KPMG

A relative risk assessment of HAL at H8

Private & confidential

Prepared for Heathrow Airport Limited

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HAL should note that our findings do not constitute recommendations as to whether or not HAL should proceed with any particular course of action.

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Executive summary

Objective, scope, and methodology

The objective of this Report is to develop a preliminary relative risk assessment of Heathrow Airport Limited (HAL) compared with its peers and to consider implications of HAL's risks for the estimation of H8 beta.

This Report can also inform HAL's response to the Civil Aviation Authority (CAA)'s consultation on the Draft H8 Method Statement and Business Planning Guidance.

The analysis systematically evaluates the key risks faced by HAL and its comparators using a comprehensive, bespoke risk framework. It positions HAL within the broader risk spectrum, drawing implications for beta estimation and required pricing of risk at H8. The approach is transparent, structured, and methodical, clearly linking risk exposure to return expectations.

The five risk categories used – **capex, opex, revenue, regulatory, and financing** – provide a view of the key risk dimensions contributing to return expectations. These risk categories capture both upfront investment risks (capex), ongoing operational risks (opex), market-driven risks (price and demand), and structural risks related to the regulatory and financing arrangements for the airports.

Findings

The comparator airports are major European hubs with similar business risk profiles, but notable differences in investment profiles, demand uncertainty, ownership structures, and risk mitigations and performance incentives specified as part of respective regulatory frameworks.

Capex

Fraport has the largest and most complex capex program, including a new terminal, increasing risk.

Aena's smaller program focuses on maintenance and security, while HAL, Zurich, and AdP have moderately complex programs.

Investment incentives in HAL and Aena's regulatory frameworks introduce risk, but are partly mitigated by risk-sharing mechanisms. Fraport, AdP, and Zurich lack these mechanisms, though Fraport and AdP benefit from annual resets offering implicit protection.

Opex

Airports lack opex risk mitigations or reward/penalty mechanisms. AdP and Fraport benefit from implicit protections through annual resets, though pass-through is not guaranteed and regulatory discretion risks remain.

AdP and Fraport benefit from implicit protections through annual resets, there is no guarantee . HAL and Aena have higher operating leverage, increasing their risk. Zurich and AdP face higher maintenance risk due to shorter asset lives, while HAL, Aena, and Fraport have longer asset lives, reducing maintenance cost risk.

Executive summary (cont.)

Revenue

HAL leads in post-Covid recovery and capacity utilisation, positioning it as the lowest risk in these areas.

While operating at full capacity is considered a risk mitigant, further analysis is needed to assess whether the inherent asymmetry of near-full capacity offsets this benefit.

Aena, though not at full capacity, has shown strong recovery, while Zurich faces peak-time constraints but has overall excess capacity. Fraport is lagging in recovery.

Fraport and AdP benefit from annual tariff adjustments that help mitigate volume risk. HAL's TRS and K-factor mechanisms provide protection, though full recovery under TRS takes up to 10 years and applies only to variances exceeding 10%, with partial recovery for smaller variances. Both measures also cap upside potential.

Aena is fully exposed to traffic fluctuations, making it higher risk, while Zurich, lacking risk mitigation mechanisms, is the highest risk. Only HAL and Aena have performance incentives, with HAL's featuring a higher penalty potential.

Regulatory

HAL and Aena operate under highly structured regulatory frameworks, where regulators have set extensive regulatory mechanisms for charge-setting, which increases regulatory risk.

Fraport and Zurich benefit from more flexible frameworks, where airline negotiations play a key role in determining charges, reducing risk relative to HAL and Aena.

AdP's framework sits between the two, with charges set through negotiations but with greater regulatory authority than at Fraport or Zurich.

Financing

HAL, as the only airport without government ownership, relies more on private investors for capital, while AdP, Aena, Fraport, and Zurich benefit from government-related status, providing greater financial stability and enhancing investor confidence during market stress.

In terms of debt cost recovery, most frameworks are similar, making differentiation difficult. Aena, Fraport, and Zurich operate within regulatory frameworks more open to recovering actual debt costs.

Executive summary (cont.)

Results of the risk analysis

Based on the analysis carried out, HAL and Zurich have the highest overall risk scores, after accounting for TRS and other regulatory risk mitigations (based on equal weight assigned to each risk category).

Categories / Airports	Capex	Opex	Revenue	Regulation	Financing	Weighted risk score
Fraport	3	1	1	1	1	1.40
Zurich	2	3	3	1	1	2.00
AdP	1	2	1	2	2	1.60
Aena	1	2	2	3	1	1.80
Heathrow	2	2	1	3	2	2.00

Legend – risk rating: Low | Med | High

As the risk analysis already incorporates the TRS mechanism, no additional adjustments are required to amend the empirical estimates of comparator betas.

This Report identifies several asymmetric risk drivers associated with the regulatory mechanisms applied to the airports: HAL's performance incentives for service delivery and the performance incentives for investment delivery for both HAL and Aena. These factors are reflected in the risk scores.

Airports operating near or at full capacity face asymmetric risk, as capacity constraints limit their ability to capitalise on potential upside from excess demand, though this is not accounted for in the risk scores pending further analysis.

While other risk drivers may also contain both systematic and asymmetric elements, a detailed analysis and modelling of these factors falls outside the scope of this Report but is recommended for further study.

To assess the impact of asymmetric incentives on risk scores, a sensitivity analysis assumes that HAL and Aena face no additional exposure to performance incentives compared to other airports. This is a conservative assumption, as these incentives may also include systematic elements, the impact of which would be removed in this analysis.

This sensitivity test does not materially alter the preliminary findings. Under this sensitivity, HAL's risk score aligns with that of Aena, and the conclusion that the TRS adjustment is not required remains unchanged.

Next steps

The analysis presented in this Report is preliminary based on initial assessment carried out in the time available. Further detailed analysis with a broader set of comparators and additional modelling to distinguish between systematic and asymmetric risks could provide additional insights and enable accurate pricing

While the high/medium/low scoring system is suitable for preliminary analysis, refinement is necessary to complete more granular assessments of risk exposure and its impact on pricing.

The current ratings are dependent on the comparator set and are assigned on a relative basis. As the comparator set expands, the ratings will need to be updated accordingly and may change.

There is an inherent level of judgment in assigning risk scores. This Report aims to to mitigate this by incorporating quantitative metrics to inform risk assessment.

Further analysis is required to assess specific exposures – whether the single till regime presents higher enterprise-level risk; whether the net impact of operating at or near full capacity is risk reducing – both of which could raise HAL's risk score further.

For calculating average risk scores, equal weights have been assigned to each risk category in this preliminary analysis. The weights could potentially be refined further with economic rationales.

01

Context, scope, and objectives

Context, scope, and objectives

The objective of this Report is to develop preliminary relative risk analysis to inform H8 beta estimation

01

Context:

- In November 2024, the Civil Aviation Authority (CAA) launched a consultation on the Draft H8 Method Statement and Business Planning Guidance, outlining its approach to setting the H8 price control, including beta estimation.
- As HAL is a private UK company, its beta is typically estimated using listed proxies. In the absence of UK-listed comparators in the aviation sector, proxies from non-airport UK sectors or large European airports are considered.
- Given that these comparators are imperfect proxies, there may be risk differences between HAL and these airports, potentially impacting pricing. This highlights the need for a relative risk assessment.
- At H7, the CAA estimated beta based on a subset of European comparator airports, adjusting upwards for the impact of Covid-19 and downwards to account for the assumed reduction in HAL's risk due to the traffic risk-sharing mechanism. This methodology was retained unchanged by the Competition and Markets Authority.
- The analysis accompanying the consultation document suggests that the comparator set for H8 could be expanded to include Aena, AdP, Fraport, and Zurich.

02

Objectives:

- The objective of this Report is to develop a preliminary relative risk assessment between HAL and its comparators and to analyse the implications for the estimation of H8 beta, to inform HAL's response to the CAA's consultation.
- Given the time available to respond to the consultation, the analysis is necessarily preliminary. The analysis is based on the comparators proposed in the H8 Draft Methodology Statement: Aena, AdP, Fraport, and Zurich.
- Consideration of additional comparators in the future would help expand the sample size and further strengthen the relationship between risk assessment and beta.
- The Report does not undertake detailed analysis and modelling of risks to delineate between systematic and asymmetric components and their individual impacts on required risk pricing at H8. It will be important to undertake this exercise in due course.

03

Scope:

- This Report systematically evaluates the key risks faced by HAL and its comparators, positioning HAL within the risk spectrum of these comparators.
- The analysis uses a bespoke framework to categorise and assess these risks, ensuring that key dimensions of the aviation sector are thoroughly captured.
- The report draws out the implications of these preliminary findings for the estimation of beta and required risk pricing at H8.

(a) https://www.caa.co.uk/commercial-industry/economic-regulation-and-competition-policy/heathrow-airport/heathrow-price-controls/current-price-control-h7-2022-2026/h7-reports-by-external-consultants/

Methodology

A robust bespoke framework is adopted to identify and assess differentiated risk exposures

The assessment of relative risk presented in this Report follows a robust methodology integrating both quantitative and qualitative analysis.

The approach systematically identifies and evaluates risks, supported by the collection and analysis of key data metrics. This objective data underpins the relative risk assessment and scoring process, enabling an evaluation of how risk differentials impact expected returns.

The methodology is transparent, structured, and systematic, facilitating the identification and assessment of differentiated risk exposures that affect pricing for both comparators and HAL; it explicitly links risks to financial exposures and hence required returns.

The diagram below summarises the methodology for the analysis.

01

Identify risk drivers and group them into distinct risk categories

- Collate a long list of potential risk drivers from publicly available sources.
- Refine the list by (1) excluding non-material risks, (2) merging similar risks into distinct drivers, and (3) removing risks unlikely to impact required returns.
- Group the selected risk drivers into categories based on their nature.

02

Identify, develop and map metrics to risk drivers

- Identify quantitative risk metrics for each driver.
- Assess the availability of relevant public data for calculation.
- Map feasible metrics to their corresponding risk drivers.

03

Compare overall risk exposure

- Analyse and comment on the potential exposure of each airport to each of the risk drivers, assigning a high/medium/low risk for each risk category.
- Calculate an overall risk score for each airport. In this Report individual risk categories are assigned equal weights.

