Auckland Airport

11 July 2022

Dane Gunnell
Head of Price-Quality Regulation
Infrastructure Branch
Commerce Commission

By email to im.review@comcom.govt.nz

Dear Dane,

Input Methodologies Review – response to Process and Issues Paper

Thank you for the opportunity to respond to the Process and Issues Paper for the Part 4 Input Methodologies ("**IMs**") Review 2023 being undertaken by the Commerce Commission ("**Commission**").

This submission focuses on topics that have been raised by the Commission that are priorities for Auckland Airport and some other important technical issues to be considered as part of the IM Review.

In addition to this submission, Auckland Airport has contributed to and supports the submission made by the New Zealand Airports Association ("**NZ Airports**").

Auckland Airport supports the current regulatory regime

In our view, the current regulatory regime for the airports sector currently operates effectively and promotes the purpose of Part 4 of the Commerce Act (the Act). It provides a significant amount of information, prepared on a transparent and consistent basis, for interested parties to assess the conduct and performance of Auckland Airport (and other regulated airports) over time.

The objective of Part 4 to promote the long-term benefits of consumers, is well aligned with Auckland Airport's business model. Our business model is strongly aligned with the public interest, as timely investment in infrastructure to facilitate future aviation growth and keep airfares low is a critical factor in the delivery of sustainable returns to shareholders.

Stability of the current regulatory regime has supported the benefits that Auckland Airport has delivered consumers over the last dozen years. Material changes to the approach to profitability assessment following this IM Review would be unjustified in our view and destabilising. Instead the focus should be on fine-tuning areas where a specific problem can be articulated and where the benefits of making changes outweigh the costs and risks of unintended consequences. This includes the Commission appropriately updating its estimate of the systematic risk airport investors will face going forward.

Evidence the regime is working

Evidence demonstrates that the current regime is working. Since 2013, in real terms at Auckland Airport, domestic passenger charges have increased by just 65 cents per passenger while international passenger charges have fallen by 10%. Landing charges have also decreased by 11% in real terms over this period for commercial passenger aircraft.

New Zealand airports including Auckland have lower domestic charges than most major Australian airports, and Auckland's charges for international passengers are also below most of its Australian peers.

The Act gives airlines, passengers, and the public confidence that our prices are carefully scrutinised by the Commission – the independent regulator who checks that aeronautical performance is in the long-term interest of consumers.

In response to its most recent pricing review, Auckland Airport reduced its charges by 31 cents per passenger over Price Setting Event 3 ("**PSE3**"). The Commission welcomed the decision which it praised as good for consumers and showed the benefits of the information disclosure regulations that are applied to New Zealand's major airports. Importantly, the Commission has the ability to trigger changes to the regulatory regime if it considers that it is necessary. To date, the Commission has not found that to be necessary.

The purpose of Part 4 of the Commerce Act is to promote the long-term benefit of consumers

The purpose of Part 4 is to:[1]

> promote the long-term benefit of consumers [in markets referred to in section 52] by promoting outcomes that are consistent with outcomes produced in competitive markets such that suppliers of regulated goods or services -
>
> a) have incentives to innovate and to invest, including in replacement, upgraded, and new assets; and
>
> b) have incentives to improve efficiency and provide services at a quality that reflects consumer demands; and
>
> c) share with consumers the benefits of efficiency gains in the supply of the regulated goods or services, including through lower prices; and
>
> d) are limited in their ability to extract excessive profits.

When determining whether any substantive changes are required to the IMs, over and above ensuring the WACC parameters are up to date and resolving any outstanding technical issues, all four limbs should be considered. A focus exclusively on limb d) might inadvertently overlook strong outcomes across the other limbs and in doing so unduly impact regulated airports' incentives to innovate and invest, improve efficiency, improve service quality or to share efficiency gains. On balance, we think the evidence to date is that the three regulated airports have delivered good outcomes for consumers across all four limbs of Part 4.

We therefore do not see any need for wholesale changes to the IMs during this review. Auckland Airport's focus is instead on ensuring that the WACC IM parameters are accurate and up to date, and bringing a handful of long-standing technical issues to the Commission's attention.

Asset beta

Regulatory certainty is an important part of the current regime. As in the previous IM review, Auckland Airport encourages the Commission to update the WACC IM parameters. Our updated analysis per Attachment A shows that airport systematic risk has changed materially since the previous reset at March 2016. We see no reason for the Commission to change its previous approach of taking the average of weekly and four weekly asset beta data across a refreshed global comparator set for the two most recent 5-year periods.

Assuming that the Commission updates its asset beta analysis as at 31 March 2023, the combined ten years of data would include three years that are impacted by COVID-19. The average asset beta across the two most recent five year periods to date of circa 0.8 is materially lower than the most recent five year period (encompassing COVID) of circa 0.9. We think that this gives an appropriate weighting to the pandemic-related systematic risk to be faced by airport investors going forward. Attachment A also includes Auckland Airport's analysis of the global comparator set and our recommendations and justifications for the handful of companies that should be removed from or added to the Commission's comparator sample.

We have also undertaken quantitative analysis as set out in Attachment A to better understand the relative systematic risk between airport companies' aeronautical segments versus their non-aeronautical activities. This detailed analysis has not found any quantitative evidence to support the Commission's current practice of applying a 0.05 downwards adjustment to the comparators set's average total company

[1] Commerce Act 1986, Part 4, Section 52A

asset beta. Instead, it shows there is some evidence that the aeronautical segment of airport businesses may have slightly higher systematic risk than the non-aeronautical segments. Auckland Airport considers that this analysis supports the removal of the downwards adjustment to asset beta for the aeronautical segment of airport businesses as part of this IM Review.

