The Commerce Commission's Section 56G Review of Auckland International Airport Ltd: Asset Beta for Aeronautical Pricing and Treatment of Asymmetric Risk

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Report prepared for:
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Authorship

This report is written by Dr Alastair Marsden on behalf of Auckland UniServices Ltd ("Auckland UniServices")[1] for Auckland International Airport Limited (Auckland Airport).

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[1] References in this report to "we" or "our" refer to the opinions of Dr Alastair Marsden.

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The Commerce Commission's Section 56G Review of Auckland International Airport Ltd: Asset Beta for Aeronautical Pricing and Treatment of Asymmetric Risk

1 Introduction

Auckland UniServices Ltd ("Auckland UniServices") has been engaged by Auckland International Airport Limited ("Auckland Airport") in relation to the Commerce Commission's review of Auckland Airport's pricing under Section 56G of the Commerce Act.

Specifically, Auckland Airport has requested that Auckland UniServices comment on:

- Systematic risk or the "asset beta" estimate used by Auckland Airport in aeronautical pricing, in accordance with Auckland UniServices' advice to Auckland Airport, as contained in our report on the appropriate weighted average cost of capital ("WACC") to be used by Auckland Airport for aeronautical pricing titled "*The Appropriate Weighted Average Cost of Capital for the Aeronautical Airport Activities of Auckland International Airport Ltd*" dated October 2011 ("October 2011 Report"); and

- The reasons why, in our view, the appropriate estimate of systematic risk for use in aeronautical pricing by Auckland Airport is different to the asset beta parameter input in the capital asset pricing model used by the Commerce Commission, in its Input Methodologies (Airport Services) Reasons paper, December 2010 ("IM Reasons Paper"), to determine the cost of capital for airports for information disclosure purposes for Auckland International Airport Limited, Christchurch International Airport Limited and Wellington International Airport Limited.

- Our advice in relation to asymmetric risk and how this has been treated by Auckland Airport in its pricing decision.

1.1 Structure of this Report

The structure of our report is as follows:

- Section 2 reviews Auckland UniServices' approach in its October 2011 Report to the determination of the appropriate asset beta for aeronautical pricing by Auckland Airport. We also compare this asset beta to the Commission's asset beta for airports in its IM Reasons Paper;

- Section 3 provides the split between the Airfield Income, Passenger Service Charge and Terminal Service Charges for the recent price review period following consultation with the Airlines;

- Section 4 sets out our advice in relation to asymmetric risks and how we understand this has been approached in pricing; and

- Section 5 concludes.

2 Asset Beta for Auckland Airport's Aeronautical Pricing

2.1 Introduction

In Auckland UniServices' (2010, section 4.7.2) submission to the Commerce Commission in respect of the draft IM Reasons Paper, we noted that first principles suggest the three individual airports may face a range of different levels of systematic risk.

We summarise below Auckland UniServices' approach in its October 2011 Report to the determination of the asset beta for Auckland Airports' aeronautical assets. In this report we concluded the appropriate point estimate asset beta for Auckland Airports' aeronautical assets was 0.65.

2.2 Revenue components of Auckland Airport's pricing for aeronautical assets and approaches to estimating beta

In our October 2011 Report for Auckland Airport we noted that:

- The key revenue components of Auckland Airport's aeronautical assets were:
    - Airfield: Aircraft landing charges were primarily based on the MCTOW of aircraft;
    - Passenger Service Charge ("PSC"): The PSC charge was levied on departing international passengers and provides part of Auckland Airport's return on its Terminal assets; and
    - Terminal Service Charges ("TSC"): The TSC represents revenues for the use of specific areas in Auckland Airport's international terminal building. The charge reflects costs and recoveries and is based on an agreed formula applied each year.

      There was at the time of that report no domestic passenger charge; and

- The basic approaches to estimating systematic risk or beta were:
    - First principles;
    - Direct estimation; and
    - Comparable companies.

2.3 First Principles

Factors that impact on the sensitivity of returns to real economic and GNP shocks and hence a company's beta includes (see Lally, 2000):

- the nature of the service;

- pricing structure;
- duration of contracts;
- market power;
- regulation; and
- operating leverage.

Market Power

Auckland Airport is a major 'hub' airport for air-travel in New Zealand. As a hub airport it may have greater potential exposure to volatility and changes in the domestic and international markets. Returns to Auckland Airport's aeronautical assets may be more closely correlated to the economy compared to smaller domestic airports.

Price structure: Proposed Split between the Airfield Income, PSC and TSC Charges for pricing consultation with the Airlines

In our October 2011 Report for Auckland Airport, we were not aware of the final split between the Airfield Income, PSC and TSC Charges, as at this stage we understood Auckland Airport was still to fully consult on this matter with the Airlines (substantial customers).