04

Derive an indicative asset beta range for HAL

- Comment on implications of the results on the beta for HAL at H8.
- Assess the extent to which each risk driver could be reflected in the cost of equity through beta, versus being accounted for through separate adjustments to the cost of equity, in line with corporate finance theory.

Overview of comparator airports

The analysis focuses on the main airport within each comparator group

Comparator airports represent groups with both domestic and international operations, while HAL operates a single airport. Relative risk assessment focuses on the core airport within each group, assumed to be representative of the overall group's risk exposure, consistent with previous analyses by the CAA and other stakeholders. Further analysis may be needed to validate this assumption.

	HAL	AdP	Aena	Fraport	Zurich
Core airport	Heathrow Airport	Paris, Charles de Gaulle Airport	Madrid Airport	Frankfurt Airport	Zurich Airport
Regulatory framework	Five-year price control, 2022-2026	Annual tariff approval following termination of the 2016-2020 control	Five-year price control, 2022-2026	Annual tariff approval	Charge settlement of up to four years
Form of till	Single till	Hybrid till	Dual till	Dual till	Hybrid till
Core/Group Passengers	79.2m / 79.2m	67.4m / 336.4m	60.2m / 314.1m	59.4m / 168.2m	28.9m / 40.5m
Government ownership	0%	51%	51%	52%	38%
Group interests (domestic)	Heathrow Airport	Owns and operates the Charles de Gaulle, Orly, and Le Bourget airports in Paris	Owns and manages 46 airports and two heliports in Spain, including the country's largest airports in Madrid, Barcelona and Mallorca.	Frankfurt Airport	Zurich Airport
Group interests (international)	N/A	Operates 23 international airports directly and through 46% ownership in TAV Airports and 49% in GMR Airports (Turkey and India).	Manages 33 airports internationally via Aena International, including those in Brazil and Mexico, and operates London-Luton Airport with a 51% stake	Owns and operates over 30 airports worldwide including in Greece, Peru and Turkey	Manages and operates several international airports, including in Brazil, Chile, Curaçao and Colombia

03

Risk drivers, categories and metrics

Establishing risk categories, drivers, and metrics

Five broad risk categories are identified to provide holistic view of risk exposure

To ensure a robust relative risk assessment, a structured framework is used to identify and evaluate risk drivers that could lead to material differences in returns. The process begins with the identification and categorisation of key risk drivers, enabling meaningful comparisons across airports. Each driver is validated to ensure it can significantly influence return expectations, confirming that the risks are both relevant and sufficiently differentiated across comparators. By establishing well-defined risk categories, the framework provides a comprehensive view of the risks faced by HAL and its comparators, while maintaining consistency in the assessment.

The five risk categories – capex, opex, revenue, regulatory, and financing – provide a holistic view of the risk dimensions contributing to return expectations. These categories capture both upfront investment risks (capex), ongoing operational risks (opex), market-driven risks (price and demand), and structural risks related to the regulatory and financing environments.

Capex

Capex risk refers to the potential for capital expenditure costs to exceed forecasts or for project delays due to factors such as design complexity, project scale, and timescales.

This category also considers any risk mitigations or delivery incentives provided by the regulatory framework.

Capex risk can vary due to differing nature of investment needs, influenced by market demand, existing infrastructure, and regulatory environments.

Opex

Opex risk refers to the potential for operational costs to exceed forecasts due to factors such as inflation, changes in input prices, or unexpected operational challenges.

Variations in conditions of existing assets and cost structures across airports can create differentiation in opex risk.

This category also considers the risk mitigations and incentive mechanisms provided by the regulatory framework.

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Revenue

Revenue risk reflects exposure to changes in market prices and/or demand.

Exposure to reducing demand and ability to manage volatility, pricing power, and capacity utilisation can all influence exposure to revenue risk, resulting in differentiated exposure.

This category also considers relevant risk mitigations and the impact of performance incentives.

Regulatory

Within this category, regulatory risk is narrowly defined as the overall stability and predictability of the regulatory framework, particularly as regards regulatory resets.

While the design of the framework, including its mechanisms and incentives, influences risk exposure, its impact is already captured in the other four risk categories and is therefore excluded from this category.

Financing

Financing risk refers to challenges in raising both equity and debt capital.

Financing risk is closely linked to operational and investment risks, which are addressed in other categories. To avoid duplication, this Report defines financing risk narrowly, focusing on government ownership and the regulatory treatment of financing costs.

To enhance objectivity, specific metrics are developed for each risk driver to quantify its impact on comparator returns, ensuring the analysis is supported by measurable data for effective comparison.

Summary of risk categories, drivers and metrics

For some risk categories there is limited differentiation in risk exposure across comparator airports

The framework adopted in this Report first validates risk drivers by assessing whether they drive risk differentiation across comparators. For the risk drivers that meet this initial criterion, the analysis then examines how they impact overall risk exposure and, consequently, required returns. Risk drivers that meet both criteria are then mapped onto the relevant risk categories below.

	Risk driver	How the driver impacts risk exposure	Associated quantitative metrics[a]
Capex	Scale of capex Complexity Regulatory risk mitigations Performance incentives	• A larger capital investment programme relative to the existing asset base, increases the risk of cost overruns, project delays, and supply chain challenges. • Higher complexity in capital spend introduces greater uncertainty, raising the risk of cost overruns and delays. Likewise, a higher proportion of new investment projects, as opposed to maintenance, may be indicative of higher exposure to execution risks. • Regulatory mitigations, such as risk-sharing mechanisms, can help manage risks by limiting the financial impact of cost overruns and delays. However, these mechanisms may also cap potential gains, thus limiting the upside for the regulated firm. • The strength and structure of performance incentives can significantly impact outturn returns and risk exposure.	$\frac{Capex\ (2021\ -\ 2026)}{Opening\ asset\ base\ (2021)}$
Opex	Condition of assets Operating leverage Regulatory risk mitigations	• Older or less well-maintained assets increase opex risk due to the higher volatility and unpredictability of maintenance costs. As these assets age, the likelihood of unexpected failures and the need for more frequent repairs or replacements increase. • Operating leverage refers to the proportion of fixed opex relative to total revenue. A higher fixed cost base reduces flexibility to absorb revenue fluctuations, as a significant portion of opex remains constant regardless of demand, leading to higher risk exposure. • Regulatory mitigations, such as risk-sharing mechanisms, can help manage risks by limiting the financial impact of cost overruns and fluctuations. However, these mechanisms may also cap potential gains, thus limiting the upside for the regulated firm.	*Average remaining asset lives* $Average\ \left[\frac{\%\ change\ in\ EBITDA}{\%change\ in\ Revenue}\right]$

Performance incentives for opex were excluded from the analysis, as none of the regulatory frameworks include incentive mechanisms that reward or penalise performance on opex, meaning they were not expected to drive risk differentiation.

Notes: (a) For accounting metrics, the data is sourced from consolidated group accounts and analyst reports that encompass all airports within the group. For aviation metrics specific to individual airports and regulatory decision documents, the analysis focuses on the largest airport within the group.

Summary of risk categories, drivers and metrics (cont.)

Form of till and competition assumed not to create material differentiation, further analysis required

Form of the till and competition/market price risk were excluded from the revenue risk category[(a)]

- Single till limits an airport's ability to manage commercial revenues according to its strategy and increases regulatory risk by exposing more revenue to forecasting errors. While dual till models also carry some risk – i.e. exposure to commercial revenue fluctuations – single till frameworks likely expose airports to higher overall risk. Quantifying this impact requires further analysis, which is beyond the scope of this report.
- All airports are assumed to have similar market power. While HAL faces competition, particularly from Gatwick and from the wider London airport system, it has significant excess demand, which may partly limit competitive pressures. HAL's capacity limitations also prevent it from fully benefitting from excess demand, limiting its ability to outperform.

	Risk drivers	How the driver impacts risk exposure	Associated quantitative metrics
Revenue	Unmitigated demand	• In sectors such as aviation, where a significant portion of revenue is tied to passenger volume, fluctuations in demand can lead to substantial revenue variations. Factors such as available spare capacity and the ability to recover during disruptions like the Covid-19 pandemic can provide important indicators of demand risk. • Regulatory mitigations, such as risk-sharing mechanisms, can help manage risks by limiting the financial impact demand fluctuations. However, these mechanisms may also cap potential gains, thus limiting the upside for the regulated firm. • The strength and structure of performance incentives can significantly impact outturn returns and risk exposure.	*Speed of recovery from Covid*
	Regulatory risk mitigations		
	Performance incentives		
Regulatory	Regulatory discretion	• Regulatory discretion refers to the flexibility regulators have in interpreting and applying rules during reset points. It is separate from the inherent risks embedded in the design of the regulatory framework for each period. Increased regulatory discretion raises perceived regulatory risk, as firms may face unexpected regulatory decisions, leading to greater uncertainty and potential volatility in financial performance.	
Financing	Government ownership	• State ownership may provide greater financial stability during market stress, boosting investor confidence. Credit rating agencies consider government support as credit-positive. • For regulated companies, the ability to recover financing costs is directly impacted by the terms set within the regulatory framework. In some cases, these frameworks may impose limitations or caps on how much of these costs can be recovered. These constraints can reduce the flexibility to raise capital, potentially affecting the company's financial health and its ability to fund necessary infrastructure or operational improvements.	*Share of local/national governments in the airport's equity*
	Financing cost recovery		

Notes: (a) See Appendix A for risk drivers and metrics not taken forward for the assessment and the associated rationale.

04
Relative risk analysis

General observations on comparator risk exposures

Despite operating in the same sector, airports face a number of differentiated risks

The comparator airports analysed in this Report represent large airports in major European cities.

The underlying business risks between these airports differ less than when compared with potential other comparators in other sectors.

The risk differentials between comparator airports are more concentrated on several key factors.

Regulatory regimes:

Regulatory frameworks across jurisdictions vary significantly, particularly in areas such as the frequency of resets, the authority of regulators in determining returns, and the discretion regulators have in changing methodologies.

HAL and Aena appear most comparable, with similar levels of regulatory authority and discretion in setting charges and influencing returns.

Zurich and Fraport operate under more light-handed regulation, with a larger role for airline negotiations.

AdP's regulator appears to have more authority compared to Fraport and Zurich.

Both Fraport and AdP benefit from annual tariff adjustments, providing flexibility to reflect market conditions (prices, demand).

