-5]	[10-20]
>20M	[0-5]	[20-30]

Source: CMA analysis of Microsoft's submission to the CMA [✂].

T.50 As discussed above, we consider that the significance of the input in competing for any single customer falls somewhere in the range that we present for each revenue bracket. Therefore, our analysis suggests that SQL Server accounts for at least [0-5]% and as much as [30-40]% of the relevant spend denominator for customers in each of the five highest revenue brackets.

T.51 Table T.7 below shows Microsoft's SQL Server input costs if it paid Google's SPLA input prices. These costs are expressed as the median share of customer spend on all Azure services and spend on Windows Server VMs and SQL Server IP spend for customers in each revenue bracket.

Table T.7: Median SQL Server input costs as a proportion of customer spend on all Azure services and spend on Windows Server VMs and SQL Server IP on Azure, Google SPLA prices

Revenue bracket ($)	*As a proportion of all Azure spend (%)*	*As a proportion of Windows Server VM and SQL Server spend (%)*
10k-1M	[5-10]	[20-30]
1M-5M	[0-5]	[10-20]
5M-10M	[0-5]	[10-20]
10M-20M	[0-5]	[10-20]
>20M	[0-5]	[10-20]

Source: CMA analysis of Microsoft's submission to the CMA [✂].

T.52 The median results are generally lower than the means across the revenue brackets. However, these results suggest that the significance of the SQL Server input for any single customer falls within a similar range of proportions as the mean results presented above.

T.53 Table T.8 below shows Microsoft's combined Windows Server and SQL Server licensing input costs if it paid Google's SPLA input prices. These costs are expressed as a share of customer spend across all Azure services and spend on Windows Server VMs and SQL Server IP on Azure on average for customers in each revenue bracket that use both products.

Table T.8: Combined Windows Server and SQL Server input costs as a proportion of customer spend on all Azure services and spend on Windows Server VMs and SQL Server IP on Azure, Google SPLA prices

Revenue bracket ($)	*As a proportion of all Azure spend (%)*	*As a proportion of Windows Server VM and SQL Server spend (%)*
10k-1M	[20-30]	[80-90]
1M-5M	[10-20]	[70-80]
5M-10M	[10-20]	[80-90]
10M-20M	[5-10]	[80-90]
>20M	[5-10]	[90-100]

Source: CMA analysis of Microsoft's submission to the CMA [✂].

T.54 As discussed above, we consider that the significance of the input in competing for any single customer falls somewhere in the range that we present for each revenue bracket. Therefore, our analysis suggests that Windows Server and SQL Server combined account for at least [5-10]% and as much as [90-100]% of the relevant spend denominator across the five highest revenue brackets.

Our comparison of the prices that Microsoft charges Azure customers for Windows Server and SQL Server with the prices that it charges AWS and Google

Methodology

T.55 As above (SPLA input cost analysis), we estimated the licensing input costs that Microsoft would incur to host Azure customers' Windows Server and SQL Server usage if it paid the same input prices that it charges AWS and Google.

T.56 To do this, we multiplied each Azure customer's total 2024 vcore hours of usage of each product by the respective per-vcore hour price in each of AWS' and Google's SPLAs. We then calculated the difference between these hypothetical input costs to serve each Azure customer and each Azure customer's actual spend on Windows Server and SQL Server licensing IP. The difference between these figures serves as an indicator of the scale of the difference between Microsoft's customer-facing prices for each product and the input prices that it charges AWS and Google.

T.57 As such, our analysis effectively compares the customer-facing prices on Azure (net of discounts) and the input prices that Microsoft charges AWS and Google, as both the IP spend figures and estimated input costs are multiples of the same volumes of usage.

T.58 We express the differences in SPLA input costs and licensing IP spend as (a) percentage differences, (b) a proportion of customer spend on Windows Server VMs (and SQL Server IP in the case of SQL Server) on Azure, and (c) customer spend across all Azure services.

T.59 The percentage differences demonstrate the magnitude of the difference between the upstream and downstream prices. The differences as a proportion of each denominator provide an indication of the additional input costs that AWS and Google would face when competing with Microsoft for customers that want to use each software product on public cloud (and cover their costs), all else equal.

T.60 As discussed above, to account for the likelihood that customers make decisions over cloud spend allocation at different levels of aggregation, we compare the difference in input and customer-facing prices to both a broad and narrow denominator. The additional costs that AWS and Google would face when competing with Microsoft for any single customer that wants to use each product on public cloud will fall within the range that we present for each revenue bracket.

