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Civil Aviation Authority

Initial Proposals for the H8 Cost of Capital

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Executive Summary

A. Introduction

1. FTI Consulting has been commissioned by the UK Civil Aviation Authority ("**CAA**") for the purpose of determining the weighted average cost of capital ("**WACC**") for Heathrow Airport Limited ("**HAL**") in the next price control period ("**H8**") which will run from the start of 2027 to the end of 2031.

2. This report sets out the methodology and analysis for providing a preliminary estimate of the WACC for H8 to inform the CAA's Initial Proposals for H8.

3. In selecting the methodology and conducting our analysis, we have considered a wide evidence base. This includes contemporaneous capital market data, the precedent set by the CAA in determining the WACC for the current price control period ("**H7**"), more recent regulatory determinations in the UK energy and water sectors, changes in market conditions since H7, and various representations made by stakeholders.

4. All external data and publications considered in this report are based on a cut-off date of 1 November 2025. This means that, in particular, we have not reflected any data following the beginning of the conflict between the USA and Israel and Iran. We would expect to consider such data in our final report.

B. Key methodological considerations

5. The H7 WACC determination was conducted during volatile global capital market conditions and particularly extreme circumstances for the global aviation industry. Since then, there have been changes in the CAA's policy, as well as relative normalisation of operating and market conditions. As such, the key issues that merit consideration in estimating the H8 WACC are:

(1) **Change in inflation basis for price control:** The CAA has made a policy decision to change the inflation basis of HAL's price control from the Retail Price Index ("**RPI**") to the Consumer Price Index including owner occupiers' housing costs ("**CPIH**"). This necessitates a change in approach to estimating a real WACC.

(2) **Change in operating conditions:** Over H7, HAL was expected to have spare capacity due to the impact on passenger traffic from the Covid-19 pandemic and the expected time to recover from this impact. However, HAL is currently handling record levels of passenger numbers and over H8, it is expected to face capacity constraints. This indicates the normalisation of operating conditions. From a passenger traffic standpoint, this is reflective of operating conditions during the Q6 price control (2014 to 2021). This suggests that capital market data pertaining to pre-, intra, and post-pandemic data needs to be considered in an appropriate manner.

(3) **Change in capital market conditions:** When determining the H7 WACC, capital market data exhibited high volatility reflecting the uncertainty associated with how the economy would recover from the pandemic. This required some judgement in interpreting market data and resulted in the CAA having to adopt novel approaches for determining the WACC. In the recent past, capital market volatility has decreased relative to H7, suggesting that the novel approaches adopted by the CAA in determining the H7 WACC merit review.

(4) **Expected alignment between RPI and CPIH:** The Office for National Statistics has announced its plan to align RPI with CPIH in 2030. The implication of this change needs to be considered thoroughly when incorporating inflation expectations in setting the WACC.

(5) **Recent regulatory precedent:** Since H7, there have been a number of regulatory WACC determinations that merit consideration. In particular, CAA's NERL 2023-27 price control ("**NR23**"), Ofwat's 2025-30 price review ("**PR24**"), Ofgem's 2026-31 'Revenues = Incentives + Innovation + Outputs' price control ("**RIIO-3**"), and the CMA's PR24 appeal Provisional Determinations ("**PR24 PD**") are all relevant precedents.

6. Our approach to determining notional gearing, cost of new debt, total market return and issuance costs is broadly aligned with the approach at H7 (with the added caveat that these parameters are now denominated on a CPIH-basis). We have updated the data for these parameters to reflect contemporaneous market evidence and recent regulatory precedent.

7. For other parameters, and reflecting the considerations in paragraph 5, we have departed from the CAA's H7 methodology where needed and explained the rationale underpinning the updated approach. These are summarised below.

(1) **Risk-free rate:** We retain reference to the yield of 20-year index-linked gilts as the primary instrument to set the risk-free rate. However, we do not advocate an allowance for the convenience yield (as was included for H7). This is because prevailing market evidence suggests that there is no observable convenience yield on gilts.

(2) **Beta:** We broadly retain the comparator set from H7 for estimating the beta. We also retain the Traffic Risk Sharing ("**TRS**") adjustment to the estimated beta value from comparators given the CAA's policy decision to continue implementing the TRS mechanism. However, in contrast to the CAA's re-weighted approach to estimating betas at H7, we rely on unweighted 2-, 5- and 10-year betas. This is primarily motivated by the observed decrease in capital market volatility since H7.

(3) **Cost of embedded debt:** We adopt a 'balance sheet-led' approach for estimating the cost of embedded debt for H8 (as opposed to the CAA's 'notional' approach at H7). This is primarily due to the practical challenges associated with calibrating a suitable notional approach for H8 relating to factors such as increased interest rates since H7 and the planned alignment between RPI and CPIH during H8.

(4) **Liquidity costs:** We adopt an 'actuals-based' approach for estimating liquidity costs instead of a notional approach. This reflects our review of market evidence, recent regulatory precedent, and concerns regarding the accuracy of the notional approach and the number of assumptions needed to implement it.

8. We have assessed whether our methodology results in a robust estimate by conducting relevant cross-checks. These are described throughout the report.

C. Results

9. Based on the evidence reviewed and presented in this report, our estimate of the real vanilla WACC range for H8 is 4.36 – 5.33% CPIH-deflated. For comparison, the final H7 WACC range was 3.53 – 4.63% CPIH-deflated[1] (2.61 – 3.70% RPI-deflated).

10. Table ES-1 below sets out the parametric details underpinning our estimates.

[1] The H7 price control was RPI-deflated, hence we need to convert this figure to a CPIH-basis to ensure it is on a like-for-like basis with H8. We convert all H7 figures assuming a RPI-CPIH wedge of 0.9%. We adopt this as it is consistent with contemporaneous regulatory decisions when H7 was finalised.

Table ES-1: H7 WACC (RPI-deflated) and H8 proposed WACC (CPIH-deflated)

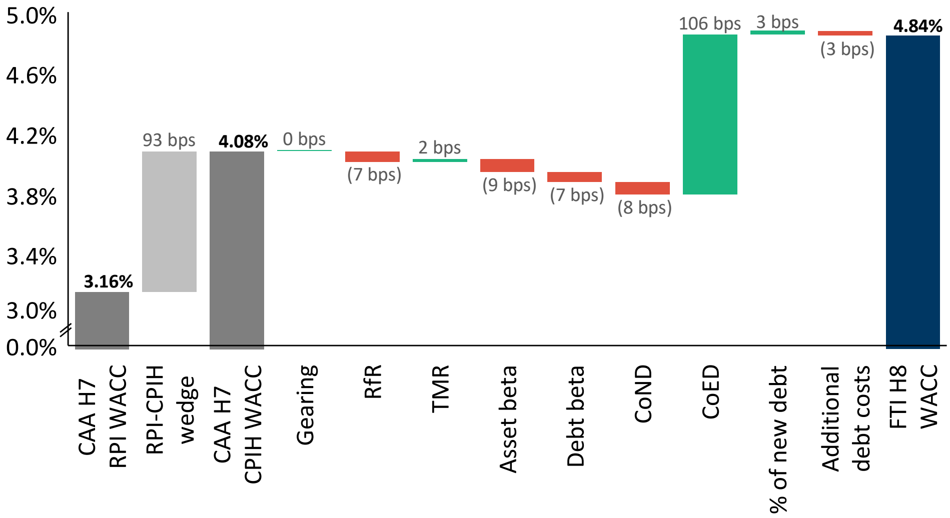
Component	H7 Final Decision (post CMA determination) (RPI)[1]		H8 Initial Proposals (CPIH)	
	Low	*High*	*Low*	*High*
Gearing	60%	60%	60%	60%
Risk-free rate	0.59%	0.59%	2.33%	2.33%
Total market return	5.85%	5.85%	6.72%	6.92%
Equity risk premium	5.26%	5.26%	4.39%	4.59%
Asset beta	0.44	0.62	0.44	0.58
Debt beta	0.10	0.05	0.15	0.05
Equity beta	0.95	1.47	0.88	1.37
Post-tax cost of equity	5.59%	8.32%	6.19%	8.62%
Cost of new debt	4.17%	4.17%	3.93%	3.93%
Cost of embedded debt	(0.12%)	(0.12%)	2.77%	2.77%
Proportion of new debt	11.61%	11.61%	15.37%	15.37%
Issuance and liquidity costs	0.25%	0.25%	0.19%	0.19%
Cost of debt	0.62%	0.62%	3.14%	3.14%
Vanilla WACC (RPI-deflated)	**2.61%**	**3.70%**		
Midpoint (RPI-deflated)	**3.16%**			
RPI-CPIH wedge	*0.90%*	*0.90%*		
Vanilla WACC (CPIH-deflated)	**3.53%**	**4.63%**	**4.36%**	**5.33%**
Mid-point (CPIH-deflated)[2]	**4.08%**		**4.84%**	

Source: CAA (2023), H7 Final Decision, Section 3: Financial issues and implementation, Table 9.6 (link); CAA (2024), Economic regulation of Heathrow airport: H7 final issues, ¶2.15 (link); FTI Consulting (2024), Cost of Capital Strategy for H8, Table 4-1 (link); CMA (2021), Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, Final report, ¶9.242 (link); FTI analysis.

*Note: (1) The cut-off date for the H7 analysis was 17 November 2022. (2) The CAA did not determine a CPIH WACC range at H7. This has been derived for the purposes of this report to facilitate comparison. Applying a RPI-CPIH wedge of 0.90% using the Fisher equation results in a CAA H7 CPIH-real WACC that is 93 basis points ("**bps**") higher than the RPI-real WACC.*

11. Our range is higher than H7 on a like-for-like basis by c. 76bps at the midpoint.[2] As illustrated in Figure ES-1 below, this is primarily due to an increase in the real cost of embedded debt, which reflects increases in interest rates and the stabilisation of inflation expectations since H7.[3]

Figure ES-1: Waterfall chart illustrating the impact of H8 parametric estimates on the midpoint of the H7 WACC range[4]



Source: CAA (2023), H7 Final Decision, Section 3: Financial issues and implementation, Table 9.6 (link); CAA (2024), Economic regulation of Heathrow airport: H7 final issues, ¶2.15 (link); FTI Consulting (2024), Cost of Capital Strategy for H8, Table 1 (link); CMA (2021), Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, Final report, ¶9.242 (link); FTI analysis.

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2 Note that this is purely for comparison purposes. This report does not opine on the issue of selecting an appropriate point estimate from within the WACC range.

3 We have reviewed the updated cost of embedded debt under the H7 methodology in our previous report and compared it to the estimate under our proposed approach for H8. The comparison indicates that the increase in the cost of embedded debt estimate is primarily a function of rising interest rates and stabilising inflation, and not a function of the change in approach. See FTI Consulting (2024), *Cost of Capital Strategy for H8*, Appendix 2 (link).

4 Note the following abbreviations: RfR – risk-free rate; TMR – total market return; CoND – cost of new debt; CoED – cost of embedded debt.

Note: (1) Applying a RPI-CPIH wedge of 0.90% (as indicated in Table ES-1) using the Fisher equation results in a CAA H7 CPIH-real WACC that is 93 bps higher than the RPI-real WACC. (2) Totals may not sum precisely due to rounding.

12. However, on a nominal basis, the implied midpoint of our proposed H8 WACC range is 46 bps lower than the H7 WACC (i.e., 7.06%[5] compared to 7.52%).[6] This illustrates the stabilisation of inflation expectations since H7.

13. Overall, our WACC range reflects the fact that while UK and global capital market conditions have changed significantly since H7 (primarily elevated interest rates and lower inflation expectations), HAL is also now operating under significantly less uncertain conditions.

[5] The nominal cost of capital is calculated as (1 + 4.84%) × (1 + 2.12%) – 1 = 7.06%, where 2.12% is the medium-term inflation forecast over H8 (i.e., a simple average of forecast CPIH inflation over 2027 – 2031).

[6] The H7 nominal WACC is estimated by inflating the CPIH-real H7 WACC by the average CPIH forecast for the H7 period at the time of the determination, using the Fisher equation. Specifically, we calculate it using the following equation: (1 + 4.81%) x (1 + 3.31%) – 1. For the inflation forecasts, see OBR (2022), Economic and fiscal outlook – November 2025 (link). Differences in values may not sum due to rounding.

1. Introduction

1.1 This report has been prepared for the UK Civil Aviation Authority ("**CAA**") for the purpose of determining the weighted average cost of capital ("**WACC**") for Heathrow Airport Limited ("**HAL**") in the next price control period ("**H8**").

A. Background

1.2 The WACC is one of the key components that determines the revenue that HAL is able to earn in each price control. Particularly, the WACC plays a key role in setting the level of 'normal profit' or 'allowed return' as part of the licensee's revenue allowance.[7] The CAA estimates the allowed return by multiplying the WACC by the regulated asset base ("**RAB**").

1.3 The WACC is estimated as the weighted average[8] of the cost of equity and cost of debt. The cost of equity and cost of debt reflect the expected return for equity and debt investors respectively.

1.4 The prevailing cost of debt can largely be observed based on the licensee's or sector's existing debt portfolio (sometimes referred to as "**embedded debt**"). Typically, regulators assess the efficiency of the observed embedded debt costs by referencing benchmark debt indices.

1.5 With respect to the cost of new debt, there tends to be varying degrees of uncertainty, with regulators typically having to forecast the level and timing of new issuances combined with the expected costs of these issuances.

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[7] Normal profit corresponds to an economic profit of zero, when a company's total revenue equals the sum of its implicit and explicit costs. It differs from accounting profit, as the latter does not take into consideration implicit costs. A company may report high accounting profit but still be in a state of normal profit if the opportunity costs of maintaining business operations are high.

[8] The weight placed on each component (cost of equity and cost of debt) reflects the proportion of equity and debt in the capital structure respectively.

1.6 Unlike the cost of debt, the cost of equity is not directly observable, and needs to be estimated. This is normally calculated on the basis of economic and financial models. The most commonly adopted model to estimate the cost of equity by regulators in Great Britain ("**GB**"), including the CAA, is the Capital Asset Pricing Model ("**CAPM**").

1.7 The CAPM framework states that the cost of equity can be estimated based on the following equation:

$$Cost\ of\ equity = RfR + \beta_e \times (TMR - RfR)$$

Where:

RfR is the risk-free rate;

β_e is the equity beta of the asset; and

TMR is the total market return ("**TMR**").

1.8 The theory underpinning the CAPM is well understood, but the estimation of the various parameters underpinning the CAPM can be an involved process and subject to some uncertainty and judgement.

B. Regulatory context

1.9 At the time of estimating the WACC for the ongoing price control period ("**H7**"), the global aviation industry faced unprecedented circumstances resulting from the Covid-19 pandemic. The CAA was therefore required to determine the WACC during a period of significant uncertainty regarding the future operations and risks of airports. This was combined with the difficulty of drawing inferences from volatile capital markets data.

1.10 To address these challenges, the CAA introduced new mechanisms and methodological adjustments reflecting the expected impact of Covid-19 on HAL's cost of capital. It revisited the suitability of market data, beta estimation approaches, and the treatment of debt and inflation.

1.11 A number of these innovations were contested by stakeholders, particularly around beta estimation, debt indexation, and inflation treatment. At appeal, the Competition and Markets Authority ("**CMA**") determined in favour of the CAA on nearly all aspects of contention regarding the WACC.[9]

[9] The only issue where the CMA differed from the CAA related to the premium on index-linked debt proposed by the CAA. This reflected the CMA's conclusion that the CAA had erred on this particular issue. See paragraph 7.305 of the CMA's final decision (link).

1.12 Since that determination, HAL is now witnessing record levels of passenger traffic.[10] Further, the macroeconomic environment has changed considerably, with relatively lower capital market volatility, higher interest rates, and stabilisation of inflation expectations (relative to at the time of the H7 determination). This suggests that the H7 methodology for estimating the WACC merits a thorough re-examination.[11]

1.13 Additionally, recent determinations by other GB economic regulators, such as Ofwat and Ofgem, provide important reference points for estimating a regulatory WACC in post-pandemic market conditions. Their decisions collectively signal a regulatory response to the decrease in capital market volatility and higher interest rates. As such, they serve as relevant evidence on how regulators have interpreted shifts in risk and required returns since Covid-19.

1.14 More generally, regulators have emphasised the importance of stable and transparent WACC methodologies. This reinforces the need for consistent, well-evidenced approaches that support efficient investment, while ensuring that returns remain commensurate with the risks borne by investors.

1.15 In this report, we provide our estimate of HAL's vanilla WACC for the H8 regulatory period.[12] This analysis forms an input to the H8 determination process. We will update the analysis presented in this report reflecting latest market data and stakeholder responses ahead of the CAA's Final Proposals for H8.

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10 HAL is currently operating at 99% capacity (link).

11 In our previous report for the CAA, we identified various potential refinements to the CAA's methodology from H7, see here for more details.

12 When setting the allowed return for HAL, the CAA sets a pre-tax WACC. However, accounting for the impact of tax is beyond the scope of this report as it requires a consideration of other aspects beyond setting the cost of capital e.g., financeability and tax policy. Therefore, we focus on the vanilla WACC in this report.

C. Overarching framework assumptions

1.16 The estimates contained in this report are underpinned by the following:

(1) Consumer Price Index including owner occupiers' housing costs ("**CPIH**") is the primary inflation measure, reflecting a policy decision made by the CAA for H8.

(2) The cost of equity is estimated based on the CAPM, in line with established UK regulatory practice.

(3) The cost of debt is constructed from its constituent elements, including embedded debt, new debt, other debt costs such as liquidity and issuance costs, as well as any relevant premia.

(4) All market data and publications considered to inform the WACC calculation are based on a cut-off date of **1 November 2025**.

(5) Parameters are calibrated assuming a 20-year asset life, consistent with the CAA's existing policy on the assumed investor horizon for investors in airports.

(6) The framework assumes a business-as-usual environment based on a 2-runway entity—issues associated with capacity expansion and the potential construction of a new runway at Heathrow are beyond the scope of this report.[13]

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[13] When finalising our estimates for this report (1 November 2025), the CAA is yet to decide on how it will regulate capacity expansion at Heathrow. Therefore, we do not consider any issues pertaining to capacity expansion as part of this report. Between the publication date of this report and the CAA's Final Proposals for H8, the CAA may decide on how to regulate capacity expansion at Heathrow. We will consider any decision on this as part of our updated report.

D. Report structure

1.17 The remainder of this report is structured as follows:

- **Section 2** sets out our methodology for estimating **inflation**, including the choice of the inflation measure, the time period covered and the wedge calculations for conversion between different measures.
- **Section 3** discusses our methodology and estimation of the **risk-free rate**, including the choice of proxy, tenor of instrument, averaging period, inflation conversion and forecast error.
- **Section 4** describes our methodology and estimates for the **total market return**, detailing our estimation approach and choice of parametric estimate.
- **Section 5** presents our methodology for the estimation of **notional gearing**.
- **Section 6** discusses our methodology and estimates of **beta**, focusing on a five-step estimation process including the estimation of raw equity betas, debt beta, and the potential risk differentials that may exist between HAL and comparators.
- **Section 7** sets out our methodology and estimates of the **cost of embedded debt**, setting out the different estimation approaches and our approach to deflating the nominal cost of embedded debt.
- **Section 8** describes our methodology and estimates of the **cost of new debt** based on two components—(a) the reference index; and (b) the estimation of a HAL-specific premium. It also sets out our approach to deflating the nominal cost of new debt.
- **Section 9** presents our methodology and estimates of the **proportion of new debt**.
- **Section 10** details our methodology and estimates of **additional debt costs**, specifically liquidity costs, issuance costs and basis risks.
- **Section 11** discusses **cross-checks** for the CAPM-based estimate, including equity to debt premia.
- **Section 12** concludes.

2. Inflation

A. Introduction

2.1 Inflation measures the changes in the prices of goods and services within an economy over a defined period of time.

2.2 In the context of the H8 price control, the RAB is indexed to inflation and then multiplied by the WACC to determine the allowed return (in absolute terms) for the regulated entity. Given that the RAB is indexed, the WACC needs to be estimated in 'real' terms to avoid double-counting inflation. This means that parameters which are informed by nominal or current price data (e.g., the cost of debt), must be deflated to remove the effects of inflation in order to set a real WACC. Additionally, parametric estimates which are informed by instruments indexed to a different inflation measure (e.g., UK index-linked gilts),[14] must be adjusted to an inflation measure consistent with the CAA's chosen measure, CPIH.

2.3 The rest of this section is structured as follows:

- Section 2B explains the key methodological considerations that need to be addressed when considering the inflation parameter for H8;
- Section 2C presents our arguments and analysis regarding the methodology;
- Section 2D sets out the results; and
- Section 2E summarises.

B. Methodological considerations

2.4 In estimating inflation over the price control, regulators need to consider:

(1) the choice of **inflation measure**;

(2) the **length of the time period** covered by the inflation assumption; and

(3) the **calculation of a 'wedge'** that can be used to convert components that may be estimated with reference to other inflation measures.

[14] Index-linked gilts are indexed to the retail price index ("**RPI**") and therefore need to be adjusted if used to set the cost of capital on a CPIH-basis. See Section 3.

2.5 We consider each of these in turn below.

Choice of inflation measure

2.6 There are three main measures for inflation in the UK. These are:

- RPI, which includes housing costs such as mortgage interest and is derived using arithmetic means;[15]
- Consumer Price Index ("**CPI**"), which excludes mortgage interest and is derived using geometric means;[16] and
- CPIH, which includes a broader measure of housing costs and is derived using geometric means.[17]

2.7 RPI is no longer considered a 'National Statistic',[18] and regulators across GB have transitioned to CPI or CPIH in setting their regulatory determinations. The current expectation is that RPI will be aligned with CPIH from February 2030.[19]

2.8 For CPIH, the owner occupiers' housing cost component accounts for approximately 17% of the index,[20] and serves as the main driver for the difference with CPI. The Office for Budget Responsibility's ("**OBR**") forecasts this difference (CPIH-CPI wedge) to decline from its current level of c. 90 bps to c. 10 bps by 2029.[21] However, the OBR's latest available long-term CPIH-CPI wedge forecast is c. 40 bps.[22]

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15 An arithmetic mean is calculated as the sum of values in a dataset divided by the number of observations. See Eurostat (2025), *Glossary: Arithmetic mean* (link).

16 A geometric mean is calculated by multiplying *a set of 'n'* positive values and taking the '*n-th'* root of this product. See Eurostat (2025), *Glossary: Geometric mean* (link).

17 *Ibid*.

18 The 'National Statistic' designation is given to official statistics that "*meet the standards of trustworthiness, quality and value, set out in the Code of Practice for Statistics*". See Office for Statistics Regulation (2024), *National Statistics designation review* (link). The Office for National Statistics ("**ONS**") does not consider the RPI to be a 'National Statistic'; see Office for National Statistics (2023), *Consumer Price Inflation* (link).

19 See here for more details.

20 ONS (2025), *Consumer price inflation, UK: September 2025*, page 3 (link).

21 OBR (2024), *The long-run difference between RPI and CPI inflation* (link).

22 OBR (2024), *The long-run difference between RPI and CPI inflation* (link).

2.9 The choice of inflation forecast to deflate nominal values can have a particular impact on the outturn financeability and returns of licensees. For example, if the licensee issues fixed-rate debt (i.e. debt with fixed interest costs) and the regulator deflates the cost of debt based on an upward-biased inflation forecast, then the licensee may under recover its debt costs and vice-versa.[23]

2.10 Separately, Inflation forecasts are often presented on an annual or long-run basis. Therefore, regulators must establish an appropriate methodology for aggregating inflation forecasts from various sources to inform their assessment of expected inflation over the investment horizon or regulatory period (as relevant).

2.11 Alternatively, market-based measures of expected inflation (derived from inflation swaps) can also be adopted to inform the analysis.

Time period covered by inflation measure

2.12 Regulators determine the allowed returns for regulated companies over the duration of each price control. For consistency across price controls, the allowed return is often deflated using an inflation measure that reflects the regulator's expectation of inflation over the investment horizon of the regulated company. This is to ensure that the licensee can recover its expected costs over its investment horizon by ensuring increases in the RAB due to inflation are appropriately offset by the corresponding deflation of the allowed return. This approach should prevent distortions when remunerating for inflation.[24]

2.13 This is particularly relevant in the context of estimating the cost of debt, as the yield on corporate debt, including the CAA's benchmark for setting the cost of debt at H7, is typically expressed in nominal terms. Therefore, to derive a real cost of debt that is consistent with a real WACC framework, the nominal rate is deflated by an inflation forecast consistent with market expectations.

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23 The cost of fixed-rate debt, once it has been issued, is invariant to changes in inflation expectations and outturn inflation. Therefore, if outturn inflation is above the inflation forecast, this would result in over remunerating the licensee as revenues increase in line with inflation but costs do not increase proportionately. The opposite is true when the inflation forecast is higher than outturn inflation. This issue is not present for inflation-linked debt as both interest costs and revenue increase or decrease in line with changes in outturn inflation.

24 See footnote 23.

2.14 The UK Regulators Network ("**UKRN**") guidance[25] on WACC estimation recommends the following two approaches to forecasting inflation:

- **Medium-run (in-year):** adopt annual inflation forecasts for the five year period of the price control; or
- **Long-run:** adopt a long-run inflation forecast, for example the target inflation rate.

2.15 In periods with low and stable inflation, regulators have signalled a preference for adopting a long-run forecast. This is because typically over the long-run, expected inflation is aligned with the Bank of England's inflation target, with no systematic deviation in either direction. In the context of deflating the nominal cost of debt, most regulators adopt fixed-rate debt indices with long tenors (e.g., iBoxx 10+ indices)[26] as reference benchmarks. The reference yields on the constituents of these indices would typically be determined with reference to long-run expectations of interest rates and inflation, thus supporting the choice of a long-run inflation forecast.[27]

2.16 However, in periods where inflation is expected to differ significantly from the long-run forecast, adopting the long-run forecast may lead to asymmetric outcomes for consumers and licensees. This issue has previously been acknowledged by regulators.[28]

2.17 Overall, there is no one clear superior approach to selecting the time period for inflation forecasts and one needs to consider the prevailing macroeconomic circumstances and regulatory objectives when selecting the time period covered by the inflation measure.

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25 UKRN (2023), *UKRN guidance for regulators on the methodology for setting the cost of capital*, page 33 (link).

26 iBoxx refers to a family of fixed-income indices developed by S&P Global that measure the performance of specified bond markets. iBoxx indices follow defined eligibility, pricing, and rebalancing methodologies and are widely used as benchmarks for portfolio measurement, investment products, and risk management. See S&P Dow Jones Indices, *iBoxx indices,* page 1 (link).

27 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.28 – 7.31 (link).

28 Ofgem (2023), *Call For Input - Impact of high inflation on the network price control operation*, page 5 (link).

Calculation of the RPI-CPIH 'wedge'

2.18 In addition to deflating nominal rates of return, regulators also need to consider the approach to converting yields on reference instruments indexed to a different inflation basis from the one adopted for the price control.

2.19 In particular, UK index-linked gilts, which typically form the basis to determine the risk-free rate, are indexed to RPI. However, GB regulators have now switched to CPI / CPIH-based price controls. As such, this necessitates a conversion factor (or 'wedge') which takes into account the difference between the inflation measure the price control is indexed to, and the inflation measure the instrument is indexed to.

2.20 Calibrating the wedge is somewhat complex, particularly for price controls which overlap with the period during which RPI and CPIH are expected to align (i.e., 2030).[29]

2.21 Presently, there are two preferred approaches adopted to calculate the RPI-CPIH wedge:

- **Official forecasts:** This approach relies on RPI and CPIH inflation forecasts from the OBR to calculate the expected wedge between RPI and CPIH.
- **Swaps:** This approach relies on data from RPI and CPI zero-coupon swaps to obtain a market-implied metric.[30] As CPI and CPIH are not perfectly aligned, a further adjustment for the difference between CPI and CPIH may be required to derive the implied RPI-CPIH wedge if there is expected to be a systematic difference between CPI and CPIH.

2.22 Official forecasts are generally consistent with the inflation forecasts relied upon to set other values in the price control (e.g., cost allowances). However, these forecasts are often only updated bi-annually and may therefore not be reflective of prevailing market conditions if there is a marked change in market conditions between update periods. As a result, augmenting this approach to include market-based measures can improve robustness.

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29 See for example Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex*, ¶3.10 (link) and Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix,* page 129 (link).

30 We are unable to directly estimate the RPI-CPIH wedge using the swap-based approach since market data on CPIH swaps is not currently available.

2.23 Another consideration is the time period for deriving the wedge. For example, the wedge could be derived based on medium-term (in-year) forecasts or on long-term forecasts. This decision is primarily driven by the choice of inflation forecast i.e., long or medium-term.

C. Our assessment

2.24 Our assessment of the key methodological considerations pertaining to inflation are discussed below.

Choice of inflation measure

2.25 For H8, the CAA has made a policy decision to switch to CPIH as its measure of inflation across the price control. This differs from H7 where the CAA opted to retain RPI as the inflation basis for the price control. This was partly because stakeholders expressed a preference to retain RPI based on their familiarity with this measure,[31] but also as a comprehensive transition to an alternative inflation measure was deemed unfeasible in the period prior to the H7 determination.[32]

2.26 The CAA's adoption of CPIH means that the H8 inflation basis will be aligned with that of other regulators, such as Ofwat[33] and Ofgem.[34]

2.27 Accordingly, in the remainder of this document, all real values are expressed in CPIH-terms unless stated otherwise.

Time period covered by inflation measure

2.28 The choice of inflation forecast should be such that it does not impact the WACC of the notional company. As mentioned previously, this is particularly relevant for estimating the allowed cost of debt and risk-free rate. Additionally, the choice of inflation forecast also needs to consider what is most relevant for the parameter in question.

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31 CAA (2021), *Appendices to Economic regulation of Heathrow Airport Limited: Consultation on the Way Forward*, Appendix D, ¶5 (link).

32 This is because a transition from RPI to CPI during the pandemic could have been challenging for HAL. See CAA (2021), *Appendices to Economic regulation of Heathrow Airport Limited: Consultation on the Way Forward*, Appendix J, ¶13 (link).

33 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.24 (link).

34 Ofgem set its RIIO-3 Draft Determinations ("**DD**") WACC allowance in CPIH terms. See Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex*, Table 20 (link).

2.29 In general, during periods of stable inflation and macroeconomic conditions, long-and medium-term inflation forecasts tend to converge and the choice of forecast becomes somewhat redundant. However, during periods when medium and long-term inflation forecasts are markedly different (like H7), this choice becomes more pertinent to avoid windfall gains and losses from the treatment of inflation.

2.30 Regulatory precedent in the UK suggests that there has been a preference to align inflation forecasts with the investor horizon assumed (i.e., long-term) as long as the forecast is unbiased and symmetric. This is consistent with the CMA's provisional position in the PR24 appeals where it opined that the long-run inflation forecast does not appear to be systematically biased upwards or downwards.[35]

2.31 In general, we agree with this observation. However, we also acknowledge that outturn inflation can be persistently higher than long-run inflation forecasts in the short/ medium-run. This could lead to distortions in the allowed return, as highlighted by the CAA at H7.[36]

2.32 As such, there is no obvious correct answer and the CAA, having deliberated on this issue, has made a policy decision to adopt OBR medium-term inflation forecasts in H8.[37]

2.33 Given this policy decision, we adopt the medium-term inflation forecasts to estimate the CPIH-real cost of debt. However, adopting medium-term inflation forecasts for obtaining CPIH-real risk-free rate estimates can result in theoretically inconsistent estimates (see ¶¶2.43 – 2.50 below) and merits further consideration.

2.34 We discuss each parameter in turn below.

Cost of debt

2.35 The cost of debt is impacted by inflation forecasts in two aspects: (a) the deflation of nominal yields on bonds/ benchmark indices; and (b) the conversion of the yield on RPI index-linked debt to a nominal or CPIH-real basis.

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35 For PR24, Ofwat adopted long-run inflation to deflate the nominal cost of debt, and the CMA adopted the same approach in its PR24 Provisional Determination. However, the CMA did assume a different long-run inflation forecast from Ofwat (2.4% versus Ofwat's assumption of 2%). See CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.28 – 7.31 and ¶7.38 (link).

36 CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation*, ¶¶9.215 – 9.218 (link).

37 See CAA (2026), *H8 Initial Proposals, Section 3*, Chapter 9.

2.36 At H7, the CAA applied a medium-term inflation forecast to deflate nominal debt.[38] This was because medium-term inflation forecasts were significantly higher than long-term forecasts. The CAA's assessment was that adopting long-run inflation forecasts would likely result in windfall gains for HAL over the price control which would not reverse in the future.[39]

2.37 However, the CAA continued to apply a long-term assumption to derive the allowed cost of index-linked debt (both new and embedded). It considered that these instruments would be priced based on whole-life inflation expectations and assumed longer-term outturn inflation would converge with longer-term inflation expectations.[40]

2.38 Therefore, the CAA's H8 policy decision to deflate the nominal cost of debt based on medium-term inflation forecasts is consistent with the policy decision at H7. It is, however, different from the decisions made by other regulators. Specifically, Ofgem at RIIO-3, Ofwat at PR24, and the CMA in its PR24 appeal Provisional Determinations ("**PR24 PD**") have all adopted longer-term inflation assumptions in their regulatory frameworks.[41]

2.39 Aligned with the CAA's policy decision, we deflate the nominal cost of embedded debt and the nominal cost of new debt for each year in H8 on the basis of the OBR's medium-term forecasts of CPIH.

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38 The CMA, in its assessment of the H7 decision, noted that the CAA was consistent in its view of using medium-term inflation over the H7 process, both when inflation was forecast to deviate to the downside (as was the case in the Initial Proposals) and when inflation was forecast to deviate to the upside (as was the case in the Final Proposals and the Final Decision). See CMA (2023), *H7 Heathrow Airport License Modification Appeals, Final Determinations*, ¶¶7.65 – 7.83 (link).

39 CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation*, ¶¶9.215 – 9.218 (link).

40 CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation*, ¶¶9.219 – 9.220 (link).

41 See Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex*, ¶2.29 and ¶¶2.48 – 2.49 (link), and CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.28 – 7.31 (link). Note that Ofgem, in the RIIO-3 Draft Determinations, uses the nominal cost of fixed-rate debt in determining its cost of debt, as opposed to applying an inflation assumption to deflate it. However, Ofgem uses long-run inflation to deflate the cost of index-linked debt.

2.40 With respect to index-linked debt, we convert HAL's RPI index-linked debt into nominal terms based on the OBR RPI medium-term inflation forecasts. This means that we can capture the expected cost of index-linked debt in nominal terms during H8. These nominal values are then converted into CPIH-real terms as above.

2.41 This is a departure from the CAA's H7 approach regarding treatment of index-linked debt as the cost of index-linked debt was derived based on a top-down approach. This involved deflating the nominal cost of embedded and new debt (inferred from benchmark indices) based on a long-term inflation forecast. However, we estimate the cost of embedded index-linked debt by adopting a bottom-up approach. The bottom-up approach involves directly observing the yields on HAL's index-linked bonds, converting these to nominal yields (by adopting the medium-term RPI forecast) and subsequently deflating these based on the medium-term CPIH forecasts. This ensures consistency with the CAA's policy decision regarding the adoption of medium-term forecasts.

2.42 Additionally, we assume that the notional company issues only fixed-rate debt going forward (due to a lack of objective index-linked benchmarks). Therefore, we do not need to estimate the cost of any new index-linked debt.

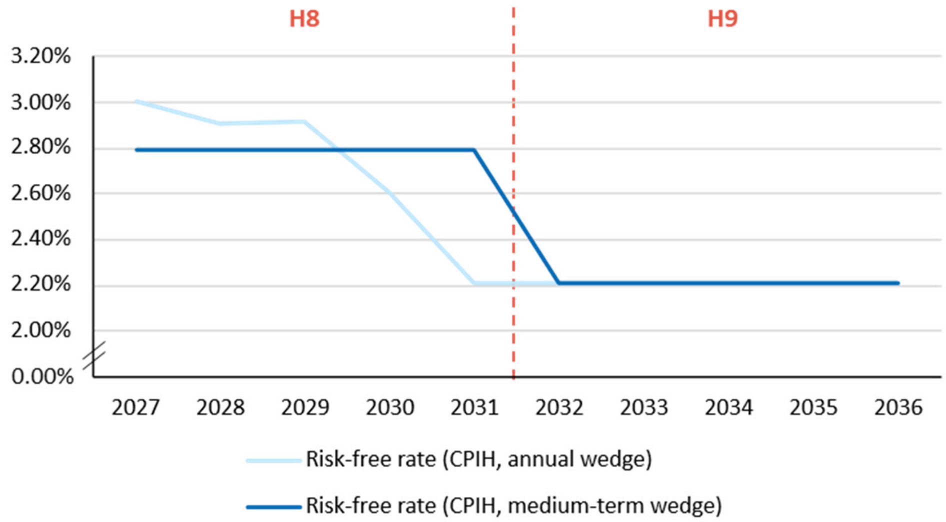
Risk-free rate

2.43 The choice of proxy routinely referenced to estimate the risk-free rate in the UK (i.e., index-linked government gilts ("**ILGs**")) is indexed to RPI. Therefore, it needs to be converted into CPIH-terms in order to derive a CPIH-deflated risk-free rate. However, in deriving this, we need to consider the risk-free rate proxy we are trying to establish. Specifically, there are two options:

- **CPIH-deflated yield on RPI-linked ILGs:** This is the yield on an RPI-linked ILG obtained by applying the RPI-CPIH wedge consistent with the choice of inflation forecast.
- **Yield on CPIH-linked ILG:** This is the yield on a hypothetical CPIH-linked ILG. This requires consideration of how a CPIH-linked ILG would be priced.

2.44 If we were aiming to adopt the former, then applying the RPI-CPIH wedge derived from medium-term forecasts as described in Section 2B would be appropriate. However, this would result in an implied risk-free rate with a distinct 'kink' in 2031 (as illustrated in Figure 2-1 below) given the expected alignment between the RPI and CPIH in 2030.[42, 43]

Figure 2-1: Evolution of the CPIH-real risk-free rate over time based on medium- and short-term wedge assumptions



Source: Bank of England, UK implied real spot curve (link); OBR (2025), Economic and fiscal outlook – November 2025 (link); FTI analysis.
Note: This chart is based on an RPI-denominated risk-free rate of 2.21% and an RPI-CPIH wedge of 0.57%. This wedge reflects an official forecasts wedge of 0.54% and a swap-based wedge of 0.60% (see our approach to calculating these wedges at ¶¶2.48 – 2.49 below).

2.45 The presence of this kink does not align with the general theory underpinning the risk-free rate that it is constant (in expectation) over the investment horizon. Instead, this reflects a mechanical quirk resulting due to the risk-free rate being derived from an asset indexed to one measure of inflation (RPI), the price control being indexed to another measure (CPIH), and the UK Government's policy to merge the RPI and CPIH in 2030.

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42 In the transition to the next price control, in which RPI will be aligned with CPIH, an adjustment for the RPI-CPIH wedge will not be required.

43 The CPIH-denominated risk-free rate based on the medium-term wedge is an aggregation of the annual CPIH-denominated risk-free rate based on the in-year RPI-CPIH wedges, which is also illustrated in Figure 2-1**Error! Reference source not found.**.

2.46 This is a one-off issue peculiar to H8 but needs to be addressed. In order to do so, we aim to estimate the yield on the hypothetical CPIH-linked ILG. This avoids the issue of creating a 'kink' for the CPIH-deflated yield.

2.47 As with RPI-linked ILGs, we expect a CPIH-linked ILG would be priced based on whole-life inflation expectations. Therefore, this requires estimating a wedge aligned with the investment horizon instead of the inflation forecast period.

2.48 This differs from medium-term inflation forecasts adopted to derive the cost of debt and reflects the difference between estimating the risk-free rate and the cost of debt. In particular, the cost of debt reflects an observable cost. Therefore the focus is ensuring efficiently incurred debt costs can be recovered. This is not reliant on choice of inflation forecast as long as the inflation forecast adopted for either horizon is unbiased. We have not observed any bias in either the medium-or long-term inflation forecasts.[44]

2.49 However, for the risk-free rate, there is no observable risk-free instrument denominated in CPIH-terms and therefore a proxy must be sought. As described previously, deflating based on medium-term inflation forecasts is unlikely to result in a risk-free rate consistent with the theory of a constant rate of return over the investment horizon. But adopting long-term inflation forecasts solves this issue.

2.50 Therefore, the difference in the choice of inflation forecast time period reflects the differences in the theory underpinning the cost of debt and risk-free rate.

[44] This requires adopting a consistent approach across price controls i.e., adopting medium-term inflation forecasts in one price control but adopting long-term in the next price control creates the potential risk of a biased inflation forecast. However, if medium and long-term inflation forecasts were to converge, then a change in approach would not undermine the robustness of the price control.

Calculation of the RPI-CPIH 'wedge'

2.51 We do not require an RPI-CPIH wedge for estimating the cost of debt as our cost of debt estimates are first derived in nominal terms before deflating into CPIH-terms.[45] This ensures a consistent CPIH-deflated estimate.

2.52 However, as our risk-free rate proxy is indexed to RPI, we estimate an RPI-CPIH wedge in order to obtain a value in CPIH-terms.[46] We derive this wedge by placing weight on both the official forecasts approach and the swap-based approach (given the reasons mentioned previously regarding improved robustness).

2.53 For the official forecasts approach, we adopt the OBR's forecasts for each quarter of the year.

2.54 This is in contrast to the annual forecasts relied on by Ofgem, Ofwat and CMA. However, we consider that quarterly forecasts allow for a more granular and accurate estimate.

2.55 For the swap-based approach, we estimate a CPIH-CPI wedge in addition to the RPI-CPI wedge obtained from swaps data. This is primarily due to the sustained difference between CPI and CPIH implied by the OBR's latest forecast.[47] This suggests that values derived based on CPI-deflated instruments (such as CPI swaps) are not reflective of market expectations for CPIH instruments and therefore require further adjustment.

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45 In our modelling, we convert the yield on HAL's RPI-linked bonds to a nominal basis by inflating the yield on these instruments using OBR RPI forecasts.

46 See ¶2.43for more details.

47 The difference between CPI and CPIH arises when considering both medium-run and long-run OBR forecasts. See OBR (2024), *The long-run difference between RPI and CPI inflation* (link), Chart D onwards.

2.56 This is in contrast to the approaches implemented by Ofwat and the CMA at PR24. Specifically, at PR24, Ofwat's long-term approach to estimating inflation forecasts assumed long-term CPI and CPIH were equal and hence did not require a CPIH-CPI wedge.[48] In contrast, the CMA adopted different long-term forecasts for CPI and CPIH, effectively assuming a prolonged difference between the two inflation measures based on the OBR's forecasts. However, the CMA did not reflect this difference in its estimation of the risk-free rate, primarily on the basis that swap-based measures of CPI were close to its long-term CPIH forecast.

2.57 Our interpretation of the observed financial data is different. Specifically, we consider it theoretically consistent for the swap-based measure of CPI to be higher than the Bank of England's inflation target for CPI and other longer-term forecasts. This is because swap-based measures of inflation typically reflect two components: (a) the forecast inflation over the period in question; and (b) a risk premium for bearing the inflation risk.[49] The presence of this risk premium explains why a swap-based measure is likely to be higher than the Bank of England's target inflation rate.[50]

D. Results

2.58 As explained above, we deflate the cost of embedded debt and the cost of new debt by the OBR's medium-term inflation forecasts for each year in the H8 period. We present these values in Table 2-1 below.

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48 Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix,* Table 31 (link). We understand that Ofwat did not have the benefit of incorporating the OBR's October 2024 report in its PR24 Final Determination, which might have led to its assumption that long term CPI and CPIH were equal.

49 ECB Economic Bulletin (2021), *Decomposing market-based measures of inflation compensation into inflation expectations and risk premia* (link).

50 Further detail on our estimation of the wedge is provided in Appendix 1.

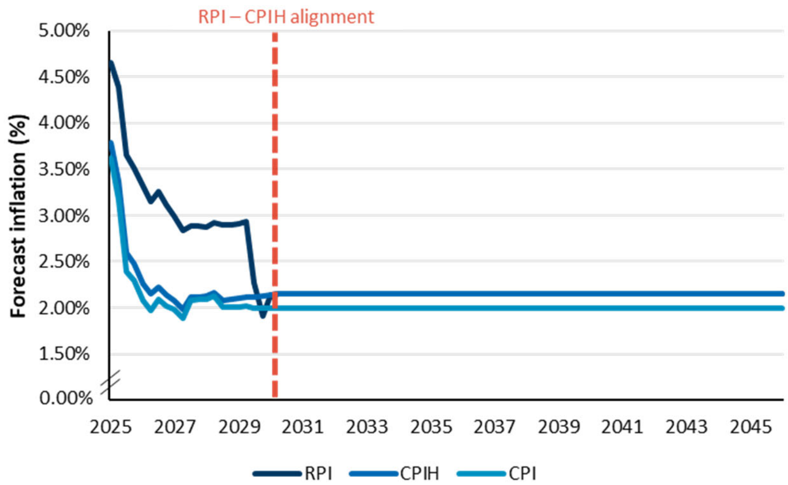
Table 2-1: Values used to deflate the cost of embedded debt and cost of new debt

	2027	2028	2029	2030	2031	Average
Inflation rate	2.15%	2.08%	2.11%	2.13%	2.13%	**2.12%**

Source: OBR (2025), Economic and fiscal outlook – November 2025, Detailed forecast tables: economy, Table 1.7 (link).
Note: The inflation rate for 2027-2030 is calculated based on annual OBR forecasts, whereas the inflation rate for 2031 is based on long-term forecasts and is assumed to equal the 2030 forecast.

2.59 For the risk-free rate, we rely on longer-term OBR forecasts and swaps. Figure 2-2 below illustrates the evolution of the OBR's RPI, CPIH, and CPI forecasts. In particular, Figure 2-2 illustrates the expected alignment between RPI and CPIH methodologies in Q1 2030.

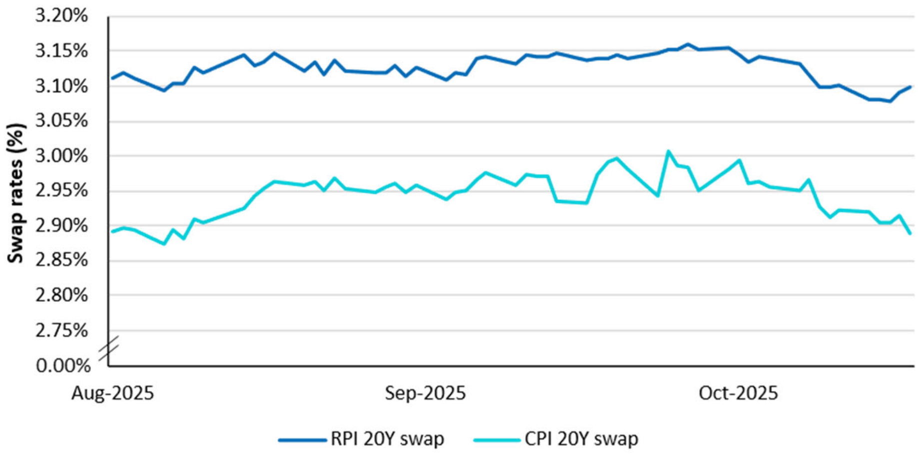
Figure 2-2: Evolution of the OBR's RPI, CPIH, and CPI quarterly forecasts



Source: OBR (2025), Economic and Fiscal Outlook – November 2025, Detailed forecast tables: economy, Table 1.7 (link).
Note: The low RPI inflation value in Q3 2030 is a due to the mechanistic change in calibrating RPI, resulting from the RPI and CPIH methodologies aligning in February 2030. The result of this is that RPI inflation is significantly lower.

2.60 Figure 2-3 below illustrates the swap-based inflation forecasts.

Figure 2-3: Evolution of RPI and CPI swap rates since August 2025



Source: Bloomberg; FTI analysis.
Note: Based on 'Mid price' of 20-year RPI and CPI swaps.

2.61 Importantly, the two charts above illustrate that CPI and CPIH are not forecast to converge over the price control period. In fact, the underlying data above results in a long-term RPI-CPIH wedge estimate of 11 bps as presented in Table 2-2 below (and this value is adopted to obtain a CPIH-based risk-free rate).

Table 2-2: H8 Initial Proposal of RPI-CPIH wedge

Component	Guide	H8 Initial Proposal
RPI-CPIH official forecasts wedge	**A**	**0.20%**
CPIH-CPI official forecasts wedge	B	0.14%
20Y RPI-CPI swap-based wedge	C	0.17%
RPI-CPIH swap-based wedge	**D = (1+ C) ÷ (1+B) – 1**	**0.03%**
Overall wedge	**E = (A + D) ÷ 2**	**0.11%**

Source: FTI analysis based on quarterly forecast data from OBR (2025), Economic and fiscal outlook – November 2025, Detailed forecast tables: economy, Table 1.7 (link) and data from Bloomberg.
*Note: (1) The RPI-CPIH and CPIH-CPI official forecasts wedges are derived using 20-year quarterly RPI, CPI and CPIH OBR forecasts using data from 1 October 2025 until 1 October 2045. (2) The 20-year ("**20Y**") RPI-CPI swap-based wedge is derived based on 20-year historical market-based zero-coupon RPI-CPI swap rates for October 2025 from Bloomberg.*

E. Summary

2.62 Given that the WACC for H8 will be set on a real basis, it is important to ensure all components of the WACC can be expressed in real terms on a consistent inflation base.

2.63 The CAA has made two key policy decisions for H8—first, that the inflation basis for the price control will be CPIH and second, that it will adopt medium-term inflation forecasts.

2.64 The key components of the H8 WACC for which inflation related adjustments are necessary to express them in CPIH-terms are the cost of debt and the risk-free rate.

2.65 We undertake the inflation adjustments for these parameters in the following manner:

- The cost of embedded and new debt are deflated by medium-term CPIH inflation forecasts (over the H8 price control period) obtained from average quarterly forecasts presented in the OBR's November 2025 economic and fiscal outlook.[51]
- For the risk-free rate, we adjust the RPI-linked index-linked gilts with the long-term RPI-CPIH wedge based on an average of: (a) the 'official forecasts' wedge (derived using 20-year quarterly RPI and CPIH OBR forecasts); and (b) the 'swap-based' wedge (derived using 20-year historical market-based zero-coupon RPI-CPI swap rates from Bloomberg and 20-year quarterly CPI and CPIH OBR forecasts).

2.66 We adopt medium-term inflation forecasts for cost of debt and long-term inflation forecasts for the risk-free rate due to differing considerations with respect to the cost of debt and risk-free rate. Specifically, the cost of debt reflects an observed cost and therefore, as long as the chosen inflation forecast is unbiased, it does not matter which forecast is adopted (as long as efficiently incurred costs can be recovered). Given the CAA has made the policy decision to adopt medium-term forecasts, we follow the CAA's decision for deflating the cost of debt.

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51 We have been advised by the CAA to align with the November 2025 OBR inflation forecasts, to ensure consistency with other elements of the price control. OBR (2025), *Economic and fiscal outlook – November 2025* (link).

2.67 However, for the risk-free rate, our key aim is to derive the yield on a hypothetical CPIH-linked ILG instrument. In our view, the yield on a CPIH-linked ILG would be inconsistent with the medium-term inflation forecast as it would imply the CPIH-linked rate of return would change sharply once the RPI methodology aligns with CPIH in 2030. This is inconsistent with the theory that the risk-free rate is constant over the investment horizon. Therefore, and specifically for H8, the yield on a CPIH-linked ILG instrument needs to be derived based on long-term inflation forecasts.

3. Risk-free rate

A. Introduction

3.1 The risk-free rate is the return an investor expects to earn for holding a riskless asset—i.e., a situation where the expected return perfectly predicts the realised return on the investment, such that no risk is incurred. In the CAPM framework, this notional riskless asset is also referred to as a 'zero-beta asset' (i.e., an asset with zero sensitivity to market risk).

3.2 The risk-free rate is unobservable as, in reality, all investments carry some risk, and therefore must be estimated with reference to a proxy.

3.3 The rest of this section is structured as follows:

- Section 3B explains the key methodological considerations that need to be addressed when estimating the risk-free rate;
- Section 3C presents our arguments and analysis regarding the methodology;
- Section 3D sets out the results; and
- Section 3E summarises.

B. Methodological considerations

3.4 The key considerations for regulators when estimating the risk-free rate are:[52]

(1) choice of proxy;

(2) choice of tenor for proxy instrument;

(3) averaging period;

(4) inflation treatment, as the proxy used needs to be on a consistent basis with the inflation measure used in the price control; and

(5) forecast error, as price controls are set for an extended period (normally five years).

52 For more information, see UKRN (2023), *UKRN guidance for regulators on the methodology for setting the cost of capital*, pages 12 – 15 (link).

3.5 We discuss each of these factors in turn below.

Choice of proxy

3.6 The choice of proxy for estimating the risk-free rate involves identifying an appropriate riskless or low-risk instrument.