Risk-sharing mechanisms present in regimes with less frequent resets also provide some flexibility.

Performance incentives:

HAL and Aena are subject to incentive mechanisms that reward or penalise them based on operational performance and investment delivery. In contrast, Fraport, Zurich, and AdP lack such mechanisms, implying lower operational performance risk in these airports' regulatory regimes.

Investment profiles:

Airports differ in the scale and complexity of their investment programmes, impacting. Aena's investment programme appears less risky than HAL's, while Fraport, with its large and complex investment programme, appears to carry higher investment risk.

Airports differ in the scale and complexity of their investment programmes. Aena’s investment programme appears the least risky, while Fraport, with its large and complex investment programme, appears to carry higher investment risk.

Demand uncertainty:

While all other airports dominate their respective cities, HAL has the lowest spare capacity and the fastest recovery from Covid-19 despite having local competition, particularly for short-haul flights.

Ownership and financing:

State ownership may provide greater financial stability during market stress, boosting investor confidence. Credit rating agencies consider government support as credit-positive.

Airports also differ in how they are remunerated for financing costs. Some airports are allowed to recover the actual projected cost of debt financing, unlike in the UK regulation, where this is not typically permitted.

The remainder of this section provides a detailed analysis of each airport’s relative risk exposure, starting with an overview of the regulatory regimes they operate under. This is followed by a detailed assessment of risks across the key categories: Capex, Opex, Revenue, Financing, and Regulatory. Unless noted otherwise, risk category ratings are derived by assigning equal weight to individual risk drivers. Detailed assessment of relative exposure for each risk driver can be found in the Appendix.

Overview of regulatory regimes at comparator airports

Differences in regulatory regimes will drive differentiated returns

Comparator airports operate under regulatory regimes that differ significantly from HAL's and other UK frameworks, making it crucial to understand these differences when assessing risk exposure.

- Some regimes, such as those for Fraport and AdP, feature annual resets, allowing for more frequent tariff updates based on current data, which helps mitigate risk. Others, like HAL and Aena, have resets every five years, with mechanisms that may share risk to compensate for longer periods between adjustments. Zurich, with less frequent resets and no risk-sharing, appears to have the riskiest regulatory framework in this regard.
- Some airports (HAL, Aena) include financial rewards or penalties based on investment delivery and service performance, while others (Fraport, Zurich, AdP) lack such incentives, suggesting lower risk exposure.
- Other airports (Fraport, Zurich) are subject to light regulation, where outcomes are driven primarily by negotiations between the regulator and airlines, limiting regulatory discretion. In contrast, airports like HAL, Aena, and AdP face greater scrutiny from the regulator, with the power to reject proposals more readily and amend its approach across regulatory periods.

Airport	Regulatory regime
HAL	HAL is regulated under a price-cap framework established by the CAA, which sets a maximum charge per passenger for services over a regulatory period, typically five years. The price cap is determined using a RAB-based building block methodology. The CAA has a financing duty to ensure that HAL can obtain the necessary funding to deliver its airport services. The regulatory framework also includes incentives and risk-sharing mechanisms. HAL must meet specific deliverables, with penalties for delays. Key features include a 75% capex risk-sharing factor[(a)], performance incentives linked to service quality (weighted towards penalties)[(b)] and a traffic risk-sharing mechanism to address significant forecast deviations[(c)].

Notes:
(a) H7 Final Decision Section 2, para 7.25
(b) H7 Final Decision, Section 1, paras 3.34, 3.35
(c) H7 Final Decision, Section 1, para 2.20

Overview of regulatory regimes at comparator airports (cont.)

Aena's regime is more comparable to HAL's, while Fraport's is more light-touch

Airport	Regulatory regime
Aena[(a)]	Aena's revenue per passenger is determined with reference to the Annual Maximum Revenue per Passenger (IMAP), set every five years. This is a ceiling which ensures the recovery of efficient operator costs, including capital costs, which are based on the regulated asset base (RAB). IMAP includes a P-index adjustment to account for input cost variations outside management control. An 'X' factor determines the allowed annual increase in IMAP during the price control period. It is calculated to ensure that the present value of expected revenue over the five-year regulatory period covers the present value of expected costs for the same period[(b)]. IMAP is then adjusted to establish the Adjusted Annual Maximum Revenue per Passenger (IMAAJ) for service and investment performance.
Fraport	Fraport, as the operator of Frankfurt Airport, is responsible for determining the fees for the use of its facilities and services, including any discounts and incentives[(c)]. It submits a draft schedule of regulated charges to the Hessian Ministry of Economics, Energy, Transport, and Housing for review and approval, as required by applicable regulations. The Ministry's role is strictly limited to ensuring that the fee structure complies with legal criteria such as objectivity, transparency, non-discrimination, and the appropriateness of the charges in relation to the expected costs and a focus on efficient service provision. The Ministry may refrain from examining the appropriateness of the charges if Fraport submits a written agreement with airport users on the charge structure, provided there is no violation of state aid law[(d)]. It does not have the authority to modify the specific structure of the fees or interfere with the incentives established by Fraport[(c,d)]. Fraport must also conduct a consultation with airport users regarding the fee structure at least once a year[(d)]. There is not publicly available information on incentives and risk-sharing mechanisms which may be included in agreements with airlines. While the airport operates under a dual-till system, aviation law permits Fraport to decide whether and how to incorporate revenues and costs from the airport's other commercial activities when setting the charges[(d)].

Notes:
(a) Annual Report, 2023, p. 37
(b) Documento de Regulación Aeroportuaria (DORA 2022-2026), p. 54
(c) Hessian Ministry of Economics, Energy, Transport,, and Housing (2021), New Fees for Frankfurt Airport
(d) Federal Ministry of Justice and Consumer Protection, Aviation Act, Section 19B

Overview of regulatory regimes at comparator airports (cont.)

Zurich has a multi-year regime whereas AdP is currently operating under an annual framework

Airport	Regulatory regime
Zurich	Zurich operates under light-handed regulation, with charges negotiated between the airport and airlines. If no agreement is reached, or if the negotiated outcome is rejected by the regulator (FOCA), the airport will submit a proposal to the regulator based on a building block approach for approval[(a)(b)]. Zurich must initiate charge adjustments within four years of the regulations taking effect[(c)]. The airport operates under a hybrid-till framework as its air traffic charges are partially adjusted for non-aeronautical revenues, such as car parking[(d)]. A mechanism introduced on January 1, 2025, corrects for excess return and shortfalls, such as those due to changes in traffic or cost assumptions, to be corrected in the next price control period[(e)]. This mechanism did not apply in previous periods. The Ordinance on Airport Charges does not include risk-sharing or performance incentives, though private airline agreements may contain such clauses.
AdP	The laws governing AdP's regulation allow for the possibility of a multi-year Economic Regulation Agreement with the State, though it is not mandatory[(f)]. Since 2020, AdP has operated under an annual tariff approval process[(g)], with an option to transition to a multi-year framework[(h)] which appears to be the preferred method for the regulator[(i)]. *This Report evaluates ADP's exposure based on the annual tariff framework, as it has been consistently applied for several years.* Each year, AdP submits a tariff proposal based on current service costs for consultation with aviation users and subsequent approval by the French Transport Regulatory Body (ART)[(f)]. The annual framework is designed to provide a fair return on capital, alignment of fees with service costs, and moderate tariff increases, without specific capex or service quality commitments[(h)]. ART approves AdP's annual tariff proposals if they comply with regulations. If opposed, AdP may submit a revised proposal within one month. ART then has one month to approve the new proposal or reject it again. If rejected, prior tariff rates remain in effect. If the last approval is over 24 months old, ART is authorised to set new rates for the following fee period[(f)]. The proposed tariffs are based on a hybrid till model, which includes certain non-aeronautical services, such as car parks and industrial services, within the regulated scope. These services are therefore factored into the calculation of aeronautical charges[(j,k)].

Notes:
(a) SR 748.131.3, Article 20, 2019 version available in English
(b) SR 748.131.3, Article 29, 2019 version available in English
(c) SR 748.131.3, Article 10, 2019 version available in English
(d) SR 748.131.3, Article 34, 2019 version available in English
(e) Ordinance on Airport Charges: Swiss Federal Council adopts Ordinance
(f) Annual Report, 2022, p. 66
(g) Termination of the 2016-2020 Economic Regulation Agreement (ERA)
(h) Groupe AdP (2024), Investor Toolbox, pp. 46-47
(i) ART (2023), Recommendations for the evolution of the regulatory framework for airports, p.12
(j) Groupe AdP (2019), Investor Toolbox, p. 21
(k) Groupe AdP (2024), Investor Toolbox, pp. 48

Relative risk analysis – Capex

Fraport has the highest risk on Capex; HAL has medium risk

Overview of relative risk ratings

In infrastructure-heavy sectors like aviation, unforeseen capital expenditure costs or project delays can significantly impact returns. The key risk drivers – investment scale, complexity, and the presence of regulatory mitigations or incentive mechanisms – directly influence returns via the likelihood of cost overruns, delays, the financial impact of performance, and the ability to manage these risks through regulatory risk-sharing.

Fraport receives a high capex risk rating due to its large and complex investment programme. Aena and AdP have low risk ratings, with smaller, simpler capex programmes and regulatory risk mitigations in place. AdP also benefits from the absence of performance penalties.

- Larger and more complex capex programmes carry higher risk due to increased likelihood of cost overruns and delays. Fraport's programme is the largest, investing 17% of its asset base annually, with a new terminal at Frankfurt (and internationally). Aena's smaller, moderately complex programme (7%) suggests the lowest exposure. The remaining airports fall in between, with investment programmes of moderate scale and complexity, presenting a relatively consistent risk profile across them.
- Stronger or asymmetric incentive structures increase risk. AdP, Fraport, and Zurich are not exposed to performance penalties, whereas Aena and HAL are. Aena's capped incentives limit downside risk, while HAL faces more exposure without caps.
- The presence of regulatory mechanisms that allow for risk sharing with customers tend to reduce overall risk exposure. HAL and Aena benefit from certain risk mitigations, though Aena's are relatively limited. In contrast, Fraport and AdP have the advantage of annual tariff adjustments, which offer flexibility to reset charges based on evolving conditions and help manage risk. Zurich, with its longer tariff reset periods (up to four years), may have embedded risk-sharing mechanisms through its negotiations with airlines.

