The Appropriate Weighted Average Cost of Capital for the Aeronautical Airport Activities of Auckland International Airport Ltd

AUCKLAND UNISERVICES LIMITED

a fully owned subsidiary of the University of Auckland

Report prepared for:
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Signature of Report Writer

Alastair Marsden

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Executive Summary

1. Introduction

Under the Airport Authorities Act 1966, Auckland International Airport Limited ("AIAL" or the "Company") is required to consult with its substantial customers ("Airlines") on the pricing of its aeronautical airport activities. This consultation must be with a frequency of at least every five years.

AIAL is planning to adopt a building block approach as part of the consultation process in the determination of the prices for use of its aeronautical assets. An important component into the building block model is the cost of capital.

Auckland UniServices Ltd ("Auckland UniServices" or "we") has been requested to prepare a report for AIAL on the weighted average cost of capital ("WACC") to be used for aeronautical pricing. In addition we have been asked to consider how new capital expenditure should be "capitalised" into AIAL's aeronautical asset base and the process by which the WACC should be updated just before prices are reset on 1 July 2012.

2. Point Estimate of WACC

Auckland UniServices' point estimate of the WACC for AIAL's aeronautical assets as at 1 September 2011 is:

- Post-tax WACC 8.65%
- Vanilla WACC 9.21%

These point estimates are prior to any allowance for parameter and model error.

The table below summarises our parameter inputs and compares our point estimates to the Commerce Commission's point estimates under the approach set out in the Commerce Commission Input Methodologies (Airport Services) Reasons Paper December 2010 ("IM Reasons Paper 2010")..

WACC for AIAL's Aeronautical Assets		
	Auckland UniServices Ltd	Commerce Commission under IM Reasons Paper (2010) approach
Parameter	**Point estimate**	**Point estimate**
Risk free rate	4.63%	4.04%
Aggregate tax rates for investors on debt	28%	28%
Asset Beta	0.65	0.60
Equity Beta	0.93	0.72
TAMRP	7.50%	7.00%
Cost of equity	10.30%	7.95%
Cost of debt		
Debt margin	1.63%	1.63%
Debt Issuance Costs	0.425%	0.35%
Cost of debt pre tax	6.69%	6.02%
Corporate tax rate	28.0%	28.0%
WACC		
Debt to Value ratio	30.0%	17.0%
Equity to Value ratio	70.0%	83.0%
Point estimate Post-tax WACC (prior to any allowance for model error)	**8.65%**	**7.33%**
Point estimate Vanilla WACC (prior to any allowance for model error)	**9.21%**	**7.62%**

3. WACC Range and Parameter Error

To determine a WACC range that accounts for parameter error we adopt the analytical approach, together with the standard errors for each parameter estimate as set out in the Commerce Commission's IM Reasons Paper (2010). The results of this analysis with ranges between the 5th and 95th percentiles are provided in the table below.

WACC Range							
Auckland UniServices Ltd							
Percentile	**5%**	**10%**	**25%**	**50%**	**75%**	**90%**	**95%**
Post-tax WACC	6.08%	6.65%	7.60%	8.65%	9.71%	10.66%	11.23%
Vanilla WACC	6.64%	7.21%	8.16%	9.21%	10.27%	11.22%	11.79%
Commerce Commission							
Percentile	**5%**	**10%**	**25%**	**50%**	**75%**	**90%**	**95%**
Post-tax WACC	4.94%	5.47%	6.35%	7.33%	8.32%	9.20%	9.73%
Vanilla WACC	5.22%	5.76%	6.64%	7.62%	8.60%	9.49%	10.02%

In the context of assessing AIAL's profitability or any measure of excess profits, we consider a WACC at the upper end of the percentile distribution (75th to 95th percentile) should be used to ensure there are appropriate incentives for investment in the presence of asymmetry of social consequences.

4. Allowance for Model Error

The Commission in its IM Reasons Paper (2010) considers no allowance to the cost of capital should be made for model error.

In our view, however, a further increment to the WACC is justified to account for model error where:

- The cash flows in AIAL's building block model do not fully reflect or make an adequate allowance for downside (Type I asymmetric) risks; and
- In the real world firms face Type II asymmetric risks, and/or other "resource" constraints due to limited managerial and other resources to undertake all positive net present value investments.

The size of any margin for asymmetric risks and resource constraints is uncertain and very difficult to precisely quantify. Thus, 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.

In the context of measuring AIAL's profitability or assessing any excess profits we consider an additional margin to WACC of up to 1% for AIAL's aeronautical assets would not be unreasonable, where under AIAL'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.

5. WACC range including an allowance for model error

In setting prices for AIAL's substantial customers under a building blocks model, AIAL will need to adopt a single point estimate of WACC.

We summarise in the table below our estimate of the WACC range including an allowance for model error between 0.15% at the 50th percentile distribution and 1.0% at the 95th percentile distribution.[1]

[1] We have calculated the model error for the 75th, 90th and 95th percentile range to conform to a standard normal distribution with 0.15% at the 50th percentile and 1.0% at the 95th percentile.