3.7 In economies with low sovereign default risk, regulators have typically estimated the risk-free rate with reference to the yield to maturity on government-issued bonds (also known as 'gilts' in the UK). In the UK, RPI index-linked government gilts (ILGs)[53] have historically served as the preferred proxy for estimating the real risk-free rate. This reflects that they display negligible inflation and default risk.

3.8 That said, there have previously been concerns that the yield on ILGs may be downward biased due to the presence of a convenience yield.[54] This convenience yield can be estimated and accounted for as the spread between ILGs and low risk corporate bond indices (e.g., AAA-rating) of equivalent tenor. However, a positive spread between gilts and low risk corporate bonds does not necessarily suggest the presence of a convenience yield. Any differential could be attributed to a variety of factors such as default risk, liquidity risk, and other market frictions.[55] Therefore, any adjustments pertaining to the presence of a convenience yield merit thorough examination of the evidence available.

Choice of instrument tenor

3.9 When selecting the tenor of the risk-free proxy instrument, regulators consider factors such as sector asset life, length of price control and investment horizon for the notional entity. For example, a longer asset life would imply selecting an instrument with longer maturity, all else equal.

3.10 Typically in UK regulation, a tenor of 10 – 20 years has been adopted in the past.

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53 ILGs have semi-annual coupon payments that rise in line with inflation and adjust the principal repayment to take account of accrued inflation since the gilt was first issued.

54 A convenience yield is a discount on the yield or return that investors are prepared to accept for government bonds relative to non-government bonds. This is because government bonds are characterised by superior liquidity, higher collateral value, and benefit from excess demand from institutional investors due to regulatory requirements and a money-like nature. See CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.143 (link).

55 Ofwat have previously concurred with evidence presented by Oxera Consulting that a spread of less than 26 bps between the yields on low risk corporate bonds and nominal gilts may be driven by factors other than convenience yield. See Ofwat (2024), *PR24 draft determinations: Aligning risk and return - allowed return appendix*, page 12 (link).

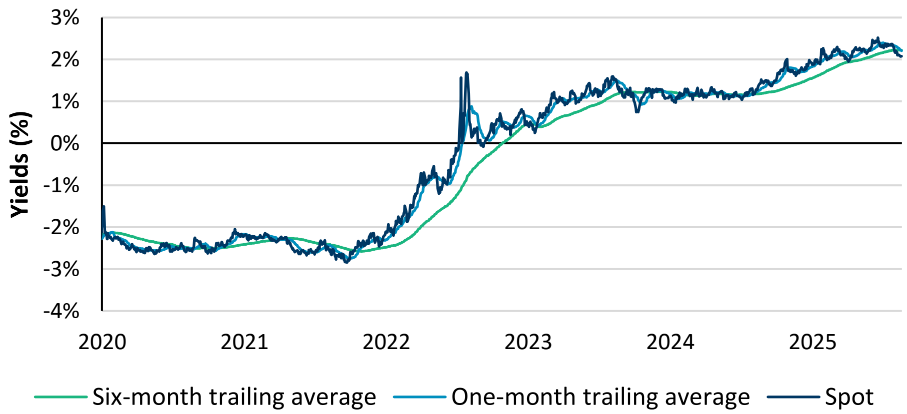
Choice of averaging period

3.11 A key issue in the choice of averaging period is whether gilt yields are generally assumed to be a random walk (i.e., to drift unpredictably over time)[56] or whether they tend to display some mean-reversion. Ofwat noted in its PR24 final methodology that movements in government bond yields are commonly found to have no empirical tendency to revert to a stable mean.[57]

3.12 Thus, in determining the averaging period, regulators need to strike a balance between referencing market data that is recent enough to be relevant, while ensuring that it is not unduly distorted by one-off or short-term events. Theoretically, spot yields are considered the best estimate of future yields.[58] However, spot yields can be volatile and influenced by short-term events. As a result, relying on a somewhat longer average of recent yields may be preferable as it helps smooth out the volatility associated with relying on a single data point.

3.13 Figure 3-1 below illustrates this by comparing the historical movements of the spot yield on ILGs and trailing averages.

Figure 3-1: 20-year index-linked gilt yields, over different averaging periods



Source: Bank of England, UK implied real spot curve (link); FTI analysis.

56 Random walk theory suggests that changes in interest rates (and asset prices) are unpredictable.

57 Ofwat (2022), *Creating tomorrow, together: Our final methodology for PR24, Appendix 11, Allowed return on capital*, page 16 (link);

58 This is consistent with the UKRN 2018 study which argued that more weight should be placed on recent yields compared to historical yields. Wright et al. (2018), *Estimating the cost of capital for implementation of price controls by UK Regulators*, Section 4.3 (link).

Note: We adopt a cut-off date of 1 November 2025.

3.14 The figure above illustrates that spot yields can vary on a daily basis and a cut-off date coinciding with a day when the yield has 'spiked' or 'dived' can result in an inaccurate estimate of the WACC. This issue can be addressed by adopting a trailing average. During periods of market stability, trailing averages tend not to differ much from spot yields. But during periods when yields have risen or dropped sharply over a short period of time (as has been the case recently), longer-term trailing averages (e.g., six-month) tend to lag prevailing market levels.

Conversion for inflation

3.15 The yield on ILGs is reported in RPI terms, and therefore needs to be adjusted to be converted to CPIH terms for the H8 price control.

3.16 We have set out the methodology for doing so in Section 2C.

Forecast error

3.17 The CAA's current policy is to set the cost of equity for the duration of the price control.[59] Therefore, HAL will be exposed to interest rate risk on the cost of equity and the CAA needs to consider whether and/or how to reflect this risk.[60]

3.18 Historically, UK regulators included a forward rate adjustment to reflect expected changes in interest rates over the price control. However, academic evidence has indicated that forward rates have poor predictive power for forecasting expected changes in interest rates,[61] as they reflect a no arbitrage condition.[62] Over the last decade, all UK regulators have departed from including this adjustment and this is no longer considered as regulatory best practice.

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59 As part of H7 (and expected to be retained as part of H8), the CAA introduced cost of new debt indexation. Therefore, the cost of new debt is be indexed to outturn movements in bond yields.

60 The CAA indexes the cost of new debt and therefore interest rate risk on the cost of new debt is reduced.

61 Fama, E. F. (1976), *Forward rates as predictors of future spot rates,* Journal of Financial Economics, 3(4), pages 361 – 377 (link).

62 This is because forward rates are derived from the mathematical relationship between current spot rates and bond prices to ensure no arbitrage opportunities exist, meaning they represent pricing consistency in the market rather than genuine forecasts of future interest rate movements.

C. Our assessment

3.19 We have considered the methodological elements for the risk-free rate, with reference to regulatory precedent, best practice and market data, and discuss these in turn below.

3.20 We have taken into account the UKRN guidance which recommends the following approach to estimate the regulatory risk-free rate:

(1) selection of long-dated ILGs at the assumed investment horizon in the relevant sector as the risk-free proxy; and

(2) recent yields (going back no more than a year) are reasonable to inform the risk-free rate.

3.21 The UKRN guidance also notes that non-ILG risk-free rate proxies, when stripped of accurately measured risk premia, could provide a useful sense check in times of ILG market volatility or to help define the range.[63]

Choice of proxy

3.22 Our starting point for the risk-free rate is to adopt ILGs as the proxy for estimating the risk-free rate.

3.23 We have further considered the issue of convenience yield as we acknowledge that there can be other factors driving the yield on these instruments (e.g., demand for low risk and liquid debt instruments). For this purpose, we have updated the CAA's H7 methodology for latest market data and note that evidence indicates a negative convenience yield (−0.08%).[64]

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63 UKRN (2023), *UKRN guidance for regulators on the methodology for setting the cost of capital*, page 14 (link).

64 See Appendix 2 for detailed calculations.

3.24 This is counterintuitive as we would expect yields on AAA-rated instruments to be higher than yields on gilts.[65] This indicates the likely presence of some market anomalies and / or potential issues with the quality of the data available.[66]

3.25 As a result, our preference is to rely solely on unadjusted ILGs in estimating the risk-free rate for H8. This is consistent with the RIIO-3 DD,[67] PR24 DD,[68] PR24 PD,[69] and UKRN guidance.[70]

3.26 We note that, at H7, the CAA estimated the risk-free rate as the average of: (i) one-month average yields on ILGs; and (ii) one-month average yields on ILGs plus an uplift of 57 bps to account for the presence of a convenience yield.[71] However, given prevailing market data, we do not consider it appropriate to include a negative convenience yield.

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65 AAA-rated corporate bonds are assumed to carry higher default risk than high-quality sovereign debt such as gilts. This is because sovereign debt is backed by governments who typically have a longer track record of repaying debt than corporates, and have a more stable source of revenue (i.e., tax receipts) for repaying debt.

66 A known data quality issue in the use of AAA-rated corporate bond indices is their inclusion of bonds with esoteric characteristics that may not be representative of a UK risk-free asset with 20-year tenor (such as foreign issuers or very long tenors). See CMA (2021), *Energy licence modification appeals 2021, Final determination, Volume 2A: Joined Grounds: Cost of equity*, ¶¶5.101 – 5.102 (link).

67 Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex*, ¶¶3.6 – 3.9 (link).

68 Ofwat (2024), *PR24 draft determinations: Aligning risk and return - allowed return appendix*, page 9 (link).

69 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.182 (link).

70 The UKRN states that *"in academic literature there are no empirical estimates of the convenience yield in index-linked gilts at the 10-20 year CAPM investment horizon used by most regulators".* For more information, see UKRN (2023), *UKRN guidance for regulators on the methodology for setting the cost of capital*, page 14 (link).

71 The convenience yield was estimated to be the average of: (1) the spread between the one-month trailing average yield of the 20-year nominal gilt and the iBoxx non-Gilts AAA-rated 10+ years index; and (2) the spread between the one-month trailing average yield of the 12.5-year nominal gilt and the iBoxx non-Gilts AAA-rated 10-15 years index. CAA (2022), *H7 Final Proposals*, *Section 3: Financial issues and implementation*, ¶¶9.246 – 9.248 (link). This value was restated following the Final Proposals, and updated to be 57bps. See FTI Consulting (2024), *Cost of Capital Strategy for H8*, Table 2-2 (link).

Choice of ILG tenor

3.27 At H8, we do not expect any changes to HAL's asset lives or the assumed investment horizon. Therefore, and consistent with H7, we adopt 20-year ILGs to estimate the risk-free rate.

3.28 This relationship between the choice of ILG tenor and asset lives in the sector is consistent with previous CAA determinations. For example, in the NERL 2023 – 2027 price control ("**NR23**"), the CAA estimated the risk-free rate based on 10-year ILGs, reflecting shorter asset lives for NERL relative to HAL.[72]

3.29 A 20-year tenor is also consistent with regulatory precedent and UKRN guidance.[73] In particular, the CAA at H7,[74] Ofwat at PR24,[75] the CMA at PR24 PD,[76] and Ofgem at RIIO-3,[77] have all referenced 20-year ILGs to estimate the risk-free rate.

Choice of averaging period

3.30 We considered a range of averaging periods from one to six months. Observing the trends in Figure 3-1, the data demonstrated that longer averaging periods were more stable but this needs to be counter-balanced against the risk of using less relevant data.

3.31 Taking into account the importance of incorporating the latest market data, we are of the mind that a one-month trailing average of 20-year ILGs is an appropriate approach to estimating the risk-free rate as it balances recency and volatility.

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72 CAA (2022), *Economic regulation of NATS (En Route) plc: Appendices to initial proposals for the next price control review ("NR23")*, ¶C17 (link).

73 UKRN (2023), *UKRN guidance for regulators on the methodology for setting the cost of capital*, page 14 (link).

74 CAA (2021), *Appendices to Economic regulation of Heathrow Airport Limited: Consultation on the Way Forward*, Appendix J, ¶¶84 – 85 (link).

75 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.100 (link).

76 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.100 (link).

77 Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex*, ¶3.16 (link).

3.32 The choice of a one-month averaging period is also consistent with CAA H7,[78] Ofwat PR24,[79] CMA PR24 PD,[80] and Ofgem RIIO-3 DD.[81]

Conversion for inflation

3.33 As set out at paragraph 2.61, we convert the yield on RPI-linked ILGs to a CPIH-basis based on a long-term RPI-CPIH wedge of 0.11%. This is derived from a combination of official forecasts and swap-based measures of inflation.[82]

3.34 The use of a long-term RPI-CPIH wedge to convert RPI-linked ILG yields into CPIH-real terms is consistent with Ofgem RIIO-3, Ofwat PR24, and the CMA PR24 PD.

3.35 We note that H7 was set in RPI-terms, and therefore the estimate of the risk-free rate did not require this conversion.[83]

Forecast error

3.36 Aligned with regulatory precedent and academic evidence, we do not consider it necessary to include a forward rate adjustment in our estimate of the risk-free rate as it is a poor predictor of future interest rates.

78 CAA (2022), *H7 Final Proposals*, *Section 3: Financial issues and implementation*, ¶9.249 (link).

79 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.103 (link).

80 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.109 – 7.111 and Figure 7.1 (link).

81 Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex*, ¶3.6 (link).

82 See Table 2-2 for details.

83 CAA (2022), *H7 Final Proposals*, *Section 3: Financial issues and implementation*, ¶9.17 (link).

3.37 The exclusion of a forward rate adjustment is consistent with CAA at H7,[84] Ofwat at PR24,[85] CMA at PR24 PD,[86] and Ofgem at RIIO-3.[87, 88]

D. Results

3.38 The calculations underpinning our risk-free rate estimate are set out in Table 3-1 below.

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84 CAA (2022), *H7 Final Proposals*, *Section 3: Financial issues and implementation*, ¶9.250 (link).

85 Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix*, page 9 (link).

86 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.123 (link).

87 Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex,* ¶¶3.9, 3.16 and 3.22 (link).

88 Ofgem removed the impact of forecast error on the risk-free rate by introducing indexation of the risk-free rate at RIIO-2. See Ofgem (2021), *RIIO-2 Final Determinations – Finance Annex (REVISED)*, ¶3.21 (link). This has been proposed to be retained for RIIO-3, see Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex*, ¶3.14 (link). The case for and against introducing risk-free rate indexation is beyond the scope of this report as it requires considering wider impacts on the price control e.g., financeability, charges profile and risk allocation.

Table 3-1: H7 Final Decision and H8 Initial Proposal of the risk-free rate estimate

Component	Guide	H7	H8 Initial Proposals
Yield on 20-year ILGs	A	0.30%	2.21%
Convenience yield (10+ years)	B	0.43%	-
Convenience yield (10-15 years)	C	0.71%	-
Average convenience yield	D = (B + C) / 2	0.57%	-
Yield on 20-year ILGs + average convenience yield	E = A + D	0.87%	2.21%
Risk-free rate (RPI-deflated)	**F = (A + E) / 2**	**0.59%**	**2.21%**
RPI-CPIH wedge	G	0.90%	0.11%
Risk-free rate (CPIH-deflated)	**H = (1 + F) × (1 + G) − 1**	**1.50%**	**2.33%**

*Source: CAA (2023), H7 Final Decision, Section 3: Financial issues and implementation, Table 9.6 (link); FTI Consulting (2024), Cost of Capital Strategy for H8, Table 2-2 (link); FTI analysis. Note: (1) The cut-off date for the H7 analysis was 17 November 2022.[89] (2) The wedge used to estimate the H7 values is based on CMA's redetermination of Ofwat's 2020-2025 price review ("**PR19**") and is an approximation given the different cut-off dates of CMA PR19 redetermination and H7. Further, we understand the CMA's assumption does not account for the expected alignment in RPI and CPI (then assumed to be equivalent to CPIH) in 2030. See CMA (2021), Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, Final report, ¶9.242 (link). (3) For the H8 Initial Proposal, we use a cut-off date of 1 November 2025. (4) Totals may not sum precisely due to rounding.*

E. Summary

3.39 Our choice of instrument for proxying the risk-free rate is the 20-year ILG. We estimate this by taking a one-month trailing average of the yields as of the cut-off date.

3.40 Unlike at H7, we do not propose to make any adjustments for convenience yields given that prevailing market data indicates a counterintuitive result of negative convenience yields.

3.41 We adjust our estimate of the risk-free rate by our estimated long-term RPI-CPIH wedge of 11 bps to present the estimate in CPIH-terms.

89 CAA (2023), *H7 Final Decision, Section 3: Financial issues and implementation*, ¶9.41 (link).

3.42 Overall, our estimate of the CPIH-deflated risk-free rate for H8 is 2.33% based on the latest market data on index-linked gilts. This reflects a c. 80 bps increase since H7, due to the increase in real interest rates since H7.

4. Total market return

A. Introduction

4.1 The TMR reflects the expected total return an investor requires for holding the 'market portfolio' (a diversified basket of securities). Practically, it is the sum of the risk-free rate and the equity risk premium ("**ERP**"), which reflects the additional compensation required to invest in risky assets rather than risk-free assets.

4.2 The ERP serves as a parametric input into the CAPM formula for determining the overall cost of equity.

4.3 To estimate the TMR it can either be assumed that the TMR is broadly stable, (i.e., that the total required return from the market is broadly stable), or that the ERP is broadly stable (i.e., the level at which the market will outperform the risk-free rate is broadly stable).

4.4 There is no universally accepted method for deriving the TMR, because it concerns investors' ex-ante expectations of returns, which are largely unobservable.

4.5 The rest of this section is structured as follows:

- Section 4B explains the key methodological considerations that need to be addressed when estimating the TMR;
- Section 4C presents our arguments and analysis regarding the methodology;
- Section 4D sets out the results; and
- Section 4E summarises.

B. Methodological considerations

4.6 There are two main methodological issues to consider:

(1) whether to estimate the ERP directly or obtain it by subtracting the risk-free rate from the TMR (i.e., estimate the TMR directly); and

(2) selecting the estimation methodology for the ERP or TMR.

4.7 We discuss each of these in turn below.

Choice of parameter

4.8 When deciding whether to estimate the TMR or ERP directly, regulators and market practitioners consider:

(1) the theory associated with TMR and ERP; and

(2) the impact that market conditions have on both, the TMR and ERP.

4.9 As mentioned above, there are two prevailing theories regarding the TMR and ERP.

4.10 The '**stable TMR**' theory assumes that the TMR is broadly stable over time. Under this approach, the TMR is estimated directly and the risk-free rate is subtracted from the TMR to derive the ERP. This approach effectively assumes that total equity returns and the expectations of these returns are broadly stable over the economic cycle. This theory is also supported by empirical evidence. In particular, Wright et al. (2018) and Wright and Smithers (2014) assess that real stock returns have remained broadly stable over the long-run. [90, 91]

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90 Wright et al. (2018), *Estimating the cost of capital for implementation of price controls by UK Regulators*, Section 4.4 (link).

91 Wright and Smithers (2014), *The Cost of Equity Capital for Regulated Companies: A Review for Ofgem* (link).

4.11 In contrast, the '**stable ERP**' theory assumes that the ERP is broadly stable over time. Under this approach, the ERP is estimated directly with the TMR being derived as the sum of the ERP and the risk-free rate. This theory has historically been considered inconsistent with empirical evidence. In particular, Wright and Smithers' paper demonstrates that the long-run risk-free rate (as proxied by the real return on cash or the real return on debt) is not stable. When considered in combination with their finding that the TMR is broadly stable, this implies that the equity risk premium (i.e., the difference between real stock returns and the risk-free rate) is not stable.[92]

4.12 A key criticism of the stable TMR approach is that it may either over- or underestimate returns required by investors for a given price control period, due to the positive empirical relationship between real interest rates and real short-run returns on equity.[93] For example, under the stable TMR approach, despite a 191 bps increase in gilt yields since H7, the TMR would remain unchanged from the H7 determination.[94]

4.13 At an extreme, subscribing steadfastly to this theory runs the risk of producing perverse results whereby the remuneration for the risk borne by debt investors could be close to, or even higher than, that for equity investors.[95]

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92 Wright and Smithers (2014), *The Cost of Equity Capital for Regulated Companies: A Review for Ofgem*, Figure 1.1 and pages 13 – 15 (link).

93 UKRN (2023), *UKRN guidance for regulators on the methodology for setting the cost of capital,* pages 19 – 20 (link).

94 The one-month trailing average yield on index-linked gilts as at the CAA's H7 cut-off date of 17 November 2022 was 0.30%, while the corresponding value as of this report's cut-off date of 1 November 2025 is 2.21%. 2.21% − 0.30% = 1.91%, or 191 bps. See Table 3-1.

95 Specifically, this result might occur when the cost of new debt is higher than the cost of equity. The cost of embedded debt is less relevant as this reflects historic market conditions while the cost of equity is forward-looking like the cost of new debt. This situation, where the cost of new debt is close to or above the cost of equity, could arise because the cost of equity is informed by long-term evidence (i.e., long-term TMR data) while the cost of new debt is informed by shorter-run evidence.

4.14 Conversely, a key criticism of the stable ERP theory is that it implies that the TMR is perfectly correlated with the risk-free rate. This outcome is not backed by empirical observations. Similarly, the observed instability of the ERP also contradicts the stable ERP approach.[96] Furthermore, considerations regarding the benefits of regulatory consistency and predictability between price control periods have also been raised as points against the adoption of this approach.[97]

4.15 In order to try to address the potential drawbacks with both approaches, some practitioners have attempted to quantify the relationship between the TMR and risk-free rate to reflect that the TMR is not *entirely* stable but *broadly* stable.[98] However, this is subject to several uncertainties associated with how to measure the relationship between equity returns and interest rates. In particular, expected equity returns are often inferred using dividend growth models, which are sensitive to the specification of inputs.[99] Therefore, this raises concerns around the accuracy of measuring the relationship between expected equity returns and interest rates.

Approach for estimating the parameter

4.16 There are four widely-accepted methods for estimating the TMR (and/or ERP). These are:

- the historical ex-post returns approach;
- the historical ex-ante returns approach;
- the forward-looking approach; and
- the survey-based approach.

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96 At PR24, Ofwat noted that the ERP is more unstable than the TMR, and therefore long-run averaging should be used to estimate the TMR, rather than the ERP. Ofwat refer to the ERP as the 'Market Risk Premium', or MRP. See Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix,* page 27 (link).

97 Ofgem (2024), *RIIO-3 Sector Specific Methodology Decision – Finance Annex*, ¶3.96, ¶3.99, ¶3.141 (link).

98 See for example National Grid Electricity Transmission's ("**NGET's**") submission to Ofgem for the RIIO-3 Sector Specific Methodology Decision ("**SSMC**"): Frontier Economics (2024), *The relationships between total market return and gilt yields*, RIIO-3 SSMC responses part 1 (link). This is referred to as the 'TMR Glider' by Ofgem and its stakeholders.

99 This was cited as a reason by Ofgem for not adopting the 'TMR Glider' in its RIIO-3 DD. It had concerns with the dividend growth model in particular, noting that it relied on an assumption of perpetual dividend growth and was sensitive to assumptions on the dividend growth rate. See Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex*, ¶3.103 (link).

Historical ex-post returns

4.17 The **historical ex-post returns approach** estimates the TMR informed by realised historical equity returns, treating these past returns as a benchmark for expected market performance.[100] Returns are converted into real terms based on the appropriate inflation index,[101] and aggregated into a representative figure by implementing an averaging method aligned with the investment horizon to derive an estimate of the expected TMR.

4.18 There are several different averaging methods (e.g., arithmetic, overlapping/non-overlapping, geometric, Jacquier, Kane & Marcus ("**JKM**"), and Blume)[102] for deriving the expected return.

100 The Dimson, Marsh and Staunton ("**DMS**") dataset, which includes nominal realised returns since 1900, is commonly used. See CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.222 (link).

101 Three inflation indices are appended for a continuous annual series for CPIH from 1900 to 2024. From 1900-1949, data from the Bank of England Millennium dataset (specifically, the O'Donoghue et al. (2004) CPI dataset) is used (Bank of England, *A millennium of macroeconomic data,* tab 'A47' (link)). From 1950-1987, the ONS CPIH backcast is used (ONS, *Consumer price inflation, historical data, UK 1950 to 1988* (link)). From 1988 onwards, the ONS' official CPIH data is used (ONS, *Consumer price inflation tables,* Table 37 (link)).

102 A range of averaging techniques can be employed when smoothing return or valuation series across different investment horizons. Arithmetic averages take the simple mean of periodic values, whereas geometric averages compound returns to capture multi-period growth. Overlapping and non-overlapping windows vary in whether multi-year periods share observations, influencing both smoothness and statistical independence. The JKM method adjusts averages to better reflect long-horizon investor experience under realistic market dynamics, while the Blume approach applies a mean-reversion adjustment that blends historical data with long-term expectations. These methods can be applied over various horizons—typically 10 or 20 years—depending on considerations such as presence of serial correlation and investor horizon assumed.

4.19 The rationale for selecting a particular averaging method is not straightforward. While the arithmetic mean is theoretically best aligned with the notion of 'expected return', the presence of serial correlation could complicate the application of the arithmetic average and needs consideration of whether one is adopting the perspective of a capital budgeter or investor.[103]

4.20 Furthermore, the adoption of arithmetic averages requires consideration of the length of the averaging period. For example, an arithmetic average of annual returns ('one-year arithmetic average') has the advantage of being transparent and simple to apply but might be exposed to the impact of serial correlation resulting in an upwards bias in the estimate of the expected return[104] over a 20-year investor horizon.

4.21 Conversely, selecting 20-year overlapping averages[105] reduces the impact of any serial correlation due to the longer averaging periods of returns and aligns with the regulator's chosen investor horizon. However, current market evidence creates practical issues with adopting the 20-year overlapping average (6.95%), as it is above the 1-year arithmetic average (6.92%)[106]—this is inconsistent with the theories underpinning TMR estimation.[107]

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103 The choice of perspective has implications for the biases that need to be corrected when selecting an estimator. The 'capital budgeter' perspective follows that of a firm making a long-term capital investment decision (for which the focus is the discount rate – the inverse of the expected return), while the 'investor' perspective follows that of a marginal investor making a long-run investment decision (for which the focus is the compounding of returns over the long run). The capital budgeter perspective requires adjustments for parameter uncertainty, which is what the Blume and JKM estimators address. See Wright and Mason (2020), *Comments on ENA/Oxera*, Section 2 (link).

104 Historically, equity market returns have been shown to be *negatively serially correlated* – i.e., a year with poor returns is typically followed by a year with strong returns, and vice-versa. Given the negative serial correlation, a holding period of 20 years will typically yield a lower annualised return relative to the arithmetic average return.

105 The 20-year overlapping average is constructed by (1) calculating the 20-year holding period return for each year in the dataset (i.e., the return earned in a given year if an investor invested in the index 20 years prior to the given year); and (2) taking the simple average of the 20-year holding period returns across the dataset and annualising the returns.

106 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* Table 7.6 (link).

107 This does not align with the theory that the 1-year arithmetic average is upward biased when estimating multi-period returns and may reflect practical issues that the 20-year overlapping average underweights datapoints at the beginning and end of the time series.

4.22 Therefore, regulators need to carefully consider whether or not the 20-year overlapping average is accurately capturing investors' expected return over the investment horizon.

4.23 One criticism of the historical ex-post returns approach is that it may contain unrepeatable events which mean that historical returns were higher or lower than could be expected in the future. The historical ex-ante approach aims to address this.

Historical ex-ante returns

4.24 The **historical ex-ante returns approach** attempts to adjust outturn returns to account for one-off unrepeatable events when estimating expected returns. For instance, if historical returns can partly be attributed to increases in the price-to-dividend ratio, this may merit some adjustment as the ratio cannot grow indefinitely.

4.25 Two main approaches that are adopted to estimate historical ex-ante returns are:

- **DMS decompositional methodology:** This estimates the TMR by splitting the historical equity premium into the mean dividend yield, the growth rate of real dividends, and the expansion of the price-to-dividend ratio. While the first two parameters capture investor expectations, the expansion of the price-to-dividend ratio is considered to be non-repeatable in expectation.
- **Fama-French methodology:** This approach relies on a dividend growth model to decompose historical returns into underlying expected and unexpected returns. The expected return is calculated as the sum of the average dividend yield and the average dividend growth rate. The unexpected return is the residual of the difference between the historical return and expected return.

4.26 The main criticism of the historical ex-ante approach is that it is largely assumption driven. For instance, assuming a higher dividend yield increases the ex-ante estimate. The unobservability of investor expectations makes it difficult to specify the appropriate assumptions. This is captured by the inclusion of 'volatility adjustments' under both approaches. These adjustments aim to correct for the potential understatement of volatility resulting from estimating the dividend yield by using long-term averages, which tend to be more stable than other sources of return such as capital appreciation.

Forward-looking returns

4.27 The **forward-looking returns approach** references prevailing share prices to infer implied discount rates based on the assumed dividend growth.[108]

4.28 This approach is sensitive to subjective judgements regarding key assumptions and can result in a wide TMR range.

4.29 UK regulators have typically not adopted this approach for regulatory WACC determinations.

Survey approach

4.30 Finally, the **survey approach** estimates the TMR and/or ERP based on stated expectations of future market returns obtained from surveys of investors, analysts and academics. These estimates can provide a useful cross-check against model-based approaches and provide insights into prevailing market sentiment.

4.31 However, a key criticism of the survey-based approach is that it often only captures a subset of market participants and can be subject to behavioural biases.[109]

4.32 The survey approach also does not typically feature in regulatory WACC determinations.

C. Our assessment

4.33 Below we discuss whether to estimate the TMR or ERP directly and our chosen approach for estimating the parameter.

Choice of parameter

4.34 The TMR has been discussed extensively in regulatory debates at PR19, PR24, RIIO-2, and RIIO-3. Despite the acknowledged potential shortcomings of this approach, regulators and practitioners have almost unanimously adopted the stable TMR theory.

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108 The forward-looking approach typically uses the Dividend Discount Model ("**DDM**"), which values a stock as the present value of its expected future dividends. By rearranging the model, one can infer the expected rate of return as the sum of the dividend yield and the dividend growth rate. This approach is most applicable to companies with stable, predictable dividends.

109 For example, ERP estimates may be subject to anchoring bias. In this context, anchoring is defined as choosing a forecast that is close to some easily observable prior (for example, one's prior forecast, or the last observed value). See Campbell and Sharpe (2007), *Anchoring Bias in Consensus Forecasts and its Effect on Market Prices* (link).

4.35 We see no sound rationale to depart from this established practice. This is mainly because market evidence indicates total equity returns are generally stable over time and are more readily observable than the ERP (which often needs to be derived from total equity returns).

4.36 However, we too acknowledge concerns with the stable TMR hypothesis potentially under- or over- estimating the ERP during times of high/low interest rates. Academic evidence also suggests the TMR is likely to adjust to some extent in line with interest rates as it is *broadly* stable (but not *entirely* stable). But, we are not aware of any established, accurate, and robust methodology for determining the relationship between TMR and the risk-free rate despite extensive debates on this issue in UK regulatory literature.[110]

4.37 As such, while we adopt the stable TMR approach, we account for prevailing market conditions by cross-checking the resultant CAPM based cost of equity against market evidence.[111] In our view, this ensures a consistent and predictable approach for determining the TMR and ERP.

4.38 As mentioned, our approach is also consistent with most recent UK regulatory determinations including Ofwat at PR24,[112] Ofgem at RIIO-3,[113] and previously, the CAA at H7.[114]

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110 For example, the TMR glider proposed by some stakeholders as part of RIIO-3 is reliant on an assumption-driven two-stage dividend discount model, which raises concerns around the accuracy of the estimated relationship between the risk-free rate and TMR.

111 See Section 11 for details.

112 Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix*, page 23 (link).

113 Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex*, ¶3.42 (link); Ofgem (2024), *RIIO-3 Sector Specific Methodology Decision – Finance Annex*, ¶3.251 (link).

114 CAA (2022), *H7 Final Proposals*, *Section 3: Financial issues and implementation*, ¶9.195 (link).

4.39 In contrast, the stable ERP approach had not been subscribed to by regulators in the UK in nearly a decade.[115] However, it has been proposed by the CMA in its PR24 PD, to partly estimate the TMR (alongside the stable TMR approach).[116] The CMA's rationale is anchored in its concerns that the 'stable TMR' approach could underestimate the cost of equity at a time in which the water sector needs to raise significant amounts of capital to fund large investment programmes.[117]

4.40 We disagree with the CMA's arguments. While its concerns regarding the 'stable TMR' approach are valid, its approach to address these concerns is not robust. It is counterintuitive to suggest that both, the TMR and ERP, could be stable. We do not consider it appropriate to adopt both theories in conjunction, as the adoption of either theory effectively renders the other implausible.

Approach for estimating the parameter

4.41 In deriving our estimate of the TMR, we prefer to rely on the historical ex-post and historical ex-ante approaches. This is consistent with UKRN guidance[118] and recent UK regulatory practice, as all UK regulators have based their most recent parameter estimates on only the historical ex-post and ex-ante methodologies.[119]

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115 In recent years, this approach has typically been applied in other jurisdictions (such as in continental Europe in 2021 by the Body of European Regulators for Electronic Communications (link) and Australia by the Independent Pricing and Regulatory Tribunal for New South Wales (link)), and not in the UK. See UKRN (2023), *UKRN guidance for regulators on the methodology for setting the cost of capital*, page 16 (link).

116 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.282 – 7.284 (link).

117 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.274 (link).

118 UKRN (2023), *UKRN guidance for regulators on the methodology for setting the cost of capital*, page 16 (link).

119 Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex*, ¶3.42 (link); Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix*, Table 8 (link); CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.282 – 7.285 (link); CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation*, ¶9.197 (link); CMA (2021), *Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, Final report*, ¶9.395 (link).

4.42 We also concur with the concerns regarding the suitability of both, the forward-looking and survey approaches. This particularly relates to their sensitivity to assumptions, survey design decisions, and behavioural biases such as anchoring.[120]

Historical ex-post returns

4.43 When applying the historical ex-post approach, we deflate the historical market returns based on an approach consistent with that adopted by Ofwat, Ofgem and the CMA.[121, 122, 123]

4.44 This is necessarily different to the returns deflator adopted at H7, as H7 was set in RPI-terms.[124]

120 See footnotes 108 and 109.

121 Historical nominal returns are deflated using a combination of (i) the Consumption Expenditure Deflator ("**CED**") for 1900-1949, (ii) the ONS CPIH back-cast for 1950-1987 and (iii) the ONS 'actual' CPIH dataset from 1988 onwards. See Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex*, ¶3.33 (link); Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix*, page 24 (link); CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.275 (link).

122 We note that there is a potential inconsistency in the Ofgem, Ofwat and CMA approach in that they use December index values from 1950 onwards, when monthly data is available, while using yearly index values from 1900 to 1950. Using annual index values results in a 1-year average estimate of 6.91%. However, to be consistent with Ofgem, Ofwat and the CMA, we adopt the same approach for deflating returns.

123 We note that Cambridge Economic Policy Associates ("**CEPA**"), an adviser to International Air Transport Association ("**IATA**"), takes a different approach to deflating historical returns and instead uses historic CPI as they cite issues with the historic backcast of CPIH due to changes in how housing costs are measured over time. However, other regulators such as Ofwat (who were advised by CEPA at PR24) have acknowledged the issue cited by CEPA and chose to adopt the CPIH-deflated returns series due to a desire to have consistency between the inflation measure used to deflate returns and index the price control.

124 The CAA adopted the same approach used by the CMA in the PR19 final determinations ("**FD**"), which places weight on both RPI/CED and CPI/CED-deflated returns. Specifically, the CMA at PR19 deflated returns using both RPI and CPI inflation, combining the CPI and RPI inflation series with CED inflation series prior to 1948. See CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation*, ¶9.187 (link); CAA (2021), *Initial Proposals, Section 2: Financial issues,* ¶9.106 (link); and CMA (2021), *Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, Final report*, ¶9.288 (link).

4.45 In principle, we consider that either a one-year arithmetic average or a 20-year overlapping average could be appropriate. For instance, the arithmetic average is theoretically best aligned with the notion of 'expected return', but the overlapping average is theoretically more appropriate to address upward bias due to serial correlation. However, the overlapping average is currently higher than the arithmetic average, suggesting that the overlapping average may not be suitable for addressing concerns regarding any upwards bias that may be present.

4.46 We have also considered the issue of taking the perspective of a capital budgeter versus portfolio investor. We are not aware of any conclusive evidence which would suggest one perspective is more consistent in deriving expected returns than the other.

4.47 Therefore, we prefer to focus on the one-year arithmetic average for deriving the historic ex-post returns. This places an appropriate balance on being transparent, stable (as it is a long time-series), reflecting returns required by investors, and consistency with other regulatory approaches (e.g., CMA PR24 PD).[125]

Historical ex-ante returns

4.48 For assessing ex-ante market returns, we place equal weight on the DMS decompositional and Fama-French methodologies. This is because both approaches rely on the premise that ex-post returns may be upward biased due to unrepeatable events, and therefore adopt consistent frameworks based on dividend discount models.

4.49 While they differ in their approaches for deriving the inputs for the dividend discount models, we do not consider either approach for deriving inputs as superior to the other and hence place weight on both approaches.

[125] CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.238 – 7.241 (link).

4.50 However, recent regulatory precedent for estimating ex-ante returns has varied. Specifically, Ofgem focused only on the DMS decompositional approach at RIIO-3,[126] whereas CAA H7,[127] Ofwat PR24,[128] and CMA PR24 PD,[129] adopted both methodologies.

D. Results

4.51 Below we summarise our estimates for the TMR based on both, the ex-post and ex-ante approaches and compare these to the estimate from H7.

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126 Ofgem relied solely on the DMS decompositional methodology. Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex*, ¶¶3.38 – 3.39 and Table 15 (link).

127 CAA (2021), *H7 Initial Proposals, Section 2: Financial issues,* ¶9.106 (link);

128 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.216 (link).

129 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* Table 7.7, Table 7.8 and ¶7.257 (link).

Table 4-1: H7 Final Decision and H8 Initial Proposal of the TMR

Component	H7[1]		H8 Initial Proposals[2]	
	Low	*High*	*Low*	*High*
Ex-post[3]	5.6%	6.5%	6.92%	6.92%
Ex-ante[4]	5.2%	5.7%	6.65%	6.79%
TMR range (RPI-deflated)	**5.2%**	**6.5%**		
Point estimate (RPI-deflated)		**5.85%**		
RPI-CPIH wedge		0.90%		
TMR (CPIH-deflated)[5]		**6.80%**	**6.72%**	**6.92%**

Source: CAA (2023), H7 Final Decision, Section 3: Financial issues and implementation, Table 9.6 (link); CMA (2021), Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, Final report, ¶9.242 (link). CMA (2025), Water PR24 References, Provisional Determinations Volume 4, Table 7.6 (link).

Note: (1) The H7 TMR estimate is based on the CMA PR19 redetermination and is in RPI-terms. (2) The H8 TMR estimate is in CPIH-terms. (3) The H7 ex-post TMR estimate is based on the 10- and 20-year overlapping and non-overlapping averages calculated in the CMA PR19 redetermination (simple and geometric averages are contained within the range),[130] while our H8 Initial Proposal relies only on the simple average (see ¶4.47). (4) The upper bound of the H7 ex-ante TMR range is informed by the Fama-French model, while the lower bound was estimated using the DMS decompositional approach adjusted for potential serial correlation.[131] For our H8 ex-ante TMR estimate the Fama-French approach informs the lower bound while the DMS decompositional approach informs the upper bound (see ¶¶4.48 and 4.54). (5) The CAA's point estimate for its TMR was the midpoint of the range; we adopt a range in which the lower bound is informed by the midpoint of the ex-ante TMR estimate range, while the upper bound is informed solely by the ex-post TMR estimate.

130 See CMA (2021), *Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, Final report*, Table 9.3 and ¶¶9.332 – 9.334 (link); CAA (2021), *H7 Initial Proposals, Section 2: Financial issues,* ¶9.106 (link).

131 CMA (2021), *Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, Final report*, footnote 2478 (link); CAA (2021), *H7 Initial Proposals, Section 2: Financial issues,* ¶9.106 (link).

E. Summary

4.52 In determining our TMR estimate for H8, we adopt the 'stable TMR' theory and estimate the TMR based on both, the historical ex-ante and ex-post approaches.

4.53 We do not consider any adjustments to our TMR estimate in order to account for prevailing market conditions and instead rely on cross-checks of the cost of equity with market evidence.

4.54 The historical ex-ante approach results in a range of 6.65 – 6.79%,[132] the midpoint of which (6.72%) represents the lower bound of our range. The historical ex-post approach implies a value of 6.92%. Therefore, our proposed range for the CPIH-real TMR is 6.72 – 6.92%.

4.55 This range is narrower than the range adopted by the CAA at H7 (in CPIH-deflated terms, 6.15 – 7.46%). However, in determining its WACC, the CAA adopted the midpoint of its TMR range for the higher and lower bound of the WACC range.

4.56 Our range reflects more recent data on historical returns and updated CPIH backcasts from the ONS. However, the midpoints of both, our proposed H8 and the CAA's H7 ranges are similar (6.82% and 6.80% respectively).

4.57 Combining the TMR with our proposed estimate of the risk-free rate (2.33%),[133] the implied ERP for our cost of equity estimation is 4.39 – 4.59%.[134] This is lower than the 5.26% set for H7,[135] reflecting the increase in interest rates since H7 has not resulted in a commensurate increase in the TMR estimate (given the adoption of the stable TMR theory).

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132 The lower bound is derived from the CMA PR24 PD using the Fama French approach whereas the upper bound is derived from Ofgem RIIO-3 DD (and CMA PR24 PD) using the DMS decompositional methodology.

133 See Table 3-1.

134 ERP is defined as TMR minus RfR (see ¶4.1 for details). Therefore, the lower bound of ERP equals 6.72% − 2.33% = 4.39% whereas the upper bound equals 6.92% − 2.33% = 4.59%.

135 CAA (2023), *H7 Final Decision, Section 3: Financial issues and implementation*, Table 9.6 (link).

5. Notional gearing

A. Introduction

5.1 Gearing is the proportion of debt within a company's capital structure. It is typically defined as net debt (total debt minus cash and cash equivalents) divided by the RAB of the licensee. In more general terms, gearing can be thought of as debt divided by the total capital base (debt plus equity).

5.2 Regulators often set a 'notional gearing' assumption when setting the allowed return, reflecting an appropriate level of gearing for an efficiently-run company in the relevant sector.[136] This notional approach allows companies to make their own choices about their financial structure whilst ensuring that customers only pay for costs associated with the efficient cost of capital for a notionally structured company.

5.3 UKRN guidance indicates that when determining the notional gearing, regulators should ideally take into account the notional company's risk profile with reference to external benchmarks (where possible), such as the gearing of comparable companies in the sector or in other jurisdictions (for e.g., beta comparators).

5.4 Notional gearing impacts the WACC in two primary ways:

(1) it determines the proportion of the cost of debt and therefore the proportion of the cost of equity within the overall cost of capital; and

(2) it affects the cost of equity as the asset betas, which do not incorporate the impact of financial leverage, are normally 're-levered' at the notional gearing assumption.[137]

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136 The use of this notional approach allows companies to choose their capital structure and bear the associated risks and rewards whilst ensuring consumers pay only for the efficient costs of capital for a notionally structured company.

137 See ¶¶6.41 – 6.45for details on re-levering.

5.5 The rest of this section is structured as follows:

- Section 5B explains the key methodological considerations that need to be addressed when estimating the notional gearing;
- Section 5C presents our arguments and analysis regarding the methodology;
- Section 5D sets out the results; and
- Section 5E summarises.

B. Methodological considerations

5.6 The level of notional gearing is a particularly important consideration for companies undertaking substantial investment programmes. Careful consideration should be given to whether the available equity buffer is sufficient to support these investments and absorb associated risks. For example, a stronger equity position, i.e., lower notional gearing, enhances financial resilience and mitigates exposure to interest rate fluctuations and adverse economic conditions.

5.7 UKRN guidance provides a comprehensive list of key issues that regulators need to consider when estimating notional gearing. These are:[138]

(1) **the risk profile of the notional company:** whether the notional gearing estimate provides the notional company with an adequate equity buffer to withstand shocks;

(2) **financial resilience**: whether the allowed returns, which depend on notional gearing, are consistent with the regulator's financeability assessment;

(3) **trends in actual gearing:** whether the observed gearing in the sector indicates what companies deem to be an efficient capital structure;

(4) **external benchmarks:** consideration of benchmarks such as the gearing levels of comparable firms in the sector, both domestic and overseas, or of firms engaged in similar activities; and

(5) **relationship with the allowed return:** test how notional gearing, asset beta and cost of debt collectively impact the WACC.

5.8 We opine on these issues in the following sub-section.

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[138] UKRN (2023), *UKRN guidance for regulators on the methodology for setting the cost of capital*, page 33 (link).

C. Our assessment

Risk profile of the notional company

5.9 At H8, we expect no material increase in the notional company's risk profile. This reflects that HAL is assumed to continue to operate as a two-runway airport, we understand that the CAA intends to retain the existing risk mitigation mechanisms from H7 and the normalisation of operating conditions post the global pandemic.

5.10 Specifically, HAL is expected to remain capacity constrained under a two-runway solution in line with its pre-pandemic operations. This implies that the company's risk profile (based on passenger volumes), has lowered since H7 and is largely unchanged from the previous price control (Q6). Given that passenger volumes are considered the most important driver of systematic risk for airports, it would suggest that the notional gearing assumption for HAL should remain unchanged from the long-term assumption (60%) adopted previously by the CAA.[139]

Financial resilience of the notional company

5.11 Assessing the financial resilience of the notional company is outside the scope of this report. In any case, we are not aware of any concerns with respect to financial resilience for deviating away from the H7 notional gearing assumption of 60%.

HAL's observed gearing

5.12 We have analysed trends in HAL's actual gearing over the H7 period to assess whether these are consistent with an unchanged notional gearing assumption. HAL's gearing has declined marginally as capital market conditions have normalised,[140] and HAL's Class A gearing (62%)[141] is aligned with the CAA's historical notional gearing assumption of 60%.

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[139] This was in-line with the UKRN guidance and with the previous price control, Q6. See CAA (2022), *H7 Final Proposals*, *Section 3: Financial issues and implementation*, ¶¶12.22 – 12.24 (link).

[140] This is because HAL's gearing ratios have decreased as we moved away from the pandemic. See Heathrow (SP) Limited (2025), *Results for the six months ended 30 June 2025*, page 22 (link).

[141] Class A gearing is consistent with the CAA's historic definition of notional gearing as it excludes junior instruments such as Class B debt and debt outside of the regulatory ringfence e.g., Heathrow Finance issued debt. Heathrow Finance is the holding company of a group of companies, which includes HAL and Heathrow Express Operating Company Limited which operates the Heathrow Express rail service. See Heathrow Finance (2025), *Annual Report 2024,* page 37 (link).

External benchmarks

5.13 Other regulators have recently proposed to either retain or reduce their notional gearing assumption from previous price controls to reflect sector-specific characteristics. For example, for RIIO-3, Ofgem has proposed a lower notional gearing assumption of 55% for electricity transmission ("**ET**") while retaining the 60% assumption for gas distribution and transmission ("**GD&T"**).

5.14 Ofgem notes that the differences in notional gearing between ET and GD&T are due to sector-specific differences, such as the level of investment anticipated over the RIIO-3 period.[142]

5.15 Similarly, at PR24, Ofwat reduced the level of notional gearing from 60% to 55%. This was to reflect investment needs,[143] incentivise efficient financing choices,[144] and incorporate different benchmarks and evidence.[145] This was retained by the CMA in its PR24 PD.[146]

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142 Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex,* ¶4.8 (link).

143 Water companies face large investment programs to meet environmental and security of supply targets over the upcoming price control period. Lower gearing implies a higher equity portion which can make the financing structure more resilient to large financial shocks.

144 By lowering the notional gearing, companies with higher debt levels might be encouraged to optimise their financing mix rather than rely heavily on debt (therefore focusing on the efficiency of the financing as opposed to purely the requisite levels).

145 Specifically, Ofwat at PR24 considered benchmarks such as gearing levels across European equity markets, company-specific gearing separately for securitised and non-securitised companies, and notional gearing in past regulatory decisions. See CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.57 (link) and Ofwat (2022), *Creating tomorrow, together: Our final methodology for PR24, Appendix 10, Aligning risk and return,* pages 29 – 32 (link).

146 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.69 (link).

5.16 There are also other rationales for adapting the notional gearing. For instance, at NR23, the CAA set NERL's notional gearing with reference to the beta comparators.[147] This reflected the precedent from Regulatory Period 3 for NERL ("**RP3**") whereby the CMA set the gearing based on the listed comparators' gearing, with the recognition that higher gearing was not in the best interests of NERL's customers at RP3.[148]

Relationship with allowed return

5.17 In UK regulation, there has been debate on how the notional gearing assumption impacts the cost of capital as it has been noted that the WACC estimate based on the CAPM is not invariant to gearing.

5.18 In particular, the WACC increases with gearing as we cannot accurately measure how the debt beta and cost of debt vary with gearing. It is therefore common practice to assume both, the debt beta and the cost of debt are fixed i.e., they do not vary with gearing. This implies that, under the assumption that the cost of debt estimate is higher than the Modigliani-Miller implied cost of debt, the WACC increases with gearing.[149]

5.19 This is a violation of the Modigliani-Miller principle,[150] and has been reviewed by regulators across sectors including the CAA at H7.[151] Also, during the NR23 appeal, the CMA noted that a higher notional gearing assumption increased the vanilla WACC (other things being equal).[152]

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147 CAA (2023), *Economic regulation of NATS (En Route) plc: Provisional Decision for the next price control review ("NR23"),* ¶5.90 (link).

148 CAA (2022), *Economic regulation of NATS (En Route) plc: Appendices to initial proposals for the next price control review ("NR23"),* ¶C32 (link).

149 For more detail, see Mason and Wright (2021), *A report on financial resilience, gearing and price controls,* page 24 onwards (link).

150 Modigliani-Miller Proposition I states that in the presence of no market imperfections, the value and cost of capital of a company are unaffected by capital structure. See Modigliani and Miller (1958), *The Cost of Capital, Corporation Finance and the Theory of Investment*, The American Economic Review, Volume 48, Issue 3 (link).

151 For example, this is discussed in CMA (2020), *NATS (En Route) Plc/CAA Regulatory Appeal, Appendix D: Technical note on betas and gearing* (link); Ofgem (2021), *RIIO-2 Final Determinations – Finance Annex (REVISED)*, ¶3.64 and Consultancy report 6, page 151 (link); CAA (2022), *Economic regulation of NATS (En Route) plc: Appendices to initial proposals for the next price control review ("NR23")*, Appendix C, ¶¶C174-C177 (link).

152 CMA (2020), *NATS (En Route) Plc/CAA Regulatory Appeal,* ¶13.112 (link).

5.20 We examine this in detail in Appendix 3.

D. Results

5.21 Given that HAL's risk profile is no higher than it was at the time of determining the H7 price control and likely lower, we propose to adopt a notional gearing assumption of 60%.

E. Summary

5.22 Overall, our review of the evidence examined indicates that there is no compelling reason to deviate from the existing assumption for notional gearing.[153] Specifically, our view is informed by the following points:

(1) **Changes in risk profile**: there has been no material change in the risk faced by the notional company at H8 that would warrant a lower gearing assumption;

(2) **Financial resilience**: we are not aware of any financial resilience concerns at the H7;

(3) **Trends in HAL's actual gearing**: HAL's Class A gearing is broadly in line with the notional gearing assumption; and

(4) **Consistency with previous price controls:** Maintaining a 60% notional gearing aligns H8 with earlier determinations at Q6 and H7, supporting stability and predictability across regulatory periods.

5.23 Also, based on our analysis in Appendix 3, we are satisfied that the impact on the WACC from changes in notional gearing is not material enough to reconsider the level of notional gearing.

153 We have analysed how sensitive our WACC assumption is to changes in notional gearing. Our analysis suggests that the vanilla WACC increases by 4 bps and pre-tax WACC decreases by 6 bps for each 10 percentage point increase in gearing. The impact of changing the gearing assumption on the allowed WACC is therefore limited. See Appendix 3 for our assessment.

6. Beta

A. Introduction

6.1 Beta within the CAPM framework reflects an asset's (or a portfolio of assets') exposure to systematic (or common) risks relative to the broader market.[154] It measures the correlation between the returns of a listed stock and the returns of the wider market. The higher the beta, the greater the exposure to systematic risk and the higher the expected return required by investors.

6.2 Systematic risks are distinct from idiosyncratic risks, which may impact only a small number of assets, or may simultaneously impact different assets positively and negatively. They are related to several factors such as macroeconomic developments (e.g., the stage of the business cycle that the economy is in), financial risk, and operating leverage.[155, 156] A commonly referenced systematic risk is the performance of the overall economy.