	HAL	Aena	AdP	Fraport	Zurich
Relative risk ratings					

Notes: (a) See Appendix B for the assessment of each of Capex risk drivers.

Relative risk analysis – Opex

Zurich has the highest risk on Opex; HAL has medium risk

Overview of relative risk rankings

Opex risk refers to the volatility in day-to-day operational costs, which can fluctuate due to factors which may be beyond the company's control. Key risk drivers – asset condition, degree of operating leverage, and regulatory risk mitigations –indicate the likelihood and sensitivity to fluctuations in opex, as well as the ability to manage these risks through regulatory risk-sharing mechanisms. No specific reward or penalty mechanisms related to opex performance were applicable to any of the comparators and, as such, were not included in the analysis.

Fraport has the lowest opex risk due to its relatively new assets, low operating leverage, and annual charge resets. Zurich carries the highest risk, with a multi-year framework, no risk mitigations, and older assets.

- Regimes with less frequent resets and no risk sharing are riskier than those with more frequent adjustments, as they offer less flexibility to manage cost fluctuations. AdP and Fraport benefit from annual resets, while HAL, Aena, and Zurich operate under longer control periods.
- Older assets increase maintenance cost risk. Zurich and AdP have the shortest remaining useful asset lives (RUL), while HAL and Aena have relatively longer RULs, and Fraport has the longest.
- A lower proportion of fixed costs (operating leverage) allows greater flexibility in adjusting to demand changes. HAL and Aena have the highest operating leverage implying higher risk relative to comparators.

	HAL	Aena	AdP	Fraport	Zurich
Relative risk ratings					

Notes: (a) See Appendix C for the assessment of each of Opex risk drivers..

Relative risk analysis – Revenue

Zurich has the highest revenue risk, with highest spare capacity and no explicit risk mitigations

Overview of relative risk rankings

In the aviation sector, demand fluctuations can significantly impact revenues and returns in the absence of regulatory risk mitigations, which help to mitigate these effects.

Factors such as available spare capacity and the ability to recover during disruptions like the Covid-19 pandemic can serve as important indicators of demand risk.

- The level of recovery from the pandemic indicates the resilience of an airport to demand disruptions.
- Airports operating near or at full capacity are less sensitive to downside demand fluctuations, as they can optimise existing capacity or shift demand between slots. However, these airports face asymmetric risk exposure, as capacity constraints prevent them from benefiting from the upside that could arise from excess demand. While downside risks can be mitigated, the potential upside is smaller than the downside. The greater the capacity constraint, the more pronounced the asymmetry. While this asymmetry may offset the positive impact of risk mitigation on overall risk, it may not be directly relevant for beta estimation unless there is also a systematic component. Therefore, the impact of asymmetric risk is excluded from the overall risk scoring at this stage pending further analysis – and operating near or at full capacity is considered a material differentiating factor.

Performance incentives, through rewards and penalties, can further amplify the outcomes of operational performance, whereas regulatory risk sharing can mitigate the financial impact of demand fluctuations.

HAL, with its TRS and K-factor mechanisms, along with AdP and Fraport, which benefit from annual charge resets, have relatively lower revenue risk compared to other airports in the group. This holds true even though HAL faces performance penalties, while the others do not. Aena, on the other hand, has limited protection against volume risk, which makes it higher risk. Zurich faces the highest level of risk as it operates with substantial spare capacity and lacks any risk mitigation mechanisms.

Notes: (a) See Appendix D for the assessment of each of Revenue risk drivers.

Relative risk analysis – Revenue (cont.)

Further analysis is required on impact of mitigations and spare capacity on net risk

Overview of relative risk rankings (cont.)

- HAL leads the group in both resilience and capacity, positioning it as the lowest risk on these drivers, given that operating at full capacity is considered a risk mitigant in this analysis.

  Aena is not operating at full capacity but has shown strong resilience in the post-Covid recovery. Zurich has the most excess capacity, while Fraport lags behind in returning to pre-Covid demand levels.

- Fraport and AdP benefit from annual tariff adjustments, which mitigate exposure to volume risk as tariffs are recalculated annually based on updated passenger volume forecasts.

  HAL's regulatory framework includes Traffic Risk Sharing (TRS) and a K-factor correction mechanisms. The former transfers part of the traffic risk to airlines and provides some risk protection. However, only variances exceeding 10% of forecasted revenues qualify for full recovery and this recovery takes up to 10 years, providing no immediate cash flow benefit. Although TRS appears less protective than annual resets, a more detailed analysis is needed to assess its overall risk impact compared to annual reset frameworks.

  The K-factor mechanism, which also applies to Aena in a similar form, adjusts revenues based on the actual traffic mix, correcting for deviations from forecasts in a symmetric manner.

  This Report assumes that, with the combination of the TRS and K-factor, HAL can be assessed with the same rating on risk mitigations as AdP and Fraport, though further analysis of specific detail is needed to validate this. Aena, on the other hand, should be assessed as higher risk than these airports, with Zurich deemed even riskier. This is due to Aena being fully exposed to passenger traffic fluctuations, except in cases of highly exceptional circumstances. Zurich, meanwhile, appears to lack specific risk mitigation mechanisms.

- Only HAL and Aena have performance incentives related to quality of service, with HAL's incentives featuring an asymmetric profile that offers a higher penalty potential.

	HAL	Aena	AdP	Fraport	Zurich
Relative risk ratings					

Notes: (a) See Appendix D for the assessment of each of Revenue risk drivers.

Relative risk analysis – Regulatory

HAL and Aena have the highest regulatory risk

Overview of relative risk rankings

Regulation has a significant impact on overall risk exposure, influencing several other risk categories discussed in this Report. However, the regulatory risk category specifically focuses on residual risk drivers, with particular emphasis on the level of regulatory discretion. This refers to the flexibility regulators have in interpreting and applying rules during reset periods, which can substantially affect outcomes.

HAL and Aena face the highest risk within the group, as their regulators possess the broadest authority and discretion in charge setting. In contrast, Fraport and Zurich present the lowest risk, with pricing being more influenced by negotiations with airlines, offering greater flexibility and autonomy.

- The regulator has the authority to set charges and adjust the methodology between resets. Additionally, for HAL, the appeal regime is error-based which allows for significant discretion to the regulator as was observed during the H7 CMA appeals.
- Fraport and Zurich operate under lighter-touch regulatory regimes. For Fraport, the regulator's review is limited, and its scope may be further constrained if an agreement is reached with the airlines. Similarly, Zurich's regulator only approves charges if an agreement cannot be reached with the airlines or if it rejects the negotiated outcome, thus limiting its discretion in charge setting.
- The authority and discretion of AdP's regulator is likely broader, as it has the power to freeze charges. Furthermore, if the last approval exceeds 24 months, the regulator is authorised to set new rates for the upcoming fee period.

	HAL	Aena	AdP	Fraport	Zurich
Relative risk ratings					

Notes: (a) See Appendix E for the assessment of each of Regulatory risk drivers..

Relative risk analysis – Financing

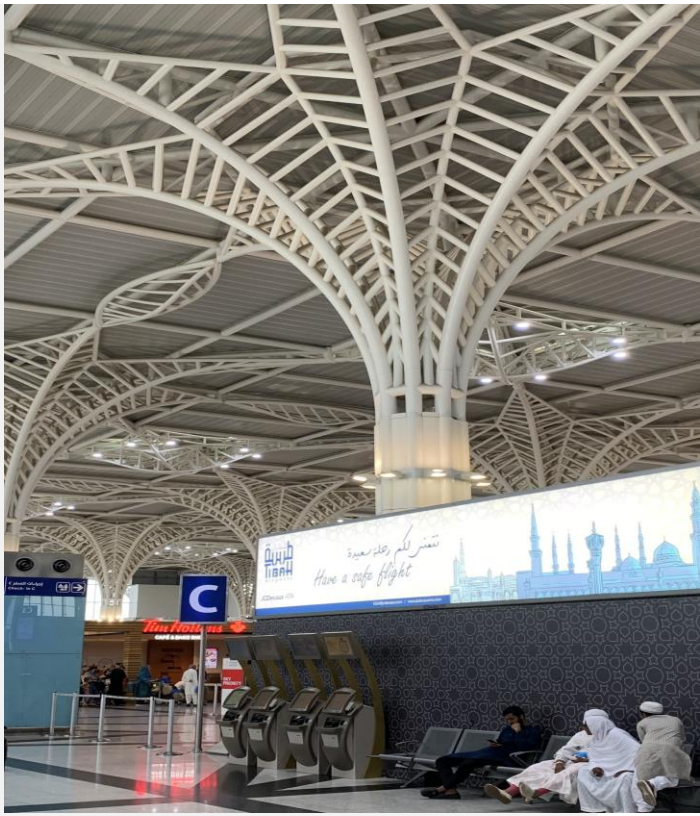
Differences in financing risk are subtle, with only HAL and AdP classified as medium risk.

Overview of relative risk rankings

Financing risk refers to challenges in raising both equity and debt capital. While it can be linked to other risk categories, as reflected in credit rating assessments that consider operational and investment risks, this Report defines it narrowly, focusing specifically on government ownership and the regulatory treatment of financing costs. As such there is no overlap with other categories. Regulatory regimes that increase the uncertainty around full capital recovery are typically seen as higher risk. In contrast, government ownership can mitigate this risk by providing greater financial stability and boosting confidence for other investors during periods of stress.

HAL and AdP receive a medium risk score. HAL's score is influenced by the lack of government ownership and the regulator's discretion in determining which financing costs are considered efficient for recovery.

- As the only airport without government ownership, HAL relies more heavily on private investors for capital. In contrast, AdP, Aena, Fraport, and Zurich benefit from government-related status, with potentially greater financial stability during market stress, boosting investor confidence.
- The ability to recover efficient debt costs is similar across most airports, making differentiation challenging. Aena, Fraport, and Zurich have regulatory regimes more open to recovering actual debt costs. HAL and AdP may be somewhat riskier: HAL's efficient costs are determined by the CAA, and AdP's financing cost recovery may be limited by the need to keep tariff increases "moderate" and less focus on actual costs.



	HAL	Aena	AdP	Fraport	Zurich
Relative risk ratings					

Notes: (a) See Appendix E for the assessment of each of Financing risk drivers..