However, we understood that Auckland Airport was discussing with the Airlines a move away from the TSC charge, with a greater emphasis to be placed on the PSC component of aeronautical pricing.

We expressed the view that a shift in pricing towards the PSC and away from the TSC would increase the overall systematic risk of Auckland Airport's aeronautical assets. This is because it results in a pricing structure that incorporates a higher percentage of variable charges than was previously the case. This means that revenue and returns are more exposed to demand shocks caused by systematic, non-diversifiable factors.

Duration of contracts - Right to adjust charges

Auckland Airports' proposed price review period was to start 1 July 2012 for a period of 5 years. Over this period we understood Auckland Airport's pricing policy was to fix prices until 2017 for the standard services set out above. As a result, Auckland Airport is therefore exposed to demand and other shocks that impact on revenues and returns over this pricing period. This includes volume risk from unexpected changes in aircraft movements, aircraft weight and passenger numbers and cost shocks.

At the Commerce Commission's New Zealand Airports Services Conference held on 26 February 2013, Mr Whittaker for Air New Zealand (page 29) suggested that some asymmetric risk can be mitigated by the ability to re-price during the five-year period.

In our October 2011 Report, we also acknowledged that Auckland Airport may reserve the right to adjust its charges following proper consultation with the Airlines should there be a material adverse

change in the aviation environment, international or domestic economic or political conditions, or other circumstances which materially affect Auckland Airport's aeronautical business.

However, based on our discussions with Auckland Airport, we further understood that:

(i) Auckland Airport has not historically sought to raise prices when faced with an adverse change in the aviation environment; and

(ii) If prices were reset following appropriate consultation, it is not Auckland Airport's intention that the new or the revised prices would seek to recover any historical shortfall in revenues in a manner inconsistent with the pricing consultation. Specifically it would not be Auckland Airport's intention to recover any historical shortfall in revenues from an unexpected drop in aircraft or passenger movements.

In addition, any review of prices may reflect a price adjustment for factors that may be largely non-systematic (for example, changes in aircraft movements arising from mergers or acquisitions by airlines or a change in Government border security requirements). Lastly, we understood that Auckland Airport would not seek to factor expectations of these types of events into its cashflow forecast in the building block model used for aeronautical pricing.

Conclusion on first principles

Overall, in our October 2011 Report we concluded first principles analysis suggested that Auckland Airport is exposed to:

- Systematic volume risk from the nature of services provided by Auckland Airport over the price review period. This includes volume risk from unexpected changes in aircraft movements, aircraft weight and passenger numbers and cost shocks; and
- Any shift to a greater emphasis on the PSC component of total charges would increase the systematic risk of Auckland Airport's aeronautical activities.

2.4 Direct Evidence

In its IM Reasons Paper, the Commission estimated Auckland Airport's asset beta to be 0.77, higher than its estimate of the asset beta for the sample of comparator airports of 0.67.[2] Auckland UniServices updated the Commission's analysis in our October 2011 Report, which resulted in an estimate of the unadjusted asset beta for Auckland Airport as at 25 August 2011 of 0.71.[3]

Notwithstanding the difference between Auckland UniServices' and the Commission's asset beta for Auckland Airport, the direct measures of Auckland Airport's asset beta is higher than the Commission's estimate of asset beta of 0.65 for the systematic risk of aeronautical services (IM

[2] These betas of 0.77 and 0.67 are the average of the monthly and weekly observations (IM Reasons Paper, Table E19).
[3] This asset beta is also an average of monthly and weekly observations.

Reasons Paper, paragraph E8.63), prior to its 0.05 downward adjustment for lower risk attributable to the aeronautical component of the business.

2.5 Comparative Evidence

Auckland UniServices also believes that it is important to consider a wide sample of airports as part of the evaluation of a company asset beta.

The table below compares Auckland UniServices' estimate of the asset beta based on the Commission's comparative sample of companies in its IM Reasons Paper.

Average Asset Beta for Comparative Sample of Companies			
Auckland UniServices (October 2011)		Commerce Commission IM Reasons Paper (2010), Table E19	
Weekly (2-year) data	Monthly (5-year) data	Weekly data	Monthly data
0.62	0.76	0.62	0.72
Average of weekly and monthly estimate	**0.69**	Average of weekly and monthly estimate	**0.67**

We note the following points:

- The Commission's monthly (weekly) beta estimate of 0.72 (0.62) in Table E19 of its IM Reasons Paper *differs* to the average monthly (weekly) asset beta estimates of 0.69 (0.60) in paragraph E8.62 of the IM Reasons Paper.[4] The Commission, nevertheless, concludes an upper bound asset beta estimate is 0.65 for the systematic risk of aeronautical services (IM Reasons Paper, paragraph E8.93), as it includes both regulated and unregulated services.