6.3 At the outset, it is important to recognise that estimating betas, particularly for a non-listed entity such as HAL, is not an exact science. There are a number of specific methodological considerations that exist within the general framework for estimating asset betas, with no consensus across regulators and practitioners on a single, consistent approach. As such, an element of judgement is required.

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154 Under the CAPM, investors are only rewarded for the degree of systematic risk they are exposed to as this risk is not diversifiable by holding a basket of securities.

155 There are various measures of estimating operating leverage. One common measure is the ratio of fixed costs to total costs.

156 Brealey, Myers, and Allen (2011), *Principles of Corporate Finance (Tenth Edition)*, *What Determines Asset Betas?*, pages 222 – 224.

6.4 This has been recognised by regulators. For instance, the CMA has stated:

> *There are a number of choices that can be made in determining the beta estimate and ultimately it will always be a matter of judgement as to which is the most appropriate.*[157]
>
> *[…]*
>
> *There is no single agreed way to estimate beta – in fact, the particular circumstances of each case make such an agreement largely impossible.*[158]

6.5 When the beta needs to be determined for an unlisted company (like HAL), then the returns of comparable companies are used as a proxy for the company (or sector) of interest. In this case, and specific to aviation, some additional issues must be considered. These include:

- the **traffic risk** associated with the comparable companies;
- the specific **underlying Capex and Opex risks** that each comparable company is exposed to;
- the **till structure** (if applicable) that the comparable companies operate under;
- the expectations of **government support** that the comparable companies can rely on; and
- the **overall regulatory regime** in which the comparable companies operate.

6.6 These issues give rise to inherent complexities involved with comparator analysis and the subjectivity of the methodological decisions required.

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157 CMA (2021), *RIIO-2 Final determination, Volume 2A: Joined Grounds: Cost of Equity*, ¶5.581 (link).

158 CMA (2021), *RIIO-2 Final determination, Volume 2A: Joined Grounds: Cost of Equity*, ¶5.583 (link).

6.7 The challenges associated with estimating the asset beta for an unlisted airport, and more generally the cost of equity and cost of capital for regulated utilities, are summarised in the following excerpt from the CAA in the context of the H7 appeals:

> *With respect to the cost of equity, the fact that Heathrow's shares do not trade openly on a stock exchange, together with the lack of close, stock exchange listed comparators for HAL made the estimation of asset and equity beta values inherently more difficult and* ***required a significant degree of judgement****. The impact of the pandemic […], introduced a further challenge.*[159] *[emphasis added]*
>
> *[…]*
>
> ***There is no single "right" way to deal with these methodological challenges. It requires an exercise of regulatory judgement to generate a price cap based in part on the cost of capital in these circumstances****.*[160] *[emphasis added]*

6.8 When deciding on the preferred methodology for estimating beta, regulators can draw on both regulatory precedent and financial theory. However, regulators can also have diverging views[161] and there may be some practical limitations related to the sector in question.[162] Therefore, regulators need to appropriately consider the pros and cons of adopting any particular approach, acknowledging that there is not one particular superior methodology.

6.9 One useful way to address this uncertainty is to consider evidence from a variety of approaches to inform a reasoned and robust range which is likely to contain the 'true estimate' of the asset beta.

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159 CAA (2023), *Response to Appeal*, ¶129.1 (link).

160 CAA (2023), *Response to Appeal*, ¶132 (link).

161 For example, Ofwat and Ofgem follow different approaches, with Ofgem placing the most emphasis on 10-year betas whereas Ofwat considered both 5- and 10-year betas. See footnotes 220 and 221 for details.

162 For example, weekly betas are desirable from a theoretical perspective as they smooth out daily fluctuations and are therefore more stable and hence more reflective of the underlying dynamics, however, they suffer from the 'reference day' effect. See ¶¶6.22 – 6.27 for details.

6.10 The rest of this section is structured as follows:

- Section 6B explains the methodological considerations for estimating asset beta;
- Section 6C presents our methodology for estimating asset beta reflecting the considerations above;
- Section 6D sets out our estimates based on recent market evidence;
- Section 6E presents high-level cross-checks to our estimated H8 beta range; and
- Section 6F summarises.

B. Methodological considerations

6.11 When estimating beta, economists, regulators, and market practitioners typically follow a four-step process:[163]

- Calculate the initial estimate of a company's systematic risk (the raw equity beta) by comparing company total returns i.e., both capital gains and dividends (or those of similar companies in the same industry if the company is not publicly traded) to the returns of a relevant stock market index, as indicated in Figure 6-1 below;[164]

163 For more information, see our report for Ofwat. FTI Consulting (2022), *Early view of water sector betas for PR24*, ¶3.6 (link).

164 ‘Raw’ equity betas are estimated by regressing total equity returns of a company (including both share price and dividend returns) against the market returns (using a representative equity index for the market e.g., FTSE All-share index for the UK).

Figure 6-1: Illustrative comparison of total returns to stock market index returns

Source: FTI analysis.

(1) Estimate debt betas (which reflect the sensitivity of debt returns to systematic risk);

(2) Transform the raw equity beta estimates into the asset beta. The asset beta is a measure of the systematic risk of the assets (i.e., both equity and debt), removing the impact of the firm's capital structure on this risk. This is important because the observed gearing of the company in question may differ from the 'notional gearing' (which is representative of the theoretical efficient capital structure assumed by the regulator for setting the WACC). This step is referred to as '**de-levering**' the equity beta;[165] and

(3) Adjust the overall risk of the company's assets (i.e., asset beta) using the 'notional gearing' to estimate the equity beta. This step is referred to as '**re-levering**' the asset beta.[166]

165 The 'actual gearing' is the amount of debt financing as a proportion of the combined value of the company's debt and equity.

166 For more information regarding the notional gearing assumption, see Section 5.

6.12 It is worth noting that the CAA's approach to estimating HAL's beta at H7 partly departed from the standard practice mentioned above. This was primarily a result of the extraordinary circumstances presented by the Covid-19 pandemic, and the subsequent unprecedented volatility in capital markets.[167]

6.13 In the case of estimating the H8 beta for HAL, we note the following challenges:

- HAL's beta cannot be directly observed as it is not listed on any stock exchange;
- There are no perfect listed comparator firms from which HAL's beta can be readily inferred;
- The CAA's policy is to continue to implement a Traffic Risk Sharing mechanism ("**TRS**") — this was introduced at H7 and is unique to HAL relative to other similarly sized airports;[168] and
- Global capital markets, including airport stocks, were severely impacted by the Covid-19 pandemic in 2020 and 2021 and subsequently (albeit to a lesser extent) by the events of 2 April 2025 when the US administration announced its tariff policy ("**Liberation Day**") — how the data pertaining to these events is dealt with forms an important aspect of the beta analysis.

167 Specifically, the CAA re-weighted pandemic period data of the comparators to derive what it considered to be an appropriate long-run beta estimate for HAL. This adjustment was calculated by weighing the data from the pandemic period, based on the assumed frequency of a 17 to 39 months long pandemic every 20 to 50 years, to ensure that the volatility observed during that period was representative of the expected frequency of future pandemics. For details see CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation*, ¶¶9.123 and 11.43 (link).

168 CAA (2026), *H8 Initial Proposals, Section 3*, Chapter 10.

6.14 While the first three issues were present at H7, capital market circumstances are somewhat different now. In particular, the volatility and uncertainty pertaining to the pandemic have now reduced,[169] and by the time the H8 determination is announced, there will be almost years of post-pandemic market data available (assuming the pandemic ended by 31 December 2021).[170] However, calculating betas based on historical data means that capital market data affected by the impact of Covid-19 will feature within the data sample for longer beta estimation windows (e.g., betas with an estimation window of 10-years).

6.15 Separately, the impact of the 'Liberation Day' announcement by the current US administration on capital market data and comparator betas will be a feature of all comparator beta estimation.

6.16 In the remainder of this sub-section, we discuss the methodological considerations associated with:

- estimating raw equity betas;
- debt betas;
- approach to de-levering beta;
- accounting for the impact of market anomalies; and
- accounting for relative risk differentials between HAL and comparators.

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169 This can be observed with reference to the Cboe Volatility Index (VIX Index). See the Cboe page for the index (link). At the height of the Covid-19 market turmoil in March 2020, the VIX surged to around 82.7, far above its typical range and marking one of its highest ever readings. In contrast, as of 24 February 2026, the VIX sits at around 20, reflecting significantly calmer market expectations of volatility today compared with the pandemic peak.

170 This is the assumed pandemic end date in NR23, based on support from the CAA's consultants. See Flint (2023), *Support to the Civil Aviation Authority: NR23 Updated Beta Assessment*, Table 3 (link); CAA (2023), *Economic regulation of NATS (En Route) plc: Provisional Decision for the next price control review ("NR23")*, ¶5.102 (link).

Estimating raw equity betas

6.17 Raw equity betas reflect the output of regressing a stock's total equity returns[171] against the market's returns.[172] It is the first step in deriving the appropriate equity beta for a regulated sector under the CAPM.

6.18 To estimate a raw equity beta for an unlisted company (like HAL), practitioners and regulators need to make five key decisions:[173]

- **Comparator companies**: identification of companies which have similar levels of exposure to the systematic risks faced by the company of interest;
- **Data frequency**: the granularity of data used in the regression (e.g., daily, weekly or monthly);
- **Estimation window**: the time period over which the regression is conducted (e.g., 1, 2, 5, or 10 years);
- **Averaging period**: the use of spot values (using the latest data available) or historical averages; and
- **Estimation method**: the econometric method used to estimate the beta (i.e., Ordinary Least Squares ("**OLS**"), generalised autoregressive conditional heteroskedasticity ("**GARCH**") models or maximum likelihood estimators ("**MLE**")).

6.19 We examine each of these issues in turn below.

Comparator analysis

6.20 When identifying the appropriate comparators for a sector, regulators need to identify comparators with similar levels of systematic risk to the sector in question. These involves considering the sources of systematic risk for the sector e.g., operating leverage, volume risk and cost risk.

6.21 Often, comparator analysis may involve the need to examine foreign comparators outside the operational jurisdiction of the asset in question. When doing so, one needs to take into account practical considerations such as currency risk or the diversity of the reference stock market being used to assess betas.

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171 Total equity returns include both share price and dividend returns. The CAPM equation can be rearranged such that the beta reflects the output of regressing excess returns. This gives practically identical results.

172 Regulators normally use a representative equity index for the market.

173 For more information, see FTI Consulting (2022), *Early view of water sector betas for PR24*, report for Ofwat, ¶4.2 (link).

Frequency of data

6.22 The regressions estimating raw equity beta can be calculated using different frequencies of data such as daily, weekly and monthly.

6.23 Each level of frequency comes with its own advantages and disadvantages. For example, for a given period, daily betas tend to have the highest statistical robustness as they incorporate the maximum number of datapoints. However, daily estimates may be susceptible to 'noise' (e.g., sharp movements in share prices due to market overreaction to short-term events) which lower-frequency data may smooth out.[174] Separately, weekly and monthly beta estimates can vary depending on the particular choice of day of the week/month selected for estimating betas.[175]

6.24 In general, there are two key determinants that influence the choice of frequency of data for beta estimates.

6.25 The first key determinant is the liquidity of the company's shares in question. If a company's shares exhibit high levels of liquidity then higher frequency data (e.g., daily) would be suitable and robust for beta analysis.

6.26 The second determinant is the robustness of the estimate. The advantage of using daily data is that it captures the largest number of data points for equity beta estimation. This results in a smaller standard error in the regression estimate and, hence, a more precise estimate.[176] Typically, weekly and monthly data estimates smooth out daily fluctuations but yield fewer data points, resulting in estimates with higher standard errors.

6.27 Additionally, weekly and monthly estimates are further susceptible to the reference day effect, whereby the day of the week or month chosen may affect the beta estimates obtained.

[174] This has been previously acknowledged by the CMA. See CMA (2021), *Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, Final report*, ¶9.458 (link).

[175] For instance, weekly betas based on returns calculated on Mondays can be different from those calculated on Wednesdays. Similarly, monthly betas based on returns calculated on the first day of the month can be different from those calculated on the fifteenth day or the twenty-third day.

[176] The standard error is a statistical term that measures the accuracy with which a sample distribution represents the underlying population.

Estimation window

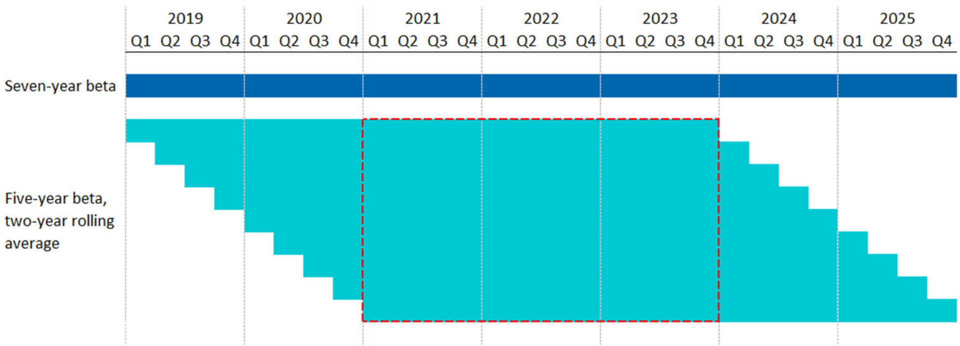
6.28 The estimation window is another key consideration when estimating raw equity betas. In selecting the appropriate estimation window, it is important to establish a balance between the relevance of historical data and the variance of the estimates. For example, shorter estimation windows place more weight on recent data which may be more reflective of the future. However, these estimates tend to have lower efficiency and can be more sensitive to outliers due to the smaller number of data points. Conversely, longer estimation windows could include data that is less relevant to the immediate future but may smooth out the impact of outliers.

6.29 Regulators have historically considered different estimation windows such as 1-, 2-, 5-, and 10-year with 2- and 5-year windows being most commonly adopted.[177]

Averaging period

6.30 When considering the approach to averaging, regulators need to consider whether this results in an under- or overweighting of particular periods of data. For example, a 2-year average of 5-year betas would place less weight on recent data points and would place the most weight on the middle three years of data (i.e., that is two years prior to the cut-off date). We illustrate this in Figure 6-2 below.

Figure 6-2: Rolling average illustration



Source: FTI analysis.

6.31 A further consideration is the time period considered if adopting rolling averages. For example, rolling averages will incorporate a longer time period than the headline estimation window e.g., a 2-year average of 5-year betas will encompass 7 years of data whereas a spot 5-year beta will encompass 5 years of data.

177 We discuss the regulatory precedent in greater detail in our assessment.

6.32 The CMA has previously recognised that:

> *"…rolling averages place different weight on the various underlying data points and that this can give rise to potential distortions in the figures…"*[178]

6.33 The use of historical averages of rolling betas may be appropriate if the regulator wishes to underweight or overweight a particular period. However, from an econometric perspective, it may be superior to use spot estimates.[179]

Estimation method

6.34 There are several estimation techniques which can be used to estimate raw equity betas including OLS, GARCH and MLE. Each method comes with its own underlying assumptions and particular focus. For example, OLS is focused on estimating the relationship between the dependent variable and independent variables by minimising the errors between the predicted and observed values.[180] On the other hand, GARCH is focused on estimating the volatility of the error term (the gap between the predicted and observed values).[181]

6.35 Regulators need to consider the focus for estimating the beta (e.g., is it maximising the accuracy of estimating the beta itself or minimising the volatility of estimates) when selecting the choice of beta estimation. Another consideration is the complexity of the method — OLS is relatively straightforward to implement and to interpret the results, whereas GARCH is a more involved model.

6.36 Historically, regulators have tended to use OLS to estimate betas.[182] This is due to several factors, such as the ease of applying the method and interpreting the results.

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178 CMA (2021), *Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, Final Report,* ¶9.473 (link).

179 For instance, the UKRN Cost of Equity Study (2018) noted that "[t]*he econometric basis for using this approach* [rolling beta averages] *is actually fairly shaky: in particular all parameter standard errors are invalidated by this methodology*". See Wright et al. (2018), *Estimating the cost of capital for implementation of price controls by UK Regulators*, page 50, footnote 67 (link).

180 See Stock, J. and Watson, M. (2020), *Introduction to Econometrics, Global Edition, Fourth Edition,* Chapter 4: The Ordinary Least Squares Estimator, pages 148 – 149.

181 See Greene, W. (2012), *Econometric Analysis, Seventh Edition,* Chapter 20.10.2: ARCH(q), ARCH-in-mean, and generalised ARCH models, pages 972 – 974.

182 We discuss this in greater detail in our assessment.

Debt beta

6.37 Debt beta reflects the sensitivity of a company's debt to systematic risk. Unlike equity beta, which plays a crucial role in setting the cost of equity, debt beta normally plays no role in setting the cost of debt for regulated entities. Instead, regulators tend to focus on the observed yield on corporate debt and the interest expense of the sector when estimating the allowed cost of debt.

6.38 However, under the CAPM approach, the debt beta impacts the cost of equity in the de-levering and re-levering of equity betas. The process involves converting the equity beta into an asset beta to remove the impact of financial leverage on both equity and debt betas.

6.39 In theory, the debt beta could be estimated using the same approach as raw equity betas. In practice, estimating the debt beta tends to be a more difficult and involved process. This is because corporate bonds are often more illiquid than stocks, and therefore estimating the debt beta in the same way as the equity beta may give inconclusive and/or inconsistent results.

6.40 As a result, regulators, economists and academic practitioners have previously considered a variety of alternative methods for estimating debt beta. The four relevant methods for estimating debt beta are: (i) the direct method; (ii) the indirect method; (iii) the structural method; and (iv) the decomposition method.[183]

Approach to de-levering and re-levering betas

6.41 Raw equity beta estimates are affected by a company's capital structure. A higher level of gearing increases the company's returns volatility thus increasing the raw equity beta, all else equal. It is therefore commonplace to de-lever the raw equity beta and convert it to an 'unlevered' beta to remove the impact of gearing.

6.42 Estimated raw equity betas are typically unlevered through the Harris-Pringle formula to allow for more precise comparisons of risk across firms with different levels of gearing. An unlevered beta is therefore a measure of operating risk not affected by the financial capital structure choices of each comparator.

183 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.418 (link).

6.43 The unlevered beta is the share of the asset beta that is comprised of the equity beta i.e., the asset beta if the debt beta is zero. The raw equity beta is typically de-levered using actual historical gearing estimates:[184]

$$\beta_u = \beta_e \times (1 - g)$$

where β_u is the unlevered beta, β_e is the raw equity beta and g is gearing.

6.44 We then estimate the asset beta as follows, using actual historical gearing estimates:

$$\beta_a = \beta_u + (g \times \beta_d)$$

where β_u is the unlevered beta, β_d is the debt beta and g is gearing.

6.45 After making any necessary adjustments to the asset beta (discussed in the following sub-sections), the asset beta is re-levered at notional gearing. This results in an implied equity beta as follows:

$$\beta_{e,notional} = \frac{\beta_a - g^N \times \beta_d}{1 - g^N}$$

where β_a is the asset beta, g^N is the notional gearing and β_d is the debt beta.

Accounting for the impact of market anomalies (Covid-19 and 'Liberation Day')

6.46 In providing a view on the reasonable beta range for H8, the data choices and methodology should utilise data that will best reflect the expected future market conditions.

6.47 In the context of regulated airports, the Covid-19 pandemic is generally agreed to have been the most important recent macroeconomic event to have had an impact on the risk of these assets. Given that the probability of another pandemic occurring is unknown, estimating the precise impact of this is a non-trivial exercise and subject to assumptions and judgements.

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184 We note that in certain cases the raw equity beta may not be de-levered using actual gearing if short term disruptions lead to unreliable or distorted gearing estimates. In this scenario, other gearing definitions may be used, such as target gearing or average sector gearing.

6.48 For instance, it is difficult to estimate the duration of the impact of the pandemic on asset betas, and the estimation is also complicated by the differing support measures for airports undertaken by national and regional governments and regulators during the pandemic. It is therefore difficult to ascertain the accuracy and relevance of the pandemic affected data for estimating forward looking betas for H8.

6.49 At H7, the CAA was faced with the atypical challenge of accounting for the impact of the pandemic on airport betas during the pandemic at a time of heightened uncertainty and no visibility of how long the effects of the pandemic would last.

6.50 As such, the CAA implemented a novel approach which effectively placed reduced weight on data affected by the pandemic.[185]

6.51 In the current circumstances, the issue of Covid-19-affected data is currently only relevant for 5- and 10-year beta estimation windows[186] with the key issue being whether or not to retain the CAA's H7 approach to adjusting pandemic-affected data.

6.52 In addition, the US government's trade policy announcements, particularly those related to 'Liberation Day' (2 April 2025) may have also had significant and atypical effects on airport betas, which could merit some form of adjustment.

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185 Specifically, the CAA noted that pandemic-affected data should not be disregarded but should be appropriately weighted to account for the fact that such pandemics are an infrequent occurrence. Accordingly, the CAA estimated the asset beta using a modified OLS regression, in which a lower weight was applied to pandemic period observations relative to pre-pandemic observations. The weight on the pandemic data reflected the assumed frequency with which pandemic-like events might occur in the future (once every 20-50 years), and their duration (17-39 months). See CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation*, ¶9.151 (link).

186 For example, the proportion of observations affected by the Covid-19 pandemic for spot 5- and 10-year betas is c. 23% and 19% respectively. This proportion has been calculated using the number of observations in the estimation window affected by Covid19 and dividing by the total number of observations in the estimation window. By the time the CAA issues its Final Proposals, weight on pandemic-affected observations will be lower for the spot 5-year beta depending on the cut-off date adopted. For example, a cut-off date of June 2026 would imply a weight of c. 10% on pandemic data for the 5-year beta assuming a pandemic end date of 31 December 2021.

Accounting for relative risk differentials between HAL and comparators

6.53 In an ideal situation, regulators should be able to identify perfect comparators when estimating the asset beta for the sector. However, this is not typically possible due to the limited range of potential listed comparators. For instance, in the case of HAL, there are no listed large standalone GB airports.

6.54 In this situation, regulators need to exercise judgement in accounting for the potential imperfections between the chosen comparators and the sector in question. This requires considering: (a) the sources of differences in systematic risk between the sector and the chosen comparators; and (b) the quantification of these differences.

6.55 Examples of these adjustments include adjustments by Ofgem for high capex intensity in RIIO-ET1,[187] operating leverage by the CMA as part of the redeterminations for PR09 and PR14[188] and the CAA for traffic risk at H7.[189]

C. Our assessment

6.56 In this section, we set out our assessment of each of the key issues identified in the previous sub-section.

Estimating raw equity betas

Comparators

6.57 At the outset it is important to recognise that any comparator analysis is subject to limitations. Particularly in the case of HAL, it is impossible to find a perfect (set of) comparator(s).

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187 Ofgem considered that, for SP Transmission Ltd ("**SPTL**") and Scottish Hydro Electric Transmission Ltd ("**SHETL**"), capex to regulated asset value ("**RAV**") ratios were on average higher in RIIO-T1 relative to transmission price control review 4. This suggested a high asset beta and Ofgem therefore chose a cost of equity for SPTL and SHETL towards the upper end of its range. See Ofgem (2012), *RIIO-T1: Initial Proposals for SP Transmission Ltd and Scottish Hydro Electric Transmission Ltd,* ¶¶5.19 – 5.22 (link).

188 The CMA included an uplift of 13% for Bristol Water's asset beta as it displayed higher operational gearing relative to comparators. See CMA (2015), *Bristol Water plc, A reference under section 12(3)(a) of the Water Industry Act 1991,* ¶¶10.151 – 10.163 (link).

189 The CAA at H7 applied a downwards adjustment to comparator asset beta values to account for the impact of the TRS mechanism. See CAA (2022), *H7 Final Proposals*, *Section 3: Financial issues and implementation*, ¶¶9.126 – 9.128 (link).

6.58 At H7, the CAA and its advisors undertook an involved process to select suitable comparators and informed its beta estimate for HAL on the basis of the following six comparator airport groups:

- Aena SA ("**AENA**") operates 46 airports and two heliports in Spain, including Madrid-Barajas and Barcelona-El Prat.[190]
- Groupe ADP SA ("**ADP**") operates 26 airports internationally, including Paris Charles de Gaulle Airport.[191]
- Fraport AG ("**FRA**") operates Frankfurt Airport and holds interests in 29 airports internationally.[192]
- Flughafen Zürich AG (**"FHZN"**), the operator of Zurich Airport, which operates nine other airports internationally.[193]
- Sydney Airport Limited ("**SYD**"), the owner of Sydney Airport.[194]
- Flughafen Wien AG ("**FLU**"), the operator of the international airports in Vienna, Malta, and Košice.[195]

6.59 The CAA placed the most weight on AENA, ADP and FRA in deriving its beta estimate as these comparators formed part of both, the baseline and Covid-19 adjustment.[196]

6.60 For H8, the key issues relating to choice of airport comparators pertains to balancing the availability of comparator airport data and relevance of the comparators.

6.61 Firstly, we observe that since the H7 determination, there has been no new listing of a relevant airport comparator that merits inclusion in a comparator set for HAL.

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190 Aena (2025), *Fact Sheet* (link) and *Our airports* (link).

191 Groupe ADP (2025), *About us* (link) and *Airport Network* (link).

192 Fraport Group (2025), *About us* (link).

193 FHZN is also currently constructing a new greenfield airport in Noida, India. See Flughafen Zürich AG (2025), *Our portrait* (link).

194 Sydney Airport (2025), *About Sydney Airport* (link).

195 Flughafen Wien AG (2025), *Company profile – Flughafen Wien AG* (link).

196 We review the CAA's approach at H7 in greater detail in Appendix 6.

6.62 Secondly, the comparability of the H7 comparators is somewhat affected by recent activities. Specifically, AENA, ADP, and FRA have acquired several smaller regional airports in the recent past and FHZN has acquired a major stake in an airport in India.[197] This likely impacts the underlying characteristics of each airport group and arguably diminishes the weight of the beta of the main group airport (which is likely to be the most comparable to a large European airport such as HAL) on the overall group beta.

6.63 Given the lack of relevant new comparators and the potential divergence in comparability of existing ones, the validity of comparator analysis for HAL merits consideration.

6.64 Practically, there are two potential ways forward:

- **Option 1**: abandon comparator analysis entirely and consider other forms of beta estimation (e.g., accounting betas);[198] or
- **Option 2**: consider the inclusion of cross-checks to enhance the robustness of comparator beta analysis.

6.65 In our view, the grounds for Option 1 are weak. While other forms of beta analysis (e.g., accounting betas) have previously featured in regulatory debate, there is no regulatory precedent for the adoption of such betas in determining the regulatory WACC in the UK or other jurisdictions.

6.66 Furthermore, accounting betas (or other types of beta estimations) also have limitations and may not necessarily result in more robust beta estimates. For example, within a regulatory context, accounting betas are often circular as the level of profit a regulated company can earn is a function of the allowed return set by the regulator.

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197 For example, AENA was awarded the concession of eleven airports in Brazil in 2022 and began to manage another airport in Brazil in 2023. See AENA (2025), *Aena's history* (link). Similarly, FRA has announced that it will be running an airport in Turkey in 2027. Fraport (2025), *Airport acquisitions in chronological sequence* (link). FHZN is also developing Noida International Airport in India. See Noida International Airport (2025), *About Noida International Airport* (link). This is further evidenced by stakeholder analysis documenting a reduced proportion of passengers at 'core' airports for ADP, FRA and AENA. See CEPA (2025), *Response to CAP3044a*, Table 2.3 (link).

198 Accounting betas measure a firm's systematic risk using financial statement data rather than share prices. They are typically estimated by regressing a company's accounting returns (such as return on assets or earnings changes) against corresponding market-wide accounting measures. Because accounting data is reported infrequently and is influenced by accounting policies, accounting betas are often subject to higher estimation error.

6.67 As such, we consider Option 2 to be the only practical solution available while acknowledging the limitations of comparator analysis. We discuss these cross-checks to comparator analysis in Section 6E.

6.68 In terms of the comparator set, at H7, the CAA also considered Københavns Lufthavne A/S ("**KBHL**") and Auckland International Airport Limited ("**AIA**") as potential comparators, but these were not included to derive the final range.

6.69 Having reviewed these comparators for the purposes of our current assessment, we note that the data limitations pertaining to these comparators continues to persist. Specifically, AIA's estimated beta continues to suffer from the limitations pertaining to the lack of diversity in the reference stock market index for New Zealand and the data for KBHL is affected by the Danish Government's acquisition in Q3 2025. As such, we are not persuaded to include these in the comparator set for H8.[199]

6.70 Additionally, FLU's asset beta has recently fallen below zero, which is highly unusual for an airport asset, and we are therefore not persuaded that it is appropriate to include it in the comparator set.[200] Finally, SYD has since delisted and therefore cannot be relied upon in our beta assessment.

6.71 We do not have any concerns regarding the robustness of the data available for AENA, ADP, FRA, and FHZN. Specifically, all four exhibit high liquidity based on bid-ask spreads of <1%,[201] a common criterion used by regulators to assess liquidity.[202]

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199 See Appendix 6 for more detail.

200 See Appendix 6 for more detail.

201 We calculate bid-ask spreads as the ask price minus the bid price, over the ask price from 1 September 2020 until 31 October 2025 using data from S&P Capital IQ. The comparators have bid-ask spreads of 0.23% (AENA), 0.22% (FRA), 0.19% (ADP), and 0.09% (FHZN).

202 For example, the CAA noted that the bid-ask spread is one possible measure used to assess the liquidity of share prices. CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation,* ¶9.71 (link). Bid-ask spreads were also used by Ofwat at PR24 to assess liquidity, see Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix,* page 15 (link).

6.72 These comparators also have relatively high free-float rates[203] and constitute an insignificant proportion of the reference index (STOXX Europe 600 index),[204, 205] suggesting that raw equity betas can be estimated reliably.[206]

6.73 Further, we do not consider it appropriate to determine distinct sets of comparators, as at H7. While a subjective comparison of risk characteristics can be informative to develop some form of ranking for comparators, translating this into specific weights for airport comparators is again a judgement-based exercise with no strong evidence to suggest that it would lead to a more accurate estimate of the beta value. Given the imperfections inherent with all comparators and their recent acquisitions of stakes in other airports, we are minded to consider all relevant comparators equally, including FHZN, in order to develop an informed beta estimate.

6.74 Finally, one approach to try to address the potential reduction in comparability between HAL and the comparators would be to decompose the comparator betas into individual sources of systematic risk. However, it is inherently not possible to accurately decompose beta estimates to ascertain how much any specific source of systematic risk is contributing to the group's beta value.[207]

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203 The CAA at H7 considered the free-floating shares of comparators to assess whether they can be estimated reliably. CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation,* ¶9.71 (link). The selected comparators have float rates which are as follows (as of 1 November 2025): AENA at 43%, ADP at 41%, FRA at 34%, and FHZN at 62%. This data is sourced from S&P Capital IQ.

204 See STOXX, *STOXX® EUROPE 600 INDEX: Components* (link), for a full list of the constituents of the STOXX Europe 600 Index and their weights. AENA, ADP, and FHZN are listed as 'AENA SME' (page 3), 'ADP' (page 7), and 'FLUGHAFEN ZURICH' (page 7).

205 FRA is not part of the STOXX Europe 600 Index. However, the STOXX Europe 600 Index still represents a good reference index for FRA, as it is representative of wider market conditions and systematic risk in Europe.

206 If the comparators constitute a small proportion of the reference index, there is limited risk of cointegration between movements in the comparators' share price and movements in the reference index. Cointegration is a statistical property describing a long-term equilibrium relationship between two or more non-stationary time series, implying that a linear combination of non-stationary time series is stationary. A stationary time-series is a time-series with a constant mean and variance over time.

207 We have considered a wider range of beta estimates from other international jurisdictions, and the manner in which they can be relied upon to augment the accuracy of our beta estimate. See Appendix 7D for more detail.

6.75 As a result, our preferred approach is to consider simple and weighted (by market capitalisation) averages of the comparator beta values across all relevant comparators in deriving the average beta estimate from the comparator set.

Frequency of data

6.76 Our preferred approach is to estimate the comparator betas based on daily betas given their higher precision.[208]

6.77 This is consistent with relevant UK regulatory precedent. Specifically:

- At H7, the CAA estimated both its pre-pandemic asset beta and the impact of the pandemic using daily data.[209]
- At PR24, Ofwat noted that daily sampling frequencies provide greater precision of estimates and avoids the 'reference day' effect observed with lower-frequency data.[210]
- The CMA's PR24 PD concurred with Ofwat, noting that the use of daily data is appropriate also due to the liquidity of water sector stocks.[211]
- Ofgem's approach in its draft determination for RIIO-3 also relies on daily betas.[212]

6.78 While weekly and monthly betas can be informative too, they suffer from their own limitations (day of the week, day of the month, etc.). At this stage, we consider that daily beta values are sufficiently robust to estimate the beta for H8.

Estimation window

6.79 In selecting the estimation window, we have considered both, accuracy of the estimates and data period captured within the choice of estimation window.

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208 In a previous report for Ofwat, while we advocated for daily betas, we also considered evidence from weekly and monthly betas. See FTI Consulting (2022), *Early view of water sector betas for PR24*, report for Ofwat, ¶4.23 (link).

209 CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation,* ¶9.27 and ¶9.30 (link).

210 Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix,* page 39 (link).

211 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.306 (link).

212 Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex,* ¶3.53 (link).

6.80 While there is no single rule in econometric theory for the minimum number of observations required to perform a regression, a common rule of thumb is that a regression with only one dependent and one independent variable requires a minimum of 30 observations in the sample.[213] A 1-year daily beta estimate includes c. 250 observations (excluding weekends) and a 1-year weekly beta estimate includes 52 observations. As a result, there does not appear to be a theoretical barrier to inferring results based on 1-year betas. However, the 1-year beta data may be unduly affected by the impact of 'Liberation Day'[214] and may not provide a true reflection of systematic risks over the H8 period. As a result we are minded to exclude 1-year data at this stage of the assessment and will revisit this at final proposals.

6.81 With respect to other short-term estimation windows, the 2-year window provides valuable insights into how the market is pricing the risk associated with airports post-pandemic as it solely captures post-pandemic data. While the two-year beta is also affected by the 'Liberation Day' effect, this is somewhat alleviated compared to the 1-year window due to the increase in the number of datapoints.

6.82 In contrast, longer estimation windows capture longer-term expectations regarding the sector's risk profile, including how market expectations have evolved prior to, during and after the pandemic.[215] They can smooth out the effect of outliers and tend to therefore be more stable. Additionally, longer estimation windows better capture 'through-the-cycle' risks because they incorporate different phases of the business cycle, such as recessions and periods of growth. This can potentially make them useful for understanding future market trends.

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213 This is because reliable statistical inference relies on asymptotic (large sample) properties. Specifically, the Central Limit Theorem states that the distribution of sample means from any population approaches a normal distribution as the sample size gets sufficiently large (often greater than 30). Additionally, the law of large numbers states that the average from a large group of independent random samples converges to the true value. See Greene, W. (2012), *Econometric Analysis, Seventh Edition,* Chapters D.2.2: Other forms of convergence and laws of large numbers and D.2.6: Central Limit Theorems.

214 See, for instance, market-wide decreases in betas of several major FTSE companies and airport groups following the announcement of the 'Liberation Day' tariffs by U.S. president Donald Trump on 2 April 2025. See Center for Strategic and International Studies (2025), *"Liberation Day" Tariffs Explained* (link). See Appendix 7 for details.

215 For example, the proportion of pandemic-affected observations out of total observations for 5-year and 10-year spot betas is c. 23% and c. 19% respectively. See footnote 186.

6.83 However, long estimation windows are not without limitations. Specifically, they place weight on historical data which may be less representative of prevailing or future levels of systematic risk, particularly if the asset has undergone fundamental changes in drivers of systematic risk.[216]

6.84 We consider that post-pandemic data is likely to provide the most accurate reflection of investor expectations regarding the future risk of investing in airports. This is captured by the 2-year estimation window.[217] However, as noted, this data may be overly affected by 'Liberation Day' market movements. Therefore, the analysis needs to consider the inclusion of longer-term betas as well.

6.85 While the 5-year estimation window currently places the most weight on the pandemic period,[218] the increases in the beta estimates during the pandemic period are somewhat offset by the opposite impact of the 'Liberation Day' effects. This suggests that 5-year betas could be informative and merit consideration.

6.86 The 10-year beta strikes a balance between incorporating pre-pandemic 'clean' data, pandemic related concerns, and post-pandemic expectations of airport betas thereby potentially providing a more holistic view of investor risk perception over the longer-term.

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216 For example, if the longer-term betas place more weight on periods where macroeconomic conditions were significantly different from today such as periods of low interest rates, inflation and geopolitical risks. The opposite could also be true if the asset or company becomes less representative over time for the sector you are proxying for.

217 We assume a pandemic start date of 1 February 2020 and a pandemic end date of 31 December 2021, in line with NR23. CAA (2023), *Economic regulation of NATS (En Route) plc: Provisional Decision for the next price control review ("NR23")*, ¶5.102 and ¶5.106 (link).

218 This weight will decline as the cut-off date for the analysis extends.

6.87 As a result, we consider it prudent to estimate 2-, 5-, and 10-year betas. This is broadly consistent with regulatory precedent from H7,[219] PR24[220] and RIIO-3 DDs.[221]

6.88 One exception is that the CMA's PR24 PD adopted an atypical 3-year estimation window to consider post-pandemic market conditions. However, this was specific to data oddities pertaining to one comparator.[222] While there is no similar issue regarding the availability of clean data for airport comparators, we estimate 3-year betas as a cross-check to our results based on 2-, 5-, and 10-year betas.[223]

Averaging period

6.89 Our review of the macroeconomic data used to estimate betas has not suggested that we are required to overweight or underweight a particular period through the use of rolling averages. We can also achieve a similar under- or overweighting of a particular period by choosing a basket of estimation windows.[224]

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219 The CAA estimated its pre-pandemic asset beta using 2- and 5-year estimation windows. See CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation*, ¶9.27 (link). The CAA did not estimate 10-year betas as AENA listed in 2015 and did not have ten years' worth of data. See CAA (2021), *H7 Initial Proposals, Section 2: Financial issues,* ¶9.56 (link).

220 Ofwat considered 5- and 10-year estimation windows due to the higher statistical precision of longer windows. Ofwat did not consider short-term windows, stating that they are volatile and could lead to misleading estimates of future betas. See Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix*, pages 40 and 42 (link).

221 Ofgem estimated 2-, 5- and 10-year betas but placed emphasis on 10-year betas as they are characterised by reduced distortions caused by periods of market volatility. See Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex,* ¶¶3.53 – 3.54, ¶3.61 and Table 16 (link).

222 A 3-year beta was estimated to remove the effect of the sale of Viridor, Pennon's recycling and residual waste business, on cash balances and business risk. See CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.299 (link).

223 See Appendix 7 for details.

224 For example, if we triangulate our range based on a mixture of 2-, 5- and 10-year betas, we implicitly place more weight on the most recent 2-years of data as this appears in all three estimates.

6.90 Therefore, our preference is to rely on spot betas in estimating the range for our assessment (and this is also broadly consistent with relevant regulatory precedent).[225, 226]

Estimation method

6.91 Our view is that OLS is the most appropriate method for estimating raw equity beta. This is because we are primarily concerned with the point estimate obtained from the regression and less on its efficiency. Additionally, the GARCH methodology is more focused on modelling variances and not on the coefficients of the CAPM (which need to be estimated from the variance equation). This increases the opaqueness of the results and the complexity of the process for little additional information.[227] Therefore, we only rely on OLS for estimating raw equity betas.

6.92 This is also consistent with recent UK regulatory precedent.[228]

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225 Specifically, both Ofwat and the CMA in the PR24 PD noted that spot betas are in general more appropriate than rolling betas as rolling betas underweight periods at the start and end of the sample. The CAA at H7 did not rely on rolling beta estimates as they place arbitrary weights to different datapoints and do not account for statistical interactions between them. Ofgem in RIIO-3 DD did not use rolling averages to estimate beta. See Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix*, page 5 (link); CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.307 (link); CAA (2023), *H7 Final Decision, Section 3: Financial issues and implementation*, ¶9.79 (link); Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex,* ¶3.48 (link).

226 We note that the CMA at PR19 estimated rolling averages and used them, alongside spot betas, in deriving their beta range. This is because the CMA considered the information provided by rolling averages, namely trends in betas, to be useful for an in round assessment. As discussed earlier, we consider spot betas to be superior to rolling averages from an econometric perspective. Therefore, we do not consider rolling betas in our assessment. CMA (2021), *Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, Final report,* ¶9.473 (link).

227 The CMA at PR19 considered that it did not receive evidence that GARCH would materially improve its estimates versus OLS. See CMA (2021), *Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, Final report,* ¶9.472 (link).

228 For example, see Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex,* ¶3.51 (link), CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation,* ¶9.109 (link). Similarly, Ofwat's advisors for PR24 used OLS; see CEPA (2024), *PR24 Cost of Equity,* Section 8.2 (link); CMA (2025), *Water PR24 references, Provisional Determinations Volume 4*, ¶7.291 (link).

Debt beta

6.93 As described previously, estimating debt beta is a resource-intensive and complex exercise, while the impact on the cost of capital from debt beta is small. For example, we estimate an increase in the debt beta of 0.1 would reduce the cost of capital by c. 13 bps based on our ERP and gearing assumptions.[229] Therefore, there is limited incremental value gained by undertaking a detailed exercise to estimate the debt beta. As such, regulatory precedent and prior analysis serve as useful reference points to guide the debt beta estimate.

6.94 In a previous report for Ofwat,[230] we estimated a recommended debt beta range of 0.05 – 0.15 based on all four estimation methods for a notional company that is rated BBB+/Baa1. Having reviewed that analysis, our findings remain relevant to the present context as the CAA's target credit rating (BBB+ at H7)[231] is consistent with Ofwat's.[232] As a result, we are not persuaded to alter our range of 0.05 – 0.15.

229 For details, see Appendix 4.

230 See FTI Consulting (2022), *Early view of water sector betas for PR24*, report for Ofwat, Section 6 (link).

231 CAA (2021), *H7 Initial Proposals, Section 2: Financial issues,* ¶11.66 (link). We also note that the target credit rating for Q6 was in the region of BBB/BBB+ using S&P's and Fitch's terminology. See CAA (2013), *Economic regulation at Heathrow from April 2014: final proposals*, ¶10.23 (link).

232 Debt beta is driven by several factors as set out in the Merton model e.g., credit spread, gearing, duration, asset variance and equity beta. We proxy these effects through credit rating as credit rating has been shown to be positively correlated with debt beta. See Schwert, M. and Strebulaev, I. A. (2014), *Capital Structure and Systematic Risk*, Rock Center for Corporate Governance at Stanford University Working Paper Series No. 178, Table A1 (link).

6.95 Furthermore, a range of 0.05 – 0.15 is also consistent with the CAA's assumption for debt beta at H7[233] and more recent precedent from Ofwat,[234] CMA[235] and Ofgem.[236, 237]

Approach to de-levering and re-levering betas

6.96 Our approach to de-levering betas is consistent with the methodology set out in ¶¶6.41 – 6.45. This is also consistent with how regulators across the UK de-lever betas.

Accounting for the impact of market anomalies (like COVID-19 and 'Liberation Day')

6.97 In our view there are three potential options to deal with the impact of market anomalies.

(1) First, exclude all or some of the affected data on the basis that the events are highly unlikely to repeat in the future.

(2) Second, consider an explicit probability of such events occurring in the future and suitably lower the weight provided to this data in the analysis (as the CAA did at H7).

(3) Third, consider a less prescriptive approach and rely on beta estimates obtained from the data sample which is most likely to inform the beta range for H8.

6.98 None of these approaches are likely to present a perfect solution but we discuss each option in turn below.

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233 The CAA estimated a debt beta range of 0.05 – 0.10 for H7. See CAA (2023), *H7 Final Decision, Section 3: Financial issues and implementation*, ¶9.90 (link).

234 Ofwat's debt beta range was 0.05 – 0.15 in PR24 FD. Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix*, Table 1 (link).

235 The CMA provisionally retained Ofwat's PR24 FD range of 0.05 – 0.15. See CMA (2025), *Water PR24 references, Provisional Determinations Volume 4,* ¶7.428 (link).

236 Ofgem used a debt beta of 0.075 in its RIIO-3 DD. See Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex,* Tables 17 – 18 (link).

237 The CAA has made a policy decision to retain the H7 debt beta estimate of 0.075 for H8. This is consistent with our recommended range of 0.05 – 0.15 (albeit below the midpoint of our range).

6.99 Regarding the first approach above, at a high-level, excluding data on the basis of structural breaks in the analysis is not a precise exercise. The issue of structural breaks was discussed extensively at the PR19 water appeals and the evidence submitted by the various experts clearly demonstrated that different specifications of the statistical test deployed can identify different breakpoints in the same data set.[238] As such, the CMA too dismissed the notion of structural breaks and we concur with the CMA's observations on this issue.

6.100 In relation to the second approach mentioned above, associating a probability to the future periodic recurrence of 'black swan' like events like the global pandemic will always be an imprecise and judgement-based exercise. In the case of the CAA at H7, the cut-off date for the CAA's H7 analysis was 31 March 2022.[239] This was immediately after the end of the period during which capital markets were most affected by the pandemic and the CAA did not have the opportunity to observe beta estimates based on more stabilised post-pandemic data. As such, the CAA was required to carefully consider alternative approaches to deriving the beta for H7 that would align with its assumed investor horizon. For H8, these extenuating circumstances are largely resolved and if a less judgement-based option is available, it merits consideration.

6.101 In the case of determining the beta for H8, there is now sufficient data available to estimate short-window betas (i.e., 2-year betas) that are likely to reflect post-pandemic investor perceptions of the systematic risk associated with investing in airport assets. The potential advantage of such short-window betas is that estimating these does not involve having to make arbitrary assumptions and judgements associated with the treatment of pandemic-affected data. However, there is the risk that short-term beta values can be misleading or less efficient if the period over which they are estimated is unduly affected by one-off market events (e.g., 'Liberation Day') and this needs to be taken into consideration when interpreting results.

6.102 Figure 6-3 below presents a time-series of 2-year comparator beta values which covers the period before, during and after the pandemic.

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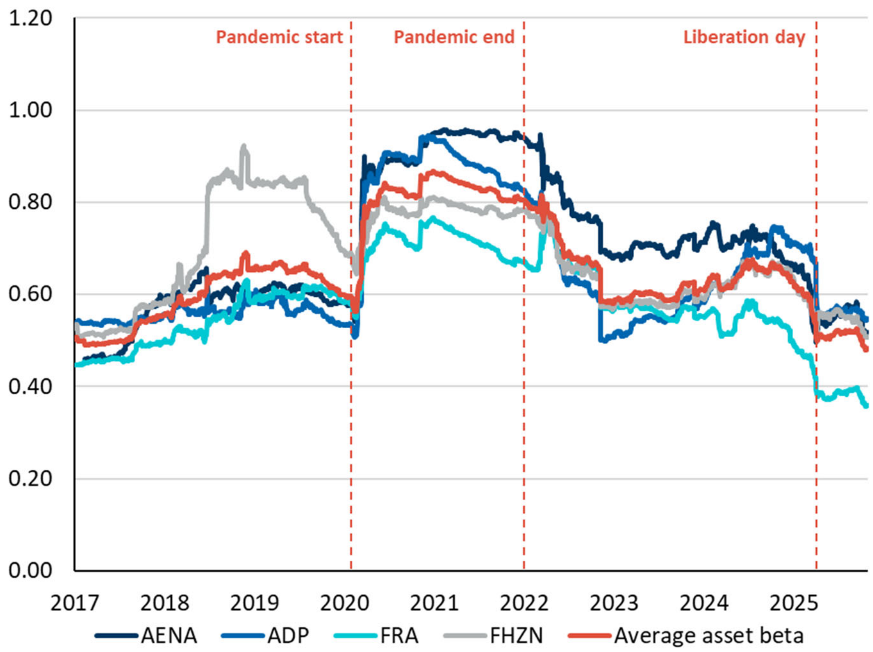
238 The reliability and robustness of structural break analysis is poor and the analysis is often inconsistent. This was recognised by the CMA in its PR19 redetermination. See CMA (2021), *Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, Final report*, ¶9.467 (link).

239 Flint (2022), *Support to the Civil Aviation Authority: H7 Updated Beta Assessment*, Table 5 (link).

Figure 6-3: Time-series of 2-year comparator beta values



Source: S&P Capital IQ; FTI analysis.

Note: (1) The assumed pandemic start and end dates are 1 February 2020 and 31 December 2021 accordingly. (2) 'Liberation Day' is 2 April 2025. (3) The average asset beta is calculated as a simple average of all four comparators.

6.103 As evidenced above, comparator airport betas exhibited a marked increase during the Covid-19 period, but subsequently declined (albeit not quite to pre-pandemic levels). However, the impact of the 'Liberation Day' announcements led to a further decline in comparator betas and it is not obvious to what extent US tariff policy concerns continue to impact capital market data.[240]

6.104 Based on these observations, it is not clear that an overly prescriptive approach in attempting to address every market anomaly will necessarily result in a superior beta estimate relative to the third, less prescriptive approach.

6.105 Our view is that our chosen estimation windows strike a balance between incorporating data from both stable and volatile market periods. Viewed together, they capture different aspects of the business cycle and arguably provide a reasonable reflection of forward-looking risk.

240 See Appendix 7C for details on the impact of the 'Liberation Day' effect on betas.

6.106 In summary, our preferred way forward is to rely on the third approach (i.e., on beta estimates obtained from the entire data sample across estimation windows to inform the H8 beta range).

6.107 This is broadly consistent with the relevant recent regulatory precedent as well. Specifically:

- Ofwat's PR24 FD relied on beta estimates obtained from its data sample, without making any adjustments for the Covid-19 pandemic or the Russia-Ukraine War. Ofwat noted that omitting or re-weighting data relies on subjective judgements, is not required to derive robust estimates and can introduce disproportionate complexity.[241]
- The CMA's PR24 PD did not adjust its econometric beta estimates for the impact of the pandemic, as it considered that any adjustment risks introducing errors and inconsistencies in the estimation.[242]
- Similarly, for RIIO-3 DD, Ofgem obtained beta estimates from its data sample without making any adjustments.[243]

6.108 We note that our proposed approach to dealing with market anomalies (in particular the Covid-19 pandemic) constitutes a departure from the CAA's approach at H7. However, given the markedly different circumstances and availability of sufficient post-pandemic data, we consider that this change in approach is valid and justified.

Accounting for relative risk differentials between HAL and comparators

6.109 As stated previously, the selected set of comparator airport groups are imperfect proxies, and their asset betas may need to be adjusted to more accurately reflect HAL's risk exposure. For example, at H7, the CAA estimated the impact of the TRS mechanism on HAL's inferred beta relative to the comparators.

6.110 However, the TRS mechanism may not be the only difference in systematic risk between comparator airports and HAL, and we have undertaken a more comprehensive review to consider whether there are other relevant risk differentials that merit an explicit adjustment to the observed values of comparator betas.

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241 Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix,* pages 42 – 43 (link).

242 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.296 and ¶¶7.356 – 7.363 (link).

243 Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex,* ¶3.61 (link).

6.111 At the outset, it is important to recognise that it is not possible to examine every factor that contributes to the risk of airport assets. As a result, our approach to selecting the relevant risks in conducting a relative risk assessment has been to include all the key risk factors that were raised during the stakeholder consultation process. Specifically, the risk factors considered are:

- traffic risk, including the TRS mechanism;
- capex and opex risk;
- regulatory consideration of airport 'till';
- regulatory framework; and
- probability of government support in stressed financial situations.

6.112 Next, we consider whether the risk being examined is systematic in nature with the premise that only systematic risks merit consideration.

6.113 Subsequently, we undertake a qualitative comparison of each risk factor between HAL and comparators to assess if there is a meaningful difference.

6.114 Finally, in the event a particular risk factor is considered to be materially different, we test the practicality of quantifying the difference in risk in a sufficiently robust manner.

6.115 Table 6-1 below presents the summary of our relative risk assessment (see details in Appendix 5).

Table 6-1: Summary of relative risk assessment for HAL versus comparator airport groups

Risk factor	Is it systematic?	Is HAL materially different from comparators?	Can it be robustly quantified?
Traffic risk incl. TRS mechanism	✓	✓	✓
Capex and Opex risk	✓	✗	✓
Regulatory consideration of airport 'till'	✓	✓	✗
Regulatory framework	✓	✗	✗
Probability of government support in stressed financial situations	✓	✓	✗

Source: FTI analysis.

Note: A tick (✓) indicates "yes"; a cross (✗) indicates "no".

6.116 Overall, our review of the relative risk assessment suggests that traffic risk is the only factor that is systematic, materially different between HAL and comparators, and can be quantified robustly.