T.61 We present the mean and median of each of (a), (b) and (c) for customers that use the relevant product in each revenue bracket to understand how the potential for the conduct to foreclose AWS and Google may vary with respect to customers of different sizes.

T.62 We also present the median results to control for the substantial variance in the results for customers in the lowest revenue brackets, which encompass a broad range of heterogenous customers and for which we suspect the SQL Server data may be less reliable.

T.63 To directly compare the input prices that AWS and Google face compared with Microsoft, we would ideally compare Microsoft's own Windows Server and SQL Server unit input costs with the prices it charges AWS and Google for each product. However, we do not have access to data on Microsoft's licensing input costs as there is no internal input cost for Microsoft. Therefore, as a proxy, our analysis compares the prices that Microsoft charges its customers to use Windows Server and SQL Server on Azure (ie, its customer facing prices) to the input prices that it charges AWS and Google.

T.64 As such, this analysis understates any potential for there to be price disadvantage on AWS and Google as it does not account for the margin that Microsoft charges over its own licensing input costs (which may be large considering Azure's overall profitability – see appendix E). That is, even if Microsoft charged a higher price to its customers than the input price it charges AWS and Google, the input price charged to the latter may still be high enough to be consistent with a material disadvantage for AWS and Google in competing for cloud customers that want or need to use Microsoft software.

Windows Server AHB vs PAYG

T.65 As noted above, due to the availability of data our analysis for Windows Server focuses on the difference in customer-facing and input prices relating to AHB usage only.

T.66 Microsoft submitted that Azure customers whose choice of cloud provider is most likely to be impacted by price factors are those eligible for and take advantage of the AHB discount.[16] In relation to this, Microsoft submitted that the Azure AHB discount is of limited importance to competition in the cloud markets, and AHB is declining in relevance. [17] In particular, Microsoft submitted that:

(a) The share of Azure UK customers that run Windows Server that use AHB declined from [40-50]% in 2020 to [20-30]% in 2023. [18]

(b) [✂]. [19]

(c) customers may consume some VMs with the AHB discount applied (where they have existing licences) and some without. Microsoft added that in 2023 [20-30]% of AHB UK customers on Azure had their entire consumption covered by AHB. [20]

(d) [✂].[21]

T.67 While we have not assessed the difference in Microsoft's customer-facing prices and the SPLA input prices for Windows Server PAYG usage, we consider that our analysis of AHB usage provides a good indication of the foreclosing potential of the conduct with respect to Windows Server generally. We set out our reasoning below.

T.68 We consider that AHB is significant in the context of total Windows Server usage and the proportion of customer spend from customers with Windows Server AHB usage. We have found that AHB usage accounted for [40-50]% of total Windows Server usage on Azure in 2024, up from [30-40]% in 2022.[22] While we considered this is in itself a material portion of usage, we believe it understates the importance of AHB. In particular, we consider that it is relevant to look at the proportion of customer spend generated by customers with AHB usage, which reflects the proportion of revenue-weighted customers that AWS and Google may be

[16] Microsoft's submission to the CMA [✂].
[17] Microsoft's submission to the CMA [✂].
[18] Microsoft's submission to the CMA [✂]. [✂].
[19] Microsoft's submission to the CMA [✂].
[20] Microsoft's submission to the CMA [✂].
[21] Microsoft's submission to the CMA [✂].
[22] 2022 figure comes from dividing the total AHB Windows Server hours of usage from Microsoft's response to the CMA's information request [✂] by the total hours of Windows Server usage in Microsoft's response to the CMA's information request [✂] for the year 2022. For the 2024 figure, we made the equivalent calculation using Microsoft's submission to the CMA [✂].

disadvantaged in competing for as a result of Microsoft's licensing practices.[23] In this regard, we found that [70-80]% of Azure spend generated by customers with positive Windows Server AHB usage in 2024.[24]