- In Figure E9 of the IM Reasons Paper, the evidence shows the average of the weekly and monthly asset betas is higher in the more recent 2009 and 2010 years. In Auckland UniServices' October 2011 Report, the average weekly and monthly unadjusted asset beta estimate of 0.69 is also higher than the Commission's average beta estimates in Figure E9 for the 5 year periods ending 2005 to 2008 inclusive. Overall, this evidence suggests an increase in airports' systematic risk over more recent time periods.

3 Split between the Airfield Income, PSC and TSC Charges subsequent to consultation with the Airlines

Auckland Airport advises that following consultation with the Airlines, forward looking aeronautical prices have greater weighting towards the PSC component of the charge.

[4] The Commission states (paragraph E8.59 of the IM Reasons Paper) that its beta estimates in Table E19 are the average unadjusted beta estimate over *all* sampling periods (emphasis added). We presume this is the average for beta estimates over six periods for the five year periods ending 31 May 2005, 31 May 2006, 31 May 2007, 31 May 2008, 31 May 2009 and 31 May 2010 (paragraph E8.48 of the IM Reasons Paper).

The table below compares the expected or ex-ante forward looking components of the Landing Charges, PSC and TSC charges for the FY 2006 to FY 2017 years. [5]

The table shows that for the recent price review period of FY 2013 to 2017 and following consultation with the Airlines:

- Total variable or semi-variable charges are 100% of total forecast material aeronautical revenues. There is no TSC component; and

- The PSC component of the charge now includes a domestic charge. Total forecast PSC charges are circa 60% of the total forecast material aeronautical revenues.

As WACC is intended to be applied on an ex-ante basis, it is important that direct estimates are adjusted to take into account changes in the nature of the service, pricing structure, duration of contracts, market power, regulation and operating leverage which will directly affect the future non-diversifiable risk for investors.

In our view, the material changes in the price structure in PSE2 will have increased the forward looking systematic risk for Auckland Airport's aeronautical assets, as a result of the greater weighting towards the PSC component of the charge. This is because passenger volumes and thereby revenues are more likely to be correlated with economic changes than MCTOW and TSC charges.

[5] Data sourced from Auckland Airport, March 2013.

Auckland Airport: Split between Airfield Income (Landing Charges), PSC and TSC Charges in setting aeronauical charges												
	FY 2006	**FY 2007**	**FY 2008**	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**
Landing Charges	67,351	66,266	70,129	70,458	66,715	72,529	77,298	80,064	83,950	89,032	93,601	98,180
PSC - International	60,405	64,389	66,952	66,542	73,252	78,760	83,081	107,168	116,161	121,722	127,539	133,557
PSC - Domestic	-	-	-	-	-	-	-	12,463	13,208	14,023	14,817	15,572
TSC	17,274	21,888	22,897	27,470	27,814	28,342	28,604	-	-	-	-	-
Total	**145,031**	**152,543**	**159,978**	**164,470**	**167,781**	**179,630**	**188,983**	**199,695**	**213,319**	**224,777**	**235,957**	**247,309**
Percent variable or semi-variable	**88%**	**86%**	**86%**	**83%**	**83%**	**84%**	**85%**	**100%**	**100%**	**100%**	**100%**	**100%**
% Landing Charge / Total revenue	**46%**	**43%**	**44%**	**43%**	**40%**	**40%**	**41%**	**40%**	**39%**	**40%**	**40%**	**40%**
% PSC - International / Total revenue	**42%**	**42%**	**42%**	**40%**	**44%**	**44%**	**44%**	**54%**	**54%**	**54%**	**54%**	**54%**
% PSC - Domestic / Total revenue	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**6%**	**6%**	**6%**	**6%**	**6%**
% TSC / Total revenue	**12%**	**14%**	**14%**	**17%**	**17%**	**16%**	**15%**	**0%**	**0%**	**0%**	**0%**	**0%**
Data Source. Auckland Airport March 2013												

4 Asymmetric Risks

As set out in our October 2011 Report we consider that Auckland Airport faces exposure from:

- Type I: risks that are generally unrelated to the day-to-day operation of a business, and arise through infrequent events that could produce large losses (SARS, terrorist attacks, volcanoes, climate change); and
- Type II: risks that derive from asset stranding/redundancy.

In Auckland UniServices (2009) submission we argued that the Commission should recognise and allow for both Type I and II asymmetric risks. We also suggested that the Commission should sponsor some research in this area and in the meantime make an allowance greater than a clearly incorrect estimate of zero. We noted that it would not be appropriate for the Commission to assume asymmetric risks are zero on the basis that the size of any adjustment could not be easily quantified (Auckland UniServices, 2009, section 7).