6.117 There are potentially different approaches to quantify the impact of traffic risk differential on betas. The CAA previously quantified the difference in risk relating to the TRS and the impact on comparator betas at H7.[244] Its assessment was successfully defended at the CMA appeal.[245]

6.118 For H8, the CAA has made a policy decision to retain its approach to quantifying the impact of the TRS with the only change being that the CAA now considers traffic risk to constitute a higher proportion of the difference between betas of regulated utilities and regulated airports.[246]

244 CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation*, Table 9.3 (link)

245 CMA (2023), H7 *Heathrow Airport licence modification appeals, Final Determinations*, ¶6.247 (link)

246 CAA (2026), *H8 Initial Proposals, Section 3*, Chapter 9.

6.119 Given the CAA's policy decision, we do not examine this issue further in this report. However, we make the following observations in relation to the CAA's policy decision:

- We assume that the CAA's H7 estimate of traffic risk contributing 50 – 90% of the differential between utility and airports betas is broadly correct.
- We note that recent regulatory determinations for betas of UK water and energy networks have trended upwards since H7[247, 248] — in our view, this is likely a reflection of the increased capex risk in both sectors as regulated licensees undertake record levels of investment programs over the current/ upcoming price controls.[249]
- Additionally, in our view, there is no conclusive evidence to suggest that capex risk for airport comparators is materially different now compared to when the H7 determination was finalised.
- Assuming that volume and capex risks explain the majority of the differential between airport betas and utility betas, this then suggests that a greater proportion of the difference is likely to be attributable to traffic now (all else being equal).

6.120 While it is not possible to accurately estimate the exact increase in this proportion of difference in betas of regulated utilities and regulated airports that can be attributed to traffic risk, one reasonable approach could be to attenuate the range from 50 – 90% to 70 – 90%.

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247 For example, Ofgem set a proposed asset beta of 0.375 in RIIO-3 DD for ET, GD and GT relative to an asset beta of 0.349 in RIIO-2 FD. Similarly, the CMA's PR24 PD set an unlevered beta range of 0.28 – 0.34 relative to the unlevered asset beta range of 0.28 – 0.30 set in PR19. See Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex*, Tables 17 – 18 (link); Ofgem (2021), *RIIO-2 Final Determinations – Finance Annex (REVISED),* Table 9 (link); CMA (2021), *Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, Final Report*, Table 9-17 (link); CMA (2025), *Water PR24 References, Provisional Determinations Volume 4*, Table 7.12 (link).

248 However, even though the betas for utilities set by regulators have increased since H7, listed utilities' betas have fluctuated and are currently trending downwards. See Appendix 7B for details.

249 For example, a high capex phase is expected over AMP8, the period for water companies that is regulated under PR24, and Ofgem expects significantly higher capex in RIIO-3 relative to RIIO-2. See CMA (2025), *Water PR24 References, Provisional Determinations Volume 4*, ¶8.305 (link); Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex*, ¶1.11 and ¶7.78 (link).

6.121 Consequently, we consider the CAA's updated methodology to estimating the impact of traffic risk differential to be reasonable.

D. Results

6.122 In this sub-section, we present the results of our beta analysis based on our assessment presented above. Specifically:

- We first present the results of the unadjusted unlevered beta estimates for all comparator airport groups and obtain a range for the unlevered beta.
- Second, we convert the unlevered beta range into an asset beta range based on a debt beta range of 0.05 – 0.15.
- Third, we set out the calculation pertaining to the adjustment of comparator asset betas to account for the difference in traffic risk relative to HAL.
- Finally, we present the results from re-levering HAL's implied asset beta at the notional gearing assumption to obtain the re-levered equity beta—this feeds into the CAPM-based cost of equity estimate.

6.123 Table 6-2 below sets out the unadjusted spot unlevered beta estimates for comparator airports based on 2-, 5- and 10-year estimation windows.[250]

Table 6-2: Summary of unadjusted unlevered betas for comparator airport groups

	AENA	ADP	FRA	FHZN	Simple average	Weighted average
2-year estimation window						
Spot	0.50	0.50	**0.29**	0.49	**0.45**	0.48
5-year estimation window						
Spot	0.68	0.55	0.48	0.60	0.58	0.62
10-year estimation window						
Spot	**0.72**	0.65	0.55	0.67	0.65	**0.67**

Source: FTI analysis.

Note: (1) The weighted average is estimated based on market capitalisation. (2) The cut-off date for the estimates is 1 November 2025. (3) Equity betas are de-levered assuming a debt beta of zero.

250 See Appendix 7 for details.

6.124 The full extent of the data presented above including all four comparators indicates a range of 0.29 – 0.72. We consider this range to be unreasonably wide given that the upper bound of the range is more than twice the lower bound.

6.125 As a result, we are minded to infer the unadjusted unlevered beta range based on the simple and weighted (by market capitalisation) averages across comparator betas for each estimation window.[251] This results in an unlevered beta range for comparator airports of 0.45 – 0.67.

6.126 In forming our equity beta range, we take the top of our debt beta range to inform the lower bound of the asset beta and the bottom of our debt beta range for the upper bound. This reflects the fact that that increasing the debt beta puts downward pressure on the equity beta if the listed comparator gearing is below the notional gearing, all else equal.

6.127 This results in an unadjusted asset beta range of 0.50 – 0.69.[252] Our estimate of the TRS related adjustment to comparator asset betas is 0.06 – 0.11.[253] This results in a post-TRS mechanism asset beta range of 0.44 – 0.58.

6.128 Re-levering this adjusted asset beta range based on our notional gearing assumption of 60% results in a re-levered equity beta range of 0.88 – 1.37 for HAL at H8.

6.129 Table 6-3 below sets out our calculations.

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251 There is no strong preference between simple and weighted average betas. Simple averages accord equal weight to all beta values – and as mentioned previously we don’t think there is any one comparator that is superior. Weighted averages accord higher weight to larger airport comparator groups – this might have some relevance given HAL’s size relative to the comparators.

252 We note that our estimates of 3-year betas are within this range. See Appendix 7 for details.

253 See Appendix 8 for details.

Table 6-3: Derivation of H8 proposed equity beta range relative to H7[254]

Component	Guide	H7		H8 Initial Proposals	
		Lower bound	Upper bound	Lower bound	Upper bound
Debt beta	A	0.05	0.10	0.15	0.05
Pre-TRS, pre-pandemic asset beta	B	0.50	0.60	0.50	0.69
Pandemic effect uplift	*C*	*0.02*	*0.11*	-	-
Pre-TRS post-pandemic asset beta	**D = B + C**	**0.52**	**0.71**	**0.50**	**0.69**
Network utility asset beta	E	0.342	0.342	0.373	0.373
Traffic risk component of gap	F	90%	50%	90%	70%
Proportion of traffic risk mitigated by TRS	G	50%	50%	50%	50%
TRS adjustment	**H = (D – E) × F × G**	**0.08**	**0.09**	**0.06**	**0.11**
Post-TRS asset beta	**I = D – H**	**0.44**	**0.62**	**0.44**	**0.58**
Notional gearing	J	60%	60%	60%	60%
Re-levered equity beta	**K = [I – (A × J)] ÷ (1 – J)**	**0.95**	**1.47**	**0.88**	**1.37**

Source: FTI analysis; CAA (2022), H7 Final Proposals, Section 3: Financial issues and implementation, ¶¶9.149 – 9.152, 9.158 – 9.159, 9.180 and 9.276 (link).

Note: (1) The pre-TRS, pre-pandemic asset beta is estimated as a function of raw equity betas, market gearing, and the debt beta. (2) The cut-off date for the H7 analysis was 17 November 2022.

254 As discussed in footnote 237, the CAA adopts a debt beta assumption of 0.075. This results in the CAA's re-levered equity beta range differing from the values presented above. See CAA (2026), *H8 Initial Proposals, Section 3*, Chapter 9 for the CAA's range reflecting its debt beta assumption.

E. High-level cross-checks to HAL's H8 beta range implied from comparator airports

6.130 As described in ¶6.63, given the limitations of the comparator analysis combined with the numerous assumptions required to derive the beta range, we consider it insightful to cross-check the implied beta range for HAL by considering:

- a high-level qualitative review in the evolution of HAL's risk landscape since H7 and its implications for HAL's beta; and
- a cross-sector comparison of regulated utility betas and their relative risk.

6.131 With respect to the first cross-check, it is not unreasonable to argue that HAL (and indeed the entire aviation sector) was faced with its most challenging period at the time of the H7 determinations. Specifically, passenger traffic had declined dramatically and there was significant uncertainty regarding the extent to when and how passenger traffic numbers would recover.

6.132 At H8, the CAA's policy decision is to adopt the same regulatory framework as at H7.[255] However, and contrastingly, HAL has now fully recovered from the impact of the pandemic and has achieved all-time high passenger numbers.[256] As a result, there is no conclusive evidence to suggest that HAL's systematic risk (under the existing two-runway solution) is any higher than it was at H7. In fact, it would not be unreasonable to suggest that HAL's systematic risk is somewhat lower than at H7.

6.133 This suggests that HAL's beta in the H7 determination likely forms a natural upper bound for the H8 beta (other things being equal and under the assumption that the H7 beta estimate was a good reflection of HAL's systematic risk).

6.134 Second, a qualitative assessment of the relative risk ranking of UK regulated assets[257] indicates that HAL's systematic risk is higher than that of regulated utility networks (water and energy), but lower than other regulated assets like NERL.[258]

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255 Specifically, this relates to the "building blocks" approach underpinning HAL's regulation at both H7 and H8. See CAA (2026), *H8 Initial Proposals,* Summary chapter.

256 Specifically, HAL recorded its busiest year ever in 2024 with 83.9 million air passengers. See HAL (2024), *Heathrow Travel Report 2024*, page 11 (link).

257 See Appendix 7B for details.

258 At NR23, the CAA set the asset beta range as 0.52 to 0.70, with a point estimate of 0.61. See CAA (2023), *Economic Regulation of NATS (En Route) plc: Final Decision for the NR23 (2023 to 2027) Price Control Review*, Table 5.8 (link).

6.135 This assessment provides further guidance on the potential bounds for HAL's H8 beta value.

6.136 Comparing our adjusted comparator based estimate of the range for HAL's H8 equity beta and the two cross-checks discussed above indicates the following:

- Our estimated H8 post-TRS asset beta range is 0.44 – 0.58 with an implied midpoint of 0.51.[259] We note, however, that our debt beta assumption is a range, and we do not select a point estimate for the purposes of our assessment. Therefore, any comparison to the asset beta for H7 is not on a like-for-like basis. The CAA's Initial Proposals retain the debt beta point estimate from H7, and therefore its asset beta range (0.42 – 0.58) is more comparable with the H7 asset beta.[260]

- At H7, the CAA estimated a post-TRS asset beta range of 0.44 – 0.62, and selected a point estimate of 0.53.[261]

6.137 Recent asset beta determinations/ proposals in other UK regulated sectors are as follows:

- Ofgem's RIIO-3 DD estimated an asset beta range of **0.30 – 0.45**, with a proposed value of 0.375 for ET, gas distribution ("**GD**") and gas transmission ("**GT**").[262]

- Ofwat's PR24 FD estimated an asset beta range of **0.32 – 0.35**, with a midpoint of 0.33[263]

- The CMA's PR24 PD estimated an asset beta range of **0.36 – 0.37**, with a proposed value of 0.36.[264]

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259 This is purely for illustrative purposes. Assessing a point estimate for the beta is beyond the scope of this report.

260 See Appendix 7E for a reconciliation between the FTI and CAA asset beta ranges.

261 CAA (2023), H7 Final Decision Section 3: Financial issues and implementation, Table 9.6 (link).

262 Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex*, Tables 17 – 18 (link).

263 Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix,* Table 13 (link). CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* Tables 7.1 (link).

264 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* Tables 7.1 and 7.11 (link).

6.138 Triangulating across this evidence indicates that the illustrative midpoint of our (and the CAA's) estimated H8 asset beta range satisfies the cross-checks described above.

F. Summary

6.139 As discussed throughout this section, there is no single agreed way to estimate betas. Often, the approach ultimately adopted is driven by the particular circumstances of each case. Furthermore, any exercise to estimate betas necessarily involves the application of judgement.

6.140 In the case of HAL, there are particular challenges associated with estimating beta (as described in Section 6C) which further complicate the estimation process.

6.141 Given these challenges, we have considered a wide range of evidence in arriving at a reasonable beta range for HAL over the H8 period. Specifically, our estimation of HAL's asset beta:

- relies upon simple and weighted averages of observed OLS beta estimates for all the relevant comparator airports relied upon by the CAA at H7;
- considers a range of different short, medium and long-term estimation windows;
- assumes a debt beta range of 0.05 – 0.15; and
- accounts for the differences in traffic risk between HAL and comparator airports due to the CAA's policy decision to retain the TRS mechanism.

6.142 Furthermore, the estimated beta range also satisfies some logical high-level cross-checks.[265] This adds a degree of robustness to the comparator beta calculations.

6.143 In selecting the methodology for estimating betas, we have been guided by principles pertaining to established financial theory (where practical), robustness of data and results, and best practice from regulatory precedent. Where we have needed to exercise judgement with respect to methodological choice, selection of data, or interpretation of results, we have considered whether there is a strong likelihood of the choice or application of judgement obtaining more meaningful and relevant results.

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[265] See Section 6E for details.

6.144 We note that while in some respects our approach is different from that adopted by the CAA at H7, we consider our adaptations to be better suited to estimating a forward-looking risk assessment for H8 given the prevailing capital market circumstances.

6.145 On balance, and having carefully examined the evidence available, our results indicate a range of 0.44 – 0.58 for the H8 asset beta range and a re-levered equity beta range of 0.88 – 1.37.

6.146 Table 6-4 below presents the results.

Table 6-4: Proposed re-levered equity beta range for H8

Component	Guide	Low	High
Post-TRS asset beta	A	0.44	0.58
Debt beta	B	0.15	0.05
Notional gearing	C	60%	60%
Equity beta	**D = (A − (B × C)) / (1 − C)**	**0.88**	**1.37**

Source: FTI analysis.

7. Cost of embedded debt

A. Introduction

7.1 The cost of embedded debt allowance aims to provide compensation for efficiently incurred interest costs on debt already held (i.e., embedded) at the start of the price control period. This debt is expected to remain in place for all or part of the H8 period.

7.2 The rest of this section is structured as follows:

- Section 7B explains the key methodological considerations that need to be addressed when estimating the cost of embedded debt;
- Section 7C presents our arguments and analysis regarding the methodology;
- Section 7D sets out the results; and
- Section 7E summarises.

B. Methodological considerations

7.3 In setting the cost of embedded debt, regulators need to consider:

(1) whether to adopt a ‘balance sheet-led’ approach or a ‘notional’ approach;

(2) how to estimate the cost of embedded debt when adopting either of these approaches; and

(3) the approach to deflating the nominal cost of embedded debt.

7.4 We discuss each of these issues in turn below.

Estimation approaches

7.5 When estimating the cost of embedded debt, regulators aim to select an approach which ensures the recovery of efficiently incurred debt costs, while providing licensees with an incentive to minimise financing costs and maintain prudent risk management.[266] To this end, regulators can select either the:

- **'Notional' approach**, whereby the regulator estimates the cost of embedded debt allowance with reference to the yields implied by external market indices and assumptions regarding the notional company's financing decisions; or
- **'Balance sheet-led' approach,** whereby the regulator estimates the cost of embedded debt allowance with reference to the debt book(s) of licensee(s).

7.6 When adopting the notional approach, regulators reference the historical yields of a suitable benchmark debt index, that is broadly consistent with its assumptions regarding the notional company's financing of its activities (e.g., credit rating, tenor, and constituents of the index). This approach effectively estimates a proxy efficient cost of embedded debt for the notional company.[267]

[266] UKRN (2023), *UKRN guidance for regulators on the methodology for setting the cost of capital,* page 32 (link).

[267] UKRN (2023), *UKRN guidance for regulators on the methodology for setting the cost of capital,* page 32 (link).

7.7 The balance sheet-led approach starts with the company's or sector's debt book to estimate the efficient cost of embedded debt for the sector. The regulator may then adjust this debt book to reflect potential differences between the notional company and the sector e.g., instruments issued, credit rating and financial structure. This approach effectively estimates the efficient cost of embedded debt for the notional company by referencing the actual cost of embedded debt for the sector.

7.8 Examples of implementing the balance sheet-led approach include:

- **'all-in'** estimate in which regulators adopt the actual composition of the debt book and estimate the cost of embedded debt based on all the instruments in the debt book;[268] and
- **'actual-notional'** estimate, whereby regulators rebalance the sector's actual debt book to reflect a notional composition[269] to estimate the cost of embedded debt, considering not only the types of debt (e.g., fixed-rate, index-linked) included but also the relative proportions of each debt type within the portfolio.[270]

Considerations for adopting the balance sheet-led approach

7.9 In estimating the cost of embedded debt based on a balance sheet-led approach, regulators need to take into account several different elements.

7.10 First, they need to define the **inclusion criteria** applied to the instruments in the debt book. Regulators typically include instruments which are clearly 'debt-like' in nature and contribute to the maintenance of the notional company's credit rating.[271] They typically do not include instruments that are not considered necessary for financing investment (and are used for other purposes, such as treasury management).[272]

268 We discuss instruments that are considered appropriate in ¶¶7.10 – 7.12 below.

269 This might mean placing more or less weight on particular instruments within the sector's debt book.

270 For example, the regulator may assume the notional company only issues fixed-rate debt instruments.

271 Ofwat (2022), *Creating tomorrow, together: Our final methodology for PR24, Appendix 11, Allowed return on capital*, Table 4.1 (link).

272 UKRN (2023), *UKRN guidance for regulators on the methodology for setting the cost of capital*, page 32 (link)

7.11 For instruments such as junior debt and derivatives linked to underlying debt issuances, regulators need to consider their role in, and impact on, the sector's or licensee's financing structure. Specifically:

- **Junior debt** has equity-like characteristics[273] due to its subordinated nature and could result in actual gearing of the licensee being substantially higher than the notional gearing assumption adopted by the regulator. This could have knock-on impacts on the sector's financing costs due to an impact on creditworthiness.
- **Derivative** instruments typically form part of risk management processes (e.g., managing inflation and currency risk), and do not actually finance the underlying assets.

7.12 Typically, regulated licensees have independent treasury functions and do not follow the financing structure adopted by the regulator for the notional company. However, if the licensee chooses to differ from the notional company's financing structure, then it is reasonable that it bears the risk of these choices.

7.13 Second, and having decided on the instruments to be included in its assessment, regulators need to determine how to model the instruments being included. Typically, there are three types of debt instrument (fixed, floating, and index-linked), each with their own characteristics:

- **Fixed-rate:** Fixed-rate instruments have a fixed interest cost over the life of the instrument (i.e., there is no exposure to interest rate risk).
- **Floating-rate:** The interest costs of floating-rate instruments fluctuate in line with a reference index (e.g., Sterling Overnight Index Average ("**SONIA**")). This means the regulator needs to make assumptions regarding the evolution of the reference index to model debt costs.
- **Index-linked:** Index-linked instruments index the principal borrowing amount to some a measure of inflation (RPI, CPI, or CPIH). This results in interest costs increasing in line with inflation and requires assumptions regarding the evolution of the inflation index to forecast the change in these costs.

7.14 Third, having selected the relevant instruments and a suitable approach to model them, the regulator needs to be able to assess whether the costs incurred are efficient or not. One way to undertake this assessment is to identify an appropriate benchmark to assess the efficiency of the costs incurred.

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273 The equity-like characteristics arise as junior debt is repaid only after senior debt and therefore it is also exposed to losses before senior debt, acting as a 'buffer'.

7.15 Furthermore, regulators need to consider the incentive properties of including these instruments. For example, including fixed-rate instruments means consumers are insulated from outturn movements in interest rates whereas the opposite is true for floating-rate instruments.

7.16 Fourth, a practical issue with the balance sheet-led approach is that the balance sheet available to the regulator could be outdated by several months (depending on the last filing of accounts and the regulator's assessment). Therefore, regulators need to forecast how the balance sheet will evolve between the last measurement date of the balance sheet and the start of the price control.

7.17 This requires forecasting the expected issuance and repayment of debt. When forecasting future issuance there are two approaches:

- **Actual:** The actual approach relies on the issuance forecast provided to the regulator by the licensee; and
- **Notional:** The notional approach forecasts future issuances as required to maintain the notional company target capital structure based on the repayment profile and RAB growth.

7.18 Additionally, under both approaches, the regulator needs to estimate the cost associated with this forecast issuance. The regulator will normally estimate this cost based on the chosen benchmark for assessing the efficiency of interest costs.

7.19 When deciding between the two approaches, regulators need to consider the impacts on efficiency (e.g., does the use of the actual approach create perverse incentives such as underwriting company financing decisions) and other factors such as how company-specific constraints (e.g., their own capital structure) might affect the issuance profile. Regulators need to balance these considerations when deciding on an issuance profile.

Considerations for adopting the notional approach

7.20 In estimating the cost of embedded debt based on a notional approach, like the balance sheet-led approach, regulators need to take into account several different elements. Some of these elements overlap with the balance sheet-led approach.

7.21 The first consideration relates to the weight accorded to the sector's actual debt costs. For example, should the notional approach purely reflect the regulator's view on what it thinks regarding the most efficient issuance strategy and expected cost of this issuance strategy, or should it take into account the sector's actual costs? The latter would require similar considerations as adopting the balance sheet-led approach (e.g., instruments to include, composition of these instruments, efficiency of the instruments and expected evolution of the debt book over the price control).

7.22 We typically observe that regulators have some given some consideration to the sector's actual costs when adopting the notional approach (e.g., Ofwat at PR19,[274] Ofgem for RIIO-3[275] and CAA at H7[276]). This reflects the difficulty in regulators identifying the optimal issuance profile for the notional company and that GB regulators have a financing duty which requires them to ensure licensees can cover efficient financing costs they have incurred.

7.23 The next consideration is in relation to constructing a relevant benchmark or allowance. This typically consists of two components:

- **Reference index or indices**: The regulator will need to identify a suitable reference index or indices that reflects the assumed characteristics of the notional company (e.g., maturity, credit rating and instrument); and

274 For example, Ofwat used the balance sheet approach as a cross-check to assess the appropriateness of its point estimate. See Ofwat (2019), *PR19 final determinations: Allowed return on capital technical appendix,* page 85 (link).

275 Ofgem applied a calibration adjustment to the iBoxx index based on forecast efficient industry debt costs under different scenarios in order to broadly align projected efficient debt costs over RIIO-3. See Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex,* Table 1 (link).

276 For example, the CAA considered data on HAL's bonds to estimate a HAL-specific premium for the cost of embedded debt. See CAA (2023), *H7 Final Decision, Section 3: Financial issues and implementation*, ¶9.138 (link).

- **Mechanism**: Based on the reference index, the regulator will then need to construct a relevant mechanism reflecting its assumptions on issuance profile of the notional company. This is typically in the form of a trailing average of the reference index or indices.

7.24 With respect to the reference index, regulators normally adopt long-dated investment-grade indices such as the iBoxx A and BBB 10+ indices (e.g., Ofgem at RIIO-3[277] and RIIO-1,[278] Ofwat at PR19[279] and PR24,[280] and CAA at H7[281]). The choice of these indices reflects the regulator's assumption on sector creditworthiness and investor horizon. However, there are also examples of regulators adopting sector-specific indices such as Ofgem at RIIO-2 referencing the iBoxx Utilities 10+ index.[282]

7.25 Sometimes, it may be deemed that there is no perfect reference index for capturing the regulator's expected cost of debt for the notional company. In this case, an adjustment to the reference index may be required.

7.26 This issue was pertinent for the CAA at H7 and for Ofgem at RIIO-3 for gas companies.[283] These adjustments are typically calibrated by analysing the difference between the sector's actual cost of debt and the observed yields on the reference index for individual instruments, and assessing whether any differences are in line with what the regulator might expect for the notional company.

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277 Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex*, Table 1 (link).

278 Ofgem (2014), *RIIO-ED1: Final determinations for the slow-track electricity distribution companies,* ¶5.6 (link).

279 This was also retained by the CMA at the PR19 water appeals. See CMA (2021), *Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, Final report*, ¶¶9.646, 9.649 (link).

280 Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix*, page 87 (link).

281 CAA (2023), *H7 Final Decision, Section 3: Financial issues and implementation*, ¶¶9.92, 9.94 (link).

282 Ofgem (2021), *RIIO-2 Final Determinations – Finance Annex,* page 9 (link).

283 We discuss this in greater detail in our assessment.

7.27 The choice of mechanism is typically informed by how much weight is placed on the sector's actual debt costs. For example, a purely notional approach with no weight placed on the actual sector costs would imply choosing a mechanism which reflects the minimum of the assumed investor horizon or the average from when the licensee started to operate.[284] In the CAA's case, this would imply that a 20-year trailing average would be appropriate for HAL.[285]

7.28 This average can be unweighted or weighted depending on considerations such as capex profile of the sector (e.g., a more capex intense period would suggest higher issuance and therefore overweighting this period would likely better reflect the expected and sector's actual costs). We have observed this in the weighting approach adopted by Ofgem at RIIO-1, RIIO-2 and RIIO-3 for capex intensive licensees or sectors (e.g., Scottish electricity transmission companies).[286]

7.29 In the case when significant or some weight is placed on actual sector costs, the choice of mechanism is typically informed by these costs.[287] However, there is also some consideration of the assumed investor horizon. For instance, HAL's assumed investor horizon is 20 years, which would imply that a longer trailing average should be adopted where possible.

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[284] This reflects that if the asset had only been operational for five years for example, then it would be inappropriate to assume it could have issued debt 20 years ago.

[285] HAL (as a standalone entity or as part of British Airports Authority) has been operational since 1987 (i.e., 38 years) and therefore the minimum of the assumed investor horizon (20 years) and this figure is 20 years.

[286] For example, in the RIIO-3 DD, Ofgem adopted RAV weighting for the trailing average of the reference debt index for ET "*owing to the high level of expected RAV growth*". To do this, Ofgem weight the yield on reference debt indices each year by the change in RAV over the year. See Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex*, ¶¶2.106 – 2.114 (link).

[287] For example, the regulator may find the use of a 10-year unweighted trailing average of the reference index or indices better captures the sector's efficient actual costs than other mechanisms.

7.30 The choice of mechanism can be further supplemented by including further 'calibration adjustments'. These are normally in the form of a scalar added to the mechanism (e.g., 10-year trailing average plus 50 bps) or the use of expanding[288] or collapsing[289] averages. We have observed Ofgem adopt both approaches in previous controls.[290]

Approach to deflating the cost of embedded debt

7.31 In order to estimate the cost of embedded debt in real terms, any estimates derived from nominal yields need to be converted to a consistent basis to the WACC estimate (i.e., CPIH-deflated).

C. Our assessment

7.32 We have considered the various issues in estimating the cost of embedded debt and discuss our assessment of these in turn below.

Estimation approaches

7.33 Regarding the choice of adopting a notional or balance sheet-led approach to estimating the cost of embedded debt, we believe there are pros and cons associated with both approaches.

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288 An expanding average is an average calculated over a growing set of data, where each new value is averaged with all previous values rather than a fixed-size window. See, for example, Ofgem (2024), *RIIO-ET2 Price Control Financial Handbook,* ¶4.4 (link).

289 A collapsing average is an average calculated over a window that decreases in length over time, so that successive averages are based on progressively fewer observations. See, for example, CMA (2021), *Water Redeterminations 2020, Cost of Debt – Working Paper,* ¶¶63 – 64 (link).

290 For example, at RIIO-ET2, Ofgem adopted expanding averages, but at RIIO-ET3, have adopted scalar average. See footnote 288 above, and Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex*, ¶¶2.111 – 2.112 (link).

7.34 Specifically, a notional approach increases the incentive for HAL to issue debt efficiently. However the notional approach may not capture the dynamics of debt issuance (e.g., a notional approach often assumes a smooth issuance profile whereas debt issuance may be more idiosyncratic due to the irregular nature of capital expenditure[291] and requires identifying a suitable benchmark index[292]). On the other hand, the balance sheet-led approach requires fewer assumptions but risks compensating HAL for inefficient issuance.

7.35 Our preference is to adopt a balance sheet-led approach to estimating the cost of embedded debt based on the below mentioned considerations.

7.36 Firstly, we have considered the practicalities of calibrating a mechanism consistent with our estimate of the notional company's expected cost of embedded debt and the notional company's characteristics.[293] This reflects the difficulty in calibrating a notional approach to match the cost of embedded debt using a trailing average of a benchmark index such as the iBoxx £ Non-Financials A and BBB 10+ year indices.

7.37 For example, observing HAL's actual issuance profile for embedded debt over H8 that was issued between 2014 – 2024, and comparing this to what would be implied under a simple or RAB-weighted[294] approach for the same period illustrates this issue. We present this evidence in Figure 7-1 below.

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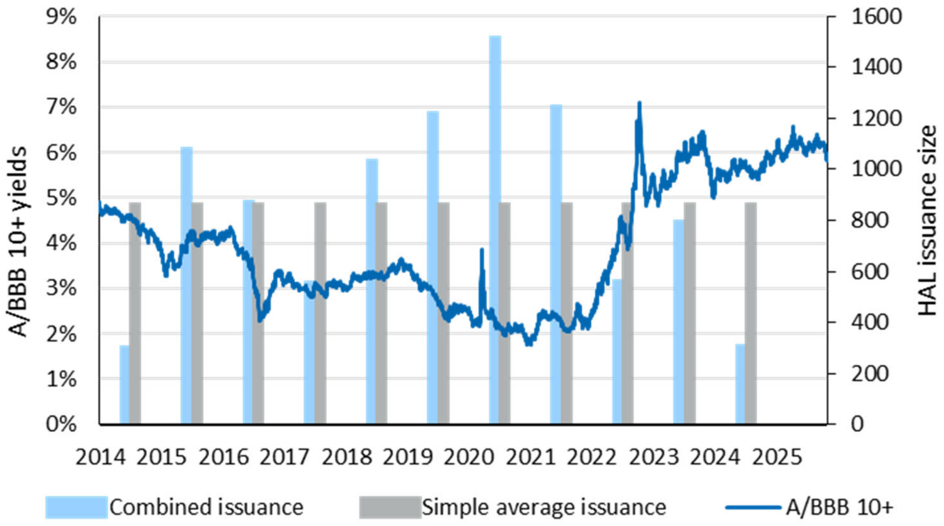
291 A simple trailing average implies capital expenditure is incurred in a uniform profile as each data point has an equal weight. However, in reality it is often more irregular resulting in a debt profile which is similarly irregular to match this timing.

292 Identifying a benchmark index which can accurately capture the dynamics of an efficient airport operator is difficult. This is due to benchmark indices such as iBoxx typically covering a wide range of sectors including regulated utilities, airports and consumer goods. Therefore, this needs to be considered when implementing the notional approach.

293 The upwards pressure on interest rates suggests that shorter-term averages of the reference index would be most appropriate in calibrating the notional-approach to match the estimate of the notional company's cost of embedded debt. However, this is not consistent with notional company asset life assumptions. An alternative would be to adopt a longer-term average consistent with the notional company's asset life assumptions and include a calibration adjustment as Ofgem has proposed for RIIO-3 and did for RIIO-2.

294 A RAB-weighted approach is effectively a weighted average calculated with reference to the opening RAB in each year of the relevant period.

Figure 7-1: Comparison of issuance profile



Source: Data from HAL's debt book.

Note: 'Combined issuance' reflects both actual senior and junior debt issuance as recorded in HAL's debt book. 'Simple average issuance' reflects the issuance profile if we adopted a constant issuance profile as implied by the use of a simple average over the period.

7.38 Figure 7-1 above illustrates that HAL has issued debt unevenly over the last 10 years, in particular, with more debt issued during periods of low interest. This illustrates the issue with adopting a notional benchmark approach to estimating HAL's cost of embedded debt as it would imply broadly constant issuance over time.[295]

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295 Alternative weighting approaches such as RAB-weighting considered by Ofgem as part of RIIO-3 are possible to try and overweight a particular period. However, RAB-weighting for HAL would also suggest constant issuance as HAL's RAB has grown in a fairly linear manner since 2016 e.g., HAL's RAB has grown by c. 4% per annum. For 2016-2021 values, see CAA, *H7 Final Decision: Section 3: Financial issues and implementation,* Table 10.1 (link); for 2022-2026 values, see CAA (2026), *H8 Initial Proposals, Section 3*, Chapter 10.

7.39 There are also other practical challenges with calibrating this approach including capturing the alignment between RPI and CPIH and changes in inflation expectations over time.[296] A notional framework is unlikely to capture the complexities and interactions associated with these factors adequately.

7.40 The issues with calibrating a notional approach have also been reflected in recent determinations such as RIIO-ET3/ GD&T3, where Ofgem included a significant ‘calibration adjustment’ to the trailing average of its benchmark index.[297] However, these calibration adjustments are sensitive to the underlying assumptions. Therefore, it would be prudent to adopt the balance sheet-led approach to avoid introducing potential inaccuracies if movements in interest rates or inflation differ from forecasts at the time of the determination.

7.41 Furthermore, a notional approach could require assumptions to be made about the efficiency of HAL’s issuance profile. This would be a difficult and involved exercise which would require detailed consideration of the financing requirements of the notional company.

7.42 We are aware of the need to ensure only efficiently incurred financing costs are recovered from consumers under the balance sheet-led approach. Therefore, we have assessed the efficiency of HAL’s issuances. We discuss this later in Section 8 as part of our assessment of whether or not to include a company-specific premium in the cost of new debt.

7.43 It is important to note that our preference for the balance sheet-led approach for H8 does not preclude the use of a notional approach for HAL in future determinations. For example, a notional approach could be appropriate when the sector’s issuance profile is broadly constant over time and market conditions are more stable.

7.44 With respect to UK regulatory precedent on this issue, the evidence is somewhat mixed. Our approach is aligned with Ofwat’s approach at PR24, where it adopted a balance sheet-led approach to assess the cost of embedded debt in the water sector (and the CMA agreed with Ofwat’s calculation in its PR24 PD).[298]

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296 For example, index-linked debt may have been issued when expected RPI inflation was higher than it is now (for instance, because of the planned alignment between RPI and CPIH from 2030).

297 Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex,* ¶2.103 (link).

298 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.585 – 7.591 and ¶7.605 (link).

7.45 Specifically, our approach is similar to the 'actual-notional' approach adopted by the CMA and Ofwat at PR24 as we have excluded the impact of outturn interest rate risk. The CMA suggested the use of an 'actual-notional' approach as a cross-check at PR19. This was based on its assessment that water companies had issued floating-rate debt, which was not considered a part of the notional financing structure as the notional company was assumed to only issue fixed-rate and index-linked debt. Consequently, at PR24, Ofwat placed weight on both, the 'all-in' and 'actual-notional' approach.[299] This was also adopted by the CMA for the PR24 PD.[300]

7.46 However, in its 'actual-notional' estimate, Ofwat applied an assumption on the composition of the debt book – in particular, it assumed that no floating-rate debt was issued, and that companies issued debt according to the notional structure of 67% fixed-rate debt and 33% index-linked debt.[301]

7.47 We have not adopted Ofwat's approach of re-weighting fixed-rate and index-linked debt to estimate the cost of embedded debt. This is because we believe it would distort the issuance profile of the sector as it implicitly assumes the floating-rate debt would instead have been issued at the same time as the existing fixed-rate and index-linked debt.[302] This appears an oversimplification.

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[299] Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix*, page 90 and Table 20 (link).

[300] CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.612 (link).

[301] CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.587 (link).

[302] For example, suppose the actual company issued a £1bn fixed-rate instrument in 2022, £0.5bn floating-rate instrument in 2023 and £0.5bn index-linked instrument in 2024. Then the actual-notional approach adopted by Ofwat (assuming the same ratio of fixed-rate to index-linked debt) would imply the £0.5bn floating-rate debt would have been replaced with a £0.33bn fixed-rate instrument in 2022 and £0.17bn index-linked instrument in 2024. This would potentially not align with the capital requirements of the business and have implications for the implied interest costs of the licensee if there was a substantial change in interest rates over the modelling period.

7.48 For Ofwat, this may not be material given the quantum of instruments available.[303] However, in the context of H8, where there is only one licensee, the potential for distortion is higher. We consider that our methodology produces a cost of embedded debt that fairly reflects the costs incurred by the notional company, while excluding instruments inconsistent with the notional capital structure.

7.49 However, other regulators such as Ofgem have consistently adopted a notional approach for setting the cost of debt based on estimates of the expected sector cost of debt for the price control.[304]

7.50 Our approach also differs from that adopted by the CAA at H7. Specifically at H7, the CAA adopted a notional benchmark comprising the 13.5-year average of a blend of the iBoxx £ Non-Financials A and BBB-rated 10+ year indices, along with a HAL-specific premium of 8 bps, to set the cost of embedded debt.[305] For the reasons outlined in ¶¶7.35 – 7.42, we believe a departure from the H7 methodology is appropriate for estimating HAL's cost of embedded debt in H8.

Considerations in adopting the balance sheet-led approach

Choice of instruments

7.51 On a theoretical basis, we are minded to include only senior debt instruments and exclude both junior debt and derivatives.

7.52 The exclusion of junior debt reflects some fundamental principles.

303 As of 31 March 2025, borrowings in the water sector were £87.2 billion. See Ofwat (2025), *Monitoring Financial Resilience, Report 2024-2025,* page 18 (link). This is relative to HAL's senior debt issuance of £13.7 billion as of 31 December 2024 per HAL's debt book.

304 For example, see Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex*, ¶1.3 (link); Ofgem (2021), *RIIO-2 Final Determinations – Finance Annex (REVISED)*, ¶¶2.2 and 2.4 (link).

305 CAA (2023), *H7 Final Decision, Section 3: Financial issues and implementation*, ¶9.92, ¶9.121 and ¶9.140 (link).

7.53 First, the inclusion of only senior debt in the cost of embedded debt assessment is consistent with long-established regulatory precedent. In particular, CAA at H7,[306] Ofwat at PR24,[307] CMA at PR24 PD,[308] and Ofgem at RIIO-3[309] all excluded junior debt (and derivatives) in their estimation of the cost of embedded debt.

7.54 Second, for the notional company to issue equity-like debt instruments would not be consistent with the notional company having sufficient equity in place. In such circumstances, the additional protective value of junior debt would be minimal.[310] This was acknowledged by the CAA at H7.[311]

7.55 Third, including junior debt in addition to senior debt is not consistent with wider parameters of the cost of capital estimation. Our cost of capital is the cost of capital for an efficient airport operator geared at 60%. If we were to include HAL's junior debt within the cost of embedded debt, this would then effectively imply that we are estimating the cost of embedded debt for a company geared at more than 60%. This would then result in a cost of embedded debt value which is inconsistent with our gearing assumption.[312]

7.56 Fourth, there could be wider impacts resulting from the inclusion of junior debt. These include financeability and ensuring HAL is incentivised to raise finance efficiently.

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306 CAA considered HAL's Class A debt as the most suitable approximation for the notional entity. It also did not consider HAL's currency swaps. See CAA (2021), *H7 Initial Proposals, Section 2: Financial issues*, ¶9.158 (link); CAA (2023), *H7 Final Decision, Section 3: Financial issues and implementation*, ¶9.135 (link).

307 Ofwat (2024), *PR24 draft determinations, Ofwat comments on cost of debt report submitted by Water UK,* Section 3.1.4 (link)

308 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.621 – 7.622 (link).

309 Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex*, ¶¶2.5 and 2.104 (link); Ofgem (2024), *RIIO-3 Sector Specific Methodology Decision – Finance Annex*, ¶¶2.15 – 2.16 (link).

310 Ofwat (2024), *PR24 draft determinations, Ofwat comments on cost of debt report submitted by water UK,* Section 3.1.4 (link)

311 CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation,* ¶9.275 (link).

312 Alternatively, we could include junior debt and assume the notional company issues no new debt until its gearing level falls below 60%. This would have implications for both the cost of embedded debt and proportion of new debt assumptions.

7.57 In sum, we see no valid reason to include junior debt within our cost of embedded debt framework.[313]

7.58 We also exclude derivatives as these instruments are risk management tools and do not reflect financing of investment. Additionally, and as a second order concern, the added complexity involved with including these instruments further diminishes the value in including derivatives.[314]

7.59 We acknowledge that an alternative financing strategy through the use of derivatives could result in a similar risk exposure to the notional company.[315] However, in our view, whether this is more efficient or not is at the discretion of the licensee and therefore the licensee should bear the risk of its strategy. This ensures licensees are incentivised to minimise financing costs but also that consumers are insulated from 'exotic' financing strategies that licensees may choose to adopt.

313 We have reviewed the use of notional benchmarks, including consideration of junior debt. See Appendix 12 for more detail.

314 Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex*, ¶2.134 (link).

315 For example, if the regulator assumed that the notional company issued fixed-rate instruments only, this could be replicated through creating a 'synthetic' fixed-rate instrument by either issuing a floating-rate instrument and interest rate swap or an index-linked instrument and inflation swap as both of these options result in no interest rate risk exposure for the notional company.

Modelling of instruments

7.60 When adopting the balance sheet-led approach, we need to consider the characteristics of HAL's instruments. HAL issues three types of senior debt: (a) fixed-rate; (b) floating-rate; and (c) index-linked.

7.61 HAL's advisors submitted their estimate of HAL's cost of embedded debt for H8. Their estimate included floating-rate instruments. However, the majority of debt classified as 'floating' by HAL's advisors represents debt issued in foreign currencies converted into a GBP-denominated equivalent via cross-currency swaps.[316] These constitute c. 90% of all debt that HAL's advisors consider 'floating', while the remaining c. 10% is 'actual' floating-rate debt i.e., linked to a particular index.[317]

7.62 There are several potential ways of modelling the foreign-currency denominated instruments (e.g., foreign currency debt with a cross-currency swap or identify a GBP-equivalent instrument). Our observation is that all of HAL's foreign-currency debt qualifies as fixed-rate in the foreign currency. Therefore, the inclusion of the cross-currency swap resulting in floating-rate debt likely reflects the exchange rate risk between GBP and the foreign currency and not the underlying pricing of the instrument itself.

7.63 Therefore, our preferred approach is to identify a GBP-equivalent instrument as this removes the exchange rate risk embedded in the price of the swaps. Additionally, the CAA has historically adopted GBP-denominated benchmark indices[318] to set the cost of debt and we see no reason to move away from this precedent by reflecting exchange rate risk in the cost of embedded debt.

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316 A cross-currency swap is a financial contract in which two parties exchange principal and interest payments in different currencies, allowing each to access financing in the other's currency. It is commonly used to hedge currency risk or to obtain cheaper financing in a foreign currency.

317 HAL has c. £3,093 million (based on principal sum outstanding as at 31 December 2024) of 'floating rate' debt in its Debt Book. Of this amount, £300 million is denominated in GBP (c. 9.7%) whereas c. £2,793 million is denominated in non-GBP currencies (c. 90.3%).

318 At H7, the CAA used the iBoxx £ Non-Financials A- and BBB-rated indices to set the cost of debt. When cross-checking this estimate against an estimate of HAL's 'all-in' cost of debt, the CAA used cross-currency swaps to estimate sterling equivalent yields for foreign currency-denominated debt. See CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation,* ¶¶9.267 – 9.268 and ¶9.307 (link).

7.64 A further consideration is the impact of including floating-rate instruments on our estimate. Specifically, the cost of floating-rate instruments fluctuates in line with market benchmarks. Therefore, if we were to reflect this in the cost of embedded debt, consumers would be exposed to changes in interest rates between price controls on embedded debt i.e., outturn interest rate risk.[319]

7.65 At H7, the CAA ensured that HAL is only compensated for interest rate risk captured in the iBoxx indices and not for any outturn interest rate risk HAL chooses to bear through issuing floating-rate instruments. Therefore, we believe it would not be appropriate to compensate HAL for choosing to bear outturn interest rate risk.

7.66 Consequently, and consistent with H7, we do not consider it appropriate to expose consumers to outturn interest rate risk. Therefore, we model foreign currency and GBP floating-rate instruments as the yield on a credit rating matched index as at the issuance date plus a contemporaneous estimate of the 'HAL-specific' premium (following the same methodology as set out in Section 8).[320, 321]

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319 If HAL's debt were modelled as floating-rate, the interest payments would vary with market interest rates (for example, if rates rise, HAL's interest costs rise; if rates fall, costs fall). In the regulatory model, consumers ultimately pay HAL's allowed costs through airport charges. So, if HAL's allowed cost of debt changes in line with interest rates, then consumers would indirectly bear the impact of interest rate fluctuations.

320 This is aligned with our estimation of the cost of new debt. We discuss the selection of the reference index and our calculation of the HAL premium in the section on the cost of new debt. See ¶¶8.55 – 8.60.

321 This means we have estimated a contemporaneous sector-specific premium for HAL's bonds on the data of issuance. We have analysed a sensitivity to our approach where we adopted a constant premium of 10 bps in line with our estimate of the HAL premium on the cost of new debt (see ¶8.59). We found our results were not sensitive to this assumption, with an impact of c. 1bps on our estimate of the cost of embedded debt. See Appendix 9 for more details.

7.67 With respect to index-linked debt, we include the cost of HAL's index-linked instruments in our estimate of the cost of embedded debt. The principle of reflecting index-linked debt in the cost of embedded debt is consistent with regulatory precedent at H7.[322] Additionally, it is likely that the notional company would issue some index-linked debt to manage its risk exposure (i.e., aligning financing costs and revenues).[323]

7.68 In order to model index-linked debt, we rely on in-period official RPI forecasts to calculate the cost of index-linked bonds over the H8 period (as HAL has only issued RPI-denominated bonds).[324, 325]

7.69 Our chosen method for applying the balance sheet-led approach is consistent with other regulators who have applied this approach (e.g., Ofwat and CMA at PR24).[326] However, we differ in our modelling of floating-rate instruments reflecting the unique circumstances of HAL's cross-currency instruments.[327]

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322 The CAA estimated the cost of index-linked debt by deflating the nominal cost of fixed-rate debt using a long-term inflation assumption. See CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation,* ¶9.263 and ¶9.309 (link).

323 Index-linked debt and HAL's revenues are positively correlated with inflation. Therefore, aligning the two minimises the risk faced by the notional company.

324 We obtain the RPI forecast from the OBR – from 2027-29, there is an RPI forecast, and following RPI-CPIH alignment this is equal to the long-run CPIH of 2.40%. See OBR (2024), *The long-run difference between RPI and CPI inflation* (link). We note that OBR assumes long-run CPIH to be 2.40% but we have adopted the long-run assumption of 2.13%, aligned with the CAA's internal modelling. See CAA (2026), *H8 Initial Proposals, Section 3*, Chapter 9.

325 We estimate the yield on index-linked bonds by first adjusting the bond principal for RPI inflation and then applying the coupon to the inflated principal. Using this approach, we calculate the implied yield over the H8 period, which reflects both the increase in principal due to RPI and the coupon on the adjusted principal, expressed relative to the opening principal balance. This provides a measure of the cost of servicing the index-linked debt.

326 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.587 and ¶7.605 (link).

327 We understand other regulated sectors issue a smaller proportion of their debt in foreign currency than HAL and therefore the issue of how to handle foreign currency instruments is less material and relevant in those sectors.

Forecasting changes in the debt book

7.70 As described previously, we need to forecast the changes in the debt book between the submission date and start of H8 as all debt issued up to the start of H8 will effectively be classified as embedded debt. In forecasting this debt book, we consider the impact of maturing debt and new issuances.

7.71 The maturing debt profile is informed by HAL's debt book. For forecasting new issuances between the date of HAL's debt book[328] (31 December 2024) and the start of H8 (1 January 2027), we utilise the notional approach to forecast issuance in 2025 and 2026. We adopt the notional approach as we have concerns regarding the incentive properties of adopting HAL's forecast issuance[329] and HAL's issuance profile may reflect HAL's actual financing structure and not the notional company's.[330]

7.72 We model the notional company's issuance in both 2025 and 2026 by making the following assumptions:

- **Type of issuance:** We assume the notional company will only issue fixed-rate debt in 2025 and 2026, as a relevant index-linked bond index (based on which we would assess the cost of issuing new index-linked debt) does not exist.[331] It is also consistent with our cost of new debt assumption, which implicitly assumes fixed-rate debt issuance.[332]
- **Amount of issuance:** Notional company will issue debt to ensure that it achieves a gearing of 60% (the notional gearing assumption) in each year.[333]
- **Yield of debt issued:** Notional company is assumed to issue debt in 2025 at the year-to-date average of the blended iBoxx £ Non-Financials A and BBB 10+ year indices plus the HAL-specific premium (including both the new issuance and sector-specific premium) as estimated for the cost of new debt,[334] as actual benchmark yields are available for the year. For 2026, we assume the debt is issued at our estimated cost of new debt.

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328 We expect HAL will submit an updated debt book reflecting its 2025 issuance in response to the CAA's initial proposals for H8.

329 HAL's issuance profile may not be efficient and therefore if we adopt HAL's assumption it may imply that, if HAL adopts this forecast, consumers should underwrite the risks involved with this issuance profile.

7.73 At PR24, Ofwat adopted the 'actual' approach in order to more accurately capture the high level of debt required to finance capital intensive programs, prior to the start of PR24.[335] This was a change from its initial proposal of adopting a largely notional approach.

7.74 This approach was retained by the CMA, which included actual debt issuances to estimate the cost of embedded debt.[336] This also reflects the more up-to-date data available to the CMA than Ofwat when setting the cost of embedded debt—specifically, the CMA could observe the actual debt issued between the consultation response deadline (28 August 2024)[337] and start of AMP8 (1 April 2025) as it was relying on data up to 31 March 2025.[338]

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330 HAL's actual gearing (including junior debt) was 72% as at 31 December 2024 (calculated as the ratio of total net debt to RAB at Heathrow (SP) Limited) and this is considerably higher than the level of notional gearing. See Heathrow Airports Holdings Limited (2025), *Annual Report 2024,* page 199 (link). Therefore, HAL's issuance profile may reflect these wider considerations which is not considered as part of the notional company.

331 In our view, estimating the 'efficient' cost of new index-linked debt requires an objective benchmark as this provides certainty to all stakeholders. We have not currently identified this as none of HAL's index-linked instruments are listed. For example, CEPA propose deflating the iBoxx index using market-based measures of inflation to arrive at an estimate of the cost of index-linked debt. We believe this is an oversimplification as other factors may drive the difference between the cost of index-linked debt and fixed-rate debt. For example, our analysis of listed inflation-linked bonds of listed regulated utilities is that the 'breakeven inflation' implied by these instruments is much lower than market measures such as inflation swaps or breakeven inflation implied by gilts. See Appendix 10 for more detail.

332 See footnote 363 for details.

333 Notional gearing is net debt divided by RAB, therefore we need to estimate both the gross debt and cash balance required to achieve the target notional gearing. We estimate the cash balance associated with this debt balance based on our liquidity cost estimates.

334 See ¶¶8.55 – 8.60 for more information.

335 Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix*, page 89 (link).

336 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.621 – 7.622 (link).

337 Ofwat (2024), *PR24 Draft Determinations webpage* (link).

338 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.621 (link).

7.75 As a two-runway entity, we do not expect the notional company's investment needs to vary significantly from the previous price control (H7). We therefore consider the notional approach for estimating the debt issuance in this period to be appropriate and in line with Ofwat's original proposal for PR24.[339] We also believe this retains the efficiency incentives while setting the cost of debt.[340]

Approach to deflating the cost of embedded debt

7.76 As described previously, the CAA has made a policy decision to adopt medium-term inflation forecasts at H8. Accordingly, we deflate our nominal annual cost of debt estimate based on in-year inflation forecasts for H8. Specifically, we deflate the nominal cost of embedded debt based on the OBR's CPIH inflation forecasts for 2027 – 2030 and the long-run inflation assumption of 2.13% for 2031.

7.77 Our approach to deflating fixed-rate debt with medium-term inflation forecasts is consistent with the approach employed by the CAA at H7.[341]

7.78 However, we differ from the CAA's H7 approach in terms of the treatment of index-linked debt. At H7, the CAA adopted a 'top-down' approach. Specifically, it proxied the cost of index-linked debt (new and embedded) by deflating the observed yield on fixed-rate debt benchmark indices (e.g., iBoxx) based on long-run inflation assumptions. This was motivated by the premise that long-term index-linked debt is typically priced with reference to long-run inflation expectations (and not short- or medium-term inflation expectations).

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339 We are open to stakeholders submitting evidence on why adopting a different profile could be appropriate.

340 As Ofgem and the CAA at H7 did not adopt the balance sheet-led approach, there is no relevant precedent from RIIO-3 or H7 relating to this approach.

341 Based on its nominal approach, it had estimated a single nominal cost of embedded debt of 4.22%, using a 13.5-year average of its chosen benchmark (4.14%) and a HAL-specific premium of 8 bps. See CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation*, ¶9.22 and Table 9.7 (link).