05

Conclusion and implications on returns required at H8

Relative risk assessment – key observations

All comparator airports operate in similar business environments but exhibit varied risk profiles

The comparator airports analysed in this Report are major European hubs with similar business risks but also important risk differentials. These differentials relate to investment profiles, ownership structures, demand uncertainty, risk mitigations and performance incentives specified as part of respective regulatory frameworks.

Capex

Fraport has the largest and most complex capex programme, including a new terminal development, which increases risk. Aena's capex programme is the smallest, focused primarily on maintenance and security, while HAL, Zurich, and AdP have moderately complex capex programmes.

Investment incentives in HAL and Aena's regulatory frameworks introduce risk but are partially offset by the mitigation provided by risk-sharing mechanisms. Fraport, AdP, and Zurich lack these mechanisms, though Fraport and AdP benefit from annual resets, providing implicit protection.

Opex

Airports generally lack opex risk mitigations or reward/penalty mechanisms. AdP and Fraport benefit from implicit risk protections through annual resets, although there is no guarantee that costs will be passed through, and the risk of regulatory discretion remains.

HAL and Aena have the highest operating leverage, implying a higher risk compared to the others.

Zurich and AdP have the shortest remaining useful asset lives, resulting in increased susceptibility to unexpected maintenance needs. HAL and Aena have relatively longer asset lives, and Fraport has the longest, reducing their maintenance cost risk.

	Capex	Opex	Revenue	Regulation	Financing	Average score
Fraport	3	1	1	1	1	1.4
Zurich	2	3	3	1	1	2.0
AdP	1	2	1	2	2	1.6
Aena	1	2	2	3	1	1.8
HAL	2	2	1	3	2	2.0

Relative risk assessment – key observations (cont.)

HAL and Zurich have the highest risk scores based on equal weighting of risk categories

Revenue

All airports are primary hubs in their respective cities. Some are the only airport in the city, such as Madrid (AENA).

HAL leads in post-Covid recovery and capacity utilisation, making it the lowest risk in these areas. Operating at full capacity is considered a risk mitigant, although further analysis is required to determine whether the inherent asymmetry of operating at or near full capacity may offset this risk reduction.

Aena is not operating at full capacity but has shown very strong recovery. Zurich is constrained at peak times but overall has excess capacity, and Fraport lags in recovery.

Fraport and AdP benefit from annual tariff adjustments, which help mitigate volume risk. HAL's TRS and K-factor mechanisms offer protection, though full recovery under TRS takes up to 10 years and applies only to variances exceeding 10%, with partial recovery for variances below this threshold and both measures also act as a cap on upside.

Aena is fully exposed to traffic fluctuations and is considered higher risk, while Zurich, which is lacking any risk mitigation mechanisms, is the highest risk.

Only HAL and Aena have performance incentives, with HAL's featuring a higher penalty potential.

Regulatory

HAL and Aena operate under highly structured regulatory frameworks, where regulators have significant authority and discretion in charge-setting, which increases risk.

In contrast, Fraport and Zurich benefit from more flexible frameworks, where airline negotiations play a key role in determining charges, reducing risk relative to HAL and Aena.

AdP's framework lies between the two, with charges determined through negotiations, but with a regulator holding more authority than in Fraport or Zurich's cases.

	Capex	Opex	Revenue	Regulation	Financing	Average score
Fraport	3	1	1	1	1	1.4
Zurich	2	3	3	1	1	2.0
AdP	1	2	1	2	2	1.6
Aena	1	2	2	3	1	1.8
HAL	2	2	1	3	2	2.0

Relative risk assessment – key observations (cont.)

Risk assessment is net of mitigations, so no downward adjustment required in lieu of TRS

Financing

HAL, as the only airport without government ownership, relies more on private investors for capital, whereas AdP, Aena, Fraport, and Zurich benefit from government-related status, which can provide greater financial stability and enhance investor confidence during market stress.

Frameworks are broadly similar n terms of debt cost recovery, making differentiation challenging. However, Aena, Fraport, and Zurich operate within regulatory frameworks that are more open to recovering actual debt costs.

When assigning equal weight to each risk category, HAL's overall risk score net of TRS is positioned at the upper end alongside Zurich, though different weighting could lead to alternative outcomes. Crucially, as this risk analysis accounts for the TRS mechanism, no further adjustments are necessary for the TRS mechanism in the form of a beta deduction.

	Capex	Opex	Revenue	Regulation	Financing	Average score
Fraport	3	1	1	1	1	1.4
Zurich	2	3	3	1	1	2.0
AdP	1	2	1	2	2	1.6
Aena	1	2	2	3	1	1.8
HAL	2	2	1	3	2	2.0

Delineating between systematic and asymmetric risks

The results remain largely unchanged when asymmetric risks are excluded as a sensitivity.

The nature of risk exposure determines how it should be accounted for in pricing. To ensure risks are properly accounted for, differences in risk exposure across comparators must be explicitly factored in.

Type of risk	Description of risk	Capturing risks in required cashflows and returns
Systematic risk	• Systematic risk refers to an entity's exposure to events that impact broad market outcomes, such as overall market returns, economy-wide resource levels, or aggregate income.	• Systematic risk is measured using the Capital Asset Pricing Model (CAPM) or similar factor models. The systematic risk is captured by the asset beta factor and can be measured empirically for listed comparators.
Asymmetric risk	• The CAPM assumes that returns are normally distributed, i.e. they are clustered around the mean with a symmetric distribution. As a result, the CAPM does not inherently account for asymmetric risk which typically takes form of expected loss[(a)]. • Expected loss occurs when financial projections on average imply a return lower than the required return. An expected loss can be a feature of any framework with mechanisms that imply downside exposure and no or limited upside. • In cases of material expected loss, the company must be compensated separately from the systematic risk premium to ensure a "fair bet" (i.e., a P50 position).	• The CAPM, and consequently the asset beta, do not capture asymmetric risk, which should be reflected in expected cash flows. This is because the CAPM estimates a risk premium based on symmetric risk exposure around the mean expected return, without accounting for potential deviations from this mean. • Any asymmetric risk exposure that affects expected cashflows and is not reflected in the latter under the regulatory regime framework should be reflected in a separate adjustment.

This Report identifies several asymmetric risk drivers associated with the regulatory mechanisms applied to the airports: HAL's performance incentives for service delivery and the performance incentives for investment delivery for both HAL and Aena. These factors are reflected in the risk scores. Additionally, airports operating near or at full capacity face asymmetric risk, as capacity constraints limit their ability to capitalise on potential upside from excess demand, though this is not accounted for in the risk scores pending further analysis. While other risk drivers may also contain both systematic and asymmetric elements, a detailed analysis and modelling of these factors falls outside the scope of this Report, but is recommended for further study.

To assess the impact of asymmetric incentives on risk scores, a sensitivity analysis assumes that HAL and Aena face no additional exposure to performance incentives compared to other airports. This is a conservative assumption, as these incentives may also include systematic elements, the impact of which would be removed in this analysis.

This sensitivity test does not materially alter the preliminary findings. Under this sensitivity, HAL's risk score aligns with that of Aena, and the conclusion that the TRS adjustment is not required remains unchanged.

Notes: (a) The other form that asymmetry can take is skewness. This occurs when the overall distribution of returns is not normal but does not necessarily imply an expected loss. Skewness measures the lack of symmetry in a distribution. If the distribution is negatively skewed, it means that there is a longer left tail, and extreme negative returns are more likely to occur.

Next steps

The objective of this Report is to develop a preliminary relative risk assessment between HAL and its comparators and to analyse the implications for the estimation of H8 beta, and to inform HAL's response to the CAA's consultation.

Given the limited time available to respond to the consultation, the analysis is preliminary. The following refinements and areas for further study have been identified:

- The use of only airport comparators, some of which operate under more opaque regulatory regimes, may limit the statistical accuracy and richness of the beta estimate. Expanding the sample size to be pan-sectoral could help establish a clearer relationship between risk scores and corresponding beta estimates, providing an enhanced understanding of key comparative risk drivers for HAL.
- Note that the current ratings are dependent on the comparator set and are assigned on a relative basis. As the comparator set expands, the ratings will need to be updated accordingly and may change.
- Similarly, while the high/medium/low scoring system is suitable for preliminary analysis, refinement is necessary for more granular assessments of risk exposure and its impact on pricing.
- A detailed analysis and modelling to distinguish between systematic and asymmetric risks would provide additional insights and enable accurate pricing.
- There is an inherent level of judgment in assigning risk scores, which this Report has attempted to mitigate by incorporating quantitative metrics for greater objectivity.
- Further analysis is required to assess specific exposures – whether the single till regime presents higher enterprise-level risk; whether the net impact of operating at or near full capacity is risk reducing – both of which could raise HAL's risk score further.

06
Appendices

Appendix A
Other risk drivers

Appendix A

Risk drivers and metrics not taken forward for the assessment

The risk drivers and metrics outlined below are excluded from the analysis as they are not expected to lead to differentiated risk exposures that would impact the required returns.

Form of the till	HAL operates under a single-till regulatory framework, where forecast non-aeronautical revenues are included in setting airport charges, with no adjustment for differences between forecasted and actual revenues. In contrast, comparator airports use dual-till or hybrid frameworks. Dual-till fully separates aeronautical and non-aeronautical revenues when setting tariffs, while hybrid frameworks allow some non-aeronautical income to influence charges. All frameworks expose airports to non-aeronautical revenue volatility at the enterprise level, with the risk differential depending on several offsetting factors: • Dual-till frameworks are fully exposed to non-aeronautical revenue fluctuations, with symmetric upside and downside risk, but with lower regulatory discretion which reduces forecasting risk. • Under HAL's single-till framework, exposure to non-aeronautical revenue fluctuations is similar during a price control period, as the aeronautical charge cap cannot be adjusted for deviations in non-aeronautical revenue forecasts. • Single till models encompass all airport revenues within the regulatory framework, limiting airports' commercial freedom to manage the non-aeronautical business in line with their strategic objectives. • Over a longer horizon, the single-till framework allows for regulatory resets to adjust non-aeronautical revenue forecasts based on updated information. While this could be partially positive, this provides greater discretion to the regulator, increasing forecasting risk. • Hybrid frameworks lie between these two models. The single-till model is likely to be higher risk to investors. However, quantifying the risk impact requires further analysis which is beyond the scope of this Report. Therefore, this Report does not consider the regulatory till as a differentiating factor within the comparator group.
Competition / market price risk	An airport's exposure to price volatility is typically influenced by the level of competition within its catchment area, with higher competition generally leading to greater pricing volatility. All airports are broadly similar in market position in terms of competition. While HAL faces competition, particularly from Gatwick, it is the most capacity-constrained which may mitigate competitive pressures. However, these capacity limitations also prevent it from fully benefitting from excess demand, limiting its ability to outperform. As a result, this Report does not consider the degree of competition to be a material differentiating risk driver between HAL and its comparators, nor within the comparator group itself.
Opex incentives	Comparator regulatory frameworks do not feature incentive mechanisms that reward or penalise opex performance.
Passenger growth volatility	Passenger growth volatilities are similar across comparators, resulting in insufficient variation to create meaningful differentiation in risk or required returns.