Asymmetric risk

The pandemic has proven that asymmetric risk for airports exists, as the downside risks to demand volumes are significant, and these are not offset by commensurate upside risks. Asymmetric risk is not fully reflected in the systematic risk as measured by asset beta, yet it should still be considered by airports when setting aeronautical prices.

Auckland Airport considers that aeronautical pricing mechanisms that can appropriately share asymmetric risk are compatible with the IMs. Approaches such as traffic risk sharing, and risk adjusted demand forecasts can be incorporated through the demand forecast setting process or the carry-forward mechanisms that currently exist. Attachment A provides Auckland Airport's desktop research into how asymmetric risk has been adjusted for by certain offshore regulated airport companies.

Technical matters

Auckland Airport has identified a number of technical issues with the IMs that believe should be corrected by the Commission as part of this IM Review. These are outlined below.

Depreciation

Currently the input methodologies do not allow for depreciation to be recognised during the year of commissioning or acquiring an aeronautical asset.

> *3.4 Depreciation*
> *(1) Unallocated depreciation, in the case of an asset with an **unallocated opening RAB value**, is determined, subject to subclause (3) and clause 3.5, in accordance with the formula- [1 ÷ remaining asset life] × **unallocated opening RAB value**.*
> *(2) Depreciation, in the case of an asset with an **opening RAB value**, is determined, subject to subclause (3) in accordance with the formula- [1 ÷ remaining asset life] × **opening RAB value**.*

For example, if commissioned on or before 30 June 2022, the asset will have an opening RAB value on 1 July 2022 so the above formula will result in depreciation from that date; but if commissioned, say, on 2 July 2022 (or any time during FY23), the opening RAB value in FY23 will be nil and the formula will result in nil depreciation during FY23. This approach is not compatible with NZ GAAP which requires accounting depreciation to commence on the day an asset is first available for use. This seems unusual given that, in general, the IMs use GAAP as a starting point with any adjustments from GAAP clearly justified. We note that tax depreciation also commences at the beginning of the month of purchase or being available for use.

Given Auckland Airport's multi-billion dollar aeronautical infrastructure development programme over the next ten years, the IM's approach to depreciation would likely defer the recognition of tens of millions of dollars of depreciation expense, and thereby over-state our reported pricing period IRR.

Tax losses and carry-forward

Under the IMs, annual disclosures require that any current year tax losses must be carried forward to future years when profits are again delivered. The problem with this approach is that when setting aeronautical prices for a five-year pricing period, regulated airports will very rarely (if ever) have the foresight to forecast an as yet unknown upcoming global financial shock (like COVID-19) that will plunge them into a loss-making position for a period of time. Hence airports have little or no ability to compensate for that as yet unknown future shock by setting higher prices that compensate for the losses with higher profits either side of the global shock. In Auckland Airport's case, COVID-19 delivered several hundred million dollars of un-forecast and therefore unmitigated economic losses.

On the other hand, our tax losses to be carried forward into Price Setting Event 4 ("PSE4") are known with certainty and must be included in the building blocks aeronautical pricing forecasts. This will reduce our allowable revenues in PSE4 and means that Auckland Airport will gain no direct financial benefit from one small saving grace from the pandemic, i.e. a tax loss that will reduce future cash tax payments. Instead that benefit will be entirely transferred to PSE4 airline customers, some of whom may not even have been operating at Auckland Airport during the pandemic.

Assets held for future use

Per the current IMs, the carrying and eventual commissioning value into the RAB of an asset held for future use ("**AHFU**") is reduced by any revenues generated by that asset before it is commissioned into the RAB (net of operating expenditure). The problem with this approach is that the IM's definition of operating expenditure excludes tax. This approach fails to recognise that tax is a genuine expense and is inconsistent with the treatment of tax elsewhere in the IMs.

This acts as a distortionary disincentive against using assets (such as land or buildings) held for future aeronautical use in an interim commercial capacity. If doing so results in a taxable profit before the asset is commissioned to the RAB, then the airport company will ultimately be worse off financially from undertaking that profitable activity than from simply leaving the asset to sit unproductive in fallow.

The financial implications for our airlines customers of any such decision are far more significant. The AHFU carrying value would simply continue to compound over time per the target return, with no offset from commercial revenues that would otherwise have been generated from the asset. This would ultimately result in a higher commissioned RAB value and therefore higher future aeronautical prices. We are sure that this was not the intent of the AHFU provisions.

Thank you again for the opportunity to respond to the Issues and Process paper and to set out the technical issues above.

We look forward to continuing to engage with the Commission throughout this IM Review.