T.69 We agree with Microsoft that it is relevant to consider customers that use some VMs running Windows Server with the AHB applied and some without the AHB applied. We have found that, of those customers with a total spend in 2024 of $10,000 or greater, customers with both Windows Server AHB and PAYG usage account for [80-90]% of Azure spend.[25] That is, almost all Windows Server AHB customers (when weighted by revenue) are also Windows Server PAYG customers. This likely shows that customers that bring their qualifying Windows Server licences to Azure using the AHB tend to increase their usage of Windows Server on Azure thereafter, as it would be irrational for customers to deploy more expensive Windows Server PAYG VMs before exhausting their available licences that qualify for the AHB. Therefore, to the extent that Microsoft's licensing practices relating to the AHB influence customers' choice of cloud provider, AWS and Google would be disadvantaged with respect to both these customers' initial workloads that qualified for AHB, and their other Windows Server workloads.[26]

T.70 Further, we have also estimated the relative usage of Windows Server VMs with the AHB applied compared to VMs without the AHB for customers that have at least some AHB usage in the data and had a total spend in 2024 of $10,000 or greater.[27] Among these customers, AHB usage accounts for [50-60]% of total Windows Server usage.[28] Therefore, to the extent that there is a significant difference in customer-facing and input prices relating to AHB licences, even if there is no difference relating to PAYG usage, the effective difference across AHB and PAYG may still be significant. For example, assuming that the input prices that AWS or Google pay are 1000% higher than Microsoft's customer-facing prices relating to AHB usage and equal to its PAYG prices, the input prices would still be [✂] higher than the effective price that such customers pay across their total Windows Server consumption on average.

T.71 Finally, we present the difference in Windows Server AHB IP spend and SPLA input costs as a proportion of customers' total spend on Windows Server VMs both with and without the AHB applied. This gives an indication of the impact of the conduct relative to customers' overall Windows Server consumption.

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[23] In comparison, Microsoft's estimate, as set out above, is an unweighted share of customers, which we therefore consider understates the importance of AHB to competition.
[24] Microsoft's submission to the CMA [✂]. CMA analysis of Microsoft's responses to the CMA's information requests [✂].
[25] CMA analysis of Microsoft's responses to the CMA's information requests [✂].
[26] We note that, to the extent that customers are willing to multi-cloud and place their Windows Server workloads on separate public clouds, the effect on AWS and Google would be reduced.
[27] We considered that Microsoft's estimate of the proportion of customers with their entire consumption covered by AHB is less informative in this regard.
[28] CMA analysis of Microsoft's submission to the CMA [✂].

SQL Server PAYG

T.72 As noted above, we have assessed the difference in Microsoft's customer-facing prices and SPLA input prices for SQL Server with respect to PAYG usage only. This is because SQL Server is eligible for BYOL to AWS and GCP. As such, AWS and Google would incur no input costs if they were to host Azure customers' SQL Server workloads that are eligible for the AHB on their clouds. That said, we note that marketing materials on Microsoft's website indicate that SQL Server may perform better and cost less when customers bring their own licences to Azure rather than AWS or GCP, and it is unclear whether this is related to a licensing practice or restriction. In case that it is related, such price and quality differences could potentially contribute to foreclosure without impacting AWS' or Google's input costs, but our analysis has not assessed that.[29]

Results of our comparison of the prices that Microsoft charges Azure customers for Windows Server and SQL Server with the prices that it charges AWS and Google

T.73 This subsection presents the results of our comparison of the prices that Microsoft charges Azure customers for Windows Server and SQL Server with the prices that it charges AWS and Google. We note that in the tables below ACR stands for Azure Consumed Revenue and denotes total customer spend on Azure services, VM denotes spend on Windows Server VMs and VM+SQL denotes spend on Windows Server VMs and SQL Server IP on Azure.

AWS SPLA prices

T.74 Table T.9 below shows the difference between the input prices that Microsoft charges AWS and Google for Windows Server and its customer-facing prices relating to Windows Server AHB usage. These price differentials are presented as average percentage differences for customers in each revenue bracket.

Table T.9: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.75 Our analysis suggests that the input prices that Microsoft charges AWS for Windows Server are at least [✂]% higher than its customer-facing prices relating to Windows Server AHB usage.

[29] For example, the Azure website states that migrating SQL Server to Azure VMs rather than AWS EC2 instances is up to 23% cheaper and allows for up to 22% faster performance. See: SQL Server on Azure Virtual Machines - Microsoft Azure.

T.76 Table T.10 shows the median percentage difference between Microsoft's customer-facing prices and the input prices that AWS pays for Windows Server for customers in each revenue bracket.

Table T.10: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.77 The median percentage differences are generally lower than the means presented above. However, they still suggest that Microsoft charges AWS a significantly higher price for Windows Server than its customer-facing prices relating to Windows Server AHB usage.