WACC Range with Parameter and Model error				
Percentile	**50%**	**75%**	**90%**	**95%**
Post-tax WACC	8.65%	9.71%	10.66%	11.23%
Increment for Model error	0.15%	0.50%	0.81%	1.00%
Post-tax WACC including an allowance for model error	**8.80%**	**10.21%**	**11.47%**	**12.23%**
Percentile	**50%**	**75%**	**90%**	**95%**
Vanilla WACC	9.21%	10.27%	11.22%	11.79%
Increment for Model error	0.15%	0.50%	0.81%	1.00%
Vanilla WACC including an allowance for model error	**9.36%**	**10.77%**	**12.03%**	**12.79%**

6. Process to update the WACC just before prices are reset on 1 July 2012

In our view the process for AIAL to update the WACC prior to prices being reset on 1 July 2012 should be similar to the Commission's approach in its IM Reasons Paper (2010) and subsequent determinations in the Commerce Commission's Decision No. 709 – Input Methodologies Determination applicable to Specified Airport Services pursuant to part 4 of the Commerce Act 1986.

Under this approach the following WACC methodology and parameters are determined and set prior to 1 July 2012:

- The use of the simplified Brennan-Lally model to determine the cost of equity capital, with the investor tax rate set equal to the corporate tax rate;
- The asset beta;
- Leverage;
- Tax-adjusted market risk premium; and
- The equity beta (based on asset beta and leverage)

The parameters to be determined on 1 July 2012 (or as close as reasonably practical prior to this date) would be:

- The risk free rate (based on the approach outlined in Appendix 1); and
- The debt risk premium (based on the approach outlined in Appendix 2).

7. Capitalisation of New Capital Expenditure into the Asset Base

Under AIAL's proposed building block model we understand assets that are being built or under construction will not be included in the value of AIAL's aeronautical asset base until such time as the assets are commissioned and in use.

We recommend the appropriate financing cost to capitalise the expected cost of new assets to be included in AIAL's aeronautical assets is the post-corporate WACC determined at the start of each five-year pricing review period.

The Appropriate Weighted Average Cost of Capital for the Aeronautical Airport Activities of Auckland International Airport Ltd

1 Introduction

Under the Airport Authorities Act 1966 and its subsequent amendments, Auckland International Airport Limited ("AIAL" or the "Company") is required to consult with its substantial customers ("Airlines") on the pricing of its aeronautical airport activities. This consultation must be with a frequency of at least every five years.

AIAL is planning to adopt a building block approach as part of the consultation approach in the determination of the prices for use of its aeronautical assets. An important component into the building block model is the cost of capital.

AIAL intends to hold consultation with the Airlines on the components relevant to the building block model between October 2011 and December 2011. These consultations will involve meetings between AIAL and its substantial customers.

Subsequent to the initial consultation phase with the Airlines, AIAL will then release a Draft Pricing Proposal.

2 Scope of Work

2.1 Introduction

Auckland UniServices Ltd ("Auckland UniServices" or "we") has been requested to prepare a report for AIAL that addresses the following issues:

(a) Recommendation on the methodology for calculation of the weighted average cost of capital ("WACC") to be used for aeronautical pricing;

(b) Parameter estimates and parameter errors including the asset beta and leverage estimates;

(c) Consideration of model error and recommendation on an appropriate percentile for pricing;

(d) Summary of post-tax and vanilla WACC estimate;

(e) Comparison of the Auckland UniServices' WACC estimate to the Commerce Commission Input Methodologies (Airport Services) Reasons Paper, December 2010 ("IM Reasons Paper 2010") approach to estimate WACC for airports;

(f) Consideration of how new capital expenditure should be "capitalised" at an appropriate cost of capital when incorporated into AIAL's aeronautical asset base, taking into account the practicality of implementation; and

(g) Consideration of the process by which the WACC should be updated just before prices are reset on 1 July 2012.

2.2 Compliance with Code of Conduct

This report is written by Dr Alastair Marsden on behalf of Auckland UniServices[2] for AIAL. In preparing this report Dr Marsden has confirmed that he has read the Code of Conduct for Expert Witnesses as contained in Schedule 4 of the New Zealand High Court Rules and that his opinion or advice provided in this report to AIAL will abide by that Code.

2.3 Disclaimer

Auckland UniServices (and Dr Marsden) will not be liable for any loss or damage to any party that may rely on our report other than the Auckland International Airport Limited. In addition, we have no obligation to update our report or to revise the information contained therein because of events and transactions occurring subsequent to the date of this report.

In accordance with the terms of this engagement letter we have not audited or independently verified any of the information provided to us.