7.79 For H8, our preference is to adopt a bottom-up approach to estimating the cost of embedded debt (i.e., balance sheet-led approach). HAL's index-linked embedded debt is expressed in RPI real terms but needs to be converted into CPIH-terms. As a result, we first estimate the cost of HAL's index-linked embedded debt in nominal terms by inflating the observed yield on these instruments by the OBR's RPI medium-term inflation forecasts. After having converted the RPI real yields into nominal terms, we then deflate the nominal cost of HAL's index-linked debt based on the OBR's CPIH medium-term inflation forecasts to express the cost of index-linked debt in CPIH-terms.[342, 343]

7.80 Other regulators (Ofwat,[344] Ofgem[345] and the CMA[346]) have deflated their cost of debt estimates by relying on longer-term inflation forecasts. This reflects their decision to adopt longer-term inflation forecasts unlike the CAA.

342 This is because the 'real' yield on index-linked instruments is unaffected by the choice of inflation forecast under the balance sheet-led approach. For example, if there is a 1% coupon index-linked instrument, whether you inflate this using a 3% or 10% inflation assumption the real yield is still 1% i.e., real yield = ((1 + index-linked coupon) × (1 + inflation rate) ÷ (1 + inflation rate)) – 1 = index-linked coupon.

343 In theory, the two approaches should result in a similar estimate for the CPIH cost of index-linked debt assuming the inputs into the top-down approach are calibrated based on the sector's actual financing costs.

344 Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix*, page 91 (link).

345 Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex*, ¶2.29 (link); Ofgem (2024), *RIIO-3 Sector Specific Methodology Decision – Finance Annex,* ¶¶2.92 – 2.94 (link).

346 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.625 – 7.626 (link).

D. Results

7.81 Applying the methodology set out above, our estimate of the cost of embedded debt is presented in Table 7-1 below.

Table 7-1: Calculation of cost of embedded debt

Component	H8 Proportion of debt book	H8 Initial Proposal (nominal)
Fixed-rate debt	73%	5.09%
Floating-rate debt	14%	4.15%
Index-linked debt	13%	5.00%
Nominal cost of embedded debt		**4.94%**

Source: FTI analysis; HAL debt book.
Note: (1) Values may not sum precisely due to rounding. (2) The nominal cost of embedded debt is weighted based on the proportion that each type of debt (fixed, floating, index-linked) constitutes (based on principal).

7.82 In Table 7-2 below, we present the results from converting the nominal cost of embedded debt to CPIH-terms.

Table 7-2: Deflating the cost of embedded debt

	Guide	2027	2028	2029	2030	2031	Weighted Average
Nominal Cost of Debt	A	4.84%	4.89%	4.91%	5.01%	5.11%	**4.94%**
Inflation	B	2.15%	2.08%	2.11%	2.13%	2.13%	**2.12%**
Real cost of debt	**C = (1 + A) / (1 + B) – 1**	**2.63%**	**2.75%**	**2.74%**	**2.82%**	**2.92%**	**2.77%**

Source: FTI analysis; HAL debt book; OBR (2025), Economic and fiscal outlook – November 2025 (link).
Note: (1) The weighted average is calculated based on the proportion of debt book that each debt type (fixed, floating, index-linked) constitutes (based on principal). (2) The inflation rate for 2027 – 2030 is calculated based on annual OBR forecasts, whereas the inflation rate of 2031 is based on long-term forecasts and is assumed to equal the 2030 forecast.

7.83 This results in an overall cost of embedded debt of 2.77% in CPIH-deflated terms.

E. Summary

7.84 For estimating HAL's embedded cost of debt, we adopt a balance sheet-led, 'actual-notional' approach. Specifically, we calculate this by:

(1) calculating the return associated with each instrument in HAL's debt book;

(2) aggregating the returns and scaling by the principal associated with those returns to obtain a cost of embedded debt for each type of instrument (fixed, floating, and index-linked) for each year of H8;

(3) taking an annual weighted average over the H8 period (weighted on the basis of principal)[347] to obtain an overall cost of embedded debt for each type of instrument;

(4) taking a weighted average of the costs of embedded debt for each type of instrument (weighted by the proportion of the debt book) to obtain an aggregate nominal cost of embedded debt; and

(5) deflating the cost of embedded debt by medium-term inflation, as discussed in Section 2.

7.85 In doing so, we have only estimated the relevant costs for HAL's senior debt.

7.86 This results in a nominal cost of embedded debt of 4.94%. We cannot directly compare this to the CAA's H7 nominal estimate (4.22%) as the CAA deflated this based on two different inflation assumptions in order to estimate the real cost of fixed-rate and index-linked debt separately. Therefore, when aggregated, the CAA's H7 real cost of embedded debt implies an effective nominal rate of 4.76%.[348]

[347] In the event that a bond is maturing during the period, for the year in which it matures, we estimate the interest paid from the beginning of the year to when the bond matures. We also time-weight the principal to reflect the repayment of debt during the year. For instance, if a bond matures on 30 June, the principal is halved to reflect the bond is only active for half the year.

[348] We inflate the real cost of embedded debt using the average RPI forecast over the H7 period, as in the CAA's determination. See Appendix 11 for more information.

7.87 In CPIH-deflated terms, our estimate of the cost of embedded debt is 2.77%. This is higher than the CAA's H7 estimate of HAL's cost of embedded debt (converted into CPIH-real) of 0.78%.[349] This is mainly due to the fact that our H8 initial proposal reflects a higher nominal estimate and a more stable inflation environment.

349 We estimate this by converting the H7 RPI-real cost of embedded debt (-0.12%) into CPI-real terms using the estimated RPI-CPIH wedge at H7. See FTI Consulting (2024), Cost of Capital Strategy for H8, Table 1 (link).

8. Cost of new debt

A. Introduction

8.1 New debt is the debt expected to be raised during the upcoming price control period primarily to finance growth in RAB and to refinance maturing debt instruments. The cost of new debt reflects the expected interest rate that an efficiently financed notional company is expected to incur when raising new debt over the price control period. It is typically assessed through benchmarking the licensee(s)'s financing costs to issuers with similar characteristics.

8.2 Establishing an efficient cost of new debt allowance incentivises licensees to raise finance efficiently and protects consumers from paying for inefficient costs.

8.3 The rest of this section is structured as follows:

- Section 8B explains the key methodological considerations that need to be addressed when estimating the cost of new debt;
- Section 8C presents our arguments and analysis regarding the methodology;
- Section 8D sets out the results; and
- Section 8E summarises.

B. Methodological considerations

8.4 Regulators typically estimate the cost of new debt as the sum of two components:

(1) the yield on a reference benchmark index ('reference based estimation'); and

(2) adjustments required to the benchmark ('HAL-specific premium') (if needed).

8.5 Reference benchmark indices tend to be quoted in nominal terms. As such, the nominal cost of new debt inferred from reference benchmarks needs to be deflated by a suitable inflation measure and converted to real terms.

8.6 The adjustments reflect the extent to which the chosen benchmark index is an accurate proxy for the cost of new debt of the sector/ asset in question. Sometimes, sector-specific factors (e.g., higher systematic risk or high exposure to a prevailing macroeconomic event such as a pandemic[350]) can merit an upward or downward adjustment to yields inferred from the reference benchmark.[351]

8.7 We discuss these two components of the cost of new debt below.

Reference based estimation

8.8 Reference based estimation needs to consider the choice of index and the averaging period for the index. This requires careful consideration of the representativeness of the reference index for the sector's debt financing costs.

8.9 When choosing the relevant index, key factors to consider include the target credit rating, investment horizon, and other relevant characteristics including debt type (i.e., fixed-rate, floating, or index-linked).

8.10 When considering the averaging period, as mentioned previously, finance theory suggests that spot yields are the best predictors of future yields. But spot data can be volatile and affected by one-off events.[352] Therefore, averaging data over a suitable time period may be preferable to smooth out the volatility associated with referencing a spot estimate (which relies on a single data point).

8.11 Ensuring the reference index adopted to set the cost of new debt is reflective of current and future market conditions is important for allowing the sector to cover efficiently incurred financing costs and incentivising licensees to raise finance efficiently. Therefore, and similar to the determination of the risk-free rate,[353] regulators aim to consider a range of market evidence when making price control determinations.

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350 During the Covid-19 pandemic, we observed a sharp increase in transport-related companies' bond yields. For example, as set out in Figure 8-2 below, the spread over the iBoxx for HAL's prevailing bonds increased from negative c. 0.2% before the pandemic to more than positive c. 1% during the pandemic.

351 In this context, a premium indicates that the sector's cost is higher than the benchmark, whereas a discount indicates that the sector's cost is lower than the benchmark. This is calculated as the spread between the yield on sector bonds and the corresponding benchmark yield.

352 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4*, ¶7.103 (link)

353 See ¶¶3.11 – 3.14 for a discussion of the averaging period used for the risk-free rate.

8.12 Some regulators have previously indexed the cost of new debt to ensure that the WACC reflects the evolution of market conditions over the price control period.[354] Indexation mitigates the risk of material divergence between the allowance and the outturn cost of debt incurred by companies due to changes in market conditions after price control determinations.

8.13 Under this approach, the allowed cost of new debt is 'trued-up' against movements in the relevant benchmarks over the control period, with an adjustment made at the start of the next price control to correct for any difference between the forecast and outturn debt costs. This ensures that the allowance remains closely aligned with actual market conditions while limiting forecasting error and avoiding undue windfall gains or losses for consumers or the regulated company. In this case, the choice of averaging period for the cost of new debt is less material than the averaging period for the risk-free rate (as the risk-free rate is not indexed).

Adjustments to the benchmark

8.14 The benchmark chosen to assess the efficiency of a sector's financing costs can represent a variety of sectors and companies with a consistent credit rating. For example, the iBoxx £ Non-Financials A 10+ index (a commonly used index by regulators in setting the cost of debt), includes bonds from nine sectors and 25 companies (as of 31 October 2025).[355, 356] However, within a credit rating, there can be a wide variety of financing costs reflecting differences in risk across issuers. For example, the underlying bonds of the iBoxx £ Non-Financials A 10+ index, varied in yield by c. 125 bps[357] (as of 1 November 2025), reflecting differences in risk and bond characteristics (e.g., maturity, covenants).

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354 CAA (2021), *H7 Initial Proposals, Section 2: Financial issues,* ¶9.211 (link). This was also applied, for example, in PR19. See CMA (2021), *Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, Final report*, ¶9.812 (link).

355 S&P IHS Markit (2025), *Indices, iBoxx £ Non-Financials A 10+, Membership Information* (link) (data as of 31 October 2025 based on rebalancing date).

356 As of 31 October 2025, the iBoxx £ Non-Financials BBB 10+ index includes bonds from eight sectors such as Consumer Services and Industrials, and 55 companies. S&P IHS Markit (2025), *Indices, iBoxx £ Non-Financials BBB 10+, Membership Information* (link) (data as of 31 October 2025 based on rebalancing date).

357 The minimum yield recorded for a bond in the iBoxx £ Non-Financials A 10+ index as of 1 November 2025 was 5.08%, whereas the maximum yield recorded was 6.33%. This results in a variation in yield of 6.33% − 5.08% = 1.25% (125 bps). The corresponding difference for the iBoxx £ Non-Financials BBB 10+ index is c. 189 bps.

8.15 Therefore, regulators need to consider whether an adjustment to the index is required to capture the sector's expected financing costs. This is akin to the real-price effects ("**RPE**") adjustment sometimes applied by regulators to cost allowances.[358]

8.16 This adjustment captures additional characteristics that would make the reference yield more representative of the sector's financing costs. Specifically, it includes:

- consideration of a 'new issuance' premium or discount (i.e., the typical difference between a debt instrument's issue price and its fair market value at issuance);[359] and
- the premium or discount associated with investors' views regarding the sector (or company) in particular.

8.17 In the context of H8, both of these can cumulatively be referred to as the 'HAL-specific discount or premium'.

8.18 When deciding whether to apply an adjustment to the benchmark index or indices, regulators need to consider whether any observed difference in the sector's actual financing costs from the benchmark would be relevant to the notional company. For example, the sector might have a higher leverage ratio than that implied by the notional structure or outperform the allowance set by the regulator.[360]

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358 RPEs reflect the difference between the headline market-wide inflation rate typically used to index the price control and the sector's actual inflation rate. This may be due to differences in the weights placed on individual cost items (e.g., the sector may place a higher weight on labour costs than the wider economy).

359 This reflects that new issuance may need to offer a yield greater than prevailing bonds to encourage investors to hold these new securities over existing securities. The same principle applies to equity investments. In most public equity offerings, especially follow-on offerings, companies typically price new shares at a discount to the current market price.

360 These impacts would have countervailing impacts on the expected cost of debt i.e., higher leverage increases the cost of debt and outperforming the price control settlement should put downward pressure on the cost of debt due to higher cash flows, all else equal.

8.19 The HAL-specific discount or premium can be estimated in two ways. These are:

- the spread[361] between the contemporaneous **secondary market yields** of the company's bonds to the yield implied by the reference index on the same date ('*secondary market analysis*'); and
- the spread between the sector's **bond yield at the date of issuance** to the yield implied by the reference index on the same date ('*primary issuance analysis*').

8.20 Under both of these approaches, regulators need to consider the potential differences between the sector's financing decisions and the notional company's financial structure.

8.21 Primary issuance analysis is able to capture the entirety of the HAL-specific premium (i.e., both the new issuance premium and the sector-specific premium) as it compares the bond's yields at issuance with the reference index.

8.22 However, there are often practical limitations with the use of primary issuance analysis. For example, primary issuance analysis will only give a snapshot of the new issuance and sector-specific premia. These snapshots may not be accurate representations of the market's current perceptions regarding the debt issued by HAL. For instance, HAL issued only four bonds in the five years between 2020 to 2024,[362] all of which were issued during high volatility in capital markets following the onset of the pandemic. Additionally, as it is a snapshot, this reduces the number of data points to single values for each bond analysed.

8.23 As such, secondary market analysis, which relies on contemporaneous relationships between HAL's bonds and the reference index, can help to address some of the concerns with primary market analysis as it provides up-to-date measures of sector-specific premia and can consider a wider sample.

8.24 However, secondary market analysis is unable to capture the new issuance premium, and therefore presents an incomplete picture regarding the overall 'HAL-specific discount or premium'.

8.25 Therefore, both the primary issuance and secondary market analysis need to be relied on simultaneously in order to accurately estimate a contemporaneous 'HAL-specific discount or premium'.

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361 The difference between the yield on a bond and the yield on the reference index is defined as the 'spread'. A positive spread implies a premium to the index whereas a negative spread implies a discount to the index.

362 Based on HAL's debt book, HAL issued four bonds between 2020 – 2024 inclusive which were senior, GBP-denominated, fixed-rate and non-private placement bonds.

Approach to deflating the nominal cost of new debt

8.26 As discussed in Section 2C, in order to estimate the cost of new debt in real terms, any estimates derived from nominal yields need to be converted to a consistent basis as the WACC estimate (i.e., CPIH-deflated for H8).

C. Our assessment

8.27 We set out our assessment of the reference based estimation and 'HAL-specific discount or premium' below.

Reference based estimation

8.28 In selecting the reference index, we have taken into account the following criteria:

- **Credit rating:** The CAA has historically assumed a target credit rating of BBB+ for the notional company. BBB+ debt is likely to have a yield in between the A and BBB indices as the A-index will include instruments rated A+, A and A- (i.e., higher than the target credit rating), while the BBB-index will include some bonds rated BBB and BBB- (i.e., lower than the target credit rating). Therefore, it is likely that the standalone A and BBB indices will imply a too low and too high cost of debt allowance for the notional company respectively.
- **Maturity:** The maturity of the indices should be closely aligned with our assumed investor horizon of 20 years.
- **Regulatory consistency:** The reference indices selected need to be credible and well established in regulatory practice.

8.29 Based on this, we propose to adopt a simple average of the yields on the iBoxx £ Non-Financials A 10+ and iBoxx £ Non-Financials BBB 10+ indices to reference the cost of new debt. These iBoxx indices have been well established in regulatory practice for over a decade,[363] the credit rating across the two indices aligns with the CAA's target credit rating for the notional company, and the maturity of the blended index is c. 18.2 years.[364]

8.30 When presenting the cost of new debt, we adopt a one-month trailing average of the yields implied by these iBoxx indices. This ensures consistency between the averaging approach adopted for the risk-free rate[365] and the cost of new debt estimates. However, we note that the choice of trailing average is less material for the cost of new debt than the risk-free rate due to the impact of cost of new debt indexation.[366]

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363 The iBoxx indices have played a prominent role in setting the cost of debt in GB regulation since RIIO-1 in 2013, with subsequent price controls in several sectors relying on these indices. Our use of this index, which consists solely of fixed-rate bonds, implicitly assumes that all newly issued debt will also be fixed-rate.

364 As of 31 October 2025, the iBoxx £ Non-Financials A 10+ index has an estimated maturity of 18.1 years; the iBoxx £ Non-Financials BBB 10+ index has an estimated maturity of 18.3 years. Therefore, the A/BBB blended index has an average maturity of (18.1 + 18.3) ÷ 2 = 18.2 years. See S&P IHS Markit (2025), *Indices, iBoxx £ Non-Financials A 10+ and iBoxx £ Non-Financials BBB 10+, Analytical data* (link).

365 See ¶¶3.9 – 3.10 for a discussion on the chosen tenor for the risk-free rate.

366 As described previously, movements in the cost of new debt over the price control are trued-up. Therefore, HAL is not exposed to any interest rate risk on the cost of new debt and hence the choice of the trailing average is less relevant for the cost of new debt.

8.31 Finally, we observe that the choice of indices is consistent with the reference index adopted by the CAA at H7, Ofwat at PR24, CMA at PR24 PD, and Ofgem at RIIO-3.[367] The choice of a one-month trailing average is also consistent with regulatory precedent.[368, 369]

Adjustments to the benchmark

8.32 When considering the merits of introducing any adjustments to the benchmark, the starting point for our analysis is to consider HAL's actual financial structure (as HAL is the only fully regulated airport in GB). We observe that HAL's actual financial structure is materially different from what the CAA assumes for the notional company.

8.33 In particular, as of 31 December 2024, HAL's leverage ratio (including junior debt) is 72%.[370] This is substantially higher than the notional gearing assumption of 60%. However, HAL adopts a highly covenanted whole business securitisation ("**WBS**") structure which, other things being equal, lowers HAL's financing costs. In contrast, the CAA does not assume a WBS structure for the notional company. Therefore, there is the potential for the benefits from the WBS being offset by HAL's higher overall gearing.

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367 For example, see Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex*, ¶2.15 (link); CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.627 (link). We note that, at RIIO-2, Ofgem chose a slightly different index (iBoxx Utilities index, rather than iBoxx Non-Financials index) based on its consideration that the Utilities index more accurately captured sector financing costs when setting RIIO-2 (see Ofgem (2021), *RIIO-2 Final Determinations - Finance Annex (REVISED),* ¶2.16 (link)). For RIIO-3, Ofgem has proposed to revert to the indices used for RIIO-1 (blend of A/BBB). See Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex*, ¶2.15 (link) and Ofgem (2017), Guide to the RIIO-ED1 electricity distribution price control, footnote 63 (link).

368 CAA (2023), *H7 Final Decision, Section 3: Financial issues and implementation*, ¶¶9.96 and 9.98 (link).

369 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.630 and 7.655 (link).

370 This is equal to the ratio of total net debt to RAB at Heathrow (SP) Limited as at 31 December 2024. See Heathrow Airports Holdings Limited (2025), *Annual Report 2024,* page 199 (link).

8.34 These effects are difficult to disentangle fully. As such, we have focused on whether there is potential for an adjustment to the reference index by considering whether HAL's credit rating for senior debt is consistent with the CAA's credit rating assumption for the notional company (BBB+).[371]

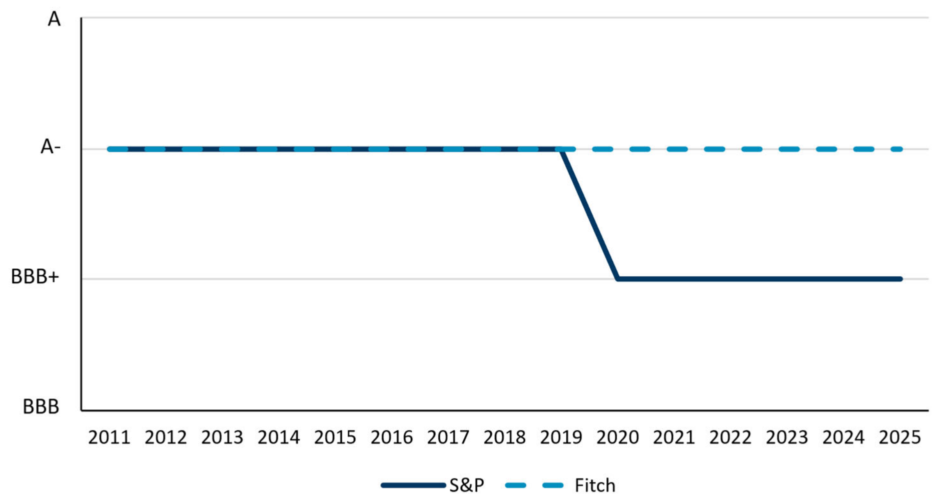
8.35 This is consistent with the approach adopted by Ofwat at PR24, which focused on bonds consistent with its credit rating assumption for the notional company when deriving any sector-specific premium.[372]

8.36 Figure 8-1 below illustrates HAL's credit rating over time.

371 This has been the case for Q5, Q6 and H7. See CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation*, ¶9.276 (link); and CAA (2023), *H7 Final Decisions, Section 3: Financial issues and implementation*, ¶13.11 (link).

372 Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix*, pages 94 and 96 – 98 (link).

Figure 8-1: HAL credit rating over time



Source: Heathrow, Investor Centre – Credit Ratings (link).
Note: (1) S&P and Finch ratings are for Heathrow Funding Ltd. Class A debt. (2) Moody's does not rate Heathrow Funding Ltd.

8.37 As indicated above, HAL's credit rating has ranged between A- and BBB+ in recent years. The downgrade in 2020 reflected uncertainty around the impact of Covid-19.[373] This does not appear to have been driven by HAL's own financing choices but sector-specific considerations on the impact of Covid-19. Therefore, any differences in HAL's financing costs and benchmark indices are likely to be consistent with what would be expected for the notional company.

8.38 Within this context, we have undertaken a secondary market analysis and primary issuance analysis for HAL's existing debt book, as described previously.

[373] S&P (2020), *Heathrow Funding Ltd. Class A Debt Downgraded To 'BBB+'; Class B Debt Downgraded To 'BBB-'; Outlooks Negative* (link).

Secondary market analysis

8.39 For the secondary market analysis, we assess the contemporaneous secondary market yields of HAL's bonds based on data from Refinitiv and Bloomberg. We only conduct this analysis on a subset of the debt securities in HAL's debt book. Specifically, we exclude bonds on the basis of:

(1) **Issuance date**: Only bonds issued from 2011 onwards are included in our assessment. This is mainly to avoid taking into account significantly outdated data and ensuring that any bonds from prior to the de-merger of the erstwhile BAA are not included.[374]

(2) **Seniority**: Only senior bonds are included, aligned with our rationale for the exclusion criteria in estimating the cost of embedded debt.[375]

(3) **Bond type**: Only fixed-rate bonds are included as the iBoxx benchmark contains fixed-rate instruments only.

(4) **Currency**: Only GBP-denominated bonds are included as the notional company is assumed not to incur exchange rate risk by issuing debt in a foreign currency (aligned with our rationale in estimating the cost of embedded debt).[376]

(5) **Placement**: Only non-private placement bonds are included as only publicly traded bonds can be observed in the secondary market.[377]

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374 The Competition Commission in 2009 required British Airports Authority ("**BAA**"), which owned seven UK airports including HAL, to sell three airports. As a result, Gatwick, Edinburgh and Stansted airports were sold from BAA in 2009, 2012 and 2013 respectively. See CMA (2016), *BAA airports: Evaluation of the Competition Commission's 2009 market investigation remedies,* ¶1.2 (link). As an example, HAL's holding company (formerly BAA) was renamed to Heathrow Airport Holdings Limited in 2012 reflecting the de-merger. Therefore, any bonds before this period are likely to be less relevant. Heathrow Airport Holdings Limited (Formerly BAA Limited) (2013), *Annual report and financial statements for the year ended 31 December 2012* (link).

375 See ¶¶7.51 – 7.59 of the cost of embedded debt section, where we provide more detail on our rationale for considering senior bonds only.

376 See ¶7.63 of the cost of embedded debt section.

377 This is because we rely on the use of contemporaneous yield data which is not available for non-traded, private bonds.

(6) **Tenor**: We restrict our sample to bonds with tenors of more than ten years to ensure alignment with the iBoxx £ Non-Financials A- and BBB-rated 10+ year corporate bond indices.[378]

8.40 The number of bonds included in the analysis varies over time, as bonds with tenors of less than ten years are removed from the sample. We start with three bonds in 2011 and end with five bonds in 2025.[379]

8.41 The resulting HAL bonds are then matched to a reference index with a similar tenor.[380] We exclude any maturity premium or discount from the tenor-matched reference index, consistent with the CMA's view in its PR24 PD.[381] Our reference index is also aligned with the assumed credit rating of our notional entity.

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378 This is consistent with Ofwat's primary issuance analysis in PR24 which included bonds with tenors above 10 years to align its analysis with the use of the 10+ benchmark index. CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.658 (link).

379 HAL's advisors focus solely on bonds included in the iBoxx £ BBB 10+ index as of June 2025, which we do not consider to be a sufficiently exhaustive sample.

380 The tenor is matched with reference to the iBoxx index closest in maturity to the bonds and estimated as follows. First, we estimate the maturity remainder for each HAL bond at a point in time. Second, we estimate the average maturity of the iBoxx index at a point in time, for different iBoxx maturity bands i.e., 1-3, 3-5, 5-7, 7-10, 10+, 10-15, 15+. Third, we estimate the difference in maturity between the HAL bond and the iBoxx index for different iBoxx maturity bands. Lastly, the chosen iBoxx maturity band is allocated by identifying the minimum difference in maturities from step 3, assuming that the chosen maturity for the index will be the same for A and BBB. For example, if the difference between the average maturity of the iBoxx 1-3 year index and a HAL bond's maturity is 2 years, and the difference between the average maturity of the iBoxx 3-5 year index and the HAL bond's maturity is 4 years, the iBoxx 1-3 year index will be chosen for both A- and BBB-rated indices. In contrast, HAL's advisors matched tenor by constructing a synthetic benchmark for each bond based on interpolation between iBoxx indices of different tenors. They also compared bonds to reference indices of matching credit rating. We consider this tenor-matching approach to be speculative and lacking transparency. We also consider that the HAL-specific premium should be measured relative to the chosen reference index — using credit rating matching risks the double counting of premia. The CMA's PR24 PD also assessed that an adjustment for tenor and rating was not appropriate. See CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶8.90 – 8.93 (link).

381 The CMA argued that it is not always possible to accurately capture differences in yield which are solely due to tenor differences and therefore opted for excluding term premium. CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.656 – 7.658 (link).

8.42 Our secondary market analysis departs from the H7 methodology in two ways. First, we do not apply a premium on index-linked debt as these instruments are not considered to be part of our analysis. Second, we do not consider secondary yields for recently issued bonds as, based on the 31 December 2024 cut-off date of HAL's debt book, we do not have access to data relating to recently issued HAL bonds.[382, 383]

Primary issuance analysis

8.43 For the primary issuance analysis, we adopt an approach consistent with our secondary market analysis for identifying the relevant bonds. This results in a sample of eight bonds.[384] We estimate the spread between these bonds and the tenor-matched reference index[385] at the date of issuance of each bond.

8.44 This spread encompasses both the new issuance premium and the sector-specific premium, at the time of issuance. However, as discussed, both of these components can be unrepresentative as it may reflect market conditions at a given point in time.

382 We note that HAL issued a £300 million Class A fixed-rate GBP bond on 3 October 2025 with a maturity in 2044. We do not consider this bond as it is not included in HAL's debt book, which has a cut-off date of 31 December 2024. We will consider this bond in our analysis once HAL's debt book is updated to ensure consistency between our cost of new debt and embedded debt analysis. Information on the bond retrieved from S&P Capital IQ Pro, ISIN: XS3198627229. See also Fitch Ratings (2025), *Fitch Rates Heathrow Funding Limited's New Class A Senior Secured Notes 'A-'; Outlook Stable* (link).

383 We will consider evidence from HAL's issuance in 2025 when we update our report ahead of the CAA's Final Proposals for H8.

384 This differs from analysis of the primary issuance premium presented by HAL's advisors, which includes foreign currency denominated bonds.

385 See footnote 380 for a discussion of our approach to tenor matching and credit rating matching (in which our primary issuance analysis is aligned with the secondary market analysis), and how this contrasts with KPMG's approach. Note that this also results in KPMG excluding a bond from its analysis due to the lack of availability of data on its credit rating, which we include (ISIN: XS1853428321).

8.45 Therefore, we adjust the calculated spread between the HAL bond and the tenor-matched reference index for the estimated spread in our secondary market analysis, which reflects the contemporaneous sector-specific premium on HAL's bonds. Removing the existing sector-specific premium from this spread allows us to isolate the implied new issuance premium.[386]

8.46 We weight this new issuance premium for each bond by the respective bond's principal.

8.47 At H7, the CAA analysed the new issuance premium based on HAL's Class A bonds issued during 2022.[387] This is primarily because it had access to data for most of 2022 (the first year of H7) when finalising H7. Additionally, market conditions at the point of the H7 determination were volatile, and therefore the CAA considered that the historical analysis did not serve as an appropriate proxy for any future premia or discounts that HAL might incur.

8.48 Since the H7 determination, capital market volatility has decreased. As a result, we consider that longer-term analysis of primary issuance premia is useful for inferring any company-specific premium for H8.

8.49 The principle of including an adjustment to the reference index is consistent with the CAA at H7,[388] Ofwat (and the CMA) at PR24,[389, 390] and Ofgem[391] for gas companies at RIIO-3.

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386 We understand that HAL's consultant, KPMG, has not made this adjustment to its estimate of the primary issuance premium.

387 CAA (2023), *H7 Final Decision, Section 3: Financial issues and implementation*, ¶¶9.172 – 9.174 (link).

388 CAA (2023), *H7 Final Decision, Section 3: Financial issues and implementation,* ¶¶9.176 – 9.177 and ¶9.181 (link).

389 Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return* appendix, page 5 (link).

390 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.629 and 7.671 (link).

391 Ofgem (2024), *RIIO-3 Draft Determinations – Finance Annex,* ¶2.25 (link).

8.50 Further, our reliance on both primary issuance and secondary market analysis is consistent with the approach employed by Ofwat (and the CMA) at PR24[392], as well as Ofgem[393] at RIIO-3.

8.51 However, at H7, the CAA only relied on primary issuance analysis[394] due to the unprecedented volatility and disruption that was observed in capital markets at the time it was determining the price control. As capital markets have since stabilised and because of the lack of recent issuances from HAL, we consider it appropriate to reference contemporaneous secondary market yields in estimating the sector-specific premium.

Approach to deflating the nominal cost of new debt

8.52 In order to estimate the cost of new debt in real terms, any estimates derived from nominal yields need to be converted to a consistent basis to the WACC estimate (i.e., CPIH-deflated).

8.53 At H7, the CAA considered both short- and long-run inflation to deflate different type of instruments in estimating the real cost of new debt. For fixed-rate debt, the CAA considered in-year inflation forecasts to deflate its nominal cost of new debt.[395] For index-linked debt, the CAA adopted a long-run inflation assumption.[396] This differs from the CMA's approach in PR24 PD and Ofwat at PR24 which deflated the nominal cost of new debt estimate using only long-term CPIH.[397]

8.54 As discussed in paragraph 2.39, we adopt medium-term forecasts to deflate the cost of new and embedded debt. As such, we deflate our nominal cost of new debt by in-year inflation forecasts from the OBR. We weight the real cost of debt in each year by the balance of new debt issued in each year of H8 to estimate a weighted average for H8.

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392 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.629(b) and 7.667 (link).

393 Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex*, ¶2.26 (link).

394 CAA (2023), *H7 Final Decision, Section 3: Financial issues and implementation*, ¶¶9.92 and 9.136 (link).

395 CAA (2023), *H7 Final Decision, Section 3: Financial issues and implementation*, ¶¶9.92 – 9.93 (link).

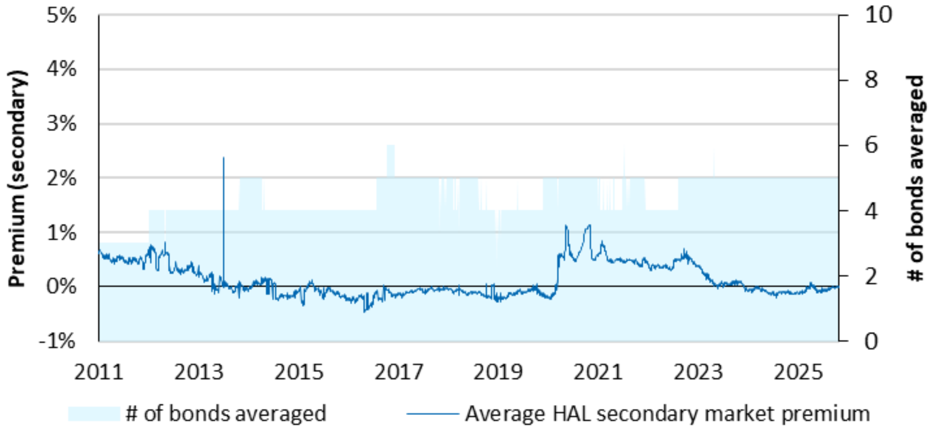
396 CAA (2023), *H7 Final Decision, Section 3: Financial issues and implementation*, ¶¶9.94 – 9.95 and Table 9.5 (link).

397 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.627 and 7.635 (link).

D. Results

8.55 Figure 8-2 below illustrates our secondary market analysis.

Figure 8-2: HAL secondary market analysis

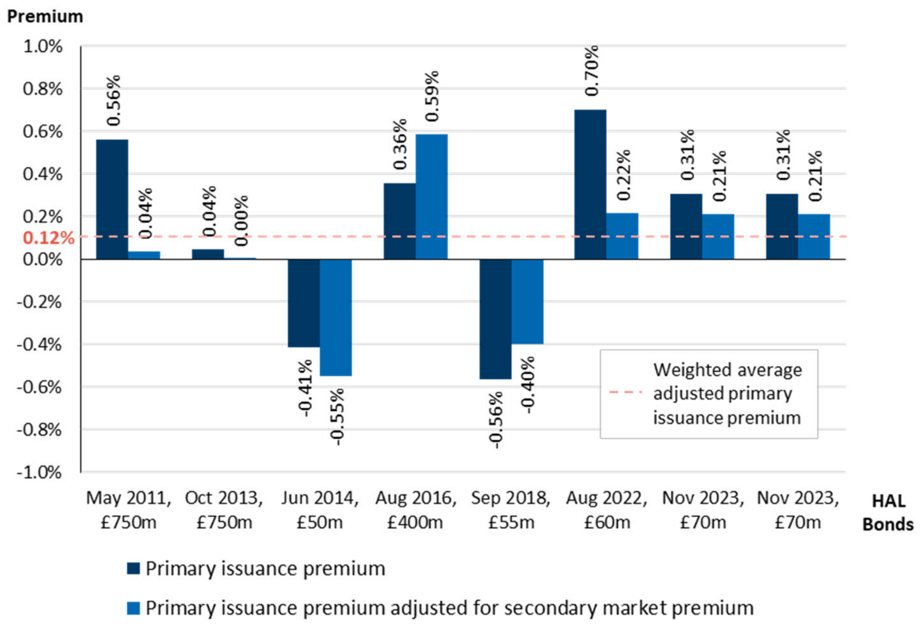


Source: HAL debt book; Bloomberg; Refinitiv; FTI analysis.
Note: (1) We excluded the three bonds in HAL's debt book issued prior to 2011. (2) We exclude bonds with tenors of less than ten years.

8.56 As evidenced above, the secondary market premium has been close to zero since 2023, and has recently been negative (implying a secondary market *discount*). Adopting a one-month average for the observed secondary market premium (aligned with our approach for the risk-free rate and reference estimate for the cost of new debt) results in a discount of 1 bp to the reference index.

8.57 In Figure 8-3 below, we illustrate the results of the primary issuance analysis.

Figure 8-3: Primary issuance analysis by bond



Source: HAL debt book; Bloomberg; Refinitiv; FTI analysis.

Note: To adjust the primary issuance premium for the secondary market premium, we subtract the secondary market premium as at the day of the issuance of the bond from the primary issuance premium.[398]

8.58 The primary market analysis implies a new issuance premium of c. 12 bps based on HAL's bonds issued since 2011.[399] The primary market analysis suggests that HAL issues at a premium to the yield on its prevailing bonds. Whether this merits a premium relative to the reference index involves taking into account current market conditions and the expected market conditions over H8.

398 For example, for the May 2011 bond (issued on 13 May 2011), the primary issuance premium was 56.4 bps, while the secondary market premium on 13 May 2011 was 52.8 bps. Therefore, the primary issuance premium, adjusted for secondary market premium, is 56.4 – 52.8 = 3.5 bps (which rounds to 4 bps, as shown in the figure).

399 This is calculated using a weighted average of the issuance premia. Analysis excludes bonds with tenors of less than ten years.

8.59 We estimate the HAL-specific premium by summing the secondary market premium (−1 bp) and the new issuance premium (12 bps).[400] This implies a HAL-specific premium of c. 10 bps. This is lower than the CAA's estimate at H7 of 26 bps,[401] and reflects the expectation that over H8, market conditions will be more stable compared to H7.[402]

8.60 Based on latest data, we estimate a cost of new debt of 3.93% CPIH-deflated for H8. We present our calculations in Table 8-1 below.

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400 Figures may not sum due to rounding. The new issuance premium is 11.6 bps and the discount from the secondary market analysis is 1.2 bps to one decimal place. This implies a sum of 10.4 bps, which we round down to 10 bps.

401 The CAA at H7 estimated the real cost of new fixed-rate debt by adding a new issue premium of 15 bps for 2022, and from 2023 onwards, also including a HAL-specific premium of 11 bps resulting in a total premium of 26 bps (and an average of 0.24% over H7). The HAL-specific premium of 11 bps is not included in estimating the uplift for 2022 as it is already implicitly included in the yield on HAL's Class A bonds. As for embedded debt, the CAA had initially included an index-linked premium of 15 bps in the estimate of the real cost of new index-linked debt, but this was removed following the CMA appeal. See CAA (2023), *H7 Final Decision, Section 3: Financial issues and implementation*, ¶¶9.176 – 9.177 (link); CMA (2023), *H7 Heathrow Airport Licence Modification Appeals, Final Determinations*, ¶¶7.305 – 7.306 and ¶7.309 (link).

402 The Covid-19 pandemic is likely to have had an overweighted impact on the aviation sector's financing costs due to its particular exposure to the Covid-19 pandemic and associated measures (e.g., travel restrictions). Therefore, one would expect the aviation sector to benefit more from normalised operating conditions than the wider economy. This would result in the aviation sector's financing costs relative to the wider economy to narrow, all else equal. We will review this further in light of any new issuance by HAL and changes in market conditions.

Table 8-1: Calculation of cost of new debt

Component	Guide	H8 Initial Proposal
One-month average of reference index	A	6.03%
HAL-specific premium	B	0.10%
Nominal cost of new debt	**C = A + B**	**6.13%**
Medium-run inflation	D	2.12%
Cost of new debt (CPIH-terms)	**E = (1 + C)/(1 + D) − 1**	**3.93%**

Source: FTI analysis; HAL debt book.

Note: The equivalent calculation for H7 is presented in Appendix 11. The medium-run inflation presented is based on CPIH inflation weighted by new debt issuance. We present average medium-run inflation for simplicity, noting that the CPIH-deflated cost of new debt estimate is calculated as the weighted average of annual CPI-deflated cost of new debt (deflated using in-year inflation forecasts) and new debt issuance.

E. Summary

8.61 We estimate the current cost of new debt by adding a HAL-specific premium to the yield on an equal blend of the iBoxx £ Non-Financials A and BBB 10+ year indices. The choice of these iBoxx indices reflects our assumptions regarding the credit rating and investor horizon (20 years) for the notional company. The addition of a HAL-specific premium is to ensure any sector-specific factors not captured by the iBoxx indices, are reflected in the cost of new debt. The HAL-specific premium comprises a sector-specific premium relative to the iBoxx indices, and a new issuance premium for primary issuance over secondary bond yields.

8.62 The sector-specific premium is estimated with reference to the difference between the yield on prevailing HAL's bonds and the iBoxx £ Non-Financials A/ BBB 10+ indices. We estimate the new issuance premium by comparing the yield on HAL's bonds on issuance date to the yield implied by our secondary market analysis. Cumulatively, this results in a HAL-specific premium of 10 bps.

8.63 We estimate the cost of new debt using a one-month average of the iBoxx £ Non-Financials A/ BBB 10+ index plus a HAL-specific premium of 10 bps. In nominal terms, this results in a cost of new debt is 6.13%. In CPIH-deflated terms, our estimate of the cost of new debt is 3.93%. This is 29 bps lower than the CAA's RPI-deflated estimate of HAL's cost of new debt of 4.22%,[403] which reflects the higher nominal estimate, more stable inflation environment, and the use of a different inflation measure.

8.64 However, we note that the CAA indexes the cost of new debt to outturn market conditions and therefore, the outturn values for the cost of new debt may differ from the values presented in our report.[404] For example, we estimate the outturn H7 cost of new debt is c. 4.21% RPI-deflated (i.e. 1 bp lower than the value set at H7) due to cost of new debt indexation.[405]

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403 CAA (2023), *H7 Final Decision, Section 3: Financial issues and implementation*, ¶9.183 (link).

404 See CAA (2026), *H8 Initial Proposals, Section 3,* Chapter 10.

405 We calculate this using the CAA's cost of new debt indexation model (link), by updating the assumed outturn yields in the 'Outturn' tab with actual outturn annual yields for the iBoxx £ Non-Financials A and BBB 10+ indices up to our cut-off of 1 November 2025. We also updated the post-cut-off values by using the one-month trailing average of the respective iBoxx indices up to 1 November 2025. This is aligned with our methodology in the cost of embedded debt section; see ¶7.72. The value presented reflects the value in tab 'H7 Cost of debt indexation', cell G68 following the updates to the underlying data in the tab 'Outturn'.

9. Proportion of new debt

A. Introduction

9.1 The proportion of new debt determines the relative weights applied to new and embedded debt when calculating the overall cost of debt. It requires an assessment of the debt raised by the notional company to refinance maturing debt and finance new investment.

9.2 The proportion of new debt is generally a sector-wide assumption. However, in the case of HAL, it is the sole regulated airport entity in this price control and the proportion of new debt estimate is therefore specific to HAL.

9.3 The rest of this section is structured as follows:

- Section 9B explains the key methodological considerations that need to be addressed when determining the proportion of new debt;
- Section 9C presents our arguments and analysis regarding the methodology;
- Section 9D sets out the results; and
- Section 9E summarises.

B. Methodological considerations

9.4 The key consideration in selecting an approach to determining the proportions of new debt is whether the regulator assumes a notional approach for refinancing embedded debt, or a profile in line with the sector's debt characteristics.

9.5 In theory, adopting a consistent approach to estimating the cost of embedded debt and proportion of new debt is desirable.

9.6 There are three plausible approaches to estimating the proportion of new debt. These are:[406]

(1) **Notional approach**, which assumes that new debt is a function of the proportion of embedded debt maturing and forecast RAB growth. The proportion of debt maturing is typically estimated based on the assumed investor horizon e.g., 20 years;[407]

(2) **Company-led approach**, which adopts licensee forecasts of future debt issuance. As such, it is dependent on companies' actual financing decisions which are not necessarily efficient and could be subject to perverse incentives;[408] and

(3) **Hybrid approach**, where new debt is estimated based on a mixture of forecast RAB growth and proportion of debt maturing based on sector's embedded debt repayment profile and characteristics (e.g., accretion of index-linked debt). This is unlike the notional approach which adopts more high-level assumptions.

9.7 We assess each of these options in the following chapter.

C. Our assessment

9.8 As we consider HAL's actual issuance profile in estimating the cost of embedded debt, our view is that the hybrid approach would be consistent with estimating the proportion of new debt.

9.9 In estimating the proportion of new debt for H8, we account for:

(1) **Accretion** on embedded index-linked debt in line with OBR's RPI forecasts for 2025 – 2029 and long-term CPIH inflation at 2.13% for 2030 onwards;

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406 CMA (2021), *Water Redeterminations 2020, Cost of Debt – Working Paper,* ¶¶230 – 240 (link).

407 This approach assumes debt is issued in a constant profile over the price control period which may not reflect actual debt issuance as capex is typically more idiosyncratic and less smooth.

408 Adopting the company-led approach may suggest that consumers should underwrite all financing decisions by the company in question if it matches the actual profile. This raises potential concerns over ensuring the sector is incentivised to raise finance in an efficiently and timely manner in line with their needs. For example, the company may initially forecast a certain profile would be efficient but this might not be the case as the price control unfolds.

(2) **Refinancing** of all debt instruments maturing during H8 using HAL's actual debt book (we consider senior debt only as the notional company is assumed to only issue senior debt);

(3) **RAB growth**, as per the CAA's modelling which results in a nominal RAB growth of 2.0% per annum on average over H8;[409] and

(4) Our **notional gearing** assumption.[410]

9.10 We estimate the new debt required in H8 by following a three-step process:[411]

- Model the embedded debt balance by considering refinancing of senior debt as well as accretion and repayment of index-linked debt;
- Calculate the forecast closing RAB based on the cost allowances for H8; and
- Estimate the new debt required to maintain a 60% notional gearing based on the forecast closing RAB.[412] This is calculated as the difference between the target debt requirement and the closing debt balance.

9.11 Our approach is a departure from H7 where the CAA adopted a notional approach. Specifically, the CAA assumed that the notional company in steady state will need to replace c. 24% of its embedded debt in any price control.[413]

9.12 However, given that we adopt a balance sheet-led approach to estimating the cost of embedded debt, we consider the hybrid approach to be more consistent with our approach than a purely notional approach.

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409 See CAA (2026), *H8 Initial Proposals, Section 3,* Chapter 10.

410 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.687 (link).

411 See Table 9-1 below for details on the proportion of new debt calculations.

412 Notional gearing is net debt divided by RAB, therefore we need to estimate both the gross debt and cash balance required to achieve the target notional gearing. We estimate the cash balance associated with this debt balance based on our liquidity cost estimates.

413 This implies the time-weighted proportion would be c. 12% over the price control given debt will be repaid gradually over the price control. CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation,* ¶9.341 (link).

9.13 This is aligned with approaches by other regulators who have adopted the balance sheet-led approach and relied on evidence from the sector's actual issuance profile in estimating the proportion of new debt (e.g., Ofwat and CMA at PR24[414, 415]). Our understanding is that Ofgem undertakes a similar approach when cross-checking its notional approach estimate to the sector's forecast cost of debt.[416]

D. Results

9.14 Table 9-1 and 9-2 below outline our calculations for the proportion of new debt following the assessment of the methodology set out above.

414 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.674 (link).

415 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.672 – 7.697 (link).

416 See Ofgem (2021), *RIIO-2 Final Determinations – Finance Annex (REVISED),* ¶¶2.40 – 2.65 (link), for discussion of how Ofgem approached calibrating its cost of debt estimate for RIIO-2. We understand a similar approach was adopted for RIIO-3.

Table 9-1: Calculation of amount of new debt issued based on notional assumptions on embedded debt (£m, nominal)

Component	Guide	2027	2028	2029	2030	2031
Notional net embedded debt[417]	A = B × (1 – cash %)	13,007	12,499	12,054	11,412	10,248
Notional gross embedded debt[418]	B = E in the preceding year	14,383	13,821	13,329	12,619	11,333
Accretion on embedded index-linked debt[419]	C	35	33	34	27	25
Debt refinancing	D	597	525	744	1,314	1,194
Closing gross H8 Embedded debt balance	E = B + C – D	13,821	13,329	12,619	11,333	10,164
Forecast Closing RAB	F	22,223	22,923	23,602	23,862	23,967
Net Debt required for 60% gearing	G = F × 60%	13,334	13,754	14,161	14,317	14,380
Implied closing gross debt	H = G / (1 – cash %)	14,745	15,209	15,660	15,832	15,902
Total new debt	**I = H – E**	**924**	**1,880**	**3,040**	**4,500**	**5,737**

Source: RAB assumptions provided by the CAA; FTI analysis.

Note: Debt refinancing based on senior debt only and face value of original issuance. Accretion calculated by multiplying the opening embedded index-linked debt by the inflation rate. Forecast closing RAB based on CAA assumptions.

417 A_{2027} (i.e., the value of notional net embedded debt in 2027) is equal to the opening RAB multiplied by the notional gearing assumption of 60% (21,678 × 60% = 13,007).

418 B_{2027} (i.e., the value of notional gross embedded debt in 2027) is equal to the A_{2027} ÷ (1 – the proportion of cash). The proportion of cash is as calculated for the liquidity calculations in Section 10 (see Table 10-1).

419 Accretion is calculated as opening embedded index-linked debt times inflation at time t, less repayment of embedded index-linked debt in that year.

Table 9-2: Calculation of proportion of new debt (£m, nominal)

Component	Guide	2027	2028	2029	2030	2031
Total new debt	A	924	1,880	3,040	4,500	5,737
Total new debt (mid-year adjustment)	B = [A(t) – A(t – 1)]/2	462	478	580	730	619
Cumulative total new debt requirement (mid-year adjustment)	C = A – B	462	1,402	2,460	3,770	5,118
Gross embedded debt based on HAL debt book	D	15,946	15,300	14,960	13,708	12,820
Proportion of new debt over H8	**E = Σ C(t) / Σ (C(t) + D(t))**	**15.37%**				

Source: RAB assumptions provided by the CAA; FTI analysis; HAL debt book.

Note: The mid-year adjustment aligns our modelling with the CAA's H7 modelling on issuing debt, in which they assume new debt is issued in an evenly-spread profile over time. This results in the time-weighted principal for in-year issuance being half the total in-year issuance e.g., if the notional company issued £1bn of new bonds in a year, and it was assumed this was issued in equal amounts each quarter then the time-weighted principal would be £500m.

9.15 Taking a sum of the new debt requirement (adjusted for the mid-year adjustment) over H8 and dividing by the sum of the new debt requirement and actual embedded debt balance results in a proportion of new debt estimate of 15.37%.

9.16 We have also conducted a cross-check based on a notional approach. Specifically, we assumed that the opening embedded debt is refinanced assuming a debt life of 20 years. This results in a weighted average proportion of new debt for the notional company of 15.44% i.e., a 7 bps difference from our estimated proportion of new debt. This suggests our proportion of new debt calculation is robust and not overly sensitive to refinancing assumptions.[420]

420 Please see Appendix 12 for our calculations as per the notional approach.

E. Summary

9.17 In estimating the proportion of new debt, we adopt a hybrid approach. Under this approach, forecast issuance is estimated by considering both the actual repayment schedule of HAL's existing debt and forecast RAB growth. Our estimate of new debt issuance ensures the notional company's gearing is equal to the notional gearing assumption. In forecasting issuance, we also take account of the accretion on HAL's index-linked debt by reflecting the characteristics of HAL's existing debt book.

9.18 This represents a departure from H7, where the CAA applied a purely notional assumption that c. 24% of embedded debt would be refinanced in each price control in steady state i.e., no RAB growth.[421]

9.19 Our approach results in a proportion of new debt of 15.37%. This is higher than the value set by the CAA at H7 (11.61%). This higher estimate is driven by changing the assumption that HAL is in steady state.

9.20 Our estimate of the proportion of new debt would increase by 7 bps if we replaced the actual repayment profile with a notional approach, as at H7. This indicates our results are robust and not overly sensitive to the repayment profile assumed.

421 The time-weighted proportion of debt replaced during every price control would be lower to reflect that debt is gradually repaid over the price control.

10. Additional debt costs

A. Introduction

10.1 Companies incur additional debt costs beyond interest costs when raising debt finance. These costs are normally reflected through an uplift to the cost of debt.[422] As with setting other aspects of the cost of debt, ensuring these costs are efficiently incurred remains important to ensure licensees are appropriately remunerated and consumers do not overpay.

10.2 Regulators have historically considered three additional costs linked to the issuance of debt:

(1) **Liquidity costs:** Costs associated with the maintenance of committed facilities and cash liquidity, which are used for various liquidity requirements.

(2) **Issuance costs:** One-time transaction costs, such as advisor fees, incurred at the time of issuing debt.

(3) **Basis risk allowance:** Costs associated with the mismatch between index-linked debt being linked to RPI and the RAB being indexed to CPIH.

10.3 The rest of this section is structured as follows:

- Section 10B explains the key methodological considerations that need to be addressed when estimating additional debt costs;
- Section 10C presents our arguments and analysis regarding the methodology;
- Section 10D sets out the results; and
- Section 10E summarises.