Yours sincerely,

P H Neutze

Philip Neutze
Chief Financial Officer

AIAL has undertaken analysis to update asset beta estimates

Method

- Asset beta estimates have been updated using the Commerce Commission's previous approach
- Weekly and 4-weekly asset betas have been estimated over two separate 5 year periods to March 2017 and March 2022
- In the same way that the Commission determined asst beta in 2016, the average of the weekly and 4-weekly asset betas results over both 5 year periods has been used for our revised asset beta estimate

Steps undertaken to update airport asset betas:

1. Update the previous sample set for the latest available information including the sample of airports – through to March 2022
2. Remove companies from the sample that are not airports
3. Consider the merits of the Commission's 0.05 downward adjustment to the total airport company asset beta average to determine the aeronautical asset beta
4. Consider the asset beta in the post-COVID aviation environment as well as how to address asymmetric risk
    a) Consider options to mitigate asymmetric risk including risk sharing and adjustments to traffic forecasts
    b) Overview of approach to mitigating asymmetric risk by the UK regulator

Updating for the latest available data

Approach

We have applied the approach used previously by the Commerce Commission to update asset beta estimates including:

- The same sample set as used by the Commission in the Input Methodology (IM) review
- Using the average of weekly and 4 weekly asset beta estimates
- The average over the two previous five year periods
- Share price information has been updated to end of March 2022
- Update the sample of airports to reflect listings and privatisation. Given the timing of these changes, all the above adjustments have been made to the sample set for the 5 year period to 2022 only

Results – updated time periods

1. The average asset beta for the most recent five year period is 0.86, materially higher than the previous five-year period of 0.67
2. The average asset beta of the sample set increased to 0.77 before updating the list of airports for changes in listing status
3. No change to the average of the sample set when the list of airports was updated for changes in listing status – asset beta remains at 0.77

Commerce Commission IM Review (2016)

5 years ended	Mar-11	Mar-16	Average
Weekly	0.62	0.62	0.62
4-weekly	0.69	0.66	0.68
Average	0.66	0.64[1]	**0.65**

Asset betas – latest two 5-year time periods, sample unchanged

5 years ended	Mar-17	Mar-22	Average
Weekly	0.65	0.87	0.76
4-weekly	0.70	0.86	0.78
Average	0.67 (1)	0.86 (2)	**0.77**

Asset betas – latest two 5-year time periods with updated airports sample

5 years ended	Mar-17	Mar-22	Average
Weekly	0.65	0.87	0.76
4-weekly	0.70	0.86	0.78
Average	0.67	0.86 (3)	**0.77**

Uncontroversial changes to airports sample based on listing / ownership status

Additions

- AENA (Spanish airport system) – listed in 2015
- Bologna Airport – listed in 2015
- Add Airports Corporation of Vietnam – listed in 2016

Removals:

- Remove SAVE - unlisted in 2017
- Remove Sydney Airport – unlisted in 2022[2]

1. *This methodology accurately re-estimated the Commerce Commission results for the 5 years to 2016 as per the Input Methodology Review of an asset beta for the sample of 0.64*
2. *While Sydney Airport was only de-listed on 9 February 2022, the share price heavily reflected the takeover offer from 4 July 2021 (having increased by 34% on the day of the offer) and therefore the systematic risk is likely highly distorted for the final year.*

Removing two non-airports from the sample

The previous sample of airports used by the Commerce Commission at the IM Review contains two companies which Auckland Airport considers should be removed from the sample set

Airport Facilitates Corporation (AFC)

- AFC is not an airport, but rather a company that provides services at airports.
- Its mission is "to develop and provide necessary facilities and functions at airports, thereby contributing to the development of aviation as a vital private company operating mainly at airports"[1]
- Its airport related businesses include, real estate services, heating and cooling, waterworks, drainage and sewerage management
- AFC was removed from assessment of asset beta by the judge in the recent Perth Airport court case with Qantas

GMR Infrastructure (GMRI)

- GMRI is an infrastructure fund that has been very active in investing in and divesting a range of infrastructure businesses. It has investments in airports, energy (infrastructure and generation), road and construction
- While the majority of GMRI revenues being from airport operations, the airport share of revenue has varied between 49% and 74% over the past decade, and can vary quite significantly from one year to the next
- Consequently, its share price performance is likely to reflect this corporate activity as much as it reflects the performance of its underlying businesses the asset beta is reflective of the portfolio, not of the airport business in isolation

Removing these non-airport companies impacts the asset beta of the sample set

1 The average asset beta increases by 0.02 to 0.79 by removing these non-airport companies from the sample set

Asset betas – updated to remove non-airport companies

5 years ended	Mar-17	Mar-22	Average
Weekly	0.66	0.90	0.78
4-weekly	0.71	0.90	0.81
Average	0.69	0.90	**0.79**