Appendix B
Capex risk drivers

Appendix B

Relative risk analysis – Capex

Scale and complexity of capex

The scale of capex [(a)] relative to a company's existing asset base[(b)] and the complexity associated with the underlying spend are important drivers of capex risk. A larger and more complex investment programme relative to the existing asset base increases the risk of cost overruns, project delays, and supply chain challenges. Similarly, a higher proportion of new investment projects, as opposed to maintenance, typically signals higher exposure to execution risks.

Fraport receives a high-risk rating on these drivers, while Aena is rated low risk. Zurich, AdP, and HAL fall into the medium-risk category.

- Fraport has the largest capex programme among the airports, including a new terminal at Frankfurt. The complexity of the new terminal constructions, alongside the scale, contributes to the relatively high risk associated with the programme.
- In contrast, Aena has the smallest capex programme, with a significant share of the investment focused on maintenance and security. The overall capex programme is expected to be of moderate complexity compared to peers.
- For H8, initial estimates by HAL suggest a moderate annual spend relative to its forecast regulated asset base as of the end of H7. The scale of spend is also moderate for AdP and Zurich.
- Nearly half of H8 investment is expected to be on asset maintenance and compliance, with the remaining spend on baggage systems, new capacity, decarbonisation, and airline automation. Given the significant share of maintenance spend, the overall programme is expected to be of moderate complexity compared to peers.
- A major share of ADP's investment programme is focused on asset maintenance, regulatory compliance, safety and security. The overall capital spend is expected to be of moderate complexity compared to its peers.
- Zurich's capex includes the completion of a new baggage system, renovation of passenger areas, a new cargo hangar and the commencement of a new replacement dock, tower, and base. As a result, the capex spend is expected to be moderately complex.

Selected risk metrics	HAL	Aena	AdP	Fraport	Zurich
Average Capex (2021-2026)/ PPE and Investment Property (2020)	c10.% [H8]	c.7%	c.12%	c.17%	c.12%
Nature of Capex	Half maintenance; along with capacity expansion and airline automation	Significant maintenance and security; along with baggage and intermodal transport	Significant maintenance, compliance, safety and security; along with capacity expansion and airline automation	New terminal at Frankfurt	Renovations and some new additions like hangars and docks

Notes: (a) For HAL, the scale of capex is based on its initial estimates for capex in H8. For the comparator airports, the scale of capex is based on capex over 2021-2026 representing both historical and planned investments.
(b) For the purposes of this analysis, the asset base is taken to be equal to the regulated asset base before the start of H8 for HAL. For the comparator airports, the asset base is taken to be equal to the Property, Plant and Equipment and Investment Property in their 2020 balance sheets.

Appendix B

Relative risk analysis – Capex (cont.)

Regulatory risk mitigations

Regulatory mitigations, such as risk-sharing mechanisms, can help manage risks by limiting the financial impact of cost overruns and delays. However, these mechanisms may also cap potential gains, thus limiting the upside for the regulated firm.

Risk mitigation can be explicit through dedicated mechanisms or implicit in the frequency of tariff adjustments.

HAL is the lowest risk on this driver, while Zurich is the highest, with the others falling in between.

- HAL and Aena operate under multi-year regulatory frameworks and benefit from some regulatory risk mitigations. However, Aena's risk-sharing mechanism appears to be triggered only by significant events, indicating a less protective regime.
- AdP and Fraport have annual tariff reviews, which serve as an implicit risk mitigant.
- Zurich, with its longer tariff reset periods (up to four years), may have embedded risk-sharing through negotiations with airlines, but the extended settlement period likely makes it higher risk compared to AdP and Fraport.

Performance incentives

The strength and structure of performance incentives can significantly impact outturn returns and risk exposure. Stronger or asymmetric incentive structures increase risk.

HAL is the higher risk on this driver, followed by Aena, while the others are considered low risk.

- AdP does not have rewards or penalties for investment delivery.
- Fraport and Zurich may or may not have such incentives, but given the central role of airline negotiations in tariff setting, it is unlikely these incentives will disadvantage the airports.
- Both HAL and Aena face the risk of penalties, though Aena's exposure is capped, whereas HAL's is not.

Selected risk metrics	HAL	Aena	AdP	Fraport	Zurich
Regulatory risk mitigations	5-year price control; sharing of overspend/underspend relative to the agreed project budget, with HAL bearing/retaining 25% of any overspend/underspend.	Symmetric adjustments to revenues for investment deviations possible, provided they are urgent, unforeseeable, and do not exceed 3% of planned investments for each year of the 5-year period[(a)].	No risk sharing mechanisms identified under the annual framework. The more frequent tariff approval process for AdP likely reduces risk, as it allows tariffs to more promptly reflect new information.	Fraport follows an annual tariff adjustment process whereas Zurich is subject to a charge settlement of up to four years. There may be some risk sharing and incentive mechanisms within the agreements with airlines.	Up to 4-year price control; no risk sharing and incentive mechanisms identified. There may be some risk sharing and incentive mechanisms within the agreements with airlines.
Additional performance incentives	Delivery incentives in the form of potential penalties tied to various deliverables.	Capex penalty for strategic investment delays over 3 months, with a maximum penalty of 5% of annual investment per individual project and 2% at the aggregate level.	No additional incentive mechanisms under the annual framework.		

Notes: (a) The Secretary of State for Infrastructure, Transport, and Housing can approve adjustments to the adjusted maximum annual revenue per passenger for investment deviations. If the deviations are due to regulatory changes mandated by law or royal decree, or provisions from international regulations that are urgent or unforeseeable, the 3% limit does not apply.

Appendix C
Opex risk drivers

Appendix C

Relative risk analysis – Opex

Condition of assets

Older or less well-maintained assets increase opex risk due to the unpredictability of maintenance costs. As these assets age, the likelihood of unexpected failures and the need for more frequent repairs or replacements increase.

The quantitative metric for this risk driver is the average remaining useful life (RUL) of PPE assets, assessed by comparing the total annual PPE base with the corresponding annual depreciation rates over the 2014-2023 period.

Fraport is the lowest risk on this driver, while AdP and Zurich are high risk, with HAL and Aena in the middle:

- Fraport's assets have the longest RUL, nearly double that of Zurich, likely due to the recent construction of a new runway and terminal over the past 15 years.
- Zurich's RUL is the shortest. This is driven by the age of Terminal A and the control tower, both of which are due for replacement, with construction delayed by Covid-19 and expected to begin in 2030, completing around 2033. AdP's RUL is similar to Zurich's.
- HAL and Aena have similar risk profiles, with newer assets (e.g., T5) balanced by older ones (e.g., T3).

Operating leverage

Operating leverage refers to the proportion of fixed opex relative to total revenue. A higher fixed cost base reduces flexibility to absorb revenue fluctuations, as a significant portion of opex remains constant regardless of demand, leading to higher risk exposure.

Operating leverage cannot typically be calculated based on the information disclosed in annual reports. As a proxy, the Degree of Operating Leverage (DOL) is used, which is calculated as the ratio of the percentage change in EBITDA to the percentage change in revenue. This proxy has limitations and does not fully capture the distinction between fixed and variable costs.

A higher DOL indicates a larger proportion of fixed costs, which heightens operational risk by reducing the airport's ability to adjust costs in response to fluctuating demand.

HAL and Aena are medium risk on this driver, while the others are low risk.

The calculation excludes the Covid-19 period to focus on normal operating conditions and excludes outliers (DOL figures beyond the +/- 10.00 range).

Due to the limitations inherent in this metric, it is assigned a lower weight in deriving the overall rating for the opex category.

Selected risk metrics	HAL	Aena	AdP	Fraport	Zurich
Remaining asset life for PPE (2014-2023)	c.17 years	c.18 years	c.14 years	c.22 years	c.12 years
Average Operating leverage (2014-2019)	1.55x	1.32x	1.05x (excluding outlier in 2016)	0.95x (excluding outliers in 2014 and 2016)	0.92x

Appendix C

Relative risk analysis – Opex (cont.)

Regulatory risk mitigations

Regulatory mitigations, such as risk-sharing mechanisms, can help manage risks by limiting the financial impact of cost overruns and fluctuations. However, these mechanisms may also cap potential gains, thus limiting the upside for the regulated firm.

Risk mitigation can be explicit through dedicated mechanisms or implicit in the frequency of tariff adjustments.

HAL and Zurich are the riskiest on this driver, while the other airports are lower risk.

- HAL and Zurich operate under multi-year frameworks with no dedicated risk mitigation mechanisms, offering minimal protection and making them riskier compared to peers.
- Aena, also under a multi-year framework, benefits from some protection through a P-index adjustment to tariffs, which allows for cost changes outside management's control, though it is capped at 1% (with larger increases possible by exception).
- AdP and Fraport lack specific risk mitigation mechanisms but operate under annual frameworks that allow tariffs to quickly adjust to new information, reducing long-term risk exposure. As a result, their risk profiles are expected to align more closely with Aena's.

Selected risk metrics	HAL	Aena	AdP	Fraport	Zurich
Regulatory risk mitigations	5-year price control; no consequential risk sharing mechanisms.	P-index: Adjusts the regulatory cost allowance annually to reflect changes in costs (e.g., personnel, security, cleaning, electricity, local taxes) outside Aena's control, subject to a "soft" cap[(a)] at 1% of the unitary aeronautical charge.	The annual tariff approval process likely reduces risk as it allows tariffs to more promptly reflect new information. There may be some risk sharing mechanisms within the agreements with airlines.		Up to 4-year price control; no risk sharing mechanisms identified. There may be some risk sharing mechanisms within the agreements with airlines.