422 The alternative would be to include a specific cost allowance for these costs. For example, under the Cap and Floor regime, interconnectors are included a specific allowance for transaction costs. See Ofgem (2024), *Interconnector Cap and Floor Regime Handbook,* Table 14 (link).

B. Methodological considerations

Liquidity costs

10.4 Companies need to ensure that they have sufficient liquidity to cover day-to-day costs (e.g., paying suppliers). There are generally two sources of liquidity: a revolving credit facility ("**RCF**")[423] and cash balances.

10.5 However, maintaining this liquidity is not costless and these costs merit an allowance within the regulatory framework.

10.6 In determining liquidity costs, regulators separately assess the cost of each source of liquidity. In doing so, regulators have adopted one of two approaches to assessing these costs:

- **Notional approach:** forecast the liquidity requirement for the notional company;[424] and
- **Actuals-based approach:** rely on sector data on liquidity requirements (e.g., actual data on cash and RCF balances and assess the costs of holding these balances).

10.7 Practitioners apply the notional approach to assess liquidity costs to address potential concerns with the efficiency incentives of the actuals-based approach. This is primarily because actual cash and RCF balances provided by companies only provide a snapshot of a company's liquidity as at the measurement date, and may not reflect actual liquidity requirements.[425]

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423 An RCF is a flexible loan agreement that allows a company to borrow, repay, and reborrow funds up to a set limit as needed, providing a reliable source of short-term funding that enhances liquidity by ensuring access to cash when operational needs arise.

424 The liquidity costs of a notional company can be forecast using forecast capex and debt service costs while accounting for cash flow from operations. We will conduct this estimation using the CAA's assumptions for the Final Proposals. See CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation*, ¶¶9.368 – 9.390 (link); CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* Table 7.21 and Table 7.22 (link).

425 For example, a licensee could increase its RCF or cash balances ahead of year-end if they knew the regulator was going to use those values to set its liquidity allowances.

10.8 Additionally, there may be a concern that the actuals-based approach could be subject to manipulation by the sector (e.g., inflating cash balances[426] or RCF availability).[427] As a result, the notional approach could help to mitigate this issue by adding a further layer of scrutiny to the data available to the regulator.

10.9 On the other hand, a notional approach can require several assumptions (e.g., sources of liquidity, liquidity requirements and cost of liquidity). These assumptions may not reflect the real world constraints that companies operate under — in particular, with regard to the relative sizing of the RCF and cash balance.[428]

10.10 The CMA has argued that the actuals-based approach to assessing the liquidity costs increases the transparency of the calculation.[429] Further, it noted that the use of actual company data reduces estimation circularity, as financial model outputs (which determine the liquidity requirements in a notional approach) themselves depend on an estimate of the liquidity cost.

Issuance costs

10.11 The additional costs associated with the issuance of debt can be assessed with reference to:

- the issuance costs of comparable companies; or
- actual issuance costs incurred by the regulated company(ies).

426 For example, companies could manipulate cash balances by delaying dividend payments to temporarily inflate liquidity levels and secure a higher allowance.

427 We consider RCFs harder to manipulate, as this would require banks to approve facilities larger than necessary, which is unlikely given that higher RCFs increase banks' risk-weighted assets and would therefore be unattractive to them.

428 A notional approach may overstate a source of liquidity (cash or RCF) relative to the other if one source appears cheaper. For example, the cost per GBP of RCF may appear lower than the cost per GBP of cash balances. However, it may fail to consider other constraints such as banks being only able to provide an RCF up to a certain limit. These constraints may be difficult to estimate and therefore cross-checking the notional approach to real-world data can help to address these concerns.

429 The CMA calculates the actual cost as (cash liquidity proportion × cost of holding cash) + (RCF proportion × RCF commitment cost), with the cash balance and RCF taken as a proportion of gross debt. CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.727 (link).

10.12 In prior price controls, regulators have reviewed historical data on the issuance costs that comparable companies incurred. These comparable companies include other regulated entities as they operate under comparable regulatory frameworks (e.g., in the UK, water and sewerage networks, energy networks, and aviation assets are all regulated under a RAB-WACC style framework).

Basis risk

10.13 The basis risk allowance reflects the difference in inflation basis adopted to index the RAB and the inflation basis for index-linked debt issued by the notional company. This arises due to a change in policy regarding the inflation index used to index the RAB and wider price control.

10.14 In particular, previously, the RAB was indexed to RPI and licensees may have issued RPI index-linked debt to match their cost and revenue exposure as described previously. Therefore, changing the indexation to CPI or CPIH could result in a mismatch between the indices adopted to index the RAB and the underlying index-linked debt. Several regulated companies have accordingly claimed that an allowance is required to hedge the risk associated with the difference in inflation indexation.

C. Our assessment

10.15 We have considered the inclusion of liquidity costs, issuance costs, and basis risk, and discuss these in turn below.

Liquidity costs

10.16 We consider that the assumptions required (e.g., forecast uses of liquidity, source of liquidity and headroom required) to adopt the notional approach are highly subjective.[430] This increases the potential for introducing errors into the estimation process. Therefore, we adopt the actuals-based approach to estimate liquidity costs.

10.17 When estimating liquidity costs, we adopt an approach consistent with the CMA's approach as applied in its PR24 PD.

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430 S&P present one framework for estimating the liquidity requirements of a business (see here). However, they do not specify how to determine which source of liquidity is prioritised, and this assumption will therefore be subject to judgement.

10.18 Table 10-1 and Table 10-2 below set out our approach when applied to HAL's data.[431]

Table 10-1: Calculation of cash liquidity component of liquidity costs

Component[432]	Guide	CMA PR24 PD	H8 Initial Proposal
Cash balance	A		£1,556 m
Gross debt	B		£16,260 m
Cash balance as a proportion of debt	**C = A / B**	**9.0%**	**9.57%**
OIS[433]	D		4.63%
Benchmark index	E		5.86%
Cost of holding cash	**F = E – D**	**1.5%**	**1.23%**
Cash liquidity cost allowance	**G = C × F**	**13 bps**	**12 bps**

*Source: FTI analysis; CMA (2025), Water PR24 References, Provisional Determinations Volume 4, ¶7.727 (link); HAL (2025), Annual Report 2024 (link); Heathrow Airport Holdings Limited ("**HAHL**") (2025), Annual Report 2024 (link); Bank of England (2025), Yield curves (link).*

Note: (1) The benchmark index is the average of the blended iBoxx £ Non-Financials A and BBB 10+ year indices plus the HAL-specific premium of 10 bps as estimated for the cost of new debt. (2) We use the three-month spot OIS rate based on yield curve data from the Bank of England.

431 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.726 – 7.727 (link).

432 The individual components are calculated as follows: (A) Cash and cash equivalents and term deposits; (B) consolidated net debt plus cash and cash equivalents and term deposits; (D) 3-year average of UK instantaneous OIS forward curve, cut-off date of 31 October 2025 (link); (E) 3-year average of benchmark debt index (A/BBB blended 10+).

433 An Overnight Index Swap ("**OIS**") is a contract in which, at maturity, one party pays a fixed, pre-agreed interest rate and receives a payment based on the compounded overnight rate that applied throughout the term of the contract. See Bank of England (2025), *Yield curve terminology and concepts* (link).

10.19 The cash liquidity cost allowance implied by our calculations is 12 bps. We have estimated the RCF commitment fee based on the information provided by HAL as part of H7.[434] The RCF commitment fee allowance implied by our calculations is 2 bps.

Table 10-2: Calculation of RCF component of liquidity costs

Component[435]	Guide	CMA PR24 PD	H8 Initial Proposal
RCF size	A		£1,436 m
Gross debt	B		£16,260 m
RCF size as a proportion of debt	C = A / B	8.0%	8.83%
RCF commitment fee	D	0.17%	0.25%
RCF commitment fee allowance	**E = C × D**	**1 bp**	**2 bps**

Source: FTI Analysis; CMA (2025), Water PR24 References, Provisional Determinations Volume 4, ¶7.727 (link); HAL (2025), Annual Report 2024 (link); HAHL (2025), Annual Report 2024 (link); CAA (2022), H7 Final Proposals, Section 3: Financial issues and implementation, ¶9.377 (link).

10.20 As described previously, we recognise that the actuals-based approach is subject to potential distortions and therefore we have cross-checked the evidence on HAL's actual liquidity costs against various benchmarks.

10.21 First, our review of HAL's cash balance as a proportion of gross debt is aligned with the ratios observed in the water sector and is lower than those of HAL's listed airport comparators.[436] This ratio has also declined to pre-pandemic levels, reflecting less volatile operating conditions.

10.22 Second, we cross-check our actuals-based estimate against the estimate based on the notional approaches implemented by the CAA at H7. We estimate that the notional approach implies an allowance of c. 15bps.[437]

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434 We have requested further information from HAL on additional debt costs. We have not received these in time for finalising our estimates for this report. We expect that HAL will provide further information on this topic in response to the CAA's Initial Proposals.

435 The individual components are calculated as follows: (A) Taken from HAL annual reports; (B) consolidated net debt plus cash and cash equivalents and term deposits; (D) based on H7 assumption.

436 See Appendix 14 for more detail.

437 See Appendix 15 for more detail.

10.23 Given both these observations, we consider the actuals-based approach is appropriate.[438]

10.24 Our approach is a departure from the notional approach used by the CAA at H7. In particular, the CAA calculated a liquidity allowance of 21 bps, based on an RCF allowance of 7 bps and a cash allowance of 14 bps.[439, 440]

10.25 Ofwat has similarly applied the notional approach in its final determination for PR24. Ofwat's calculations resulted in a higher RCF balance than cash balance which was not reflective of actual company accounts in the sector (i.e., companies held higher cash balances than RCFs).[441] This suggests that the notional approach may not capture some of the intricacies and real world constraints faced by licensees (e.g., RCFs may be limited in size due to constraints faced by lenders).

10.26 The CMA, having reviewed Ofwat's approach at PR24, chose to adopt an actuals-based approach. In light of this, and the concerns regarding the consistency of the notional approach with real-world data, we consider the use of the actuals-based to be superior.

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438 We will consider this issue further when updating our report ahead of the CAA's Final Proposals for H8.

439 For further detail on how the CAA estimated liquidity costs for the notional company, see CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation*, ¶¶9.368 – 9.391 (link). Note that the CAA updated its estimate for the cash allowance (labelled as 'pandemic liquidity costs') in the H7 Final Decision; see CAA (2023), *H7 Final Decision, Section 3: Financial issues and implementation*, ¶¶9.187 – 9.190 (link).

440 Note that the CAA included RCF set-up costs in its calculation of the liquidity cost allowance, while Ofwat and the CMA include this in issuance costs in PR24. While the latter is not explicitly stated by Ofwat or the CMA, it is implied by the fact that Ofwat used issuance costs submitted via annual performance reports ("**APRs**") in Table 4B of the companies' APR data, and that the issuance costs submitted by the companies included the issuance costs related to RCFs. See CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation*, ¶9.377 (link); CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.700(a) (link); as an example of an APR submission including RCF data, see Severn Trent Water (2025), *APR Tables excluding Tables 3A-3I 2024/25,* Tab 4B, Row 169 (link).

441 Using a notional approach, Ofwat calculated a yearly cash liquidity requirement of 6.28% and an RCF requirement of 12.39% relative to gross debt. The CMA, in its actuals-based approach, calculated a cash liquidity requirement of 9.0% and an RCF proportion of 8.0%. See CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* Tables 7.21 and 7.22, and ¶7.727, respectively (link).

Issuance costs

10.27 We consider the use of actual issuance costs is a natural starting point as it reflects the actual costs incurred by the sector.[442] However, as noted previously, HAL is the only licensee in the sector and therefore the efficiency of these estimates needs to be considered.

10.28 In its Business Plan, HAL requested an allowance of 4 bps. Our review of recent precedents (CMA PR24, Ofgem RIIO-3, CAA H7 and Ofwat PR24) suggests that this is aligned with estimates in the other sectors.[443] Therefore, we consider this request to be appropriate.

10.29 HAL also separately requested an allowance of 2 bps for RCF and Liquidity Facility ("**LF**") arrangement and ongoing fees as a part of its liquidity allowance. We capture these costs through the issuance costs allowance instead of the liquidity allowance in line with the approach adopted by other regulators (Ofwat and CMA).[444]

10.30 To calculate the cost of setting up the RCF on an annual basis, we propose to size the RCF based on the same approach adopted to estimate the commitment fee. We estimate the annual set-up costs based on the information provided by HAL as part of H7.

10.31 The calculation of the allowance for RCF set-up costs is provided in Table 10-3 below.

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442 The CAA, in its Initial Proposals, relies on external benchmarks to assess issuance costs (excluding the set-up costs of RCFs). This results in the same baseline value as our assessment using actual costs. See CAA (2026), *H8 Initial Proposals, Section 3,* Chapter 9.

443 At PR24, Ofwat estimated issuance costs to be 5 bps, which was upheld by the CMA. See CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.721 (link); Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix*, pages 102 and 111 (link). Similarly, at RIIO-3, Ofgem estimated issuance costs to be 5 bps for ET networks, and 7 bps for GD and GT networks. See Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex,* Table 5 and ¶2.71 (link).

444 Ofwat (and the CMA) considered the cost of issuing RCFs based on issuance costs data which included the cost of setting-up RCFs. See footnote 440.

Table 10-3: Calculation of allowance for RCF set-up costs

Component	Guide	H8 Initial Proposal
RCF size	A	£1,436 m
Gross debt	B	£16,260 m
RCF size as a proportion of debt	C = A / B	8.83%
RCF set-up costs	D	0.75%
RCF set-up cost on annual basis	E = D / 5	0.15%
RCF set-up cost allowance	**F = C × E**	**1 bp**

Source: HAL (2025), Annual Report 2024, page 180 (link); HAL (2025), Annual Report 2024, page 197 (link); HAHL (2025), Annual Report 2024, page 230 (link); HAL (2025), Annual Report 2024, page 146 (link);[445] CAA (2022), H7 Final Proposals, Section 3: Financial issues and implementation, ¶9.377 (link).

10.32 Therefore, the total issuance cost allowance is 5 bps (4 bps for issuing debt instruments and 1 bp for RCF set-up costs).

10.33 Our approach is consistent with the CAA's approach at H7.[446] In sectors where there are multiple licensees (i.e., water and energy), the approach adopted by regulators such as Ofgem,[447] Ofwat[448] and CMA at PR24[449] relies on actual sector data to set issuance costs. This is likely due to the existence of more reference points for these regulators and an ability to benchmark across licensees.

10.34 Given that the CAA is regulating a single entity as part of H8, there is no ability to benchmark the actual data provided by HAL. As a result, we consider that our departure from regulatory precedent in this instance valid.

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445 We calculate gross debt as ((RAB × total net debt to RAB ratio) + cash, cash equivalents, and term deposits).

446 CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation*, ¶¶9.365 – 9.367 (link).

447 Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex*, ¶2.73 (link).

448 Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix*, page 102 (link).

449 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4*, ¶7.721 (link).

Basis risk

10.35 There are divergent views amongst regulators on whether to include an allowance for basis risk. Ofgem, in its RIIO-3 DD, proposed a basis risk allowance of 1 – 3 bps.[450] However, Ofwat and the CMA decided not to include an allowance for basis risk as they do not consider there to be a material risk arising from the revenues being indexed to CPIH and finance costs being indexed to RPI.[451]

10.36 H7 was set in RPI-terms,[452] and therefore a basis risk allowance was not relevant as there was no mismatch between the index used to index the RAB and the index underlying index-linked debt.

10.37 HAL did not request an allowance for basis risk in its BP, and has not provided any evidence of costs it has incurred associated with hedging basis risk.

10.38 Given the CMA's recent findings, and current lack of evidence regarding HAL's specific circumstances relating to basis risk, we consider it appropriate not to include basis risk allowance in our estimation of other debt costs.

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450 This reflects its assessment of the cost of RPI/CPI swaps, the extent to which this issue would affect RIIO-3, and the proportion of index-linked debt that a notional company would hold within the gas distribution & transmission sectors (30%) and the electricity transmission sector (10%). Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex*, ¶¶2.79 – 2.84 (link).

451 Ofwat (2022), *Creating tomorrow, together: Our final methodology for PR24, Appendix 11, Allowed return on capital*, pages 84 – 85 (link); CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.732 (link).

452 CAA (2022), *H7 Final Proposals*, *Section 3: Financial issues and implementation*, ¶9.17 (link).

D. Results

10.39 Table 10-4 below calculates HAL's total allowance for additional debt costs.

Table 10-4: Calculation of additional debt costs for H8 (bps)

Component	Guide	H8 Initial Proposal
Cash liquidity component	A	12
RCF commitment costs component	B	2
Liquidity allowance	**C = A + B**	**14**
Issuance costs for normal debt	D	4
RCF set-up costs	E	1
Issuance cost allowance	**F = D + E**	**5**
Basis risk allowance	**G**	**0**
Overall additional debt costs allowance	**H = C + F + G**	**19**

Source: FTI analysis.

Note: Numbers may not add due to rounding.

10.40 As indicated above, the total additional allowance for debt costs for HAL is 19 bps.

E. Summary

10.41 We have assessed three sources of additional debt costs. These are liquidity costs, issuance costs, and basis risk.

10.42 Our estimate for liquidity costs comprises the cost of holding cash and the cost of maintaining sufficient liquidity facilities e.g., RCF. We have estimated these costs using an actuals-based approach. This reflects a change in approach from H7 and is primarily related to the difficulty in calibrating a notional approach due to the number of subjective assumptions required and potential circularity between the WACC and notional approach.

10.43 However, recognising the potential for distortions under the actuals-based approach due to the reliance on observed data, we have cross-checked the inputs against other regulated sectors, and HAL's listed comparators. We have also cross-checked our estimate with the notional approach adopted for H7. Based on these cross-checks, we consider the actuals-based approach is appropriate for estimating HAL's liquidity costs at H8.

10.44 Our approach results in a total liquidity allowance of 14 bps. This comprises an actual cash liquidity component of 12 bps and an RCF costs component of 2 bps.

10.45 With respect to issuance costs, we have benchmarked HAL's request of 4 bps for issuance costs to the allowance in other regulated sectors (water and energy) and past precedent from H7. Our review indicates that this level is consistent with allowances in other sectors; accordingly, we consider this estimate to be appropriate.

10.46 HAL also requested a separate allowance for RCF and LF arrangement and ongoing fees within its liquidity allowance. Our review of regulatory precedent suggests that these costs are included in the issuance cost allowance. We have estimated the RCF set-up costs using our liquidity allowance estimates and from the assumptions adopted at H7. This implies an estimate of 1 bp for RCF set-up costs. We have added this to HAL's issuance costs request of 4bps resulting in a total issuance cost allowance of 5 bps.

10.47 We have not included a basis risk allowance primarily because HAL did not request this in its BP submission, but also based on Ofwat's and the CMA's observations at PR24.

10.48 Summing the liquidity and issuance costs allowances results in an overall additional costs allowance of 19 bps.

11. Cross-checks

A. Introduction

11.1 The CAPM provides a transparent and theoretically robust estimate of the cost of equity. However, the estimation of each parameter requires regulators and advisors to make a number of assumptions and exercise judgement.

11.2 These assumptions can be independent of each other (e.g., assumptions regarding the beta estimation may not necessarily impact the risk-free rate and total market return estimates). Therefore, this creates the potential for CAPM-based estimates to be inconsistent with concurrent market evidence — especially if certain parameters place weight on long-term capital market evidence (e.g., ex-post approach for deriving the TMR) while others place more weight on short-term capital market evidence (e.g., risk-free rate).

11.3 Therefore, to guard against contradictory or perverse outcome, market practitioners often employ cross-checks to ensure the CAPM-based estimate is reasonable, credible, and consistent with concurrent market evidence. The use of cross-checks generally improves the robustness and transparency of the overall CAPM estimates.

11.4 Our review of recent determinations, submissions made by HAL, and knowledge of financial theory has identified the following relevant cross-checks:[453]

(1) **Equity to debt premia**, which compare the difference in returns to debt investors and equity investors to provide a cross-check on the reasonableness of the cost of equity;

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[453] This is not an exhaustive list as some cross-checks used in other sectors may be less relevant to HAL (e.g., Ofgem's use of evidence from offshore transmission owner ("**OFTO**") tender rounds to cross-check its cost of equity (see Ofgem (2025), *RIIO-3 Draft Determinations – Finance Annex,* ¶3.95 (link)) is likely to be less relevant to HAL as these assets are low risk operational (i.e., no construction risk) single assets with no volume risk). This is not comparable to HAL's operating environment and risk exposure.

(2) **Market to Asset ratios ("MAR"),** which assess the ratio of companies' market valuations to their RAB to test whether the overall allowed returns are broadly consistent with market expectations;

(3) **Top-down** cross-checks, which aim to observe high-level indicators of the overall return required by investors, such as long-term historical averages of realised returns, to test whether the bottom-up CAPM-based estimate is broadly reasonable; and

(4) **Multi-factor models**, which differ from the traditional CAPM framework by incorporating additional risk factors (such as size, value, or momentum) to provide an alternative perspective on the appropriate equity return.

11.5 Of these four cross-checks mentioned above, we consider the first two to be relevant but have reservations about top-down cross-checks and multi-factor models.

11.6 Specifically, we do not consider top-down cross-checks informative as the available evidence is too sparse or volatile and the outputs are highly sensitive to assumptions. In addition, such cross-checks often reflect regulatory expectations rather than the sentiments of investors.

11.7 Multi-factor models were recently debated as part of the PR24 appeals and the CMA ultimately refrained from adopting them.[454]

11.8 We are in agreement with the CMA's observations on this issue. We also consider that multi-factor models may be inconsistent with the theoretical underpinnings of the CAPM, and as stated in our discussion regarding TMR, we do not consider it appropriate to adopt conflicting theories.

[454] The CMA examined the applicability of the q-factor model to regulated utilities. It noted that regulated utilities are highly capital-intensive, and their returns are limited by price controls which are designed so that the net present value of investments is expected to be zero. This therefore appears to contradict an implication of multi-factor models, which is that companies with lower investment should have a higher cost of equity. See CMA (2025), *Water PR24 References, Provisional Determinations Volume 5,* ¶¶F.14 and F.16 (link).

11.9 For instance, multi-factor models imply a higher capex intensity would reduce the cost of capital whereas the CAPM implies the opposite. This creates an inconsistency with views otherwise expressed by regulators and capital market analysts (e.g., credit rating agencies' rating frameworks).[455]

11.10 With respect to MAR values, we do consider these to be informative. However, as HAL is not listed, the MAR can only be estimated with reference to transactions that have previously occurred. Large infrastructure transactions are, however, only snapshots of perceived value at specific points of time, subject to the 'winner's curse',[456] and may not be entirely representative of expected returns over H8.

11.11 Transaction values are also driven by a number of assumptions (e.g., capacity expansion, macroeconomic assumptions and assumptions on the future regulatory regime). Therefore, it can be difficult to infer the required cost of equity for the notional company without knowing the cash flows assumed.

11.12 As a result, without knowing these details, estimating the cost of capital for a transaction can be an imprecise exercise. For example, a MAR greater than one could imply: (a) the investor assumed higher cash flows than the regulator due to assumptions on outperformance or macroeconomic factors (e.g., inflation, interest rates); and/ or (b) the cost of capital set by the regulator is too high.

11.13 The CMA has also opted to exclude top-down cross-checks and multi-factor models.[457] They have, however, included the consideration of MARs primarily derived from the three listed water licensees. Given that HAL is not listed and there has only been one relevant transaction since H7, it is not possible to replicate the analysis considered in the water sector.

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455 For example, Fitch Ratings identifies several key rating drivers for transportation infrastructure, including 'Infrastructure Development/Renewal' (a company's capital investment and maintenance strategy), 'Debt Structure' (the composition of debt maturities and liquidity position), and 'Financial Profile' (cash-flow resilience). Capital intensity influences these drivers through its effect on financial risk, cash-flow stability, and future capital requirements. In particular, higher capital intensity is typically associated with higher leverage, and under Fitch Rating's 'Airports' credit rating guidance, higher leverage corresponds to a weaker credit rating—which in turn implies a higher cost of capital. See Fitch Ratings (2025), *Transportation Infrastructure Rating Criteria*, pages 1 and 14 (link).

456 The winner's curse (often referred to in the context of buying as the "buyer's curse") is a phenomenon in auction theory and behavioural economics where the winning bidder in a competitive auction overestimates the value of an item and hence overpays for it.

457 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.513, 7.520, 7.525, 7.533 and 7.538 (link).

11.14 We therefore only rely on the equity to debt premia cross-check. At PR24, Ofwat applied this cross-check on a levered basis.[458] In contrast, the CMA in its PD for PR24 applied it on an unlevered basis.[459] For RIIO-3, Ofgem has stated its intent to consider whether to employ this cross-check to validate its estimates.[460] In our view, the unlevered approach is the correct approach. This reflects that the levered approach can result in perverse outcomes due to the interaction between gearing and the cost of equity and cost of debt.[461]

11.15 We discuss the equity to debt premia analysis below.

[458] Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix*, page 64 (link).

[459] CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.480 (link).

[460] Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex*, ¶3.72 (link).

[461] For example, under the levered approach, you could observe the cost of equity is above the cost of debt at notional gearing. However, the unlevered cost of equity (i.e., cost of equity at zero gearing) could be below the cost of debt. This would imply that adding a less risky source of capital (i.e., debt) increases the cost of capital, which would be inconsistent with financial theory.

B. Equity to debt premia

11.16 The equity to debt premia cross-check estimates the difference between the unlevered equity premium or asset risk premium and the debt risk premium.[462] An insufficient spread between equity and debt returns would indicate that the cost of equity estimate may be too low. This ensures sufficient returns to equity, which must exceed the returns to debt, and therefore signals consistency with the incentives to different sources of financing.[463]

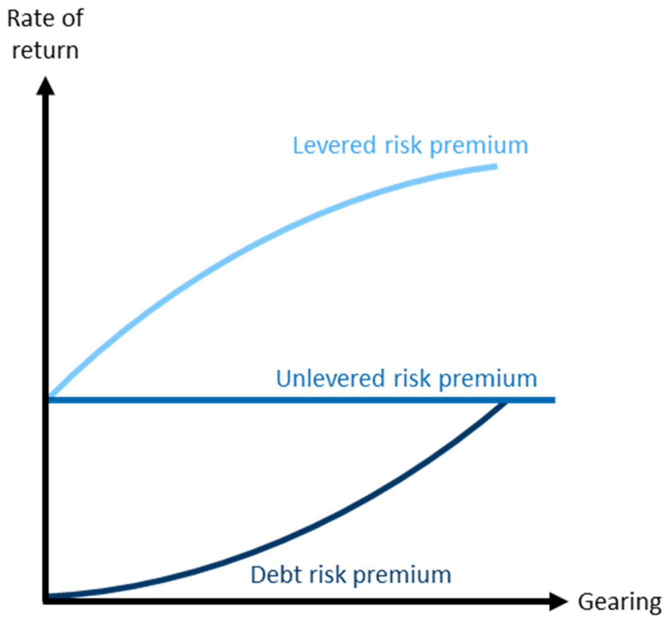
11.17 The asset risk premium represents the incremental risk premium required for investing in a risky asset over a riskless asset. In the context of the CAPM framework, this is estimated by multiplying the asset beta by the ERP. The asset risk premium is therefore an unlevered risk premium. As described previously, we prefer to observe the unlevered risk premium as leverage can impact the comparison between the cost of equity and cost of debt.

11.18 Specifically, the unlevered risk premium must be at least as high as the debt risk premium as the asset risk premium is comprised of the risk premium for assets which are riskier (i.e., equity) and the same risk (i.e., debt) as debt. In other words, if a company was fully equity financed it must offer a premium at least as large as the premium currently observed on debt given the relative risk of assets to debt. We illustrate this in the figure below.

462 This is not equivalent to the credit spread i.e., the difference between the yield on corporate debt and risk-free government bonds. The debt risk premium reflects the difference between expected return on debt (i.e., the yield on corporate debt minus any expected loss) and the expected return on risk-free instruments such as government bonds.

463 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4*, ¶¶7.474 – 7.481 (link).

Figure 11-1: Illustrative example of the relationship between risk premia



Source: FTI analysis.

11.19 The debt risk premium represents the incremental risk premium required for investing in a risky debt instrument instead of holding a riskless asset. This can be derived in two ways. One approach is to estimate the debt risk premium based on the CAPM framework, where one multiplies the debt beta by the equity risk premium.

11.20 The other approach is to estimate the debt risk premium based on a top-down methodology whereby we subtract the risk-free rate and expected loss from the cost of new debt.[464] Note that it is appropriate to reference the cost of new debt as it is consistent with the CAPM, which estimates a *forward-looking* cost of equity. The cost of embedded debt reflects historic market conditions, and is less relevant when setting the cost of equity for a price control.[465]

464 Expected loss represents the portion of a lender's return that compensates for the anticipated credit losses associated with lending—namely, the probability that a borrower may default multiplied by the loss the lender would incur if default occurs. For more information on how our expected loss is calculated, please see Appendix 16.

465 Historic market conditions may be relevant when setting the cost of equity if the cost of equity set based on forward-looking conditions results in a financeability challenge for the licensee.

11.21 The top-down approach is generally preferred given the practical issues with deriving robust estimates of debt beta.

11.22 Therefore, our calculation for this cross-check is as follows:

(1) Derive the asset risk premium ("**ARP**") by multiplying the asset beta by the ERP (which is calculated by subtracting the risk-free rate from the TMR).

(2) Derive the debt risk premium ("**DRP**") by subtracting the risk-free rate and expected loss from the cost of new debt.

(3) Compare the ARP and DRP to assess whether the margin between equity and debt returns is adequate.

11.23 While the spread between the ARP and DRP provides a useful diagnostic, there is no defined minimum threshold for this spread other than it needing to be non-negative. Given the uncertainty in estimating both premia, even a margin roughly equal to the expected loss of 30 bps in our framework[466] could be considered to be sufficient compensation for the additional risk borne by equity investors.[467]

11.24 Table 11-1 below sets out our estimates for the ARP and DRP.

Table 11-1: ARP-DRP calculations

Parameter	Guide	Low	High
Cost of new debt	A	3.93%	3.93%
Risk-free rate	B	2.33%	2.33%
Expected loss	C	0.30%	0.30%
DRP	**D = A – B – C**	**1.30%**	**1.30%**
Asset beta	E	0.44	0.58
TMR	F	6.72%	6.92%
ARP	**G = E × (F – B)**	**1.94%**	**2.65%**
ARP-DRP differential	**H = G – D**	**0.64%**	**1.35%**

Source: FTI analysis.

Note: (1) Totals may not sum precisely due to rounding. (2) See Appendix 16 for details on our expected loss calculations.

466 See Appendix 16 for details on our expected loss calculations.

467 This reflects that the expected loss is more difficult to observe compared to the credit spread i.e. yield on debt – risk-free rate. Therefore, reflecting this uncertainty in the choice of buffer between the asset risk premium and debt risk premium may be prudent to reduce the potential impact of estimation error.

11.25 The analysis indicates that the spread between the ARP and DRP ranges from 64 to 135 bps. Since our range is significantly greater than the expected loss embedded in our calculation, we consider the APR–DRP cross-check to be satisfied on both ends of our suggested range for H8. Therefore, this implies our CAPM-based cost of equity is consistent with current market evidence.

12. Conclusion

12.1 This report sets out the methodology and analysis for providing a preliminary estimate of the WACC for H8 to inform the CAA's Initial Proposals for H8.

12.2 In selecting the methodology and conducting our analysis, we have considered a wide evidence base. This includes contemporaneous capital market data, the precedent set by the CAA in determining the WACC for H7, more recent regulatory determinations in the UK energy and water sectors, changes in market conditions since H7, and various representations made by stakeholders.

12.3 All external data and publications considered in this report are based on a cut-off date of 1 November 2025. This means that, in particular, we have not reflected any data following the beginning of the conflict between the USA and Israel and Iran. We would expect to consider such data in our final report.

C. Key methodological considerations

12.4 The H7 WACC determination was conducted during volatile global capital market conditions and particularly extreme circumstances for the global aviation industry. Since then, there have been changes in the CAA's policy, as well as relative normalisation of operating and market conditions. As such, the key issues that merit consideration in estimating the H8 WACC are:

(1) **Change in inflation basis for price control:** The CAA has made a policy decision to change the inflation basis of HAL's price control from the RPI to the CPIH. This necessitates a change in approach to estimating a real WACC.

(2) **Change in operating conditions:** Over H7, HAL was expected to have spare capacity due to the impact on passenger traffic from the Covid-19 pandemic and the expected time to recover from this impact. However, HAL is currently handling record levels of passenger numbers and over H8, it is expected to face capacity constraints. This indicates the normalisation of operating conditions. From a passenger traffic standpoint, this is reflective of operating conditions during the Q6 price control (2014 to 2021). This suggests that capital market data pertaining to pre-, intra, and post-pandemic data needs to be considered in an appropriate manner.

(3) **Change in capital market conditions:** When determining the H7 WACC, capital market data exhibited high volatility reflecting the uncertainty associated with how the economy would recover from the pandemic. This required some judgement in interpreting market data and resulted in the CAA having to adopt novel approaches for determining the WACC. In the recent past, capital market volatility has decreased relative to H7, suggesting that the novel approaches adopted by the CAA in determining the H7 WACC merit review.

(4) **Expected alignment between RPI and CPIH:** The Office for National Statistics has announced its plan to align RPI with CPIH in 2030. The implication of this change needs to be considered thoroughly when incorporating inflation expectations in setting the WACC.

(5) **Recent regulatory precedent:** Since H7, there have been a number of regulatory WACC determinations that merit consideration. In particular, NR23, PR24, RIIO-3, and the CMA's PR24 PD are all relevant precedents.

12.5 Our approach to determining notional gearing, cost of new debt, total market return and issuance costs is broadly aligned with the approach at H7 (with the added caveat that these parameters are now denominated on a CPIH-basis). We have updated the data for these parameters to reflect contemporaneous market evidence and recent regulatory precedent.

12.6 For other parameters, and reflecting the considerations in paragraph 12.4, we have departed from the CAA's H7 methodology where needed and explained the rationale underpinning the updated approach. These are summarised below.

(1) **Risk-free rate:** We retain reference to the yield of 20-year index-linked gilts as the primary instrument to set the risk-free rate. However, we do not advocate an allowance for the convenience yield (as was included for H7). This is because prevailing market evidence suggests that there is no observable convenience yield on gilts.

(2) **Beta:** We broadly retain the comparator set from H7 for estimating the beta. We also retain the Traffic Risk Sharing ("**TRS**") adjustment to the estimated beta value from comparators given the CAA's policy decision to continue implementing the TRS mechanism. However, in contrast to the CAA's re-weighted approach to estimating betas at H7, we rely on unweighted 2-, 5- and 10-year betas. This is primarily motivated by the observed decrease in capital market volatility since H7.

(3) **Cost of embedded debt:** We adopt a 'balance sheet-led' approach for estimating the cost of embedded debt for H8 (as opposed to the CAA's 'notional' approach at H7). This is primarily due to the practical challenges associated with calibrating a suitable notional approach for H8 relating to factors such as increased interest rates since H7 and the planned alignment between RPI and CPIH during H8.

(4) **Liquidity costs:** We adopt an 'actuals-based' approach for estimating liquidity costs instead of a notional approach. This reflects our review of market evidence, recent regulatory precedent, and concerns regarding the accuracy of the notional approach and the number of assumptions needed to implement it.

12.7 We have assessed whether our methodology results in a robust estimate by conducting relevant cross-checks. These are described throughout the report.

D. Results

12.8 Based on the evidence reviewed and presented in this report, our estimate of the real vanilla WACC range for H8 is 4.36 – 5.33% CPIH-deflated. For comparison, the final H7 WACC range was 3.53 – 4.63% CPIH-deflated[468] (2.61 – 3.70% RPI-deflated).

12.9 Table 12-1 below sets out the parametric details underpinning our estimates.

468 The H7 price control was RPI-deflated, hence we need to convert this figure to a CPIH-basis to ensure it is on a like-for-like basis with H8. We convert all H7 figures assuming a RPI-CPIH wedge of 0.9%. We adopt this as it is consistent with contemporaneous regulatory decisions when H7 was finalised.

Table 12-1: H7 WACC (RPI-deflated) and H8 proposed WACC (CPIH-deflated)

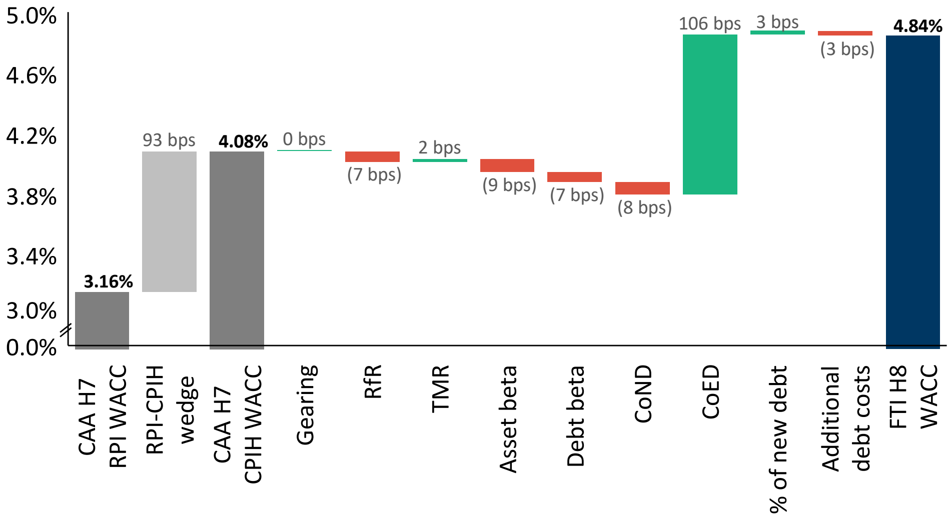
Component	H7 Final Decision (post CMA determination) (RPI)[1]		H8 Initial Proposals (CPIH)	
	Low	*High*	*Low*	*High*
Gearing	60%	60%	60%	60%
Risk-free rate	0.59%	0.59%	2.33%	2.33%
Total market return	5.85%	5.85%	6.72%	6.92%
Equity risk premium	5.26%	5.26%	4.39%	4.59%
Asset beta	0.44	0.62	0.44	0.58
Debt beta	0.10	0.05	0.15	0.05
Equity beta	0.95	1.47	0.88	1.37
Post-tax cost of equity	5.59%	8.32%	6.19%	8.62%
Cost of new debt	4.17%	4.17%	3.93%	3.93%
Cost of embedded debt	(0.12%)	(0.12%)	2.77%	2.77%
Proportion of new debt	11.61%	11.61%	15.37%	15.37%
Issuance and liquidity costs	0.25%	0.25%	0.19%	0.19%
Cost of debt	0.62%	0.62%	3.14%	3.14%
Vanilla WACC (RPI-deflated)	**2.61%**	**3.70%**		
Midpoint (RPI-deflated)	**3.16%**			
RPI-CPIH wedge	*0.90%*	*0.90%*		
Vanilla WACC (CPIH-deflated)	**3.53%**	**4.63%**	**4.36%**	**5.33%**
Mid-point (CPIH-deflated)[2]	**4.08%**		**4.84%**	

Source: CAA (2023), H7 Final Decision, Section 3: Financial issues and implementation, Table 9.6 (link); CAA (2024), Economic regulation of Heathrow airport: H7 final issues, ¶2.15 (link); FTI Consulting (2024), Cost of Capital Strategy for H8, Table 4-1 (link); CMA (2021), Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, Final report, ¶9.242 (link); FTI analysis.

Note: (1) The cut-off date for the H7 analysis was 17 November 2022. (2) The CAA did not determine a CPIH WACC range at H7. This has been derived for the purposes of this report to facilitate comparison. Applying a RPI-CPIH wedge of 0.90% using the Fisher equation results in a CAA H7 CPIH-real WACC that is 93 bps higher than the RPI-real WACC.

12.10 Our range is higher than H7 on a like-for-like basis by c. 76bps at the midpoint.[469] As illustrated in Figure 12-1-1 below, this is primarily due to an increase in the real cost of embedded debt, which reflects increases in interest rates and the stabilisation of inflation expectations since H7.[470]

Figure 12-1: Waterfall chart illustrating the impact of H8 parametric estimates on the midpoint of the H7 WACC range[471]



Source: CAA (2023), H7 Final Decision, Section 3: Financial issues and implementation, Table 9.6 (link); CAA (2024), Economic regulation of Heathrow airport: H7 final issues, ¶2.15 (link); FTI Consulting (2024), Cost of Capital Strategy for H8, Table 1 (link); CMA (2021), Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, Final report, ¶9.242 (link); FTI analysis.

469 Note that this is purely for comparison purposes. This report does not opine on the issue of selecting an appropriate point estimate from within the WACC range.

470 We have reviewed the updated cost of embedded debt under the H7 methodology in our previous report and compared it to the estimate under our proposed approach for H8. The comparison indicates that the increase in the cost of embedded debt estimate is primarily a function of rising interest rates and stabilising inflation, and not a function of the change in approach. See FTI Consulting (2024), *Cost of Capital Strategy for H8*, Appendix 2 (link).

471 Note the following abbreviations: RfR – risk-free rate; TMR – total market return; CoND – cost of new debt; CoED – cost of embedded debt.

Note: (1) Applying a RPI-CPIH wedge of 0.90% (as indicated in Table 12-1) using the Fisher equation results in a CAA H7 CPIH-real WACC that is 93 bps higher than the RPI-real WACC. (2) Totals may not sum precisely due to rounding.

12.11 However, on a nominal basis, the implied midpoint of our proposed H8 WACC range is 46 bps lower than the H7 WACC (i.e., 7.06%[472] compared to 7.52%).[473] This illustrates the stabilisation of inflation expectations since H7.

12.12 Overall, our WACC range reflects the fact that while UK and global capital market conditions have changed significantly since H7 (primarily elevated interest rates and lower inflation expectations), HAL is also now operating under significantly less uncertain conditions.

[472] The nominal cost of capital is calculated as (1 + 4.84%) × (1 + 2.12%) – 1 = 7.06%, where 2.12% is the medium-term inflation forecast over H8 (i.e., a simple average of forecast CPIH inflation over 2027 – 2031).

[473] The H7 nominal WACC is estimated by inflating the CPIH-real H7 WACC by the average CPIH forecast for the H7 period at the time of the determination, using the Fisher equation. Specifically, we calculate it using the following equation: (1 + 4.81%) x (1 + 3.31%) – 1. For the inflation forecasts, see OBR (2022), Economic and fiscal outlook – November 2025 (link). Differences in values may not sum due to rounding.

Appendix 1 RPI-CPIH wedge

A1.1 In this appendix, we provide additional detail on our estimation of the RPI-CPIH wedge calculation, as well as the existing regulatory precedent for estimating the wedge. This appendix should be reviewed in combination with Section 2 of the report.

A1.2 There are three methodological elements for estimating the wedge:

(1) how the wedge is calculated for individual years;

(2) how those annual wedges are aggregated over the price control; and

(3) the relevance of market-based measures.

A1.3 We discuss the different approaches for each of these methodological elements below.

A. Calculation of the wedge for individual years

A1.4 The inflation wedge for each year can be estimated as either the difference between the individual forecasts of RPI and CPIH for that period, or the difference between long-term averages of RPI and CPIH forecasts.

A1.5 At PR24, Ofwat and the CMA have relied on the former approach.[474] Conversely, for RIIO-3, Ofgem has estimated the wedge for each year based on the difference between the 20-year averages of RPI and CPIH from that year.[475]

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474 See, for instance, CMA (2025), *Water PR24 References, Provisional Determinations Volume 4*, Figure 7.3 (link).

475 For instance, under Ofgem's methodology, the inflation assumption for RPI in 2027 would be the average of the RPI assumption from 2027 to 2046 (i.e., over the next 20 years), in line with the assumed investment horizon of the sector. See Ofgem (2024), *RIIO-3 Sector Specific Methodology Decision – Finance Annex*, Table 2 and ¶3.65 (link).

A1.6 Given the CMA's PR24 PD, and aligned with our approach to deflating the notional cost of embedded debt, we calculate the inflation wedge for each year as the difference between the individual forecasts of RPI and CPIH. However, to allow for greater granularity, we consolidate quarterly data into the estimates for each year to inform an annual value.

B. Aggregating the annual wedges over the price control

A1.7 The individual wedges can be aggregated over different time horizons, i.e., over the price control period or over the assumed investor horizon for the sector.

A1.8 At PR24, Ofwat and the CMA have estimated the aggregated wedge as a 20-year geometric average of the difference between the two measures to capture expectations over the investor horizon.[476] However, at RIIO-3, as Ofgem accounts for the investor horizon in estimating the individual wedges, it aggregates them as the geometric average over the price control period.[477]

A1.9 As our approach for estimating the individual wedges is aligned with that of Ofwat and the CMA, we aggregate the individual wedges over the assumed 20-year investor horizon for H8. However, we somewhat depart from regulatory precedent, as our assumed 20-year horizon commences from the quarter in which we have estimated the average ILG yield (i.e., starting from Q4 of 2025) instead of the first year of the price control period. In our view, this better reflects the implied yield on a CPIH-denominated risk-free instrument with a tenor matching the assumed investor horizon.

A1.10 Table A1-1 below provides a summary of the calculations using the methodologies adopted by regulators and us.

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[476] See, for instance, CMA (2025), *Water PR24 References, Provisional Determinations Volume 4*, Figure 7.3 (link).

[477] Ofgem (2024), *RIIO-3 Sector Specific Methodology Decision – Finance Annex*, Table 2 and ¶3.65 (link); Ofgem (2024), *RIIO-3 SSMD Allowed Return on Equity Early View Summary Calculations*, tab 'RPI-CPI Wedge' (link).

Table A1-1: Summary of calculations adopted (official forecasts approach only) over H8

Approach	Calculation of individual wedge	Aggregation across wedges	Implied RPI-CPIH wedge (bps)
Ofgem RIIO-3 approach	$\frac{1+[Geometric\ Mean\ of\ 20Y\ RPI]}{1+[Geometric\ Mean\ of\ 20Y\ CPIH]}-1$	Geometric Mean of RPI-CPIH wedges over H8 period	6
Ofwat/ CMA PR24 approach	$\frac{1+[Annual\ RPI]}{1+[Annual\ CPIH]}-1$	Geometric Mean of calculated RPI-CPIH wedges over 20 years	13
FTI approach for H8	$\frac{1+[Quarterly\ RPI]}{1+[Quarterly\ CPIH]}-1$	Geometric Mean of calculated RPI-CPIH wedges over 20 years	20

Source: Ofgem (2024), RIIO-3 SSMD Allowed Return on Equity Early View Summary Calculations, tab 'RPI-CPI Wedge' (link); CMA (2025), Water PR24 References, Provisional Determinations Volume 4, Figure 7.3 (link); OBR (2025), Economic and Fiscal Outlook – November 2025, Detailed forecast tables: economy, Table 1.7 (link); FTI analysis.

Note: The data used by the Ofgem and Ofwat/CMA calculations encompasses the period between 2027 and 2046, in line with their approach of using the price control start date as the start date for the wedge calculation. The data used in our approach spans the time period between Q4 2025 and Q3 2045.

C. The relevance of market-based measures

A1.11 Ofgem does not rely on market-based measures of inflation but Ofwat adopts a one-month average of the difference between 20-year RPI and 20-year CPI zero-coupon swaps, and applies a CPIH-CPI wedge of zero.[478] The resulting swap-based wedge is 0.59%.[479]

478 Ofwat treats CPI and CPIH as proxies due to a small CPIH-CPI wedge that is neither persistently negative nor positive. See Ofwat (2025), *PR24 Final Determinations, Aligning risk and return – allowed return appendix*, Table 31 (link).

479 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.139 (link).

A1.12 As we are broadly aligned with the approach adopted by Ofwat and the CMA, we have also relied upon inflation swaps in our estimate of the wedge, but do include a CPIH-CPI wedge for the reasons explained in ¶¶2.55 – 2.57.

A1.13 We estimate the swap-implied RPI-CPIH wedge by:

(1) taking the one-month trailing average of the mid-price[480] of the 20Y RPI and CPI swaps as at 1 November 2025;[481]

(2) applying the Fisher formula to estimate the wedge between the RPI and CPI swap rates (i.e., the RPI-CPI wedge);[482] and

(3) applying the Fisher formula to remove the CPIH-CPI wedge, calculated in the same manner as the RPI-CPIH wedge illustrated in Table A1-1.[483]

A1.14 Table A1-2 describes our calculation of the swap-implied RPI-CPIH wedge.

Table A1-2: Calculation of swap-based wedge

Component	Guide	Value
One-month average of 20Y RPI swap rates	A	3.13%
One-month average of 20Y CPI swap rates	B	2.95%
RPI-CPI wedge	C = (1 + A) ÷ (1 + B) – 1	17 bps
CPIH-CPI wedge	D	14 bps
Swap-based RPI-CPIH wedge	**C = (1 + C) ÷ (1 + D) – 1**	**3 bps**

Source: Bloomberg; OBR (2025), Economic and Fiscal Outlook – November 2025, Detailed forecast tables: economy, Table 1.7 (link).
Note: Our calculation of the CPIH-CPI wedge is explained in ¶A1.13(3).

A1.15 Accordingly, we calculate a swap-based RPI-CPIH wedge of 3 bps.

480 We interpret the mid-price of these swaps to denote the swap rates. Accordingly, we refer to these as the swap rates in the rest of this appendix and in the main body of the report.

481 These are retrieved from Bloomberg. The tickers for the 20Y RPI and CPI swaps are 'BPSWIT20' and 'BPSWCP20', respectively.

482 That is, we calculate (1 + RPI) ÷ (1 + CPI) – 1 = RPI-CPI wedge, where RPI denotes the one-month trailing average of the RPI swap rates, and CPI denotes the one-month trailing average of the CPI swap rates.

483 That is, we calculate (1 + RPI-CPI wedge) ÷ (1 + CPIH-CPI wedge) – 1 = RPI-CPIH wedge.

Appendix 2 Assessing the convenience yield for the risk-free rate

A2.1 In this appendix, we:

(1) review the rationale behind the application of the convenience yield;[484] and

(2) assess the inclusion of a convenience yield based on recent market evidence.

A2.2 As described previously, the convenience yield is a discount on the yield that investors are prepared to accept for government bonds relative to non-government bonds. At H7, the CAA considered that ILGs may underestimate the true risk-free rate due to the presence of a convenience yield, and therefore placed weight on AAA-rated corporate (Non-Gilts) bond indices to adjust its estimate of ILGs.[485]

A2.3 Specifically, to account for the convenience yield associated with ILGs, the CAA placed weight on the iBoxx £ Non-Gilts AAA-rated 10+ year and 10-15 year indices.

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484 See ¶¶3.7 – 3.8 in Section 3 for details.

485 A key tenet of the CAPM is that all market participants can borrow and lend at the risk-free rate. At the time of setting H7, there was a concern from regulators such as the CMA that the risk-free rate implied by ILGs was not consistent with the CAPM due to ILGs having special properties such as liquidity. This could depress the yield on ILGs below the risk-free rate implied by the CAPM. Therefore, a convenience yield was added to the yield on ILGs to reflect this. See CMA (2021), *Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations*, *Final report,* ¶¶9.90 – 9.108 (link), and see UKRN (2023), *UKRN guidance for regulators on the methodology for setting the cost of capital*, page 12 (link).

A2.4 In particular, the CAA calculated the convenience yield as the average of:[486]

(1) the spread between the one-month trailing average yield of the 20-year nominal gilt and the iBoxx £ Non-Gilts AAA-rated 10+ years index; and

(2) the spread between the one-month trailing average yield of the 12.5-year nominal gilt and the iBoxx £ Non-Gilts AAA-rated 10-15 years index.

A2.5 This resulted in a convenience yield range of 0.43 – 0.71% in H7.[487]

A2.6 In our previous report for the CAA on the cost of capital strategy for H8 , we proposed to either remove the convenience yield if market evidence did not support its inclusion, or to estimate it using a simplified approach (whereby we focus on the spread between the one-month trailing average yield of the 20-year nominal gilt and the iBoxx £ Non-Gilts AAA-rated 10+ years index).[488] We assessed that using only the 10+ years index better matched the CAA's assumed investment horizon for the risk-free rate.

A2.7 We have reviewed our position in light of current market evidence. As set out in Table A2-1 below, we replicate the H7 methodology and our simplified approach using ILGs and corporate bond indices as of our cut-off date.

486 CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation*, ¶¶9.246 – 9.248 (link).

487 FTI Consulting (2024), *Cost of Capital Strategy for H8,* Table 2-2 (link). Note that we do not need to adjust the convenience yield estimate for inflation expectations, as is it derived using the nominal yields on bonds, and therefore already incorporates inflation expectations.