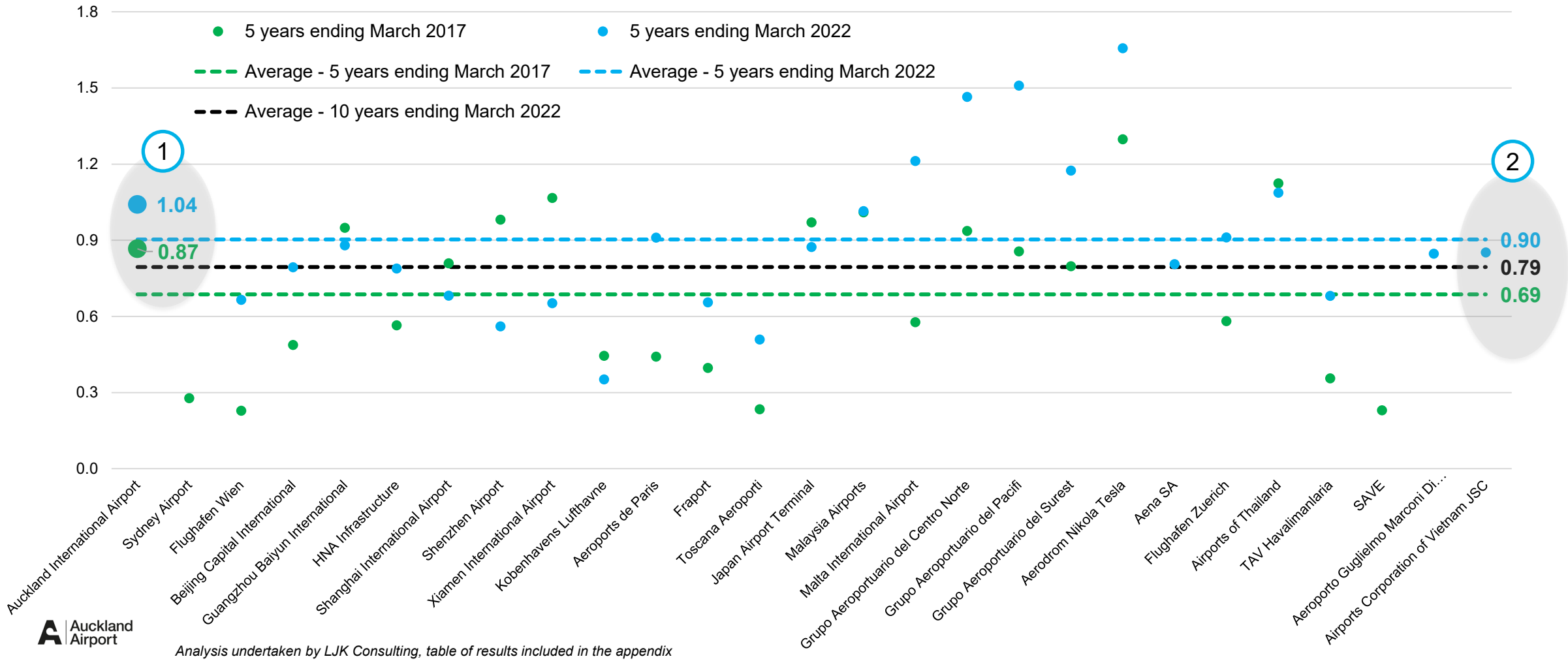
1

1. Airport Facilities Co. Website

Overview of asset beta analysis results

1. Consistent with previous analysis the average AIAL asset beta is above the sample, at 1.04 over the past five years to March 2022, and 0.87 in the 5 years previous – an average of 0.95

2. Overall comparator set average is 0.79 across the two five year periods analysed, higher more recently at 0.9 in the past five years which includes the pandemic



Auckland Airport

Analysis undertaken by LJK Consulting, table of results included in the appendix

No reason for downward adjustment to asset beta for aero business

- Previously the Commission has applied a 0.05 downwards adjustment to the airports sample average asset beta
- The Commission considered that the raw average asset beta from the comparator sample was likely to overstate beta for regulated aeronautical activities, because the beta relates to airport's overall (multi-divisional) businesses
- However, this adjustment was not based on statistical evidence that the non-aeronautical part of the sample set of airport companies had a greater risk profile than the aeronautical elements
- Analysis undertaken by AIAL and external advisors indicates there is no evidence of the aeronautical segment of airports being lower risk and, in fact, weak evidence that the aeronautical business is higher risk (e.g. vs investment property)
- While this may not sufficiently justify an upward adjustment to asset beta due to the dual-till – AIAL considers that it alongside AIAL's asset beta being consistently higher than the sample average, supports a 0.01 'rounding up'
- At the very least, this analysis shows that there is no basis for a downward adjustment for the aeronautical segment

Analysis undertaken

COVID-19 Impact on AIAL revenue and expenses

- The impact of the pandemic on AIAL's aeronautical revenues and expenses is broadly in-line with the total company impact
- This can be explained when considering each business segment in isolation, its exposure to aeronautical demand risk, and the ways this risk can be mitigated / impacted

Regression analysis of AIAL income per passenger

- AIAL monthly results for traffic, retail and car parking revenues suggest that airport retail and car parking have either similar or lower systematic risk than aeronautical activities

Regression of airport asset betas

- Analysis of airport asset beta regressions suggest that airports with higher non-aero shares may have lower asset betas
- This implies the underlying aeronautical asset beta is more likely to be higher than the non-aeronautical asset beta

Impact of pandemic on aero segment in-line with company wide impact

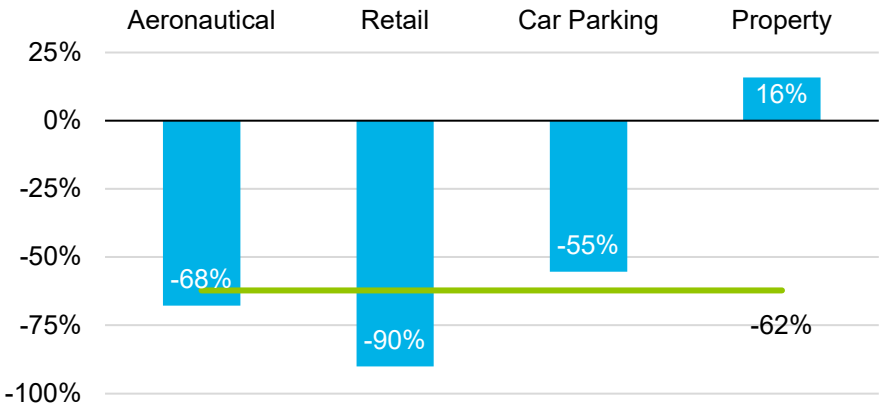
Auckland Airport's aeronautical activities appear to share a similar risk profile to the rest of business in total. Albeit retail revenues were more adversely impacted by COVID than aeronautical, car parking and property revenues were less adversely impacted