The size of any margin for asymmetric risks and resource constraints is, however, uncertain and very difficult to precisely quantify. While some judgement on the size of the increment to WACC for model error is required, we do not consider it appropriate to set an allowance for model error equal to zero, particularly when forecast cashflows are biased on the upside and fail to fully recognise asymmetric risks. In addition the burden of proof on the level or quantum of asymmetric risks should not be impossibly high.

Auckland UniServices has previously noted three potential mechanisms to deal with Type I asymmetric risks, namely:

- Determination of an actuarially-fair insurance premium and modelling this cost into the cash flows under any building blocks approach;
- Adding an increment to the WACC; or
- Ex post protection - that is, when, or if, the adverse event occurs the cost is reimbursed by the customer.

For convenience, the following discussion of those options has been extracted from Auckland UniServices' report[6]:

> Actuarially-fair insurance premium
>
> Assessment of the level or quantum of adjustment for asymmetric risks is difficult. Commercial third party insurance to cover asymmetric risks is often not available and even where available is typically much more expensive that an "actuarially-fair" premium charge.
>
> In this regard Boyle (2002) (quoting Froot, 1999) notes that reinsurers often require substantial risk premiums to ensure against catastrophe risks. Boyle (2002) also notes in 1996 Berkshire Hathaway sold $1.05 billion of reinsurance to the California Earthquake Authority. The probability of Berkshire Hathaway having to pay anything under the reinsurance policy was estimated at 1.7%, but the premium was $113 million - 6.3 times the expected loss. That is, according to the theory of the CAPM that provides a return for systematic or non-diversifiable risk only the premium should have been less than $17.85 million.

[6] Auckland UniServices, Comments on the Commerce Commission's Approach to Estimate the Cost of Capital, 2 Dec 2009, pages 65 to 66.

Increment to cost of capital

In our view more common commercial practice is to add an increment to the discount rate as opposed to providing for asymmetric risks in the 'cashflow' expectations. This recognises modelling any asymmetric risks in the expected cashflows is often not well understood or accepted in practice.

Ex-post protection

In respect of ex-post protection, assets owned by regulated firms typically have long expected asset lives and any contract for ex-post protection would need to be binding on the parties (including the regulator) and of long-term duration.

For Airports ex-post protection does not appear a realistic option given the potential for changes in the airlines that operate at each Airport. Future passengers would also be required to meet the cost of a past event.

Auckland UniServices understands that Auckland Airport has also provided advice in its submission about the interaction between its insurance policies and the Type 1 asymmetric risks faced by Auckland Airport.

In practice, we understand that Auckland Airport did not make cashflow adjustments in its building block model for Type 1 asymmetric risks described above, furthermore insurance does not fully cover these risks and ex-post protection is not provided. Rather, Auckland Airport considered the existence of asymmetric risks to provide strong grounds for departing from the Commission's 75th percentile for pricing purposes.

Our advice to Auckland Airport, in the context of measuring Auckland Airport's profitability or assessing any excess profits, was that we consider an additional margin to WACC of up to 1% for Auckland Airport's aeronautical assets would not be unreasonable, where under Auckland Airport's building block model the cashflows are upward "biased" and inadequate allowance is made for all asymmetric risks and other market frictions. This is in addition to any allowance for parameter error.

Auckland UniServices recommends that the Commission make an allowance for asymmetric risks when evaluating Auckland Airport's forecast effective return to the extent this has not been provided for in the building block model.

5 Conclusion

In summary we conclude:

- In its October 2011 Report, Auckland UniServices considered that the point estimate asset beta for Auckland Airport's aeronautical assets was 0.65. We noted that Auckland Airport faces systematic volume risk from the nature of services provided by Auckland Airport over the price review period. This includes volume risk from unexpected changes in aircraft movements, aircraft weight and passenger numbers and cost shocks.

- In our view, the analysis undertaken in Auckland UniServices' October 2011 Report supports the position taken by Auckland Airport in adopting an asset beta in its recent pricing for aeronautical services that was higher than the Commission's estimate of beta in its IM Reasons Paper. Additional reasons in support of Auckland Airport's position on its asset beta include, inter-alia:

- The Commission's own empirical measurement of Auckland Airport's asset beta that demonstrates its asset beta was higher than the Commission's average industry sample asset beta for airports; and
- Since that time, Auckland Airport has revised its price structure in a way which will increase the forward looking systematic risk for Auckland Airport's aeronautical assets, due to the materially higher weighting towards the PSC (exposure to shifts in passenger volumes) in forecast revenues.

- Auckland Airport continues to face asymmetric risk in its forecast returns. Consistent with our understanding during consultation, Auckland Airport faces risks from natural disasters, pandemics and terrorist attacks that are not insurable or fully covered by its insurance and no allowance for these risks are provided in the forecast cashflows. In that context, Auckland UniServices recommends that the Commission make an allowance for asymmetric risks when evaluating Auckland Airport's forecast effective returns.

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