T.78 Table T.11 below shows the difference between the input prices that Microsoft charges AWS and Google for Windows Server and its customer-facing prices expressed as a proportion of total spend across all Azure services and spend on Windows Server VMs on Azure on average for customers in each revenue bracket.

Table T.11: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.79 Our analysis suggests that the difference between Microsoft's customer facing prices and the input prices it charges AWS for Windows Server account for at least [✂]% of customer spend across all Azure services and as much as [✂] of spend on Windows Server VMs across all revenue brackets.

T.80 As discussed above, the additional costs that AWS face when competing with Microsoft for any single customer that wants to use Windows Server on public cloud and qualifies for the AHB falls within the range that we present for each revenue bracket. These results suggest that AWS faces a disadvantage in competing for such customers, and this is particularly the case for customers that allocate their cloud spend in a less aggregated way.

T.81 Table T.12 below shows the median difference between the input prices that AWS pays for Windows Server and Microsoft's customer-facing prices expressed as a proportion of total Azure spend and spend on Windows Server VMs on Azure.

Table T.12: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.82 The median results are generally lower than the means presented above. However, they still suggest that AWS faces a disadvantage in competing for customers that want to use Windows Server on public cloud and qualify for the AHB, and this is particularly the case for customers that aggregate their cloud spend in a less aggregated way.

T.83 Table T.13 below shows the percentage difference between the input prices that Microsoft charges AWS for SQL Server and its customer-facing prices relating to SQL Server PAYG usage on average for customers in each revenue bracket.

Table T.13: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.84 Our analysis suggests that the input prices are at least [✂]% higher than Microsoft's customer-facing prices for customers.

T.85 Table T.14 below shows the median difference between the input prices that AWS pays for Windows Server and Microsoft's customer-facing prices expressed as a proportion of total Azure spend and spend on Windows Server VMs on Azure.

Table T.14: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.86 The median percentage differences are generally lower than the means presented above. However, they still suggest that Microsoft charges AWS significantly higher prices for SQL Server than its PAYG customer-facing prices.

T.87 Table T.15 below shows the difference between the input prices that Microsoft charges AWS for SQL Server and its customer-facing prices relating to SQL Server PAYG usage expressed as a proportion of customer spend across all Azure services and spend on Windows Server VMs and SQL Server IP on average for SQL Server customers in each revenue bracket.

Table T.15: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.88 Our analysis suggests that the difference between Microsoft's customer facing prices and the input prices it charges AWS for SQL Server account for at least [✂] of customer spend across all Azure services and as much as [✂] of spend on Windows Server VMs across all revenue brackets.

T.89 As discussed above, the additional costs that AWS face when competing with Microsoft for any single customer that wants to use SQL Server on a PAYG basis on public cloud falls within the range that we present for each revenue bracket. These results suggest that AWS faces a disadvantage in competing for such customers, and this is particularly the case for customers that allocate their cloud spend in a less aggregated way.

T.90 Table T.16 below shows the median difference between the input prices that Microsoft charges AWS for SQL Server and its customer-facing prices relating to SQL Server PAYG usage expressed as a proportion of customer spend across all Azure services and spend on Windows Server VMs and SQL Server IP for SQL Server customers in each revenue bracket.

Table T.16: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request issued [✂].

T.91 The median results are generally lower than the means presented above. However, they also suggest that AWS faces a disadvantage in competing for customers that want to use SQL Server on a PAYG basis on public cloud, and this is particularly the case for customers that allocated cloud spend in a less aggregated way.

T.92 Table T.17 below shows the combined percentage difference in the input prices that Microsoft charges AWS for Windows Server and SQL Server and its customer-facing prices relating to Windows Server AHB and SQL Server PAYG usage, on average for customers in each revenue bracket.

Table T.17: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]. Microsoft's response to Ofcom's information request [✂].

T.93 Our analysis suggests that the input prices that Microsoft charges AWS for Windows Server and SQL Server are together at least [✂]% higher than its customer-facing prices across Windows Server AHB and SQL Server PAYG usage.

T.94 Table T.18 below shows the median percentage differences between the combined input prices that Microsoft charges AWS for Windows Server and SQL Server and its customer-facing prices relating to Windows Server AHB and SQL Server PAYG usage.