- **Retail revenue** at an airport is reliant on passenger volumes – a different driver of demand versus suburban retail. There is little an airport can do mitigate retail revenues to very large shocks in demand, but lease agreements with retailers do provide some protection against this risk – e.g. a baseline minimum annual guaranteed rent (MAG) plus percentage of sales is a common arrangement. However AIAL provided huge rent relief to our retailers in response to the pandemic which exacerbated the retail revenue shock
- **Car parking** while also reliant on passenger volumes to drive revenue and was impacted less than retail or aeronautical revenue – this is because domestic passenger numbers weren't as badly impacted as international. Unlike retail and aeronautical revenues, domestic parking revenue per pax is similar to international, thus softening the impact
- **Property revenues** are not directly related to aeronautical demand – the pandemic has demonstrated these revenues are not driven by aeronautical demand in a significant way

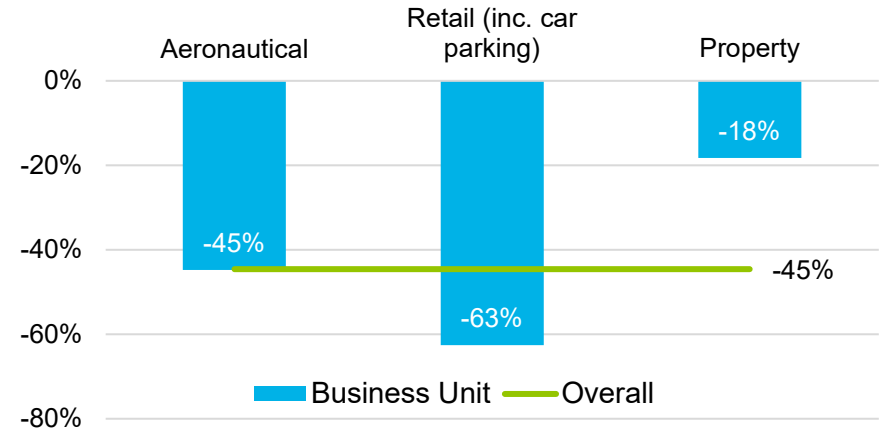
With expenses, on the other hand, the trend is similar with changes in aeronautical expenses at AIAL in-line with overall change in business expenses

AIAL revenue	Share of pre-COVID revenue	Change in revenue FY21 v FY19	Impact relative to aeronautical
Aeronautical	46%	-68%	N/A
Retail	32%	-90%	Higher
Car parking	8%	-55%	Lower
Property	13%	16%	Significantly Lower
Total	100%	**-62%**	Slightly lower

AIAL Revenue by function – FY21 vs FY19



AIAL Expenses by function – FY21 vs FY19



Source: AIAL FY21 and FY19 regulatory disclosures, and other publicly reported information

Regression analysis finds no evidence of AIAL aero activities having lower risk than non-aero

AIAL monthly results for traffic, retail and car parking revenues suggest that airport retail and car parking have either similar or lower systematic risk than aeronautical activities

Approach:

While it is not possible to directly test the asset beta of the non-aeronautical and aeronautical businesses, it is possible to examine the relationship between non-aero income per passenger (IPP) and traffic volumes:

- If IPPs are positively correlated with passenger volumes then, ceteris paribus, the systematic risk of passenger volumes is magnified for non-aero compared to aero
- If IPPs are negatively correlated with passenger volumes then, ceteris paribus, the systematic risk of passenger volumes is reduced for non-aero (vs aero)

The analytical approach applied was to regress:

- Monthly AIAL retail, transport and 'non-aero' (retail + transport) IPPs, against
- AIAL traffic (Int-dom, Total), and 'time', from January 2013 to December 2019[1]

Results of regression analysis[2]

Variables	Retail IPP	Transport IPP	Non-aero IPP
Int-dom	Adj R^2: 0.14 t-stat (Int -2.2; Dom +3.7)	Adj R^2: 0.46 t-stat (Int -7.2; Dom +3.1)	
Pax	Adj R^2: 0.04 t-stat (Pax -2.2)	Adj R^2: 0.30 t-stat (Pax -6.1)	Adj R^2: 0.00 t-stat (Pax +0.44)
Int-dom and time	Adj R^2: 0.51 t-stat (Int -4.0; Dom -2.2)	Adj R^2: 0.60 t-stat (Int -9.0; Dom -1.3)	
Pax and time	Adj R^2: 0.52 t-stat (Pax -6.1)	Adj R^2: 0.57 t-stat (Pax -10.2)	Adj R^2: 0.60 t-stat (Pax -9.3)

Regression analysis undertaken by LJK Consulting

Findings:

When time is used as an explanatory variable, there is a consistent and statistically significant inverse relationship between non-aeronautical IPPs and traffic volumes, and the combined time and traffic variables explain a large component of the variability in IPPs. This is true:

- Whether traffic is considered as a single variable (Pax) or as two (Int-Dom)
- For retail, transport and other 'non-aero'

When time is not used as an explanatory variable, there are conflicting and weak results, indicating either no correlation or a weak inverse correlation

The strongest results are obtained when 'non-aero' IPPs are explained by time and total passengers:

- Non-aeronautical IPP increased by ~5% p.a. plus inflation (assuming no traffic growth). This result could be consistent with ongoing improvements being made by AIAL, retail contract terms, or to external factors (that may potentially reflect systematic risk)
- IPP decreases by ~6% if passengers increase by 10%. Ceteris paribus, this would reduce the non-aero asset beta relative to the aero asset beta

1. 2020 and 2021 data was excluded because the dramatic onset of Covid appears to result in several instances of inter-month accounting adjustments to monthly revenues
2. Notes on regression analysis:
   a) Adj R^2 measures how much of the variation in IPP is explained by the variables, on a scale of 0.00 to 1.00 (100% explained). Values greater than 0.5 are considered good, values of 0.3-0.5 acceptable.
   b) t-stats measure how unlikely it is that the observed relationship is random noise (0-1.5) and how likely it is to be causal (>2), with the larger the value the better.
   c) Time is a constructed variable that starts at 0 in January 2013 and increases by 1/12 each month

Regression analysis of asset betas indicates no evidence of lower aero risk

Analysis of global airport asset beta regressions suggest that airports with higher non-aero shares may have lower asset betas

- This implies the underlying aeronautical asset beta is likely to be higher than the non-aeronautical asset beta

Airport characteristic	First principles	Evidence: asset beta regression
Non-aeronautical revenues	Aero, airport retail and airport car parking are equally exposed to inflation, interest rates and passenger volumes. Aero and airport retail have similar contractual pricing risks/protections. Property has lower systematic risk.	**Statistical significance**: very low (2011-16); good (2016-21) **Direction and magnitude**: Airports with a higher non-aero share have a lower observed asset beta, particularly in 2016-21 **Data issues**: Some airports undertake non-core activities and/or don't provide aero/non-aero breakdown for overseas subsidiaries. The Chinese airports don't report the split. This analysis assumes the FY19 aero/non-aero split was representative of the whole 2011-21 period

Regression results	2011-16	2016-21
Adjusted R-square	-0.073	0.206
t Stat	-0.207	-2.209

Regression analysis undertaken by LJK Consulting, based on a 16 airports from the Commerce Commission sample for which data is available on aero / non-aero breakdowns
Further detail on this analysis is provided in the appendix

Considering COVID and asymmetric risk when estimating asset beta

Determining the asset beta based on the Commerce Commission approach

1. Updating the asset beta as per the previous approach used by the Commission (absent non-aeronautical downward adjustment) results in an asset beta of 0.79

- AIAL's asset beta is much higher than the sample set (AIAL asset beta estimate of 0.95). This considered together with the findings from the analysis of aero vs non-aero risk, supports a 0.01 rounding up of the aeronautical asset beta to 0.80
- Applying today's market interest rates and the Commission's recently updated post-tax market risk premium of 7.5% (up from 7%), an asset beta of 0.8 would result in a post-tax WACC of 8.63% at the 50th percentile[1]
- This is a large increase from the previous target return adopted for PSE3 of 6.62%, and the Commerce Commission's PSE3 benchmark return for airports of 6.41%

Asset betas – updated to remove non-airport companies

5 years ended	Mar-17	Mar-22	Average
Weekly	0.66	0.90	0.78
4-weekly	0.71	0.90	0.81
Average	0.69	0.90	**0.79**

2 1

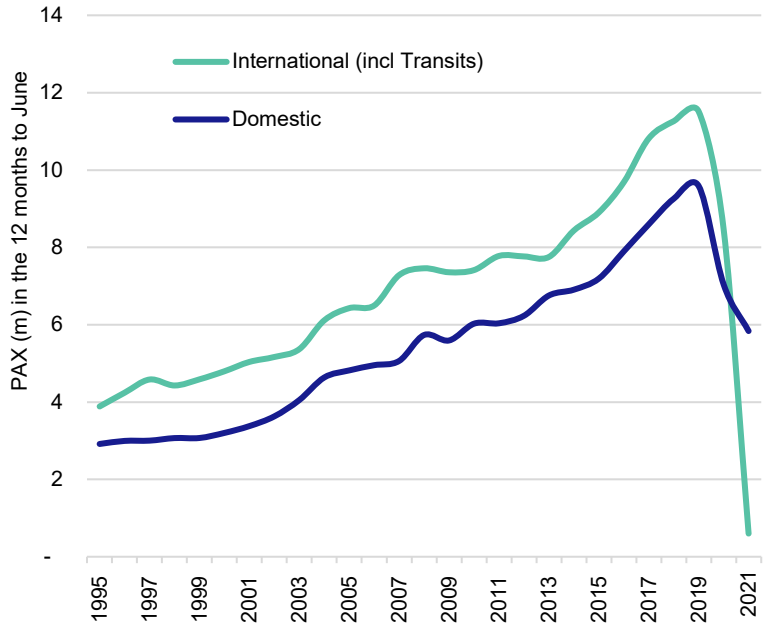
The pandemic has revealed the asymmetric risk profile for aeronautical demand