Notes: (a) In July 2023, Aena proposed a 4.09% year-on-year increase in the adjusted annual maximum revenue per passenger applicable from March 2024, reflecting an annual P-index of 3.5% which is well above the 1% regulatory cap but was accepted.

Appendix D
Revenue risk drivers

Appendix D

Relative risk analysis – Revenue

Unmitigated demand risk

In sectors such as aviation, where a significant portion of revenue is tied to passenger volume, fluctuations in demand can lead to substantial revenue variations. Factors such as available spare capacity and the ability to recover during disruptions like the Covid-19 pandemic can serve as important indicators of demand risk.

The level of recovery from the pandemic indicates the resilience of an airport to demand disruptions.

Airports operating near or at full capacity are less sensitive to downside demand fluctuations, as they can optimise existing capacity or shift demand between slots. However, these airports face asymmetric risk exposure, as capacity constraints prevent them from benefiting from the upside that could arise from excess demand. While downside risks can be mitigated, the potential upside is smaller than the downside. The greater the capacity constraint, the more pronounced the asymmetry. While this asymmetry may offset the positive impact of risk mitigation on overall risk, it may not be directly relevant for beta estimation unless there is also a systematic component. Therefore, the impact of asymmetric risk is excluded from the overall risk scoring at this stage pending further analysis – and operating near or at full capacity is considered a material differentiating factor.

Across resilience and spare capacity metrics, HAL has the lowest risk and Zurich has the highest, with others in the middle.

- HAL and Aena demonstrate the highest resilience within the group, reflecting their strong recovery from the Covid-19 pandemic. AdP and Zurich show slightly lower, but broadly comparable resilience, while Fraport is the least resilient.
- All airports face some capacity constraints due to economic regulation, with HAL being the most constrained. Expansion is currently on hold until the third runway project resumes, and capacity increases are further limited by legal and political barriers to adjusting curfew hours (~11:00 PM to 5:00 AM). HAL benefits from particularly strong demand for its slots, meaning that any slots relinquished by incumbent airlines are highly likely to be reallocated to others.
- Fraport is opening a new terminal at the Frankfurt airport in 2026 which suggests that it had been operating near capacity pre-Covid.
- AdP, after cancelling its expansion plans in 2021, is now planning for medium-term capacity growth, suggesting that the airport is nearing or has reached capacity in line with demand. Charles De Gaulle has space to expand 'in the short term' though some data sources indicate this may be limited. Aena, while less constrained, is also planning a long-term expansion project at Madrid Barajas – though unlike HAL and others, Madrid benefits from significantly less restrictive curfew and operates broadly 24/7.
- Zurich, with overall capacity utilisation around 70%, is the least constrained in general but experiences peak-time congestion.
- The spare capacity assessment indicates that Zurich has the highest risk, followed by AdP and Aena, while HAL and Fraport face lower risks.

Selected risk metrics	HAL	Aena	AdP	Fraport	Zurich
Resilience to Covid-19 (passenger recovery at core airports)	98% of the pre-Covid footfall achieved in 2023	98% of the pre-Covid footfall achieved in 2023	89% of the pre-Covid footfall achieved in 2023	84% of the pre-Covid footfall achieved in 2023	92% of the pre-Covid footfall achieved in 2023
Spare capacity	Operating at full capacity	Constrained at peak times, some capacity overall; expansion under planning to boost capacity further	Constrained at peak times; some capacity at CDG in the short term; new terminal plans cancelled in 2021.	Constrained at peak times and very limited overall capacity at Frankfurt until opening of new terminal in 2026	Constrained at peak times, but c.30% free overall

Appendix D

Relative risk analysis – Revenue (cont.)

Regulatory risk mitigations

Regulatory mitigations such as risk-sharing mechanisms can help insulate risk exposure by limiting the financial impact of downside demand fluctuations. However, these mechanisms may also cap potential gains, thus limiting the upside for the regulated firm.

Risk mitigation can be explicit through dedicated mechanisms or implicit in the frequency of tariff adjustments.

HAL, AdP, and Fraport are assessed as medium risk for this driver, while Aena and Zurich are classified as high risk.

- Fraport and AdP benefit from annual tariff adjustments, which mitigate exposure to volume risk to a degree. These airports do not receive ex-post compensation for in-period losses due to lower passenger volumes, tariffs are recalculated annually based on updated passenger volume forecasts.
- HAL, Aena, and Zurich operate within multi-year regulatory frameworks. HAL's settlement includes a Traffic Risk Sharing (TRS) mechanism, which transfers part of the traffic risk to airlines and provides some risk protection. However, only variances exceeding 10% of forecasted revenues qualify for full recovery and this recovery takes up to 10 years, providing no immediate cash flow benefit. Although TRS appears less protective than annual resets, a more detailed analysis is needed to assess its overall risk impact compared to annual reset frameworks.
- Aena's five-year framework fully exposes it to passenger traffic fluctuations, except in cases of highly exceptional circumstances.
- Both HAL and Aena have mechanisms (K-factor and K_t-factor) that adjust revenues based on actual traffic mix, correcting for deviations from forecasts in a symmetric manner.
- Zurich appears to lack specific risk mitigation mechanisms. It has a 4-yr charge settlement which is relatively shorter than Aena's 5-yr period. Aena, with no volume risk protection, is deemed similar in risk to Zurich on this risk driver and both are assessed as high risk.
- This Report assumes that, with the combination of the TRS and K-factor, HAL can be classified with the same medium-risk rating as AdP and Fraport, though further analysis of specific detail is needed to validate this.

Selected risk metrics	HAL	Aena	AdP	Fraport	Zurich
Regulatory risk mitigations	TRS: Shares 50% of any variance up to 10% of forecasted allowed revenues and 105% above 10% K-factor: Adjusts revenue to reflect changes in passenger mix between long-haul and short-haul, reducing forecast error risk.	Fully exposed to passenger traffic variations unless exceptional circumstances cause annual reductions over 10%, such as natural disasters, terrorist acts, or war. K_t-factor: Adjusts revenue to reflect changes in passenger mix reducing forecast error risk.	The annual tariff approval process likely reduces risk as it allows tariffs to more promptly reflect new information. There may be some risk sharing and incentive mechanisms within the agreements with airlines		Up to 4-year price control; no risk sharing mechanisms identified. There may be some risk sharing and incentive mechanisms within the agreements with airlines

Appendix D

Relative risk analysis – Revenue (cont.)

Performance incentives

The strength and structure of performance incentives can significantly impact outturn returns and risk exposure. Stronger or asymmetric incentive structures increase risk.

HAL is the highest risk on this driver while AdP, Fraport, and Zurich are low risk. Aena falls into the medium risk category.

- HAL and Aena are the only airports with explicit performance incentives based on publicly available information. Among HAL and Aena, HAL faces greater incentive risk due to higher penalty potential.
- The risk associated with performance incentives at HAL seems to have a considerable asymmetric component, which would not be reflected in the beta estimate via comparator evidence. This risk should either be mitigated at source or factored in as an additional premium over the CAPM-derived cost of equity.

Selected risk metrics	HAL	Aena	AdP	Fraport	Zurich
Additional Performance incentives	Rebates and bonuses based on service quality: HAL's maximum exposure to service quality penalties is 7.30% of airport charges revenue, with a maximum reward of 1.44%	Maximum penalty/reward related to quality of service is 2.00% of total revenue for the year.	No additional incentive mechanisms under the annual framework.	There may be some incentive mechanisms within the agreements with airlines	

Appendix E
Regulation and financing risk drivers

Appendix E

Relative risk analysis – Regulation

Regulatory Discretion

Regulatory discretion refers to the flexibility regulators have in interpreting and applying rules at reset points. It is separate from the inherent risks embedded in the design of the regulatory framework for each period. Increased regulatory discretion raises perceived regulatory risk, as firms may face unexpected regulatory decisions, leading to greater uncertainty and potential volatility in financial performance.

HAL and Aena are considered high risk on this driver while Fraport and Zurich are considered low risk. AdP is rated medium risk as its regulator enjoys few additional authorities.

Selected risk metrics	HAL	Aena	AdP	Fraport	Zurich
Regulatory discretion	The regulator has the authority to set charges and adjust the methodology between resets. HAL operates under an errors-based appeal regime, enabling appeals to the CMA. This framework grants the regulator significant discretion, as demonstrated by the recent H7 CMA appeals.	The regulator has the authority to set charges, adjust the methodology between resets, and assign significant weight to the views of other stakeholders, as demonstrated by the negotiations surrounding the current regulatory framework.	The regulator has the authority to approve charges and reject ADP's proposals. If it disagrees with updated proposals, it can freeze charges. Additionally, if the last approval exceeds 24 months, ART is authorised to set new rates for the next fee period.	The Ministry's authority is limited to ensuring the fee structure meets legal criteria such as objectivity, transparency, non-discrimination, and cost appropriateness for efficient service provision. It may refrain from reviewing charge appropriateness if Fraport submits a written agreement with airport users. The Ministry cannot modify the fee structure or interfere with the incentives set by Fraport.	The regulator approves charges only if an agreement cannot be reached with airlines or if it rejects the negotiated outcome, which somewhat limits its discretion.

Appendix E

Relative risk analysis – Financing

Government ownership

Government ownership can affect access to capital, cost of debt, and investor perception, while potentially providing subsidies or support during stress.

HAL is the highest risk on this driver, with the remaining airports exhibiting lower and comparable levels of risk.

Recovery of financing costs within the regulatory framework

For regulated companies, the ability to recover financing costs is directly impacted by the terms set within the regulatory framework. In some cases, these frameworks may impose limitations or caps on how much of these costs can be recovered. These constraints can reduce the flexibility to raise capital, potentially affecting the company's financial health and its ability to fund necessary infrastructure or operational improvements.

The differences in the ability to recover financing costs across airports are relatively subtle. However, HAL and AdP may be somewhat riskier. For HAL, the CAA determines what constitutes efficient costs, while for AdP, financing cost recovery may be constrained by the need to keep tariff increases "moderate," with less emphasis on actual costs.