Table T.18: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; [✂] to Microsoft's response to Ofcom's information request [✂].

T.95 The median percentage differences are generally lower than the mean results presented above across most revenue brackets. However, they still suggest that Microsoft charges AWS significantly higher prices for SQL Server than its PAYG customer-facing prices.

T.96 Table T.19 below shows the combined difference in the input prices that Microsoft charges AWS for Windows Server and SQL Server and its customer-facing prices relating to Windows Server AHB and SQL Server PAYG usage expressed as a proportion of customer spend across all Azure services and spend on Windows Server VMs and SQL Server IP on average for SQL Server customers in the four highest revenue brackets.

Table T.19: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.97 Our analysis suggests that the difference between the input prices that Microsoft charges AWS for Windows Server and SQL Server and its customer-facing prices account for at least [✂] of spend across all Azure services and as much as [✂] of spend on Windows Server VMs and SQL Server IP across all revenue brackets.

T.98 As discussed above, the additional costs that AWS must face when competing with Microsoft for any single customer that wants to use Windows Server and SQL Server on a PAYG basis on public cloud falls within the range that we present for each revenue bracket. These results suggest that AWS faces a disadvantage in competing for such customers, and this is particularly the case for customers that allocate their cloud spend in a less aggregated way.

T.99 Table T.20 below shows the median combined difference in the input prices that Microsoft charges AWS for Windows Server and SQL Server and its customer-facing prices relating to Windows Server AHB and SQL Server PAYG prices, as a proportion of total spend on all Azure services and spend on Windows Server VMs and SQL Server IP on Azure.

Table T.20: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.100 The median results are generally lower than the means presented above across most revenue brackets. However, they also suggest that AWS faces a disadvantage in competing for customers that want to use Windows Server and

SQL Server on a PAYG basis on public cloud, and this is particularly the case for customers that aggregate their cloud spend in a less aggregated way.

Google SPLA prices

T.101 Table T.21 below shows the difference between the input prices that Microsoft charges Google for Windows Server and its customer-facing prices relating to Windows Server AHB usage. These price differentials are presented as average percentage differences for customers in each revenue bracket.

Table T.21: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.102 Our analysis suggests that the input prices that Microsoft charges Google for Windows Server are at least [✂]% higher than its customer-facing prices relating to Windows Server AHB usage.

T.103 Table T.22 shows the median percentage difference between Microsoft's customer-facing prices and the input prices that Google pays for Windows Server for customers in each revenue bracket.

Table T.22: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.104 The median percentage differences are generally lower than the means presented above. However, they still suggest that Microsoft charges Google a significantly higher price for Windows Server than its customer-facing prices relating to Windows Server AHB usage.

T.105 Table T.23 below shows the difference between the input prices that Microsoft charges Google and Google for Windows Server and its customer-facing prices expressed as a proportion of total spend across all Azure services and spend on Windows Server VMs on Azure on average for customers in each revenue bracket.

Table T.23: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.106 Our analysis suggests that the difference between Microsoft's customer facing prices and the input prices it charges Google for Windows Server account for at

least [✂]% of customer spend across all Azure services and as much as [✂] of spend on Windows Server VMs across all revenue brackets.

T.107 As discussed above, the additional costs that Google must face when competing with Microsoft for any single customer that wants to use Windows Server on public cloud and qualifies for the AHB falls within the range that we present for each revenue bracket. These results suggest that Google faces a disadvantage in competing for such customers, and this is particularly the case for customers that allocate their cloud spend in a less aggregated way.

T.108 Table T.24 below shows the median difference between the input prices that Google pays for Windows Server and Microsoft's customer-facing prices expressed as a proportion of total Azure spend and spend on Windows Server VMs on Azure.

Table T.24: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.109 The median results are generally lower than the means presented above. However, they still suggest that Google faces a disadvantage in competing for customers that want to use Windows Server on public cloud and qualify for the AHB, and this is particularly the case for customers that aggregate their cloud spend in a less aggregated way.

T.110 Table T.25 below shows the percentage difference between the input prices that Microsoft charges Google for SQL Server and its customer-facing prices relating to SQL Server PAYG usage on average for customers in each revenue bracket.

Table T.25: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.111 Our analysis suggests that the input prices are at least [✂]% higher than Microsoft's customer-facing prices for customers.

T.112 Table T.26 below shows the median percentage difference between the input prices that Google pays for Windows Server and Microsoft's customer-facing prices relating to SQL Server PAYG usage.