- Given the significant impact of the pandemic, this long-term average covering the past 10 years is unlikely to fully capture the risk investors currently expect to face in the airports sector post-COVID

2. The current risks that are faced by the sector are therefore more likely to be better reflected in the most recent 5-year period, during which 2 of the 5 years have been during the pandemic – this would indicate an asset beta of 0.90

- Border closures and domestic health measures have demonstrated the downside asymmetric risk that exists for aeronautical demand, with no commensurate upside risk to the impact of border closures or health measures
- Adjustments to demand forecasts to account for traffic shocks, or risk sharing mechanisms can mitigate this asymmetric risk. This is appropriate, and is in-line with the approach adopted by the regulator in the United Kingdom
- Combined with mitigations for asymmetric risk in place, the 0.8 asset beta outlined above is appropriate in the post-COVID environment

Auckland Airport Passenger Volumes



1. *Interpolated 5 year NZ govt bond yield of 3.38% as of 11 July 2022, TAMRP of 7.5% in-line with determination for gas pipeline regulation*

Potential approaches to separately adjust for asymmetric risk

Adjustments to traffic forecasts to account for future traffic shocks

- In the past, demand forecasts for aeronautical pricing have been undertaken on the basis that the traffic risks are symmetrical, and that the 'most likely' traffic outcome (best guess) is what is used when determining aeronautical prices
- However, pandemic risks are not symmetrical for airports. COVID has demonstrated that it is possible to experience a 75-95% reduction in passenger flows compared with the ex-ante most likely forecast, but it is very hard to envisage a scenario where passenger numbers could exceed the most likely forecast by such a magnitude
- Traffic forecasts used for setting aeronautical prices based on the most likely recovery scenario do not properly account for asymmetric downside risk. Instead, the weighted average of all possible probability-weighted traffic outcomes should be used. Because of asymmetric downside risk, this would result in a lower traffic forecast than the most likely best guess
- The preparation and weighting of the potential traffic scenarios could draw upon expertise from aviation traffic forecasting experts, along with the evaluation of potential pandemic outcomes and other factors e.g. the uncertainty due to Russia-Ukraine should potentially be included
- AIAL has not yet formed a view if we should adopt this approach for our aero pricing traffic forecasts. Assigning probabilities across a range of potential recovery scenarios would likely be controversial in practice. And the empirically evidenced asset beta increase discussed above would have a far more material impact on AIAL's PSE4 aero pricing than would adjusting our traffic forecasts in this way. Finally, a risk sharing mechanism as outlined below-right might be preferred by airlines versus adjusting traffic forecasts.

Pandemic recovery scenarios – illustrative example

Relative to FY19 growth with GDP

Scenario	Probability	FY22	FY23	FY24	FY25	FY26	FY27
No new Covid variants – pent up demand	5%	55%	95%	110%	105%	100%	100%
No new Covid variants – full freedom FY24	10%		90%	100%	100%	100%	100%
Only minor variants	20%		85%	95%	100%	100%	100%
'Most likely' – full freedom FY25	**30%**		**75%**	**90%**	**95%**	**100%**	**100%**
Ongoing variants – full freedom FY26	20%		60%	80%	90%	95%	100%
Ongoing variants – short border closure	10%		40%	65%	80%	85%	90%
Covid-22 – FY23/24 mirrors FY21/22	5%		20%	50%	60%	70%	80%
Weighted average (5/10/20/30/20/10/5)		55%	70%	87%	93%	96%	98%
Gap vs 'most likely' - adjustment		**0.0%**	**-4.8%**	**-3.5%**	**-2.3%**	**-4.0%**	**-2.0%**

Traffic as a percentage of the volumes implied by pre-Covid traffic and economic growth

Risk-sharing mechanism to remove downside asymmetric risk

- A 'cap and collar' risk sharing mechanism might be preferable to adjusting traffic forecasts for asymmetric risk
- This could be triggered if volumes deviate from forecast by a certain percentage – e.g. 10% / 20% / 30% above or below forecast
- If the mechanism was triggered, any over or under-recovery could then be capitalised and carried forward into the next pricing period in a NPV neutral manner
- Carrying forward any over or under recovery into future pricing periods has a number of benefits including that it:
    - avoids adjusting aeronautical prices during a pricing period
    - means that downside shocks would not immediately impact prices during a period of uncertainty