488 FTI Consulting (2024), *Cost of Capital Strategy for H8,* ¶¶3.60 – 3.61 (link).

Table A2-1: Convenience yield estimates

Component	Guide	H7 approach	Simplified approach
One-month average of iBoxx £ Non-Gilts AAA-rated 10+ years index	A	5.19%	5.19%
One-month average of 20-year nominal gilt	B	5.38%	5.38%
Convenience yield (10+ years)	C = A – B	(0.20%)	(0.20%)
One-month average of iBoxx £ Non-Gilts AAA-rated 10-15 years index	D	4.93%	
One-month average of 12.5-year nominal gilt	E	4.89%	
Convenience yield (10-15 years)	F = D – E	0.04%	
Average convenience yield	**G = (C + F) ÷ 2**	**(0.08%)**	

Source: FTI analysis; iBoxx indices; Bank of England, UK implied real spot curve (link).
Note: We use a cut-off date of 1 November 2025.

A2.8 As shown in Table A2-1, estimates of the convenience yield based on the H7 and our simplified approaches are negative. This is counterintuitive as we would expect the yield on AAA-rated non-gilt instruments to be higher than the yield on gilts, therefore indicating potential issues with the quality of the data available.[489]

A2.9 Furthermore, even if there were a positive spread between gilts and low risk corporate bonds, this would not necessarily suggest the presence of a convenience yield. Any differential could reflect factors such as default risk, liquidity risk, and other market frictions.[490] Therefore, we are not persuaded to incorporate a convenience yield in our estimate of the risk-free rate for H8.

489 For example, this may reflect the fact that there are few corporate AAA-rated issues available which would constitute the AAA-rated corporate bond indices, and that the bond indices may include bonds with tenors significantly longer than the 20-year CAPM investment horizon. See UKRN (2023), *UKRN guidance for regulators on the methodology for setting the cost of capital*, page 14 (link).

490 Ofwat cited that advisors to companies in the CMA PR19 redeterminations considered that a spread of less than 26 bps between the yields on low risk corporate bonds and nominal gilts may be driven by factors other than convenience yield. See Ofwat (2024), *PR24 draft determinations, Aligning risk and return - Allowed return appendix*, page 12 (link).

Appendix 3 Sensitivity of vanilla and pre-tax WACC to notional gearing

A3.1 In UK regulation, it has been noted that the WACC estimate based on the CAPM is not invariant to gearing.[491] This is inconsistent with the Modigliani-Miller principle[492] (a key tenet underpinning GB regulatory decisions),[493] and has been considered by regulators across sectors including by the CAA at H7.[494]

A3.2 This appendix assesses how the pre-tax and vanilla WACC change with a change in notional gearing.

A. Sensitivity of pre-tax WACC to notional gearing

A3.3 The sensitivity of pre-tax WACC to notional gearing is estimated by taking the derivative of pre-tax WACC with respect to notional gearing.

A3.4 Specifically, the pre-tax WACC is equal to:

$$WACC\ (pre\text{-}tax) = (1-g) \times \frac{CoE(g)}{1-\tau} + g \times CoD,$$

where g is notional gearing, CoE is cost of equity, τ is the tax rate (assumed to equal the main corporation tax rate of 25%[495]) and CoD is the cost of debt.

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491 See paragraph **Error! Reference source not found.** for details.

492 Modigliani-Miller Proposition I states that in the presence of no market imperfections, the value and cost of capital of a company are unaffected by capital structure. See Modigliani and Miller (1958), *The Cost of Capital, Corporation Finance and the Theory of Investment*, The American Economic Review, Volume 48, Issue 3 (link).

493 See for example Mason and Wright (2021), *A report on financial resilience, gearing and price controls* (link).

494 For example, this is discussed in CMA (2020), *NATS (En Route) Plc/CAA Regulatory Appeal, Appendix D: Technical note on betas and gearing* (link); Ofgem (2021), *RIIO-2 Final Determinations – Finance Annex (REVISED)*, ¶3.64 and Consultancy report 6, page 151 (link); CAA (2022), *Economic regulation of NATS (En Route) plc: Appendices to initial proposals for the next price control review ("NR23")*, Appendix C, ¶¶C174 – C177 (link).

495 GOV.UK (2026), Corporation Tax rates, expenses and reliefs (link).

A3.5 The CoE is defined as:

$$CoE = RfR + ERP \times \frac{\beta_a - \beta_d \times g}{1 - g},$$

where RfR is the risk-free rate, ERP is the equity risk premium, β_α is the asset beta and β_d is the debt beta.

A3.6 Plugging in the cost of equity formula in the pre-tax WACC formula results in:

$$WACC\ (pre\text{-}tax) = (1 - g) \times \frac{\left(RfR + ERP \times \frac{\beta_a - \beta_d \times g}{1 - g}\right)}{1 - \tau} + g \times CoD$$

A3.7 Differentiating the pre-tax WACC formula in ¶A3.6 with respect to g results in:

$$\frac{dWACC\ (pre\text{-}tax)}{dg} = -\frac{RfR + \beta_d \times ERP}{1 - \tau} + CoD$$

A3.8 This equation implies that if the pre-tax top-down cost of debt is greater than the pre-tax CAPM-implied cost of debt,[496] the pre-tax WACC increases with gearing.

A3.9 Plugging in our estimated values for the risk-free rate, equity risk premium, debt beta, tax rate and cost of debt results in a negative derivative for both High and Low scenarios as set out in Table A3-1 below.[497]

A3.10 Therefore, the pre-tax WACC decreases with gearing.

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[496] The CAPM implied post-tax cost of debt would be equal to the risk-free rate plus debt beta multiplied by the equity risk premium. Therefore, the pre-tax cost of debt is equal to the post-tax cost of debt divided by one minus the tax rate.

[497] Note that the relationship between pre-tax WACC and notional gearing is also based on the assumption that the debt beta and cost of debt do not vary with gearing. This is a simplifying assumption as it is difficult to estimate how these variables change with respect to changes in gearing.

Table A3-1: Derivation of the impact of change in gearing on pre-tax WACC

Component	Guide	High	Low
Risk-free rate	A	2.33%	2.33%
Debt beta	B	0.05	0.15
Equity risk premium	C	4.59%	4.39%
Tax rate	D	25%	25%
Cost of debt	E	3.14%	3.14%
Impact of a 100-bp change in gearing on pre-tax WACC	**F = – [(1 ÷ (1 – D)) × (A + B × C) + E] ÷ 100**	**(0.3 bps)**	**(0.8 bps)**

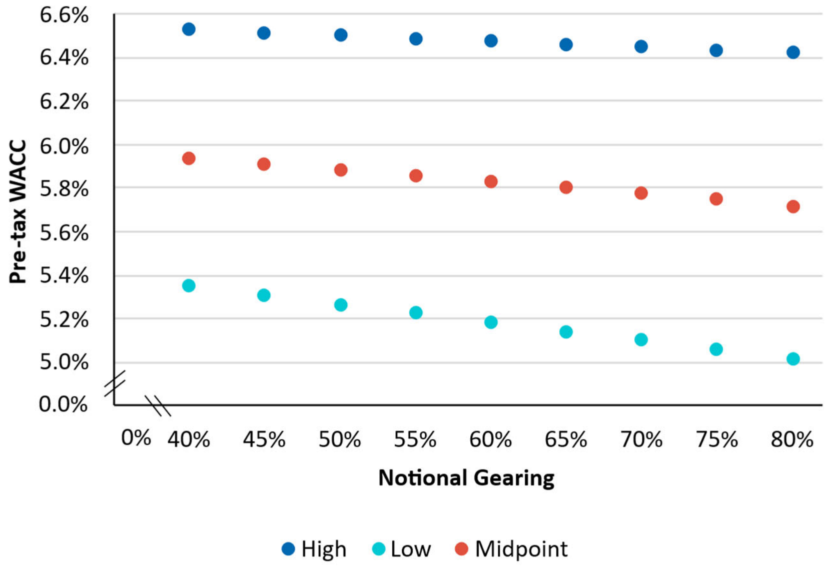
Source: FTI analysis.

Note: For our estimates of RFR, debt beta, ERP and cost of debt see Table ES-1. The 'High' estimate refers to the impact using the upper bound of the WACC, while the 'Low' estimate refers to the impact using the lower bound of the WACC.

A3.11 In Figure A3-1, we demonstrate the estimated pre-tax WACC using different assumptions regarding notional gearing. Overall, a 10 percentage point or 1,000 bp increase in notional gearing leads to a decrease in pre-tax WACC by 6 bps.[498]

[498] Note that the derivation of the impact of a change in gearing on pre-tax WACC applies to marginal changes only and should therefore, in principle, not be applied directly to changes that are not marginal. This is because the impact of a change in gearing is estimated based on a derivative which by definition only applies to marginal changes (as the derivative is defined as the instantaneous rate of change of a function f with respect to a variable x, i.e., the limit of the difference quotient $\frac{f(x+h)-f(x)}{h}$ when h approaches zero).

Figure A3-1: Pre-tax WACC at different levels of notional gearing



Source: FTI analysis.

A3.12 This relationship is also illustrated in Table A3-2 below. It describes the low, high and midpoint estimates of pre-tax WACC based on different levels of notional gearing, as well as the difference in WACC mid-points for every 5% i.e., 500 bps increase in gearing.

Table A3-2: Sensitivity of pre-tax WACC to gearing

Gearing	Low	High	Midpoint	Difference in midpoint
40%	5.35%	6.53%	5.94%	
45%	5.31%	6.52%	5.91%	(0.03%)
50%	5.27%	6.50%	5.89%	(0.03%)
55%	5.22%	6.49%	5.86%	(0.03%)
60%	5.18%	6.48%	5.83%	(0.03%)
65%	5.14%	6.46%	5.80%	(0.03%)
70%	5.10%	6.45%	5.77%	(0.03%)
75%	5.06%	6.44%	5.75%	(0.03%)
80%	5.01%	6.42%	5.72%	(0.03%)
85%	4.97%	6.41%	5.69%	(0.03%)
90%	4.93%	6.40%	5.56%	(0.03%)

Source: FTI analysis.

B. Sensitivity of vanilla WACC to notional gearing

A3.13 In calculating how sensitive the vanilla WACC is to changes in gearing, we can take the equation in ¶A3.7 and assume the tax rate equals zero as the vanilla WACC uses a pre-tax cost of debt and post-tax cost of equity. This simplifies the equation to:

$$\frac{dWACC(vanilla)}{dg} = -RFR - \beta_d \times ERP + CoD$$

A3.14 The equation above implies that, under the assumption that the pre-tax top-down cost of debt estimate is higher than the post-tax CAPM-implied cost of debt, the WACC increases with gearing.[499]

A3.15 Inputting our estimated values for risk-free rate, ERP, debt beta and cost of debt results in a positive derivative for both High and Low scenarios as shown in Table A3-3 below. Therefore, the vanilla WACC increases with gearing.

Table A3-3: Derivation of the impact of a change in gearing on vanilla WACC

Component	Guide	Low	High
RFR	A	2.33%	2.33%
Debt beta	B	0.15	0.05
ERP	C	4.39%	4.59%
Cost of debt	E	3.14%	3.14%
Impact of 100-bp change in gearing on vanilla WACC	**F = [E − (A + B × C)] ÷ 100**	**0.2 bps**	**0.6 bps**

Source: FTI analysis.

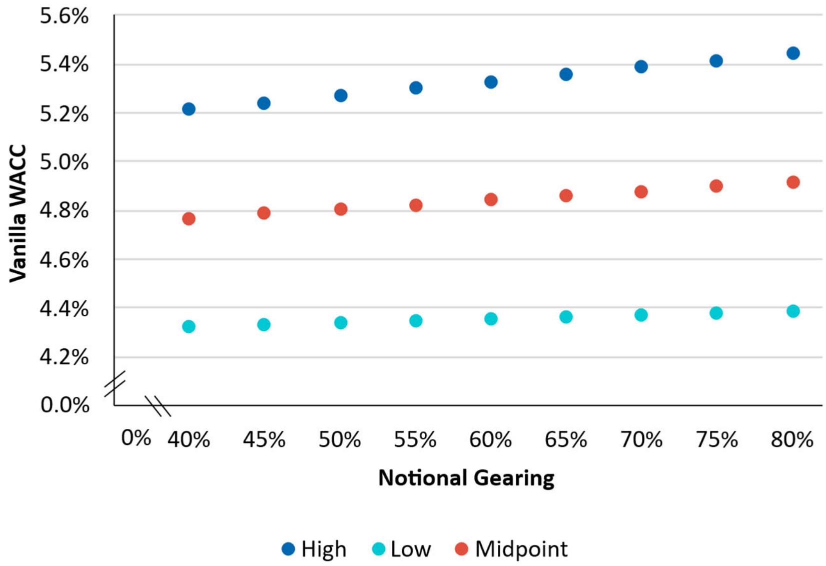
Note: For our estimates of RFR, debt beta, ERP and cost of debt see Table ES-1.

A3.16 In Figure A3-2, we demonstrate the estimated vanilla WACC using different assumptions regarding notional gearing. Overall, a 10 percentage points or 1,000 bps increase in notional gearing leads to an increase in the vanilla WACC by 4 bps.[500]

[499] See Mason and Wright (2021), *A report on financial resilience, gearing and price controls,* page 24 onwards (link).

[500] As noted earlier, the estimated impact of a change in gearing on vanilla WACC can, in principle, only be estimated for marginal changes. See footnote 498 for details.

Figure A3-2: Vanilla WACC at different levels of notional gearing



Source: FTI analysis.

A3.17 This relationship is also illustrated in Table A3-4 below. The table shows the low, high and midpoint estimates of vanilla WACC based on different levels of notional gearing, as well as the difference in vanilla WACC midpoints for every 5% increase in gearing.

Table A3-4: Sensitivity of vanilla WACC to gearing

Gearing	Low	High	Midpoint	Difference in midpoint
40%	4.33%	5.21%	4.77%	
45%	4.33%	5.24%	4.79%	0.02%
50%	4.34%	5.27%	4.81%	0.02%
55%	4.35%	5.30%	4.82%	0.02%
60%	4.36%	5.33%	4.84%	0.02%
65%	4.37%	5.36%	4.86%	0.02%
70%	4.37%	5.39%	4.88%	0.02%
75%	4.38%	5.42%	4.90%	0.02%
80%	4.39%	5.45%	4.92%	0.02%
85%	4.40%	5.47%	4.94%	0.02%
90%	4.40%	5.50%	4.95%	0.02%

Source: FTI analysis.

Appendix 4 Impact of change in debt beta on vanilla WACC

A4.1 This appendix presents the impact on vanilla WACC from a change in debt beta. This is estimated by taking the derivative of the vanilla WACC with respect to debt beta, and estimating the impact of a unit change in debt beta on the vanilla WACC.

A4.2 The vanilla WACC is defined as:

$$WACC = (1 - g) \times CoE + g \times CoD,$$

where g is notional gearing, CoE is the cost of equity and CoD is the cost of debt.

A4.3 The cost of equity is defined as:

$$\begin{aligned} CoE &= RFR + ERP \times \beta_E \\ &= RFR + ERP \times \left(\frac{\beta_A - g \times \beta_D}{1 - g}\right) \\ &= RFR + ERP \times \left(\frac{\beta_U + g_M \times \beta_D - g \times \beta_D}{1 - g}\right) \end{aligned}$$

where β_E is the re-levered equity beta, β_A is the asset beta, β_D is the debt beta, β_U is the unlevered beta, and g_M is market gearing.

A4.4 Therefore, by replacing the cost of equity term in the vanilla WACC formula, the vanilla WACC equation can be re-stated as:

$$WACC = (1 - g) \times \left[RFR + ERP \times \left(\frac{\beta_U + g_M \times \beta_D - g \times \beta_D}{1 - g}\right)\right] + g \times CoD$$

A4.5 Taking the derivative of the WACC formula in ¶A4.4 with respect to debt beta results in:[501]

$$\frac{dWACC}{d\beta_D} = (1 - g) \times \frac{ERP}{1 - g} \times (g_M - g) = ERP \times (g_M - g)$$

501 Note that the cost of debt is independent of debt beta and therefore the derivative of the cost of debt with respect to the debt beta is zero.

A4.6 The equation above implies that for a unit change in the debt beta, the vanilla WACC changes by the ERP multiplied by the difference between the market gearing and the notional gearing. Therefore, when the market gearing is lower than the notional gearing, the WACC decreases with an increase in debt beta, all else equal.

A4.7 As shown in Table A4-1 below, inputting the values for ERP, notional gearing, and market gearing in the equation from ¶A4.5 results in a negative derivative for both High and Low scenarios.

Table A4-1: Derivation of the impact of 0.01 change in debt beta on vanilla WACC

Component	Guide	High	Low
ERP	A	4.59%	4.39%
Notional gearing	B	60%	60%
Market gearing	C	29%	34%
Impact of 0.01 change in debt beta on vanilla WACC	**D = (A × (C – B)) ÷ 100**	**(1.4 bps)**	**(1.1 bps)**
Average	**E = (D_L + D_H) ÷ 2**	**(1.3 bps)**	

Source: FTI analysis.

Note: For ERP estimates, see Table ES-1. For notional gearing estimates, see Table 6-3. The 'High' estimate refers to the impact using the upper bound of the WACC, while the 'Low' estimate refers to the impact using the lower bound of the WACC.

A4.8 The estimates of the derivative are −1.4 bps and −1.1 bps for the High and Low scenarios, respectively. Taking the average of these estimates results in an estimated impact on the vanilla WACC midpoint of –1.3 bps for every 0.01 change in debt beta.

Appendix 5 Relative risk differentials between HAL and comparators

A5.1 This appendix presents our methodology for identifying relative risk differentials between HAL and comparators.

A5.2 Table A5-1 below presents five key factors that could influence the relative risk exposure of HAL.

Table A5-1: Key factors that could influence the relative risk exposure of HAL

Risk factor	**Rationale**
Traffic risk incl. TRS mechanism	Volatility in passenger volumes ("**traffic**") is linked to volatility in an airport's aeronautical and non-aeronautical revenues (and hence profits). This can vary based on a number of factors such as the nature of traffic (e.g., business vs. leisure), number of airlines, number of destinations served, etc.
Capex and Opex risk	An airport's exposure to cost risks (capital and operating costs) is linked to volatility in profits. In particular, a higher proportion of fixed costs magnifies the impact that revenue fluctuations have on overall profitability.
Regulatory consideration of airport 'till'	Airports generate revenues from two sources – aeronautical and non-aeronautical. In the case of regulated airports, regulators can set passenger charges on the basis of just the aeronautical business (*single till)*, or aeronautical and non-aeronautical businesses (*dual till)*, or some hybrid. Under a single- or hybrid-till approach to regulation, non-aeronautical revenues effectively cross-subsidise aeronautical charges as higher commercial charges result in lower aeronautical charges, and vice-versa. As such, *single till* regulation provides a certain degree of co-insurance across the aeronautical and non-aeronautical aspects of an airport's business. In contrast, under a *dual till* arrangement, commercial activities are fully exposed to their own risks.

Regulatory framework	The extent to which an airport may reasonably expect financial, regulatory, or policy intervention from government in periods of severe stress. This may include explicit guarantees, access to emergency liquidity, temporary regulatory relief, or other forms of assistance e.g., financial support for tangential sectors such as airlines. The likelihood and credibility of such support influences perceived downside risk and therefore affects the assessment of systematic risk.
Probability of government support in stressed financial situations	The overall regime governing how the airport's operations and financing are regulated. This includes mechanisms for funding and incentivising capex and opex, the form of economic control (e.g., price cap, revenue cap, hybrid models), the treatment of risk and uncertainty, and the regulatory approach to investment, service quality, and financial resilience. The design and predictability of the regulatory framework materially affects the risk borne by the airport.

Source: FTI analysis.

A5.3 We assess each of these five factors based on three criteria. For the purposes of our assessment, all three criteria need to be met to motivate an adjustment to the beta estimate. These criteria are:

(1) **Whether the risk arising from this factor is systematic:** If the risk contributes only to unsystematic i.e., diversifiable risk, then it does not affect beta and no adjustment needs to be made.

(2) **Observable difference between HAL and comparators pertaining to the risk factor**: If HAL and comparators are not meaningfully different, then this does not warrant an adjustment to the comparator's beta estimate.

(3) **Whether the risk can be quantified:** It is essential that any observable difference in risk can be robustly quantified in order to feature in any relative risk adjustment.

A5.4 We consider **traffic risk** to be systematic as fluctuations in passenger demand are driven largely by macroeconomic factors, such as Gross Domestic Product ("**GDP**") growth, global trade flows, consumer confidence, and exchange rates, that affect all airports simultaneously and cannot be diversified away. Our selected set of comparators currently operate close to capacity[502] suggesting a similar level of traffic risk to HAL, absent any consideration of the TRS mechanism.[503] However, due to the implementation of the TRS mechanism, HAL has material traffic risk protections relative to the comparator airports.[504] As described at paragraph 6.127, we account for this through a TRS adjustment applied to comparator betas.

502 For example, AENA in its Spanish airports had c. 310 million passengers in 2024 out of a total estimated capacity of 347 million passengers (89%). See AENA (2025), *Aena main annual data, Total passengers* (link). Similarly, ADP had 70.3 million passengers in its Charles de Gaulle airport in 2024, with an estimated capacity of 81 million passengers annually (87%). See ADP (2025), *December 2024 and Full-Year traffic figures* (link); Grand Roissy Tourist Office (2025), *Paris-Charles De Gaulle Airport (CDG)* (link). HAL is currently operating at 99% capacity; see AirlingRatings.com (2025), *London's Airport Divide: Heathrow's Capacity Crunch vs Gatwick's Growth* (link).

503 The TRS mechanism was designed to mitigate the effect of the pandemic on both HAL and passengers. On the one hand, it protects HAL from significant financial losses if passenger numbers fall below expected levels (by increasing future airport charges to cover lost revenues). On the other hand, it protects airlines and passengers from excessive charges if passenger numbers exceeded forecasts by decreasing future airport charges to cover the over-recovery of revenue.

504 The TRS mechanism has reduced revenue risk in the price control in both upside and downside scenarios. The TRS mechanism allocates traffic risk between HAL and airlines according to specific parameters. Specifically, in the event that outturn traffic and forecast traffic differ by up to 10% of forecast traffic for that year, 50% of the difference will be shared between HAL and airlines. In the event that outturn traffic and forecast traffic differ by more than 10% of forecast traffic for that year, 105% of the difference will be shared between HAL and airlines. For more information on the TRS design, see CAA (2023), Economic Regulation of Heathrow Airport: H7 Final Decision Section 1: Regulatory Framework; ¶2.20 (link).

A5.5 We consider **capex and opex risk** to be systematic as it amplifies the airports' exposure to systematic shocks. In particular, a higher proportion of fixed costs magnifies the impact that revenue fluctuations have on overall profitability, as it cannot quickly adjust its costs in response to macroeconomic conditions, such as GDP cycles, interest rate movements, and market-wide demand shocks. Airports are normally characterised as having high fixed costs due to their capital intensive nature and highly fixed operating costs (due to high labour costs, maintenance and safety costs). As this exposure is driven by economy-wide factors rather than firm-specific events, it is non-diversifiable and therefore contributes to beta. However, under a two-runway scenario, we have not observed that HAL materially differs from our chosen comparators.[505] Therefore, we do not make an adjustment to the beta to reflect this.

A5.6 We consider **till structure** could introduce differences in systematic risk because the till structure determines how sensitive airport cash flows are to macroeconomic conditions that influence both non-aeronautical and aeronautical demand. Under a dual till regime, non-aeronautical revenues are fully exposed to economy-wide shocks, such as changes in consumer spending and general market demand, which increases sensitivity to systematic factors. As these exposures stem from broad economic conditions rather than firm-specific events, the risk is non-diversifiable and therefore affects beta. Whereas under a single till regime, airports are somewhat protected as lower non-aeronautical profitability in one regulatory period could be compensated with higher aeronautical charges in the next regulatory period. Stakeholders cited that HAL operated under a different till structure from its comparators. We agree with this observation. For example, HAL operates under a single till structure; AENA and FRA have a dual till structure whereas ADP and FHZN have a hybrid-till structure.[506, 507] However, the number of differences between airport groups beyond just till systems renders it difficult to truly isolate the impact of till structures on beta.[508] We therefore do not consider this factor further.

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505 Operating leverage is not directly observable. It is often inferred based on proportion of capex in a company's cost base. However, both capex and opex contain some fixed and variable elements. Therefore, it is not as simple as comparing capex to opex ratios across comparators. We expect all of our chosen comparators face similarly fixed costs to HAL.

506 Whilst a dual-till structure fully separates aeronautical and non-aeronautical revenues, a hybrid structure allows *some* non-aeronautical revenues to influence aeronautical tariffs.

507 KPMG (2025), *A relative risk assessment of HAL at H8*, page 9 (link).

508 For example, airport groups differ depending on capacity, focus on short- or long-haul flights, regulatory framework, etc.

A5.7 We consider that **government support** could introduce differences in systematic risk, as it can reduce an airport's exposure to broader market risks through potential financial or policy intervention during systemic events.[509] We note that HAL has different levels of government support from all of the comparators which are partly government owned and therefore likely have more explicit government support.[510] Nonetheless, HAL benefits from implicit support as it is a critical piece of national infrastructure and has a continuity of service framework.[511] However, the number of differences between airport groups beyond just ownership structures make it difficult to isolate and assess the impact of government support. We therefore do not consider this factor further.

509 For example, the German federal & Hesse governments provided compensation of around €160 million to FRA to ensure the airport remained operational despite traffic collapse. See Fraport (2021), *Fraport Receives Pandemic Compensation for Maintaining Operations at Frankfurt Airport* (link).

510 For example, c. 51% of AENA is owned by the state administration; c. 52% of FRA is owned by German regional and local authorities; c. 51% of ADP is owned by the French State; and c. 38% of FHZN is owned by the Canton of Zurich and City of Zurich. See AENA (2025), *Significant holdings and own shares* (link); FRA (2025), *Annual Report 2024,* page 36 (link); ADP (2024), *Share Capital Breakdown as of 31 December 2024* (link); FHZN (2025), *Key stock data* (link).

511 A continuity of service framework is a structured system designed to ensure that an organisation's critical services can operate at acceptable predefined levels both during and after a disaster or a disruption. The scope of the CAA's duties under the Civil Aviation Act 2012 includes the continuity of airport operation services. See CAA (2025), *Economic regulation of Heathrow airport: Outcome Based Regulation Mid-Term Review – Initial Proposals*, ¶9 (link). HAL also benefits from other provisions in its licence such as re-opening the price control or settlement in the face of exceptional circumstances. For example, the CAA applied a RAB adjustment to HAL's RAB during H7 due to impact of Covid-19. See CAA (2021), *Economic regulation of Heathrow Airport Limited: response to its request for a covid-19 related RAB adjustment*, ¶4 and ¶¶1.2 – 1.6 (link).

A5.8 We consider **regulatory frameworks** to introduce differences in systematic risk to some degree, as it can materially influence other risks, such as traffic risk, through levers such as the TRS mechanism. We note that each airport group operates under a different regulatory framework from all of the other airports groups, and that HAL likely faces lower systematic risk due to the presence of the TRS mechanism. However, because the overall balance of risk and reward depends on a range of interacting regulatory levers, this risk cannot be meaningfully isolated and quantified beyond impacts on traffic risk. We therefore do not consider this risk further.

Appendix 6 Review of comparators used at H7 beta estimation

A6.1 In this appendix, we provide a more comprehensive description of the comparators considered to estimate the asset beta at H7.

A6.2 In the H7 Way Forward document, eight airport operators were selected as potential comparators to estimate the asset beta for HAL.[512] These included our four core comparators (AENA, ADP, FRA, FHZN) as well as SYD,[513] KBHL,[514] AIA[515] and FLU.[516]

A6.3 Specifically, the CAA selected AENA, ADP and FRA (the "**baseline comparator set"**) to set the pre-pandemic asset beta.[517] The CAA then calculated its pandemic adjustment to the pre-pandemic asset beta using 1-, 4-, and 6-airport comparator sets comprising AENA, ADP, FRA, FHZN, SYD and FLU.[518] The CAA did not place any weight on KBHL and AIA.[519]

512 CAA (2021), *Appendices to Economic regulation of Heathrow Airport Limited: Consultation on the Way Forward*, Appendix J, ¶50 (link).

513 SYD owns and operates Sydney Airport. It was delisted in March 2022 from the Australian Stock Exchange. See Reuters (2022), *Sydney Airport shareholders approve $17 bn takeover* (link).

514 KBHL operates Copenhagen Airport and Roskilde Airport. See KBHL (2024), *Annual Report 2023*, page 12 (link).

515 For details, see AIA (2022), *About* (link).

516 FLU operates the international airports in Vienna, Malta, and Košice. See FLU (2025), *Company profile – Flughafen Wien AG* (link).

517 CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation*, ¶9.66 (link).

518 We note that the greatest weight was placed on AENA, some weight was placed on ADP, FRA and FHZN, and limited weight was placed on SYD and FLU. See CAA (2021), *H7 Initial Proposals, Section 2: Financial issues*, ¶9.49 (link); CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation*, ¶9.151 (link).

519 This was because Flint's analysis suggested that equity betas could not be estimated reliably. CAA (2021), *H7 Initial Proposals, Section 2: Financial issues*, ¶9.48 (link).

A6.4 The CAA did not rely on SYD, KHBL, AIA and FLU in its baseline comparator set for H7.

A6.5 For H8, we are minded to not rely on any of these comparators for the following reasons:

- SYD is no longer listed, and therefore can no longer be used as a comparator.[520]
- KBHL has a low free-float which impacts our ability to reliably and accurately estimate its equity betas.[521]
- AIA constitutes c. 7% of its reference index, NZSX, which will likely impact its equity beta estimate due to the cointegration between movements in the market and AIA's share price.[522]
- FLU's asset beta has recently dropped below zero (see Figure A6-1 below) which is highly unusual for an airport asset and inconsistent with the values observed for all other comparators. The rationale behind this observed outcome is unclear.[523]

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520 The CAA excluded SYD from its baseline comparator set but considered SYD in its broader set of comparators to estimate the impact of the pandemic. See CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation,* ¶9.103 (link). SYD owns and operates Sydney Airport. It was delisted in March 2022 from the Australian Stock Exchange. See Reuters (2022), *Sydney Airport shareholders approve $17 bn takeover* (link).

521 KBHL has a free float of c. 1%. See KBHL (2024), *The Danish State's acquisition of Copenhagen Airports A/S has been completed* (link).

522 As of 22 October 2025, the NZSX had a total market capitalisation of NZD 190,730,496,327, and AIA had a market capitalisation of NZD 13,830,983,784. This results in a proportion of c. 7%. For the latest figures, see NZX (2025*), NZX Main Board (NZSX)* (link).

523 This is consistent with the CAA's rationale at H7 which noted FLU was much smaller than HAL with a limited float and therefore a less statistically robust asset beta relative to other comparators. CAA (2021), *H7 Initial Proposals, Section 2: Financial issues*, ¶9.47 (link).

Figure A6-1: FLU's two-year asset beta (debt beta 0.10)

Source: FTI analysis of S&P Capital IQ data.

Note: (1) Uses a data cut-off of 1 November 2025. (2) The raw equity betas for FLU have been de-levered using a debt beta of 0.10.

A6.6 The CAA excluded FHZN from its baseline comparator set at H7 as FHZN was not considered to be as closely aligned to HAL as AENA, ADP and FRA.[524] However, over the last two years, Zurich Airport's operations have grown considerably, driven by the expansion of SWISS Air, increased transfer traffic, and stronger international connectivity.[525] Although it remains smaller than major hubs like Heathrow or Frankfurt airports, these developments suggest that FHZN may be a reasonable comparator for inferring HAL's beta. We therefore include FHZN in our comparator set.

524 Flint (2021), *Support to the Civil Aviation Authority: Estimating Heathrow's beta post-COVID-19*, Section 6.2 (link)

525 See, for instance, Zurich Airport (2024), *Business update* (link).

Appendix 7 Asset beta detailed calculations

A7.1 In this appendix, we present:

- asset beta estimates for the four comparators across different averaging windows, separately for the bounds of our debt beta range of 0.05 and 0.15;
- estimates of utilities' asset beta estimates since H7 to contextualise the wider market evidence for the TRS adjustment;
- demonstration of the effects of 'Liberation Day' on asset betas across the equity market more broadly;
- estimated betas for international airport groups to assess the directional impact of the addition of regional airports on the overall estimated beta of international airport groups; and,
- a table reconciling the CAA and FTI beta estimates.

A. Estimation of asset betas based on debt beta range

A7.2 We present asset beta estimates based on debt betas of 0.05 and 0.15 in Tables A7-1 and A7-2 respectively.

Table A7-1: Asset beta estimates for AENA, ADP, FRA and FHZN across averaging periods based on a debt beta of 0.05

Averaging period	AENA	ADP	FRA	FHZN	Simple average	Weighted average
2-year estimation window						
Spot	0.51	0.52	0.33	0.50	**0.47**	0.49
1-year average	0.58	0.60	0.39	0.57	0.54	0.56
2-year average	0.64	0.62	0.46	0.60	0.58	0.61
3-year estimation window						
Spot	0.59	0.57	0.41	0.56	0.53	0.56
1-year average	0.64	0.58	0.44	0.58	0.56	0.60
2-year average	0.67	0.57	0.49	0.59	0.58	0.62
5-year estimation window						
Spot	0.69	0.57	0.51	0.61	0.60	0.63
10-year estimation window						
Spot	0.73	0.67	0.57	0.67	0.66	**0.69**

Source: FTI analysis.

Note: (1) The raw equity betas for the comparators have been de-levered using a debt beta of 0.05. (2) The weighted average is estimated based on market capitalisation over the corresponding estimation window. (3) The cut-off date for the estimates is 1 November 2025.

Table A7-2: Asset beta estimates for AENA, ADP, FRA and FHZN across averaging periods based on a debt beta of 0.15

Averaging period	AENA	ADP	FRA	FHZN	Simple average	Weighted average
2-year estimation window						
Spot	0.52	0.57	0.39	0.51	**0.50**	0.52
1-year average	0.60	0.64	0.46	0.58	0.57	0.59
2-year average	0.66	0.66	0.52	0.61	0.61	0.64
3-year estimation window						
Spot	0.61	0.61	0.47	0.58	0.57	0.59
1-year average	0.66	0.62	0.51	0.60	0.60	0.63
2-year average	0.69	0.61	0.55	0.61	0.62	0.65
5-year estimation window						
Spot	0.71	0.61	0.57	0.62	0.63	0.66
10-year estimation window						
Spot	0.75	0.70	0.62	0.69	0.69	**0.71**

Source: FTI analysis.

Note: (1) The raw equity betas for the comparators have been de-levered using a debt beta of 0.15. (2) The weighted average is estimated based on market capitalisation. (3) The cut-off date for the estimates is 1 November 2025.

A7.3 Using a debt beta of 0.05, the resulting asset beta range is 0.47 – 0.69, informed by spot 2- and 10-year betas. Using a debt beta of 0.15, the resulting asset beta range is 0.50 – 0.71, similarly informed by spot 2- and 10-year betas. The combination of these ranges informs our final asset beta range of 0.50 (assuming a debt beta of 0.15) to 0.69 (assuming a debt beta of 0.05).

A7.4 We note that, even though we do not rely on three-year betas to inform our asset beta range, the resulting asset beta range using 3-year betas (0.57 – 0.62) falls entirely within our estimated range of 0.50 – 0.69.

B. Utilities betas

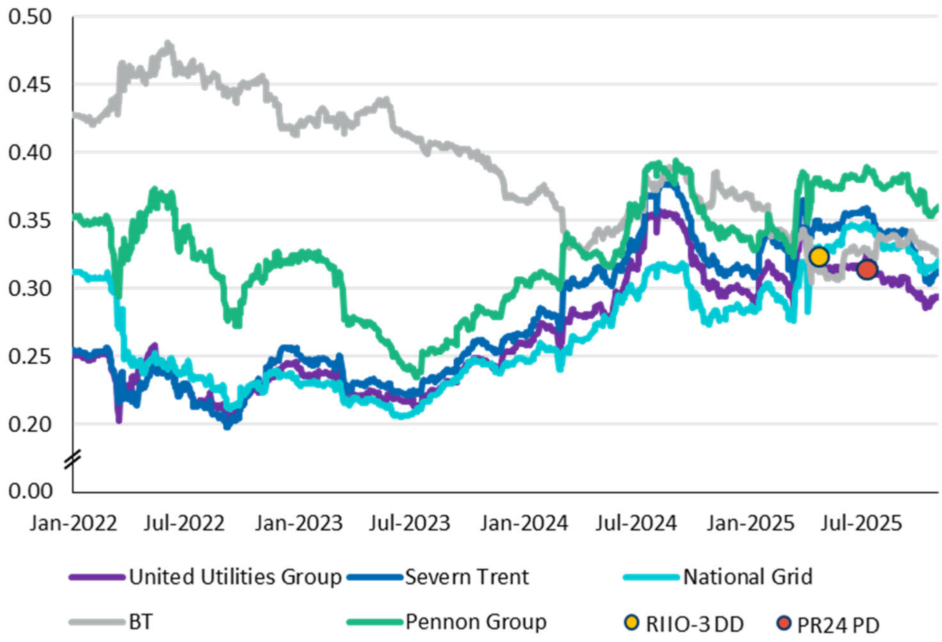
A7.5 Recent regulatory precedent suggests that the betas for utilities set by regulators have increased since H7.[526] However, listed utilities' betas have fluctuated and as of our cut-off date, were trending downwards.

A7.6 This is illustrated for selected utilities (United Utilities Group, Severn Trent, National Grid, BT and Pennon Group) in Figure A7-1 below.[527]

[526] For example, the H7 network utility asset beta selected for the TRS adjustment was 0.342 with a debt beta midpoint of 0.075, whereas the proposed asset beta midpoint in Ofgem's RIIO-3 DD was 0.375 using a debt beta of 0.075. See CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation*, Table 9.3 and ¶9.180 (link); Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex*, Tables 17 – 18 (link) for details.

[527] United Utilities Group, Severn Trent, and Pennon Group represent the water sector, National Grid represents the energy sector, and BT represents the telecoms sector.

Figure A7-1: Regulated utilities' 2-year unlevered betas



Source: FTI analysis of S&P Capital IQ data.
Note: (1) We assume a debt beta of zero. This assumption normalises for the potentially significant variation in debt betas across comparators arising from differences in credit rating, gearing, and other factors. (2) The cut-off date for the estimates is 1 November 2025. (3) The cut-off date used in the RIIO-3 DD is March 2025;[528] the cut-off date used in the PR24 PD is 30 June 2025.[529]

A7.7 As evidenced above, since H7, 2-year betas for regulated UK utilities exhibited an upward trend from the second half of 2023 to the first half of 2024. Between July 2024 and May 2025, these first declined sharply and subsequently increased sharply. Since then the betas have exhibited a downward trend (albeit weak).

528 Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex*, ¶1.10 (link).

529 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶9.10 (link).

A7.8 Figure A7-1 also highlights regulatory asset beta estimates from recent determinations. Specifically, Ofgem's RIIO-3 DD proposed an asset beta of 0.375 based on a debt beta of 0.075.[530] Ofgem noted that historical data might be less useful for some comparators – for example, Ofgem stated that changes in Pennon's business profile rendered historical data less relevant.[531]

A7.9 Additionally, the CMA's PR24 PD proposed an asset beta of 0.36 based on a debt beta of 0.10.[532] The comparators forming the CMA's range were Severn Trent, United Utilities and Pennon.[533]

A7.10 Regulators set asset betas for the price control period based on their expectations of risk over the entire regulatory horizon, rather than on short-term market movements. We consider this forward-looking assessment more relevant than potential short-term trends that may not be representative of underlying risk. Accordingly, we rely solely on regulator-set betas in our analysis.

C. 'Liberation Day' effect

A7.11 Two-year betas are more sensitive to outliers due to the smaller number of datapoints they include relative to 5- and 10-year betas.

A7.12 This is evident from the 'Liberation Day' effect on 2 April 2025,[534] the day on which the US administration announced an increase in import duties. This had a pronounced impact on the 2-year spot unlevered betas of the largest companies on the Financial Times Stock Exchange 100 Index ("**FTSE100**") and on comparators, as demonstrated in Figures A7-2 and A7-3 below.

A7.13 'Liberation Day' had heterogeneous impacts across sectors and companies. However, this makes it difficult to adjust betas to reflect these impacts. Therefore, we consider both short-term and long-term betas to enable a well-rounded assessment without values being disproportionately affected by short-term events and potential outliers.

530 Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex*, Tables 17 – 18 (link).

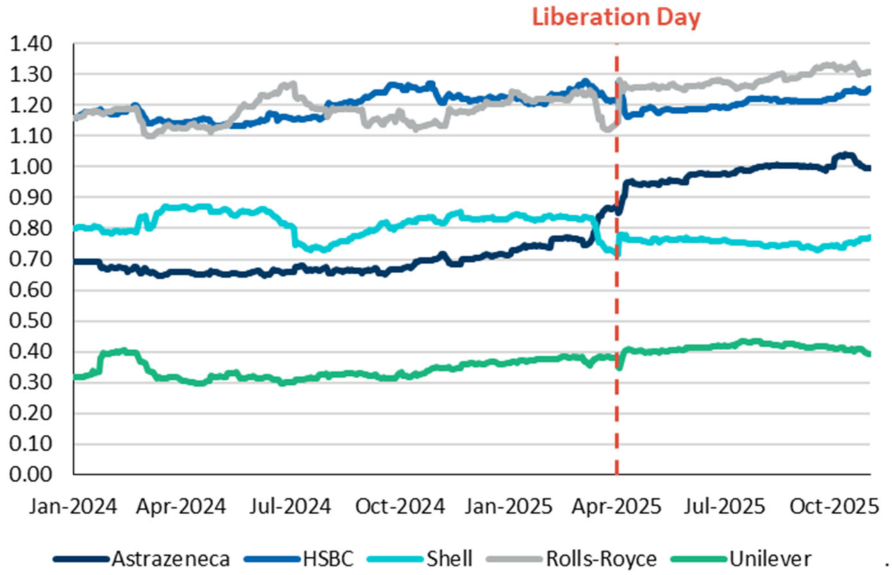
531 Ofgem (2025), *RIIO-3 Draft Determinations - Finance Annex*, ¶3.48 (link).

532 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* Table 7.1 (link).

533 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.431 (link).

534 See Center for Strategic and International Studies (2025), *"Liberation Day" Tariffs Explained* (link).

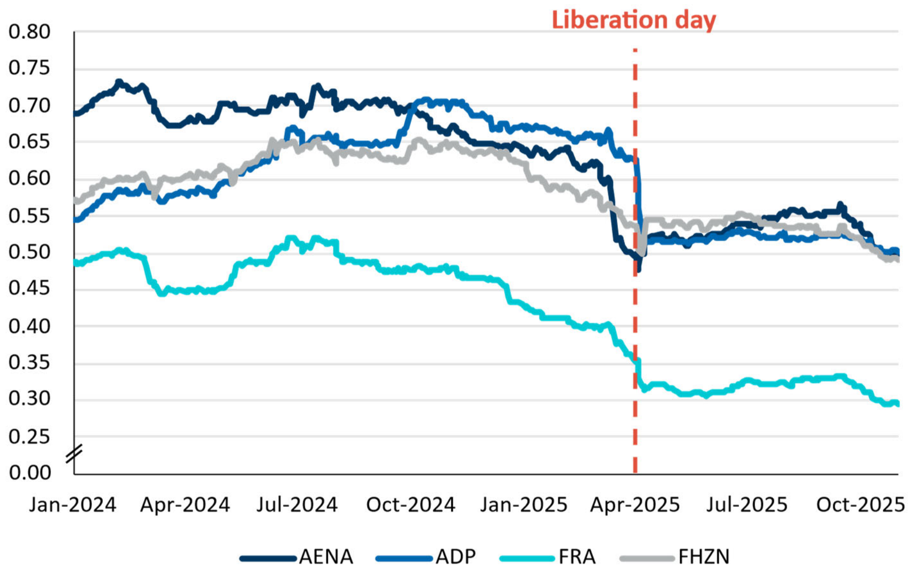
Figure A7-2: 2-year spot unlevered betas for top five FTSE 100 companies (by market cap) showing 'Liberation Day' effect



Source: FTI analysis of S&P Capital IQ data.

Note: (1) We assume a debt beta of zero. This assumption normalises for the potentially significant variation in debt betas across companies arising from differences in credit rating, gearing, and other factors. (2) The cut-off date for the estimates is 1 November 2025. (3) These companies were the 5 largest companies in the FTSE 100 index by market capitalisation as at 1 November 2025 (based on data from Refinitiv). (4) We use the FTSE All Share Index as the reference index to calculate the betas.

Figure A7-3: 2-year spot asset betas for comparators showing 'Liberation Day' effect



Source: FTI analysis of S&P Capital IQ data.
Note: (1) We assume a debt beta of zero. This assumption normalises for the potentially significant variation in debt betas across comparators arising from differences in credit rating, gearing, and other factors. (2) The cut-off date for the estimates is 1 November 2025. (3) As in our analysis of betas in Section 6, we use the STOXX Europe 600 as the reference index to calculate the betas.

D. Analysis of international airport group betas

A7.14 One of the stakeholders submitted that comparators relied upon at H7 are less relevant than at previous determinations because the composition of these comparators has shifted over recent years as these airport groups added smaller airports to their portfolios. They contended that these smaller airports carry higher risk than 'core' airports,[535] placing upward pressure on H7 comparator betas and therefore necessitating a corresponding downward adjustment to comparator betas.

535 'Core airports' were typically defined as large European hub airports. For example, a 'core airport' for AENA would be the Adolfo Suárez Madrid-Barajas airport in Spain, whereas a 'non-core' airport would be the Gilberto Freyre Recife - Guararapes International Airport in Brazil.

A7.15 If this were true, then we would expect the betas of these smaller European airports and non-European airports to be higher than that of the core comparator set. Therefore, we test this hypothesis by examining the unlevered betas for regional and global airport operators, estimated with reference to the STOXX Europe 600 index.

A7.16 This analysis serves as a high-level cross-check for reviewing stakeholder submissions, and does not form a part of our beta estimation methodology for the H8 WACC.

A7.17 Our approach estimates 2-, 5- and 10-year unlevered betas for the top 21 airport groups with core aeronautical operations by market capitalisation, comparing these to our proposed H8 comparators (AENA, ADP, FRA, and FHZN).

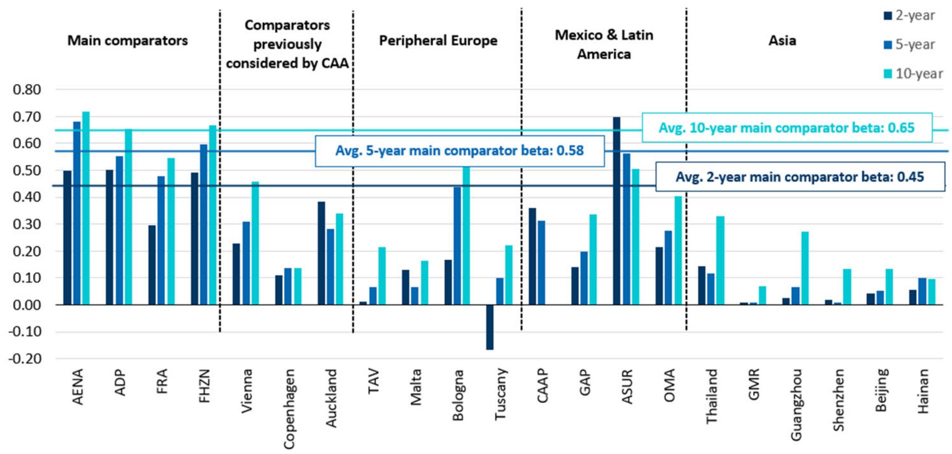
A7.18 We have categorised these international airport groups as follows:

- **Main comparators:** The four suggested comparator airport groups for H8 (AENA, ADP, FRA, FHZN);
- **Comparators previously considered by the CAA:** Airport groups the CAA considered at H7 other than the main comparators (FLU ("**Vienna**"), KBHL ("**Copenhagen**"), and AIA ("**Auckland**"));
- **Peripheral Europe:** TAV Havalimanlari Holding A.S. ("**TAV**", operator of multiple international airports in Turkey, Eastern Europe, Central Asia, and the Middle East), Malta International Airport plc ("**Malta**"),[536] Aeroporto Guglielmo Marconi di Bologna S.p.A. ("**Bologna**"), and Toscana Aeroporti S.p.A. ("**Tuscany**");
- **Mexico & Latin America:** Corporación América Airports ("**CAAP**", operator with extensive global network, primarily in Latin America), Grupo Aeroportuario del Pacífico ("**GAP**"), Grupo Aeroportuario del Sureste ("**ASUR**"), and Grupo Aeroportuario del Centro Norte ("**OMA**", operators of airports in Mexican regions with some international exposure); and,
- **Asia:** Airports of Thailand Public Company Limited ("**Thailand**"), GMR Airports Limited ("**GMR**", operator of several Indian airports, including Delhi International Airport), Guangzhou Baiyun International Airport Company ("**Guangzhou**"), Shenzhen Airport Co. Ltd. ("**Shenzhen**"), Beijing Capital International Airport Company Limited ("**Beijing**"), and Hainan Meilan International Airport Company Limited ("**Hainan**").

[536] Note that FLU has a stake in Malta International Airport plc, the company that owns Malta International Airport. See Vienna Airport, *Company profile – Flughafen Wien AG* (link).

A7.19 Figure A7-4 summarises the spot 2-, 5-, and 10-year unlevered betas of the top 21 airport groups by market capitalisation.

Figure A7-4: Spot 2-, 5-, and 10-year spot unlevered betas of top 21 publicly listed airport groups by market capitalisation



Source: FTI analysis based on S&P Capital IQ data.

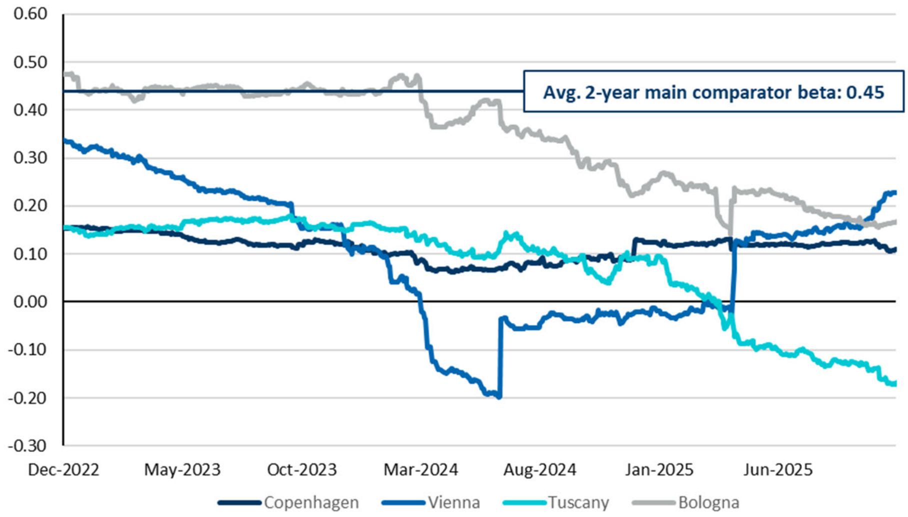
Note: (1) Data as of 1 November 2025. (2) Equity betas are de-levered assuming a debt beta of zero. This assumption normalises for the potentially significant variation in debt betas across airport groups arising from differences in credit rating, gearing, and other factors. (3) Equity betas are calculated using STOXX Europe 600 Index, rather than a more relevant index for each airport group, as the analysis aims to assess the impact of acquiring a small airport on the beta of the main comparators, all of which are listed in Europe. (4) We are unable to estimate a 10-year unlevered beta for CAAP as the stock has not publicly traded for 10-years, ad CAAP only listed in 2018. (5) Averages presented in the figure above represent simple averages.

A7.20 As evidenced above, other airport groups generally exhibit lower betas than the main comparators. This analysis suggests any upward movement in the core comparator group betas is unlikely to be driven by their acquisition of other airports.

A7.21 We also present daily 2-year asset betas for airport groups owning primarily smaller European airports, namely, Copenhagen, Vienna, Tuscany and Bologna in Figure A7-5 below. Overall, consistent with Figure A7-4, this subset of European airport groups also largely exhibits lower betas than the main comparators.

A7.22 Additionally, Vienna and Tuscany have recently exhibited negative asset betas which are highly unusual for airport assets and are inconsistent with the values observed for other comparators. The rationale for this observed outcome is unclear. Therefore, we do not consider there is sufficient appropriate evidence to adjust the betas of the core comparator group.

Figure A7-5: Daily spot 2-year spot asset betas for Copenhagen, Vienna, Tuscany, Bologna[537]



Source: FTI analysis based on S&P Capital IQ data.
Note: (1) Data as of 1 November 2025. (2) Equity betas are de-levered assuming a debt beta of zero. (2) Averages presented in the figure above represent simple averages.