Table T.26: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.113 The median percentage differences are generally lower than the means presented above. However, they still suggest that Microsoft charges Google significantly higher prices for SQL Server than its PAYG customer-facing prices.

T.114 Table T.27 below shows the difference between the input prices that Microsoft charges Google for SQL Server and its customer-facing prices relating to SQL Server PAYG usage expressed as a proportion of customer spend across all Azure services and spend on Windows Server VMs and SQL Server IP on average for SQL Server customers in each revenue bracket.

Table T.27: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.115 Our analysis suggests that the difference between Microsoft's customer facing prices and the input prices it charges Google for SQL Server account for at least [✂]% of customer spend across all Azure services and as much as [✂] of spend on Windows Server VMs across all revenue brackets.

T.116 As discussed above, the additional costs that Google must face when competing with Microsoft for any single customer that wants to use SQL Server on a PAYG basis on public cloud falls within the range that we present for each revenue bracket. These results suggest that Google faces a disadvantage in competing for such customers, and this is particularly the case for customers that allocate their cloud spend in a less aggregated way.

T.117 Table T.28 below shows the median difference between the input prices that Microsoft charges Google for SQL Server and its customer-facing prices relating to SQL Server PAYG usage expressed as a proportion of customer spend across all Azure services and spend on Windows Server VMs and SQL Server IP for SQL Server customers in each revenue bracket.

Table T.28: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.118 The median results are generally lower than the means presented above. However, they also suggest that Google faces a disadvantage in competing for customers that want to use SQL Server on a PAYG basis on public cloud, and this is particularly the case for customers that allocated cloud spend in a less aggregated way.

T.119 Table T.29 below shows the combined percentage difference in the input prices that Microsoft charges Google for Windows Server and SQL Server and its

customer-facing prices relating to Windows Server AHB and SQL Server PAYG usage, on average for customers in each revenue bracket.

Table T.29: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.120 Our analysis suggests that the input prices that Microsoft charges Google for Windows Server and SQL Server are together at least [✂]% higher than its customer-facing prices across Windows Server AHB and SQL Server PAYG usage.

T.121 Table T.30 below shows the median percentage differences between the combined input prices that Microsoft charges Google for Windows Server and SQL Server and its customer-facing prices relating to Windows Server AHB and SQL Server PAYG usage.

Table T.30: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.122 The median percentage differences are generally lower than the mean results presented above across most revenue brackets. However, they still suggest that Microsoft charges Google significantly higher prices for SQL Server than its PAYG customer-facing prices.

T.123 Table T.31 below shows the combined difference in the input prices that Microsoft charges Google for Windows Server and SQL Server and its customer-facing prices relating to Windows Server AHB and SQL Server PAYG usage expressed as a proportion of customer spend across all Azure services and spend on Windows Server VMs and SQL Server IP on average for SQL Server customers in the four highest revenue brackets.

Table T.31: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA[✂]; Microsoft's response to Ofcom's information request [✂].

T.124 Our analysis suggests that the difference between the input prices that Microsoft charges Google for Windows Server and SQL Server and its customer-facing prices account for at least [✂]% of spend across all Azure services and as much as [✂]% of spend on Windows Server VMs and SQL Server IP across all revenue brackets.

T.125 As discussed above, the additional costs that Google must face when competing with Microsoft for any single customer that wants to use Windows Server and SQL Server on a PAYG basis on public cloud falls within the range that we present for each revenue bracket. These results suggest that Google faces a disadvantage in competing for such customers, and this is particularly the case for customers that allocate their cloud spend in a less aggregated way.

T.126 Table T.32 below shows the median combined difference in the input prices that Microsoft charges Google for Windows Server and SQL Server and its customer-facing prices relating to Windows Server AHB and SQL Server PAYG prices, as a proportion of total spend on all Azure services and spend on Windows Server VMs and SQL Server IP on Azure.

Table T.32: [✂]

[✂]

Source: CMA analysis of Microsoft's submission to the CMA [✂]; Microsoft's response to Ofcom's information request [✂].

T.127 The median results are generally lower than the means presented above across most revenue brackets. However, they also suggest that Google faces a disadvantage in competing for customers that want to use Windows Server and SQL Server on a PAYG basis on public cloud, and this is particularly the case for customers that aggregate their cloud spend in a less aggregated way.