Appendix – asset beta analysis

Sample Airports	Weekly		Four-weekly		Average	
5 years ending	Mar-17	Mar-22	Mar-17	Mar-22	Mar-17	Mar-22
2016 IM Review Sample Average	**0.65**	**0.87**	**0.70**	**0.86**	**0.67**	**0.86**
Sample adjusted for listings^ and de-listings*	**0.65**	**0.87**	**0.70**	**0.87**	**0.67**	**0.87**
Sample adjusted to remove 'non airports'	**0.66**	**0.90**	**0.71**	**0.90**	**0.69**	**0.90**
Auckland International Airport	0.90	1.05	0.83	1.03	0.87	1.04
Sydney Airport	0.32	0.66*	0.23	0.65*	0.28	0.66*
Flughafen Wien	0.19	0.67	0.27	0.66	0.23	0.67
Beijing Capital International	0.45	0.78	0.52	0.81	0.49	0.79
Guangzhou Baiyun International	0.94	0.97	0.96	0.79	0.95	0.88
HNA Infrastructure	0.59	0.66	0.54	0.92	0.56	0.79
Shanghai International Airport	0.83	0.83	0.78	0.53	0.81	0.68
Shenzhen Airport	0.95	0.67	1.01	0.45	0.98	0.56
Xiamen International Airport	1.06	0.74	1.07	0.57	1.07	0.65
Kobenhavens Lufthavne	0.42	0.38	0.47	0.33	0.44	0.35
Aeroports de Paris	0.43	0.94	0.45	0.88	0.44	0.91
Fraport	0.40	0.66	0.39	0.65	0.40	0.65
Toscana Aeroporti	0.12	0.47	0.34	0.55	0.23	0.51
GMR Infrastructure	0.44	0.38	0.49	0.42	0.46	0.40
Airport Facilities	0.53	0.43	0.56	0.43	0.54	0.43
Japan Airport Terminal	0.91	0.87	1.03	0.88	0.97	0.87
Malaysia Airports	0.93	0.88	1.09	1.15	1.01	1.01
Malta International Airport	0.36	1.12	0.79	1.30	0.58	1.21
Grupo Aeroportuario del Centro Norte	0.82	1.38	1.05	1.54	0.94	1.46
Grupo Aeroportuario del Pacifi	0.87	1.48	0.84	1.54	0.86	1.51
Grupo Aeroportuario del Surest	0.83	1.13	0.76	1.21	0.80	1.17
Aerodrom Nikola Tesla	1.27	1.87	1.32	1.44	1.30	1.66
Aena SA		0.79^		0.82^		0.81^
Flughafen Zuerich	0.53	0.91	0.63	0.91	0.58	0.91
Airports of Thailand	1.08	1.12	1.17	1.05	1.12	1.09
TAV Havalimanlaria	0.42	0.67	0.29	0.69	0.36	0.68
SAVE	0.21	*	0.25	*	0.23	*
Aeroporto Guglielmo Marconi Di Bologna SpA		0.75^		0.94^		0.85^
Airports Corporation of Vietnam JSC		0.81^		0.89^		0.85^

Appendix – regression analysis of asset betas and aeronautical till

2011-16 Regression

Regression Statistics	
Multiple R	0.057194
R Square	0.003271
Adjusted R Square	-0.0734
Standard Error	0.239939
Observations	15

ANOVA

	df	*SS*	*MS*
Regression	1	0.002456	0.002456
Residual	13	0.748416	0.05757
Total	14	0.750873	

	Coefficients	*tandard Erro*	*t Stat*
Intercept	0.650808	0.260875	2.494713
Non-aero	-0.11113	0.538046	-0.20655

2016-21 Regression

Regression Statistics	
Multiple R	0.508423
R Square	0.258494
Adjusted R Square	0.205529
Standard Error	0.30738
Observations	16

ANOVA

	df	*SS*	*MS*
Regression	1	0.461121	0.461121
Residual	14	1.322757	0.094483
Total	15	1.783878	

	Coefficients	*tandard Erro*	*t Stat*
Intercept	1.555467	0.310682	5.006624
Non-aero	-1.44191	0.652689	-2.20918

2011-20 Regression

Regression Statistics	
Multiple R	0.436769
R Square	0.190767
Adjusted R Square	0.128518
Standard Error	0.257658
Observations	15

ANOVA

	df	*SS*	*MS*
Regression	1	0.203452	0.203452
Residual	13	0.863042	0.066388
Total	14	1.066494	

	Coefficients	*tandard Erro*	*t Stat*
Intercept	1.234411	0.280141	4.406392
Non-aero	-1.01146	0.577782	-1.7506

	Asset betas			NonAero
	2011-16	2016-21	2011-20	FY19
Auckland	0.74	1.17	0.99	51%
Sydney	0.29	0.72	0.48	52%
Vienna	0.35	0.69	0.46	52%
Beijing	0.53	0.76	0.63	62%
Copenhagen	0.38	0.41	0.43	38%
A de Paris	0.49	0.74	0.62	59%
Fraport	0.46	0.48	0.50	54%
Toscana Aeroporti	0.24	0.43	0.34	49%
Japan Airport Terminal	1.03	0.83	0.98	67%
Malaysia	0.92	0.97	0.88	47%
Malta	0.75	1.22	1.05	29%
OMAB (Mexico)	0.71	1.52	1.13	24%
GAPB (Mexico)	0.63	1.49	1.10	35%
ASUR (Mexico)	0.73	1.18	0.97	41%
Zurich	0.72	0.91	0.82	45%
AENA (Spain)		0.72		31%
Average	0.60	0.89	0.76	
Implied asset beta if 100% aero				

Implied overall asset betas (if adjusting for aero/non-aero only)

2011-16	2016-21	2011-20
0.59	0.82	0.72
0.59	0.81	0.71
0.59	0.81	0.71
0.58	0.66	0.61
0.61	1.01	0.85
0.59	0.71	0.64
0.59	0.77	0.69
0.60	0.85	0.74
0.58	0.59	0.56
0.60	0.88	0.76
0.62	1.13	0.94
0.62	1.21	0.99
0.61	1.05	0.88
0.61	0.96	0.82
0.60	0.90	0.78
0.62	1.10	0.92
0.60	0.89	0.77
0.65	1.56	1.23

Notes

Non-aero/aero split not available for other airports (incl all Chinese airports)

FY19 used for aero/non-aero splits. May have varied in other years

As with all financial statements, some judgement was required in classification