537 For details on these airport groups, see ¶A7.18.

A7.23 We note that this analysis serves only as a high-level cross-check due to inherent limitations. Specifically:

- **Choice of index:** these airports' shocks are likely less correlated with European market shocks given their geographic dispersion (though this does not apply to the Peripheral Europe comparators for example).
- **Airport size and capacity constraints:** the majority of the comparator airports are significantly smaller than the main comparator airports,[538] which may offset regional risk factors if they are capacity constrained.
- **Comparability of individual airports within airport groups:** the wider airport groups are themselves diversified and therefore are imperfect proxies for standalone airports. Additionally, these groups are not necessarily representative of the airports within the main comparators' portfolios.
- **Liquidity:** robustness concerns arise from the limited liquidity in several airport groups analysed e.g., Tuscany has a bid-ask spread c. 5 times the average across all 21 airport groups.[539]

A7.24 As a result, we do not consider that the recent acquisitions of smaller airports merits any adjustments to the betas of the core comparator group.

E. Reconciliation between CAA and FTI betas

A7.25 As noted in footnote 237, the CAA has made a policy decision to retain the H7 debt beta of 0.075 as its point estimate for the debt beta at H8. We do not opine on the debt beta point estimate, but note that the CAA's assumption is within our recommended range of 0.05 – 0.15. However, this results in marginal differences between the CAA's and our estimates of the asset and equity betas, which flows through to the overall cost of equity estimates.

538 Except Airports of Thailand Public Company Limited, which is larger in market capitalisation terms than the rest of the airport groups apart from AENA as of 1 November 2025, and includes the major international Thai airports – e.g., Suvarnabhumi Airport in Bangkok. Market capitalisation data is sourced from S&P Capital IQ.

539 We calculate bid-ask spreads as the ask price minus the bid price, over the ask price from 1 September 2020 until 31 October 2025 using data from S&P Capital IQ.

A7.26 Table A7-3 below sets out the comparison between the CAA and FTI's asset and re-levered equity beta values, based on the different debt beta ranges.

Table A7-3: Reconciliation between CAA and FTI betas

		FTI H8		CAA H8	
Component	**Guide**	**Low**	**High**	**Low**	**High**
Pre-TRS asset beta	A	0.50	0.69	0.47	0.70
TRS adjustment[540]	B	0.06	0.11	0.05	0.12
Post-TRS asset beta	**C = A - B**	**0.44**	**0.58**	**0.42**	**0.58**
Debt beta	D	0.15	0.05	0.075	0.075
Notional gearing	E	60%	60%	60%	60%
Equity beta	**F = [C – (D × E)] ÷ (1 – E)**	**0.88**	**1.37**	**0.94**	**1.34**

Source: FTI analysis based on S&P Capital IQ data.
Note: The initial difference in the pre-TRS asset beta between the CAA and FTI results from the different debt beta assumptions implied in the calculation of the asset betas.

540 The TRS adjustment for both CAA and FTI betas are shown in Table A8-2.

Appendix 8 TRS adjustment to the asset beta

A8.1 The key adjustment to the asset beta range reflects the reduced level of systematic risk faced by HAL (relative to its comparators) as a result of the TRS mechanism introduced in H7.

A8.2 The CAA introduced this mechanism to mitigate HAL's exposure to the risk associated with outturn passenger numbers (traffic) differing significantly from the CAA's forecast traffic when setting the price control.

A8.3 Traffic forecasts are an important component in determining HAL's aeronautical charges as HAL operates under a price cap regime.[541] Prior to the implementation of the TRS mechanism, HAL bore all traffic risk as it could not adjust airport charges to reflect outturn passenger numbers during the price control.

A8.4 Given the impact of the Covid-19 pandemic on passenger traffic, the TRS mechanism was designed to:[542]

- protect HAL from significant financial losses if passenger numbers fell below expected levels (by increasing future airport charges to cover lost revenues); and
- protect airlines and passengers from excessive charges if passenger numbers exceeded forecasts by decreasing future airport charges to balance the over-recovery of revenue.

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541 A price cap regime caps the level the licensee(s) can charge on a per unit basis, but volume risk normally sits with the licensee.

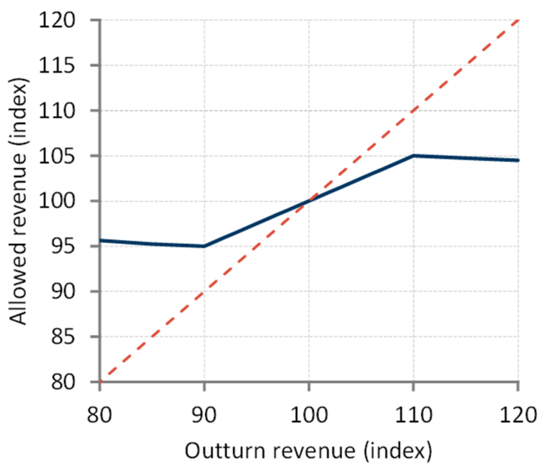
542 For additional detail on the mechanism, see CAA (2023), *H7 Final Decision Section 1: Regulatory Framework*; ¶¶2.20 – 2.23 (link).

A8.5 The CAA's TRS achieves its objectives by allocating traffic risk between HAL and airlines according to specific parameters. Specifically:

- in the event that outturn traffic and forecast traffic differ by up to 10% of forecast traffic for that year, 50% of the difference will be shared between HAL and airlines; and
- in the event that outturn traffic and forecast traffic differ by more than 10% of forecast traffic for that year, 105% of the difference will be shared between HAL and airlines.

12.13 We demonstrate the impact of the TRS on HAL's aeronautical revenues (i.e., passenger numbers multiplied by the maximum allowed airport charge) below.[543]

Figure A8-1: HAL outturn aeronautical revenues versus allowed (forecast) aeronautical revenues



Source: FTI analysis.
Note: The red dotted line illustrates indexed outturn revenue without the TRS mechanism, while the solid blue line illustrates indexed HAL revenues following the implementation of the TRS mechanism (with forecast revenues indexed at 100).

543 Non-aeronautical revenues are not included as part of the TRS. We understand the impact of volumes on non-aeronautical revenues influences the calibration of the sharing factors applied as part of the TRS mechanism.

A8.6 As demonstrated in the figure above, the TRS mechanism reduces HAL's exposure to traffic risk. As the listed comparators selected to estimate HAL's asset beta did not have a mechanism like the TRS in their regulatory regimes, the listed comparator asset beta estimates needed to be adjusted in order to make them consistent with HAL's risk exposure.

A8.7 The CAA accounted for this differential at H7 by implementing a TRS adjustment to the asset beta, and we are minded to adjust HAL's implied asset beta for H8 along similar lines.

A8.8 Specifically, in this appendix, we:

(1) calculate network utility asset betas; and,

(2) estimate the TRS adjustment based on the H7 methodology.

A. Calculation of network utility asset betas

A8.9 First, we calculate network utility asset betas based on recent determinations in the energy and water sectors, specifically: (i) Ofgem's approach in the RIIO-3 Draft Determinations; and (ii) the CMA's approach in the PR24 redeterminations.[544]

A8.10 We note that Ofgem used a debt beta of 0.075 whereas our asset beta estimates for HAL are based on a debt beta range of 0.05 – 0.15.[545] Therefore, in Table A8-1 below, we recalibrate Ofgem's RIIO-3 high and low asset betas for our upper and lower bound debt betas of 0.05 and 0.15, respectively, to ensure our calculations are made on a consistent basis.

[544] Note that we do not use Ofwat's asset beta in PR24 to estimate the TRS adjustment as it does not pass the ARP-DRP cross-check. Specifically, we estimated the DRP at 1.92% (i.e., 3.74% − 1.52% − 0.30%) and the ARP at 1.75% (0.33 × (6.83% − 1.52%)) which implies an ARP-DRP differential of −0.17% (i.e., 1.75% − 1.92%). The strict criterion of the ARP-DRP cross-check is that the differential is positive, therefore, due to a negative differential for Ofwat's PR24 figures, we do not use Ofwat's PR24 asset beta to estimate the TRS adjustment. See Ofwat (2025), *PR24 final determinations, Aligning risk and return – allowed return appendix,* Tables 1 and 13 (link); and Appendix 16 for details on our expected loss calculations.

[545] The relationship between equity beta and debt beta is given by the Harris-Pringle formula: $\beta_e = \frac{\beta_a - g \times \beta_d}{(1-g)}$. Therefore, as a higher debt beta results in a lower equity beta, the lower debt beta is in our high scenario, and vice versa.

Table A8-1: Ofgem RIIO-3 Draft Determinations asset beta[546]

Component	Guide	High	Low
Asset beta	A	0.45	0.30
Average asset beta	**B**	**0.375**	
Implied market gearing[1]	C	47%	47%
Debt beta	D	0.075	0.075
Implied unlevered beta	E = A − C × D	0.41	0.26
Updated debt beta[2]	F	0.05	0.15
Asset beta	G = E + C × F	0.44	0.34
Updated Ofgem average asset beta	**H**	**0.39**	

Source: Ofgem (2025), RIIO-3 Draft Determinations – Finance Annex, Table 17 (link); Ofgem (2024), RIIO-3 Sector Specific Methodology Decision – Finance Annex, Table 8 (link); FTI analysis.

Note: (1) Implied market gearing above is calculated as the simple average of all (2-year, 5-year and 10-year) average gearing levels for the chosen comparators. (2) A lower debt beta means the firm's debt is less sensitive to market risk, so more of the company's overall (asset) risk must be borne by equity, resulting in a higher asset beta. Conversely, when debt beta is higher, more risk is absorbed by debt holders, reducing the portion of risk attributed to the firm's assets and equity.

A8.11 The CMA used a debt beta of 0.10 for its PR24 estimates, therefore, no adjustment is needed for our estimates given this forms the midpoint of our two debt beta assumptions (0.05 and 0.15).[547]

A8.12 The resultant overall asset beta for network utilities is 0.37 (average of 0.36 and 0.39).[548]

546 We note that an adjustment to Ofgem's RIIO-3 Draft Determinations asset beta is not required for the CAA's estimated TRS adjustment, as the CAA assumes a debt beta of 0.075, equal to Ofgem's assumption.

547 We note that an adjustment to the CMA's network utility asset beta is needed to calculate the CAA's estimated TRS adjustment for H8. This is because the CAA assumes a debt beta of 0.075, and an adjustment will ensure a consistent comparison. This results in an updated CMA network utility asset beta of 0.35 (using a debt beta of 0.075) relative to 0.36 (using a debt beta of 0.10).

548 Due to rounding to two decimal points, the presented average may not align precisely with underlying values.

B. Estimation of TRS adjustment

A8.13 We calculate the 'TRS adjustment' based on the H7 methodology:

- First, we take the difference between the pre-TRS asset beta (which includes systematic volume risk) and the network utility asset beta (which largely excludes volume risk).
- Second, we allocate a proportion of this difference to systematic volume risk (or traffic risk in the case of HAL).
- Next, we allocate a proportion of the difference attributable to systematic volume risk as being mitigated by the TRS.
- Finally, we adjust the pre-TRS asset beta with the impact of the TRS on asset beta.

A8.14 We present our calculations of the TRS adjustment to asset beta relative to the CAA's calculation in Table A8-2 below:

Table A8-2: Calculation of the TRS adjustment

Component	Guide	FTI H8 Initial Proposal		CAA H8 Initial Proposal	
		Lower bound	Upper bound	Lower bound	Upper bound
Pre-TRS asset beta	**A**	**0.50**	**0.69**	**0.47**	**0.70**
Network utility asset beta	B	0.373	0.373	0.361	0.361
Traffic risk component of gap	C	90%	70%	90%	70%
Proportion of traffic risk mitigated by TRS	D	50%	50%	50%	50%
TRS adjustment	**E = (A – B) × C × D**	**0.06**	**0.11**	**0.05**	**0.12**

Source: FTI analysis.

Note: The pre-TRS asset beta for the respective estimates is calculated in Table A7-3. The network utility asset beta for the FTI H8 Initial Proposal is as explained in ¶A8.12, and the network utility asset beta for the CAA H8 Initial Proposal is as explained in footnote 547 and Ofgem's original asset beta of 0.375 (as in Table A8-1).

Appendix 9 HAL premium applied to floating-rate debt

A9.1 In estimating the cost of embedded debt, we modelled the cost of foreign currency and GBP floating-rate instruments as the benchmark index yield on the issuance date plus:

- a new issuance premium of c. 12 bps;[549] and
- the estimated sector-specific premium[550] for HAL's bonds at the point of issuance, based on our secondary market analysis (referred to as the 'variable sector-specific premium' approach below).

A9.2 In this appendix, we compare the results from this approach with an approach in which we adopt a new issuance premium of c. 12 bps (as before), while adopting a constant sector-specific *discount* of 1 bp.[551] This results in a constant overall premium of c. 10 bps applied to all foreign currency and GBP floating-rate instruments, regardless of issuance date.[552] The results are illustrated in Table A9-1 below.

Table A9-1: Nominal cost of embedded debt at H8 with different sector-specific premia

Parameter	Variable sector-specific premium	Constant premium
Fixed-rate debt	5.09%	5.09%
Floating-rate debt	4.15%	4.22%
Index-linked debt	5.00%	5.00%
Nominal cost of embedded debt	**4.94%**	**4.95%**

Source: FTI analysis.

549 See ¶¶8.55 – 8.60.

550 Also referred to as the 'secondary market premium'.

551 See ¶8.59.

552 This is calculated using a new issuance premium of 11.6 bps, and secondary market discount of 1.2 bps, which results in 11.6 – 1.2 = 10.4 bps, which we round to 10 bps. See footnote 400.

Note: The nominal cost of embedded debt is weighted based on the proportion that each type of debt (fixed, floating, index-linked) constitutes (based on principal).

A9.3 The two approaches do not affect the cost of embedded fixed-rate and index-linked debt, as we adopt the yields as given in HAL's debt book.

A9.4 As evidenced above, applying a constant premium results in an increase in the cost of floating-rate debt from 4.15% to 4.22% i.e., an increase of 7 bps. Our assessment is that this is likely a result of the constant premium approach under-representing periods in which the sector-specific discount was significantly higher than 1 bp.

Appendix 10 Index-linked cost of debt

A10.1 In estimating the cost of debt, we have made certain assumptions in relation to index-linked debt. Specifically, we have:

- modelled the index-linked debt already in HAL's debt book based on the forecast evolution of RPI inflation and the listed coupon rates on the debt;[553]
- assumed that all debt issued after 31 December 2024 (i.e., the cut-off date for HAL's debt book) was fixed-rate debt;[554] and
- assumed that the new debt issued by HAL over H8 would be fixed-rate debt.[555]

A10.2 We do not model yields on index-linked debt on a forward-looking basis as the only available indices constitute fixed-rate bonds, and therefore do not accurately capture the contemporaneous yield on index-linked debt.

A10.3 At H7 and H8, airline stakeholders have suggested that index-linked debt can be modelled as the yield on a fixed-rate reference index (i.e., the iBoxx £ Non-Financials A and BBB 10+ indices), deflated by market-based measures of inflation – in particular, tenor-matched CPI-linked swaps.[556]

553 See ¶¶7.67 – 7.68.

554 See ¶7.72.

555 See ¶7.72(1) for details.

556 We understand the stakeholders use CPI-linked swaps (rather than RPI-linked swaps, despite the instruments being denominated in RPI) so as to obtain a CPI-denominated measure of the real yield on index-linked debt.

A10.4 If these claims hold, then it would follow that the spread between otherwise identical[557] fixed-rate and index-linked bonds would be equal to the swap rate on a tenor-matched inflation swap that references the same inflation index as the index-linked bond. Accordingly, we consider that this can be tested using the following approach:

(1) review regulated companies for issuances of publicly traded index-linked bonds for which bonds with comparable seniority and maturity dates exist;

(2) calculate the spread between comparable fixed-rate and index-linked bonds (the "**FR-IL spread**"); and

(3) compare the FR-IL spread with the swap rates for tenor-matched inflation swaps referencing the same inflation index as the index-linked bond.

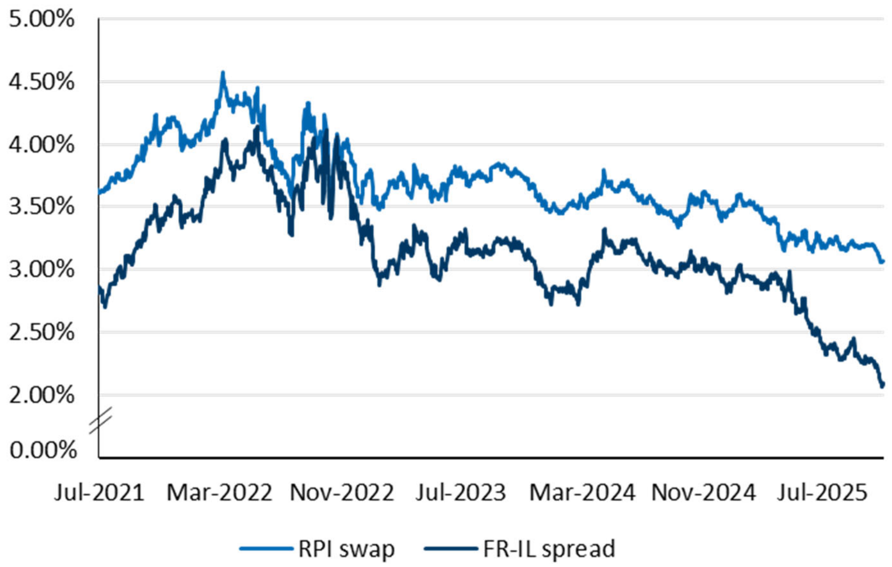
A10.5 Our analysis indicates that RPI swap rates do not represent the entirety of the FR-IL spread. Specifically:

- Using a sample of five index-linked bonds issued by HAL, NGET, and United Utilities ("**UU**"), and corresponding tenor-matched fixed-rate bonds, we observe that tenor-matched RPI swap rates are almost always higher than the corresponding FR-IL spread.
- The historical relationship shows that the difference between the RPI swap rate and the FR-IL spread has been persistently positive, with the exception of a short period in October 2022.
- In recent months this difference has widened and is now close to 100 bps as of 1 November 2025.

A10.6 This is illustrated in Figure A10-1, which depicts the average RPI swap rate (tenor-matched to the index-linked bond) and the average FR-IL spread across the sample.

557 That is, identical in tenor, company, seniority (and hence credit rating), and any other characteristics relevant for the yield.

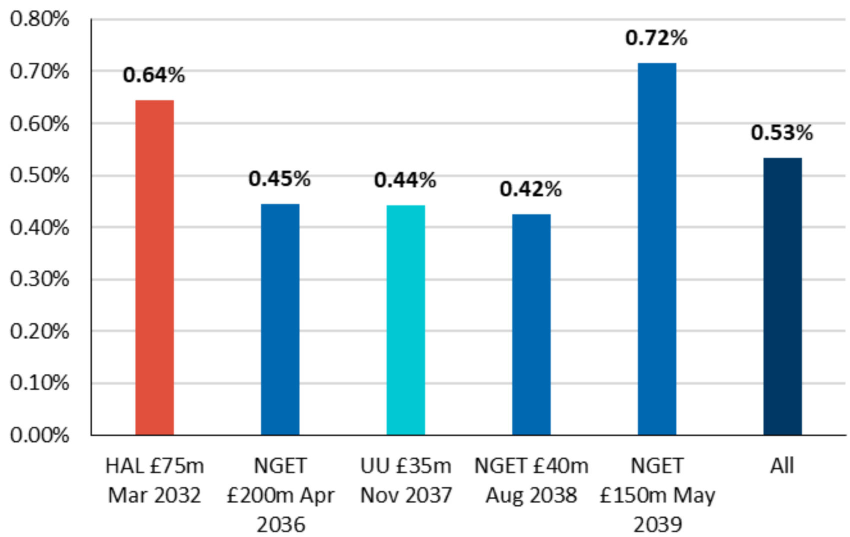
Figure A10-1: Average RPI swap rates and average FR-IL spread across sample



Source: Refinitiv; FTI analysis.

A10.7 Considering the bonds individually, each of the five bonds exhibits a positive average difference between its tenor-matched RPI swap rate, and its IL-FR spread. We illustrate this in Figure A10-2.

Figure A10-2: Average differences between tenor-matched RPI swap rates and FR-IL spreads for each bond



Source: Refinitiv; FTI analysis.

A10.8 While the sample is relatively small, contributing to volatility in the time-series data, the consistency of the result across time and bonds from different sectors suggests that this pattern is structural rather than incidental as all bonds demonstrate a negative difference between the FR-IL spread and RPI swap rate. Accordingly, our conclusions from the data are that:

- airline stakeholders' assumption that the FR-IL spread can be fully proxied using inflation swaps is not supported by historical evidence; and
- the persistent positive difference indicates that inflation swaps systematically overstate the inflation compensation actually embedded in IL bonds.

A10.9 As a result, we consider that the method forwarded by airline stakeholders likely understates the real cost of IL debt. Based on the data available, it appears that estimating the cost of new index-linked debt is a more complicated exercise than that suggested by them.

A10.10 Therefore, given the lack of available objective index-linked debt indices, we contend that our assumption of all new debt being fixed-rate is appropriate for H8.

Appendix 11 Effective nominal cost of embedded debt at H7

A11.1 This appendix sets out the CAA's approach to estimating the cost of embedded debt at H7 and explains how an implied ("**effective**") nominal rate for H7 may be derived from that approach.

A11.2 At H7, the CAA deflated the nominal cost of debt assumption of 4.22%[558] using different inflation assumptions to estimate separately the costs of fixed-rate and index-linked debt. In particular, the nominal cost of debt was deflated using in-year inflation forecasts to derive the real cost of fixed-rate debt for each year of H7, while long-term inflation forecasts were used to derive the real cost of index-linked debt for each year of H7.[559]

A11.3 The resulting annual real costs of fixed-rate and index-linked debt were then combined using an assumed weighting of 70% fixed-rate and 30% index-linked debt. Finally, these were aggregated on a weighted average basis using outstanding principal of embedded debt.

A11.4 This means that if this value is re-inflated using a single inflation assumption (whether medium-term or long-term), the implied nominal cost of embedded debt will not equal the nominal reference index yield. This reflects that a combination of different inflation assumptions were used to derive the blended RPI-deflated cost of debt estimate.

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558 This consisted of its reference iBoxx yield of 4.14% plus a HAL-specific premium of 8 bps. See CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation,* Tables 9.7 and 9.8 (link).

559 For example, at H7, to calculate the real cost of fixed-rate debt for 2022, the CAA deflated its nominal cost of debt assumption of 4.22% by the forecast RPI for 2022 of 11.60%. This resulted in a real cost of fixed-rate debt for the year of −6.61%. To calculate the real cost of index-linked debt in 2022, it used the same nominal cost of debt assumption of 4.22% and deflated it by its long-term RPI assumption of 2.73% to obtain a real cost of index-linked debt of 1.45%. The CAA initially included an index-linked premium of 15 bps in its estimate of the cost of embedded index-linked debt, but this was rescinded following the CMA appeal. See CAA (2022), *H7 Final Proposals, Section 3: Financial issues and implementation,* Tables 9.7 and 9.8 (link); CAA (2023), *H7 Final Decision, Section 3: Financial issues and implementation*, Tables 9.2 and 9.3, and ¶¶9.165 and 9.167 (link); CMA (2023), *H7 Heathrow Airport Licence Modification Appeals, Final Determinations*, ¶7.309 (link).

A11.5 For example, if we inflated the H7 RPI-deflated cost of debt (−0.12%)[560] using the CAA's medium-term H7 inflation assumption (defined as the simple average of inflation forecasts over the period 2021 to 2026) of 4.88%, this results in an implied nominal rate of 4.76%. This reflects the expected nominal cost of debt during H7 and is most consistent with our balance sheet-led approach estimate as that also reflects medium-term inflation forecasts.

A11.6 We illustrate the calculations for the effective nominal rate at H7 in Table A11-1. Our nominal cost of embedded debt of 4.94% is c. 18 bps higher than the H7 effective nominal cost of embedded debt.

Table A11-1: Effective nominal cost of embedded debt at H7

Parameter	Guide	Medium-term
H7 real cost of embedded debt	A	(0.12%)
Applicable inflation rate	B	4.89%
Effective nominal rate	**C = (1 + A) × (1 + B) – 1**	**4.76%**

Source: CAA (2022), H7 Final Proposals, Section 3: Financial issues and implementation (link); CAA (2023), H7 Final Decision, Section 3: Financial issues and implementation (link); FTI analysis.

560 FTI Consulting (2024), *Cost of Capital Strategy for H8*, Table A2-1 (link).

Appendix 12 Notional benchmarks for cost of embedded debt

A12.1 As discussed in Section 7, we have considered how to construct a notional estimate for the cost of embedded debt.[561] We have considered two notional estimates:

- **Senior only:** For the issuance profile, we consider only HAL's senior debt but replace the cost of these instruments using the benchmark cost (set out below).
- **Senior and junior debt:** For the issuance profile, we consider HAL's senior and junior debt but replace the cost of these instruments using the benchmark cost (set out below).

A12.2 Specifically, we benchmark the cost of both senior and junior debt as the sum of:

(1) the average yield of the iBoxx £ Non-Financials A and BBB 10+ year indices at issuance; and

(2) a HAL-specific premium, estimated as the sum of a new issuance premium[562] and a secondary market premium as of the date of issuance.[563]

A12.3 Table A12-1 below summarises the estimates under both these notional benchmarks.

561 Several regulators rely on averages of a reference index in calibrating a notional benchmark for the cost of embedded debt. We have previously considered the use of a notional benchmark that assumes constant issuance, e.g., an average of the iBoxx £ Non-Financials A/BBB indices over a period. Specifically, a 7.5-year collapsing average results in a nominal cost of embedded debt estimate of 4.91% which is close to HAL's balance sheet-led cost of embedded debt estimate. However, as the use of 7.5-years is not aligned with the assumed investor horizon, or the underlying asset lives of HAL's RAB, we do not consider this to be an appropriate approach.

562 This is assumed to be 12 bps. For details, see Section 8, ¶¶8.57 – 8.58.

563 For details on our approach to estimating the secondary market premia, see Section 8, ¶¶8.39 – 8.42.

Table A12-1: Notional benchmarks for the cost of embedded debt

Component	Estimated CoED	Senior only (A/BBB)	Senior and Junior (A/BBB)
Debt included	Senior	Senior	Senior and Junior
Senior debt yield calculation	Balance sheet-led	Using iBoxx A/BBB index matched to issuance date	Using iBoxx A/BBB index matched to issuance date
Junior debt yield calculation	N/A	N/A	Using iBoxx A/BBB index matched to issuance date
Cost of embedded debt	**4.94%**	**5.06%**	**5.01%**

Source: FTI analysis based on iBoxx indices and HAL debt book.
Note: (1) Both senior and junior yields include a HAL premium, calculated as the sum of the new issuance premium (12 bps) and the secondary market premium as of the date of issuance. This is assumed to be the same for both senior and junior instruments. (2) The cost of embedded debt is weighted based on principal.

A12.4 As shown above, our estimated cost of embedded debt is lower than the cost of debt under the 'Senior only' benchmark. This likely reflects issues such as HAL being able to leverage efficiencies on debt issuance or that it is difficult to accurately estimate the HAL-specific premium for all bonds over time.

A12.5 Additionally, in the table above, we observe the 'Senior and Junior' debt benchmark is lower than the 'Senior only' benchmark. This reflects the low interest rate environment at the time of HAL's junior debt issuance, which places downward pressure on the overall benchmark cost of debt when the junior debt issuance profile is taken into account.[564]

[564] As we hold constant the approach to estimating the cost of debt for each instrument across the different options, the only difference between the 'Senior only' and 'Senior and Junior' approach is the weight placed on the cost of debt over time. Therefore, any difference between the two approaches is timing. In reality, we would expect the junior debt to have a higher cost of debt than the senior debt instruments.

A12.6 However, we do not consider the 'Senior and Junior' approach would accurately reflect the cost of embedded debt for the notional company as implementing this approach may not capture reality. For example, it is not clear that HAL would have been able to issue senior debt instead of junior debt at this point in time and there could also be potential knock-on impacts on the cost of senior debt from increased senior debt issuance. We view these concerns as relevant and material.

Appendix 13 Notional proportion of new debt

A13.1 As set out in ¶¶9.8 – 9.11, we consider that the proportion of new debt should follow the hybrid approach.[565] Specifically, we assume that new debt is a function of maturing embedded debt and forecast RAB growth, ensuring that the notional gearing assumption is met.

A13.2 However, notional analysis can serve as a useful cross-check of our hybrid approach, as it reflects the evolution of the debt profile for a theoretical efficient firm, ensuring consumers are unaffected by regulated companies' actual financing choices which may be inefficient. In practice, the difference between the hybrid approach and the notional approach is the calculation of debt refinancing.

A13.3 In this appendix, we cross-check our calculation of the proportion of new debt based on the hybrid approach by estimating a notional proportion of new debt. Specifically, we describe:

(1) the assumptions and inputs for the notional proportion of new debt calculation; and

(2) our methodology and findings.

A. Assumptions and inputs

A13.4 Table A13-1 below provides details on the assumptions and inputs that feed into our calculations of the notional proportion of new debt calculated using the hybrid approach.

A13.5 We note that we calculate the repayment proportion (index-linked) as the sum of the index-linked debt refinancing and the repayment of the amortising index-linked bond, over total debt refinancing.

565 For details on the different approaches, see ¶¶9.4 – 9.11 above.

Table A13-1: Assumptions and inputs for the calculation of the notional proportion of new debt (£m, nominal)

Component	Guide	2025	2026	2027	2028	2029	2030	2031
Debt refinancing (senior only, excl. amortising bond)	A	-	961	594	522	741	1,311	1,191
Debt refinancing (index-linked)	B	-	0	0	0	0	0	0
Repayment of amortising index-linked bond	C	-	2.4	2.5	2.5	2.6	2.7	2.7
Closing RAB (nominal)	D	21,087	21,678	22,223	22,923	23,602	23,862	23,967
Inflation	E	4.3%	3.7%	3.1%	2.9%	2.9%	2.3%	2.1%
Repayment proportion (index-linked)	F = (B + C) / (A + B + C)	-	0.25%	0.41%	0.48%	0.35%	0.20%	0.23%
Proportion of index-linked debt issuance at the start of H8	G	-	-	8.29%	-	-	-	-

Source: HAL debt book; OBR (2025), March 2025 Economic and fiscal outlook – detailed forecast tables: economy, tab '1.7' (link); CAA RAB calculations; FTI analysis.

Note: (1) The proportion of index-linked debt issuance at the start of H8 is equal to the original facility size of senior, index-linked debt maturing after 1 January 2027 as a share of the original facility size of senior debt maturing after 1 January 2027. (2) There is no index-linked debt maturing during H8.

B. Methodology and findings

A13.6 Tables A13-2 and A13-3 present our detailed calculations of the notional proportion of new debt.

A13.7 The only difference relative to the hybrid approach is the calculation of debt refinancing. Specifically, in Table A12-2 below, debt refinancing is calculated as opening embedded debt divided by remaining asset life,[566] as opposed to being based on actual embedded debt maturing.

A13.8 Specifically, in estimating the notional proportion of new debt for H8, we consider:

(1) **Accretion** on embedded index-linked debt in line with OBR's RPI forecasts for 2025 – 2029 and long-term CPIH inflation at 2.13% for 2030 onwards;

(2) **Refinancing** is assumed on a notional basis, such that one-twentieth (5%) of the total embedded debt is treated as maturing and being refinanced each year;

(3) **RAB growth**, as per the CAA's modelling. This results in a nominal RAB growth of 2.0% over H8;[567] and,

(4) our **notional gearing** assumption.[568]

A13.9 We estimate the new debt required in H8 by following a three-step process:[569]

(1) Model the embedded debt balance by considering refinancing of senior debt as well as accretion and repayment of index-linked debt;

(2) Calculate the forecast closing RAB based on the cost allowances for H8; and

(3) Estimate the new debt required to maintain a 60% notional gearing based on the forecast closing RAB.[570] This is calculated as the difference between the target debt requirement and the closing embedded debt balance.

A13.10 We present these calculations in Tables A13-2 and A13-3 below.

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566 This is assumed to be 20 years, consistent with the CAA's existing policy on the assumed investor horizon for investors in airports. See ¶1.16 for details.

567 CAA (2026), *H8 Initial Proposals, Section 3,* Chapter 10.

568 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶7.687 (link).

569 See Table A13-2 below for details on the proportion of new debt calculations.

570 Notional gearing is net debt divided by RAB, therefore we need to estimate both the gross debt and cash balance required to achieve the target notional gearing. We estimate the cash balance associated with this debt balance based on our liquidity cost estimates.

Table A13-2: Detailed calculations of the notional share of new debt using the hybrid approach (£m, nominal)

Component	Guide	2027	2028	2029	2030	2031
Notional net embedded debt[571]	A = B × (1 – cash %)	13,007	-	-	-	-
Notional gross embedded debt[572]	B = E in the preceding year	14,383	13,698	13,009	12,320	11,624
Accretion on embedded IL debt[573]	C	34	32	34	28	26
Debt refinancing	D	719	721	723	725	727
Closing gross H8 Embedded debt balance	E = B + C – D	13,698	13,009	12,320	11,624	10,924
Forecast Closing RAB	F	22,223	22,923	23,602	23,862	23,967
Net Debt required for 60% gearing	G = F × 60%	13,334	13,754	14,161	14,317	14,380
Implied closing gross debt	H = G / (1 – cash %)	14,745	15,209	15,660	15,832	15,902
Total new debt	**I = H – E**	**1,047**	**2,200**	**3,339**	**4,208**	**4,978**

Source: RAB assumptions provided by the CAA; FTI analysis.

Note: Debt refinancing based on notional assumption, assuming 5% of debt is refinanced annually. Accretion calculated by multiplying the opening embedded index-linked debt by the inflation rate. Forecast closing RAB based on CAA assumptions.

571 A_{2027} (i.e., the value of notional net embedded debt in 2027) is equal to the opening RAB multiplied by the notional gearing assumption of 60% (21,678 × 60% = 13,007).

572 B_{2027} (i.e., the value of notional gross embedded debt in 2027) is equal to the A_{2027} ÷ (1 – the proportion of cash). The proportion of cash is as calculated for the liquidity calculations in Section 10 (see Table 10-1).

573 Accretion is calculated as opening embedded index-linked debt times inflation at time t, less repayment of embedded index-linked debt in that year.

Table A13-3: Calculation of notional proportion of new debt (£m, nominal)

Component	Guide	2027	2028	2029	2030	2031
Total new debt	A	1,047	2,200	3,339	4,208	4,978
Total new debt (mid-year adjustment)	B = [A(t) – A(t – 1)]/2	523	577	569	435	385
Cumulative total new debt requirement (mid-year adjustment)	C = A – B	523	1,623	2,770	3,774	4,593
Gross embedded debt based on HAL debt book	D	15,946	15,300	14,960	13,708	12,820
Proportion of new debt over H8	**E = Σ C(t) / Σ (C(t) + D(t))**			**15.44%**		

Source: RAB assumptions provided by the CAA; FTI analysis; HAL debt book.

Note: The mid-year adjustment aligns our modelling with the CAA's H7 modelling on issuing debt, in which the CAA assumed new debt is issued in an evenly-spread profile over time. This results in the time-weighted principal for in-year issuance being half the total in-year issuance e.g., if the notional company issued £1bn of new bonds in a year, and it was assumed this was issued in equal amounts each quarter then the time-weighted principal would be £500m.

A13.11 The resulting notional proportion of new debt is on average 15.44%. This is c. 7 bps different from our estimated proportion of new debt using a hybrid approach. This suggests the proportion of new debt is not sensitive to refinancing assumptions.

Appendix 14 Cash liquidity cost benchmarking

A14.1 As detailed in Section 10, we use an actuals-based approach to estimate HAL's liquidity cost allowance. However, we recognise that this approach is subject to potential distortions.[574] We therefore present cross-checks to the actuals-based approach using evidence on HAL's actual liquidity costs based on various benchmarks.

A14.2 Cash liquidity is assessed with reference to an entity's proportion of cash balance relative to gross debt.[575] We assess cash liquidity using two different benchmarks. Specifically, we set out our assessment of:

(1) HAL's historic cash balance as a proportion of gross debt; and

(2) comparison of HAL's cash balance as a proportion of gross debt in 2024 to its comparators (AENA, ADP, FRA and FHZN) and the water sector.

A. Review of HAL's historical cash balance proportion

A14.3 Cash balance can be estimated using either: (a) cash and cash equivalents only; or (b) cash and cash equivalents and term deposits.

A14.4 We first review HAL's historical cash balance by including and excluding term deposits[576] (Figure A14-1 below). Our estimate of HAL's proportion of cash balance to gross debt in 2024 including and excluding term deposits is 9.57% and 6.96% respectively.

A14.5 We note that excluding term deposits does not appear appropriate as historical data illustrates lower cash balances during the Covid-19 pandemic when excluding term deposits (see Figure A14-1).

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574 See ¶10.7 – 10.8 for details.

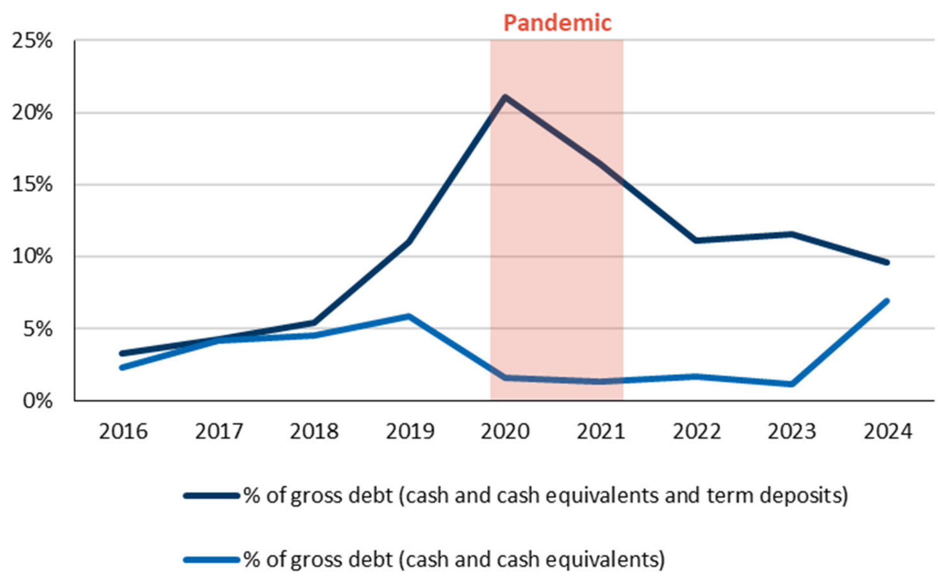
575 This was the approach taken by the CMA in PR24 PD. See CMA (2025), *Water PR24 References, Provisional Determinations Volume 4*, ¶7.727 (link).

576 Term deposits are interest-bearing investments that may not be immediately accessible due to maturity or notice requirements and are therefore less liquid than cash and cash equivalents. FSMA (2026), *Term Deposit* (link).

A14.6 HAL also includes term deposits in calculating its net debt,[577] illustrating that term deposits are considered cash equivalents. CMA precedent on this issue is unclear as the CMA does not clearly define the cash balances it adopts in its PR24 PD.[578] Therefore, we consider term deposits as part of cash and cash equivalents.

A14.7 As shown in Figure A14-1 below, HAL's proportion of cash balance to gross debt has declined to pre-pandemic levels. This indicates that HAL's operating conditions are likely to have normalised.

Figure A14-1: HAL's historic proportion of cash balance to gross debt ratios



Source: FTI analysis; HAL and HAHL Annual Reports (2016 – 2024, see Table A14-1).
Note: (1) Cash balance proportions are calculated as (cash and cash equivalents and term deposits) / gross debt, and (cash and cash equivalents) / gross debt respectively. (2) The assumed pandemic start and end dates are 1 February 2020 and 31 December 2021 accordingly, and the data for each year is at 31 December of that year.

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577 HAHL (2025), *Annual Report 2024*, page 187 (link).

578 Cash liquidity is examined by the CMA – see CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* ¶¶7.722 – 7.728 (link).

Table A14-1: Sources of HAL historic cash balance proportion to gross debt ratios

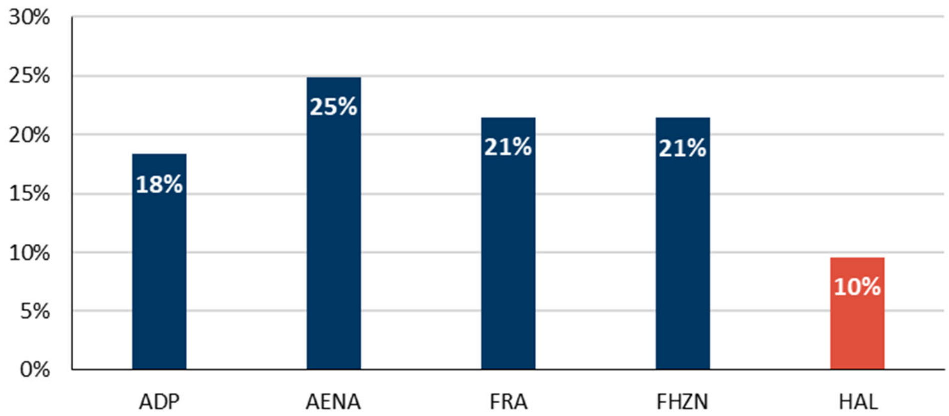
Year	Item	Source	Link	Page
2016	RAB	HAL Annual Report 2017	Link	15
2016	Net debt to RAB	HAHL Annual Report 2017	Link	80
2016	Cash Balance	HAL Annual Report 2017	Link	54
2017	RAB	HAL Annual Report 2018	Link	14
2017	Net debt to RAB	HAHL Annual Report 2018	Link	82
2017	Cash Balance	HAL Annual Report 2018	Link	59
2018	RAB	HAL Annual Report 2019	Link	155
2018	Net debt to RAB	HAHL Annual Report 2019	Link	164
2018	Cash Balance	HAL Annual Report 2019	Link	118
2019	RAB	HAL Annual Report 2020	Link	171
2019	Net debt to RAB	HAL Annual Report 2020	Link	171
2019	Cash Balance	HAL Annual Report 2020	Link	130
2020	RAB	HAL Annual Report 2021	Link	184
2020	Net debt to RAB	HAL Annual Report 2021	Link	184
2020	Cash Balance	HAL Annual Report 2021	Link	134
2021	RAB	HAL Annual Report 2022	Link	191
2021	Net debt to RAB	HAL Annual Report 2022	Link	191
2021	Cash Balance	HAL Annual Report 2022	Link	138
2022	RAB	HAL Annual Report 2023	Link	211
2022	Net debt to RAB	HAL Annual Report 2023	Link	211
2022	Cash Balance	HAL Annual Report 2023	Link	160
2023	RAB	HAL Annual Report 2024	Link	197
2023	Net debt to RAB	HAHL Annual Report 2024	Link	230
2023	Cash Balance	HAL Annual Report 2024	Link	146
2024	RAB	HAL Annual Report 2024	Link	197
2024	Net debt to RAB	HAHL Annual Report 2024	Link	230
2024	Cash Balance	HAL Annual Report 2024	Link	146

Note: We use the following year's annual report to utilise the most up-to date financial information available for the previous year. For example, we use the 2018 annual report for data as in 2017. We use the RAB, net debt to RAB ratio, and the cash balance (cash, cash equivalents and term deposits) to obtain the gross debt. We have relied upon the annual reports for both HAL and Heathrow Airports Holding Limited (HAHL).

B. Review of comparator and water sector cash balance proportions in 2024

A14.8 We also consider whether HAL's comparators[579] can serve as a cross-check to HAL's cash liquidity allowance. Figure A14-2 plots HAL's and comparators' proportion of cash balance to gross debt in 2024.[580]

Figure A14-2: HAL and comparators' cash balance proportion to gross debt ratios (as at 31 December 2024)



Source: FTI analysis; AENA (2025), 2024 Results presentation, Slide 22 (link); FRA (2025), Annual Report 2024, pages 186 and 250 (link); ADP (2025), Annual Report 2024, pages 29 – 30 (link); FHZN (2025), Financial report 2024 - Consolidated Balance Sheet, (link); HAL (2025), Annual Report 2024, pages 146 and 197 (link); HAHL (2025), Annual Report 2024, page 230 (link).
Note: Cash balance proportion is calculated as cash balance (incl. term deposits) over gross debt in the local currency of each airport group.

A14.9 The figure shows that HAL's proportion of cash balance to gross debt is lower than that of its comparators. The higher cash liquidity proportion observed among comparators relative to HAL may be driven by factors such as the leverage ratio for the different entities, acquisitions, or asset disposals. As a result, we do not consider the comparators to be a credible cross-check to HAL's cash balances.

A14.10 We also consider whether companies in the water sector can serve as a cross-check on HAL's cash liquidity allowance.

579 The comparators selected reflect the set of comparators included in our beta assessment. See ¶¶6.57 – 6.75 and Table 6-2 for details.

580 At the cut-off date, only financial information for 2024 is available.

A14.11 Ratios observed in the water sector indicate mean cash and cash equivalents as a proportion of gross debt of 9.7% for FY25.[581] This suggests that HAL's proportion including term deposits (9.57%) as at 31 December 2024 is broadly in line with ratios in the water sector.

A14.12 Based on the results of the above cross-checks, we therefore consider that our actuals-based approach to estimating liquidity costs i.e., the use of actual sector data on cash balances, is reasonable.

581 CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* Table 7.24 (link).

Appendix 15 Notional liquidity cost calculation

A15.1 This appendix presents our notional liquidity cost calculation based on the framework adopted by the CAA at H7.[582]

A15.2 We forecast the liquidity requirement for the notional company using projected capex and debt service costs ('liquidity uses') while accounting for cash flow from operations ('liquidity sources').

A15.3 We estimate the notional company's liquidity costs using S&P's 'Liquidity Descriptors for Global Corporate Issuers', targeting a 'Strong' assessment.[583]

A15.4 As shown in Table A15-1 below, the H8 values indicate cash and liquidity requirements of 19.1% of gross debt (compared to 18.4% based on HAL's actual liquidity position).[584]

A15.5 Allocating this liquidity requirement between cash and RCF in proportion to HAL's actual balances in 2024 results in a liquidity allowance of 15 bps.

582 We do not apply Ofwat's PR24 framework for H8, as doing so would imply HAL incurs zero liquidity costs during this period, an outcome we consider implausible. Ofwat's approach implies that (i) no cash costs arise when in-year cash from operations exceeds capex; and (ii) no RCF costs are incurred when in-year cash from operations exceeds both capex and debt refinancing requirements. Given that HAL is forecast to generate substantial cash flows during H8, applying this framework would result in no recognized liquidity costs for the period, which does not reflect the operational and financial realities of maintaining appropriate liquidity buffers. See CMA (2025), *Water PR24 References, Provisional Determinations Volume 4,* Tables 7.21 and 7.22 (link).

583 For a company to have 'strong' liquidity, it needs to have a ratio of liquidity sources to liquidity uses above 1.5x for the upcoming 12 months, and above 1.0x in the subsequent 12-month period. See S&P Global (2014), *Criteria | Corporates | General: Methodology And Assumptions: Liquidity Descriptors For Global Corporate Issuers,* Section 'B. Liquidity Categories', Section '2. Strong' (link).

584 This is estimated based on 2024 data as (1,556 + 1,436) ÷ 16,260 = 18.4%, where 16,260 is HAL's gross debt in 2024. HAL's gross debt is estimated as RAB times the net debt to RAB ratio, plus cash, cash equivalents and term deposits. See HAL (2025), *Annual report 2024,* page 197 (link); HAHL (2025), *Annual Report 2024,* page 230 (link) for RAB figures, and Table A15-1 for figures on cash and RCF values.

A15.6 This is marginally higher than our estimate of 14 bps derived using an actuals-based approach.[585]

Table A15-1: Notional liquidity cost calculation based on CAA H7 methodology (£m, nominal unless stated otherwise)

Component	Guide	2027	2028	2029	2030	2031	H8 avg.
CFO	A	2,439	2,483	2,600	2,726	2,819	2,613
Capex	B	1,425	1,446	1,515	1,151	1,062	1,320
Debt refinancing	C	597	525	744	1,314	1,194	875
Uses	D = 1.5 × (B_t+C_t) + 1.0 x (B_{t+1}+C_{t+1})	5,004	5,215	5,853	5,953		5,506
Sources	E = A	2,439	2,483	2,600	2,726		2,562
Total cash and RCF requirement	**F = D – E**	**2,565**	**2,732**	**3,253**	**3,227**		**2,944**
Gross debt	G	14,745	15,209	15,660	15,832	15,902	15,470
Requirement as a % of gross debt	**H = F ÷ G**	**17.4%**	**18.0%**	**20.8%**	**20.4%**		**19.1%**
Cost of holding cash	*I*						*1.23%*
RCF requirement	*J*						*0.25%*
Cash in 2024	*K*						*1,556*
RCF in 2024	*L*						*1,436*
Notional liquidity cost	**M = H×I×K÷(K+L) + H×J×L÷(K+L)**						**0.15%**

Source: FTI analysis based on data from CAA, HAL annual reports, Bank of England and iBoxx; HAL (2025), Annual Report 2024, pages 146 and 180 (link).

Note: (1) Debt refinancing includes the repayment of the amortising bond. (2) The cost of holding cash is equal to the blended iBoxx £ Non-Financials A/BBB 10+ year index minus the OIS three-month spot rate. (3) The RCF commitment fee is assumed to be 0.25% based on H7 Final Proposal. (4) The split between cash, cash equivalents and term deposits ('cash') and RCF is based on HAL 2024 values. (5) 'CFO' is cash flow from operations.

A15.7 As noted in ¶10.16 above, we consider that the assumptions required to adopt the notional approach such as forecast sources and uses of liquidity as well as the required headroom are highly subjective, increasing the potential for introducing errors in the estimation process. Therefore, we adopt the actuals-based approach to estimate liquidity costs.

[585] See Table 10-4 for details on our liquidity cost calculation using an actuals-based approach.

Appendix 16 Expected loss calculations

A16.1 In Section 11, we use the spread between the ARP and DRP to cross check whether our cost of equity is consistent with market data. To estimate the DRP, we subtract expected credit losses from the cost of new debt.

A16.2 This is because the expected loss represents the portion of a lender's return that compensates for the anticipated credit losses associated with lending—namely, the probability that a borrower may default multiplied by the loss the lender would incur if default occurs.

A16.3 We calculate expected losses using the following approach:

(1) First, we adopt the recovery rate from Moody's Ratings. The recovery rate for a fixed income security is the proportion of the principal and interest that can be recovered after a default. This is measured by post-default trading prices for senior unsecured bonds.

(2) Second, we infer cumulative 20-year default rates both for A-rated bonds, and for BBB-rated bonds from Feldhütter and Schaefer (2018). The cumulative 20-year default rate is the probability that a given bond will default over that 20-year period.

(3) Next, we calculate the probability of default (in any given year) using the 20-year cumulative default rates from step (2).[586] This step therefore converts the cumulative default rate to an annualised default rate for both A-rated and BBB-rated bonds.

(4) Finally, we calculate expected losses (in a given year) as the probability of default multiplied by one less the recovery rate i.e., the loss given default.

A16.4 We present our expected losses calculations in Table A16-1 below.

586 We observe that one less the 20-year cumulative default rate (i.e., the probability that a given bond will not default over the 20-year period) is equal to one less the probability of default in a given year (i.e., the probability that a given bond will not default in a given year) raised to the power of 20. Mathematically, for example, $(1 - B) = (1 - E)^{20}$. We then rearrange for E in Table A16-1.

Table A16-1: Expected losses calculations

Component	Guide	Value
Recovery rate	A	37.90%
Cumulative default rates A (20-year)	B	6.37%
Cumulative default rates BBB (20-year)	C	14.24%
Number of years	D	20
Probability of default A	$E = 1 - (1 - B)^{(1/D)}$	0.33%
Probability of default BBB	$F = 1 - (1 - C)^{(1/D)}$	0.77%
Expected loss A	$G = E \times (1 - A)$	0.20%
Expected loss BBB	$H = F \times (1 - A)$	0.48%
Expected loss A/ BBB	$\mathbf{I = 0.5 \times (G + H)}$	**0.34%**

Source: Moody's Ratings (2025), Annual default study, Corporate default rate to fall below its long-term average in 2025 (link) for recovery rate; Feldhütter, P. and Schaefer, S. M. (2018), The Myth of the Credit Spread Puzzle, Review of Financial Studies, Volume 31, Issue 8, Table 8 (link) for cumulative default rates; FTI analysis.
Note: Recovery rate is the average recovery rate measured by post-default trading prices for senior unsecured bonds (long-term average).

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