	HAL	Aena	AdP	Fraport	Zurich
Government ownership	0%	51%	51%	52%	c.40%
Recovery of financing costs within the regulatory framework	The CAA has a statutory duty to set a return that secures HAL's financeability. The determination of reasonable and efficient financing costs for the notional company is based on the regulator's assessment and primarily considers market evidence, including benchmarks for the cost of debt. The cost of new debt allowance is indexed.	The regulatory WACC for the current period was set nearly 1.5% below Aena's proposal after extensive debate. While the cost of debt allowance reflects Aena's projected costs, the WACC determination incorporates several factors, including stakeholder input, best practices from European working groups, and alignment with other regulated sectors.	The annual framework provides a fair return on investment, stipulating that the regulatory ROCE remaining equal to or below the regulated WACC. The regulator reviews WACC evidence to assess the fairness of remuneration and holds public consultations, as seen in the UK. It constrains tariff increases to 'moderate'. For example, in 2023, it decided to calculate the cost of debt based on market data but also allowed for consideration of actual costs if higher than market estimates.	Tariff approval depends on the 'appropriateness' of the relationship between charges set by the airport operator and expected costs and efficiency, giving the regulator discretion to disallow inefficient financing costs in principle. The Ministry may refrain from reviewing charges if Fraport submits a written agreement with airport users.	The basis for calculating charges includes "reasonable" capital interest, with the cost of debt estimated on a market basis reflecting an appropriate rating. However, if actual costs are anticipated to exceed the market estimate, actual costs will be considered.

Appendix F
Sources for risk metrics data

Appendix F

Sources for risk metrics

Selected risk metrics		HAL	Aena	AdP	Fraport	Zurich
Capex	Capex [2021-2026]	HAL Input	Barclays Equity Research, October 2024, AENA: Strong 3Q, but unfavourable timing in the regulatory cycle; political uncertainty remains, p.6	Equity Research from Kepler, 25 October 2024, Groupe ADP: Slightly ahead Q3 revenue and look at the draft Finance Bill for 2025, p.3	Deutsche Bank Research, 5 November 2024, Fraport AG: Q3'24 results: disappointing, p.1,2	Barclays Equity Research, August 2024, Zurich Downgrade to EW. Trading well but burdened by inflation; key regulatory news somewhat distant, p.6
	Asset base [2020]	CAA H7 Price Control Model, tab 'C_RAB', Cell Ref. AL222	Annual Report 2021, p.475	Annual Report 2020, p.200	Annual Report 2020, p.157	Annual Report 2020, p.62
	Nature of Capex	Input from HAL	DORA 2 - 2022-2026 Aena p.154 Fitch Report - Aena - June 2023 2024 9M Management Report, pg. 27	Annual Report 2023, Investments, p.421-425 Annual Report 2022, Investments, p.334-337 Annual Report 2021, Investments, p.269-272	Annual Report 2023- Terminal 3 p. 49,75, 137, 237; Expansion Programmes p.180, 207	Annual Report, 2023, p.22-23
	Regulatory risk mitigations	H7 Final Decision Section 2, para 7,25	Spanish Law 18/2014, BOE No. 252, Article 31, p.47 (English translation available here)	Groupe ADP, Investor Toolbox, 2023, pp.46-49 ART, Recommendations for the Evolution of the regulatory Framework for airports, 2023, p.5, 12		
	Performance incentives	H7 Final Decision Section 2, para 7,25 H7 Guidance on capital expenditure governance, p.20-24	Spanish Law 18/2014, BOE No. 252, Article 33, p.49 (English translation available here) DORA 2022-26, p.169-170	Groupe ADP, Investor Toolbox, 2023, pp.46-49 ART, Recommendations for the Evolution of the regulatory Framework for airports, 2023, p.5, 12		

Appendix F

Sources for risk metrics (cont.)

Selected risk metrics		HAL	Aena	AdP	Fraport	Zurich
Opex	Remaining asset life for PPE (2014-2023)	Annual Report, 2014- PPE p.59, Depreciation p.52 Annual Report, 2015- PPE p.52, Depreciation p.48 Annual Report, 2016- PPE p.35, Depreciation p.53 Annual Report, 2017- PPE p.44, Depreciation p.63 Annual Report, 2018- PPE p.62, Depreciation p.59 Annual Report, 2019- PPE p.126, Depreciation p.149 Annual Report, 2020- PPE p.130, Depreciation p.155 Annual Report, 2021- PPE p.124, Depreciation p.161 Annual Report, 2022- PPE p.138, Depreciation p.165 Annual Report, 2023- PPE p.160, Depreciation p.185	Annual Report 2014, p.59 Annual Report, 2015, p.63 Annual Report, 2016, p.63 Annual Report 2017, p.66 Annual Report 2018, p.74 Annual Report 2019, p. 69 Annual Report 2020, p.81 Annual Report 2021, p.99 Annual Report 2022, p.86 Annual Report 2023, p.78	Annual Report, 2014 p.187 Annual Report, 2015 p.199 Annual Report, 2016 p.190 Annual Report, 2017 p.196 Annual Report, 2018 p.216 Annual Report, 2019 p.225 Annual Report, 2020 p.234 Annual Report, 2021 p.326 Annual Report, 2022 p.335 Annual Report, 2023 p.475	Annual Report, 2023- PPE 2014-2023 p.251 Annual Report, 2023- Depreciation p.147 Annual Report, 2014- Depreciation p.105 Annual Report, 2015- Depreciation p.109 Annual Report, 2016- Depreciation p.107 Annual Report, 2017- Depreciation p.141 Annual Report, 2018- Depreciation p.145 Annual Report, 2019- Depreciation p.141 Annual Report, 2020- Depreciation p.157 Annual Report, 2021- Depreciation p.143 Annual Report, 2022- Depreciation p.147	Annual report, 2014- PPE p.71, Depreciation p.85 Annual Report, 2015- PPE p.117, Depreciation p.85 Annual Report, 2016- PPE p.60, Depreciation p.84 Annual Report, 2017- PPE p.67, Depreciation p.96 Annual Report, 2018- PPE p.66, Depreciation p.95 Annual Report, 2019- PPE p.64, Depreciation p.94 Annual Report,2020- PPE p.61, Depreciation p.91 Annual Report, 2021- PPE p.122, Depreciation p.150 Annual Report, 2022- PPE p.138, Depreciation p.166 Annual Report, 2023- PPE p.145, Depreciation p.173
	Operating leverage (2014-2019)	Capital IQ : Heathrow (SP) Limited Financials > Income Statement	Capital IQ : Aena S.M.E., S.A. (BME:AENA) Financials > Income Statement	Capital IQ : Aeroports de Paris SA (ENXTPA:ADP) Financials > Income Statement	Revenue 2013, p.9 Capital IQ : Fraport AG (XTRA:FRA) Financials > Income Statement	Capital IQ : Flughafen Zürich AG (SWX:FHZN) Financials > Income Statement

Appendix F

Sources for risk metrics (cont.)

Selected risk metrics		HAL	Aena	AdP	Fraport	Zurich
Opex (cont.)	Regulatory risk mitigations	H7 Final Decision Section 2, para 4.3	Spanish Law 18/2014, Annex VIII, p150, P-index (English translation available here) Details on P-index calculation	Groupe ADP, Investor Toolbox, 2023, pp.46-49 ART, Recommendations for the Evolution of the regulatory Framework for airports, 2023, p.5, 12		
	Performance incentives	H7 Final Decision Section 2, para 4.3		Groupe ADP, Investor Toolbox, 2023, pp.46-49 ART, Recommendations for the Evolution of the regulatory Framework for airports, 2023, p.5, 12		
Revenue	Resilience to Covid-19 (passenger recovery at core airports)	Annual Report 2019,p.28 Annual Report, 2023,p.12	Passenger Traffic, 2019 Passenger Traffic, Dec 2023 Report	Paris Aéroport traffic 2023 Aéroports de Paris - Trafic 2019	Annual Report 2023, p 250	Annual Report,2019-23, p.17
	Spare capacity	https://www.heathrow.com/company/about-heathrow/airports-commission-expansion https://assets.publishing.service.gov.uk/media/5e2054fc40f0b65dbed71467/airports-nps-new-runway-capacity-and-infrastructure-at-airports-in-the-south-east-of-england-web-version.pdf	Fitch Upgrades Aena to 'A'; Outlook Stable Madrid Barajas Airport expansion to cost EUR2.4 billion; profitable AENA gets airport charges boost | CAPA	Roissy CDG: a new (colossal) terminal is planned in 10 years (CEO of Aéroports de Paris) https://www.politico.eu/article/french-minister-roissy-charles-de-gaulle-airport-expansion-scrapped/	germany-competitiveness-index-report-2019.pdf Frankfurt Airport to Build Terminal 3 as Spare Capacity Runs Out - Bloomberg	Air Transport Regulatory Competitiveness Indicators

Appendix F

Sources for risk metrics (cont.)

Selected risk metrics		HAL	Aena	AdP	Fraport	Zurich
Revenue (cont.)	Regulatory risk mitigations	H7 Final Decision, Section 1, para 2.20	Spanish Law 18/2014, BOE No. 252, Article 27, Annex VIII, Annex IX (p.43, 150, 152) (English version here) Moody's (March 2024), Aena S.M.E., S.A. Update following change to positive outlook	Groupe ADP, Investor Toolbox, 2023, p.47 ART, Recommendations for the Evolution of the regulatory Framework for airports, 2023, p.5, 12		Roll-over mechanism adopted by Swiss Federal Council Planned introduction of roll-over mechanism for future charge periods at Zurich
	Performance incentives	H7 Final Decision, Section 1, paras 3.34, 3.35	Spanish Law 18/2014, BOE No. 252, Article 33, p.49 (English version here – see Article 33)	Groupe ADP, Investor Toolbox, 2023, p.47 ART, Recommendations for the Evolution of the regulatory Framework for airports, 2023, p.5, 12		
Financing	Recovery of financing costs within the regulatory framework	H7 Final Decision: Section 3, Cost of Debt, para 9.184	ACUERDO DE INFORME SOBRE EL DORA II, p. 94	Groupe AdP (2024), Investor Toolbox, pp. 46-47 Décision n° 2023-012 du 9 février 2023 Décision n° 2023-052 du 9 novembre 2023	Federal Ministry of Justice and Consumer Protection, Aviation Act, Section 19B	SR 748.131.3, Annex 1, 2019 version available in English
	Government ownership		Shareholders and investors	Shareholders structure	The Fraport Share	Annual Report, 2023

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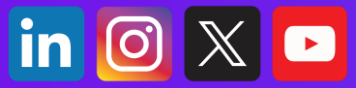

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