2.4 Structure of this Report

The remainder of our report is structured as follows:

- Section 3 provides an overview of AIAL's identified and non-identified Airport Activities ;
- Section 4 defines the post-corporate tax WACC and the vanilla WACC ;
- Section 5 provides our estimates of the risk free rate, cost of debt, market risk premium and asset beta ;
- Section 6 discusses the tax rates ;
- Section 7 discusses leverage ;

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

- Section 8 provides an overview of the cost of capital range;
- Section 9 reviews adjustments to WACC for model error;
- Section 10 concludes on WACC;
- Section 11 discusses the process to update WACC prior to prices being reset on 1 July 2010; and
- Section 12 discusses the appropriate cost of capital to capitalise new capital expenditure to be included into the asset base once the asset is commissioned and in use.

3 AIAL's Identified and non-Identified Airport Activities

3.1 Airport Activities within AIAL

AIAL is New Zealand's largest domestic and international airport. It owns and operates aeronautical and non-aeronautical (airport) assets.

Table 1 summarises AIAL's revenue split between its identified Airport activities and non-identified Airport activities for the 2009 - 2011 financial years.

Table 1. AIAL - Revenue split between identified and non-identified Airport activities

Revenue	2011		2010		2009	
	$m	% Total	$m	% Total	$m	% Total
Identified Airport Activities						
Airfield Income	72.529	18.49%	66.715	18.37%	70.458	19.13%
Passenger Services Charge	78.760	20.07%	73.252	20.17%	66.542	18.07%
Terminal services charge	28.342	7.22%	27.814	7.66%	27.47	7.46%
Rental income	18.941	4.83%	23.509	6.47%	24.362	6.61%
Interest income	0	0.00%	0.937	0.26%	1.542	0.42%
Other income	5.611	1.43%	4.245	1.17%	4.957	1.35%
Total Identified Airport Activities	**204.183**	**52.0%**	**196.472**	**54.1%**	**195.331**	**53.0%**
Non- Identified Airport Activities						
Retail	111.15	28.33%	95.817	26.39%	105.316	28.60%
Rental income	34.791	8.87%	25.024	6.89%	23.613	6.41%
Car parks	33.435	8.52%	31.057	8.55%	29.377	7.98%
Interest	0	0.00%	0.741	0.20%	1.069	0.29%
Other income	8.794	2.24%	14.002	3.86%	13.589	3.69%
Total Non- Identified Airport Activities	**188.17**	**48.0%**	**166.641**	**45.9%**	**172.964**	**47.0%**
Total income	**392.353**	**100%**	**363.113**	**100%**	**368.295**	**100%**

Source: AIAL 2010 and 2010 Disclosure Statement and FY 2011 annual results 2011 Full Investor information Pack.

3.2 Aeronautical Airport activities

The key revenue components of AIAL's aeronautical assets are:

- Airfield: Aircraft landing charges are primarily based on the MCTOW of aircraft. Revenue for the 2011 (2010) year was $72.529 million ($66.715 million), or an 8.7% increase on the previous year.

- Passenger Service Charge ("PSC"): The PSC charge is levied on departing international passengers[3] and provides part of AIAL's return on its Terminal assets. Revenue for the 2011 (2010) year was $78.76 million ($73.252 million), or a 7.5% increase on the previous year.

- Terminal Service Charges ("TSC"): The TSC represents revenues for the use of specific areas in AIAL's international terminal building. The charge reflects costs and recoveries and is based on an agreed formula applied each year.

There is currently no domestic terminal service or passenger service charge.

3.3 Non-identified Airport activities

The key revenue components of AIAL's non-identified Airport Activities are:

- Retail: This comprises revenue to AIAL from its retail concessions, including duty free and speciality stores, foreign exchange and food and beverage outlets.

  We understand that the retail income is primarily based on a percentage of gross retail sales with varying margins differing for different product categories. However, given that sales over the licence period can be variable, most of AIAL's retail income or licence fees are subject to minimum guaranteed payments. This is set at a level below the expected licence fee based on the percentage calculation applied to forecast sales.

- Rental income: This is income based on square metres occupied by tenants.[4]

- Car parks: This comprises revenues from car parking buildings and space located in the wider airport environment.

- Other income and general: This category includes revenues from the sale of electricity, gas and water, rates recoveries from tenants, transport license fees and other miscellaneous revenue items.

3.4 AIAL's Assets and EBITDA

Table 2 summaries AIAL's assets and earnings before interest and tax ("EBIT") for the 2009 and 2010 financial years, split between its identified Airport activities and non-identified Airport

[3] The development charge is not levied on transits, transfers and children under twelve years old.
[4] AIAL is also developing its existing land bank as part of its non-aeronautical Airport activities. In this regard, we understand that AIAL will generally only undertake property development and construct new buildings where it has tenant pre-commitments and a high degree of certainty on building costs.

activities. The assets and EBIT for AIAL's non-identified Airport activities is assumed to be the difference between AIAL's aeronautical assets as disclosed in AIAL's 2010 Information Disclosure Accounts and the total consolidated assets and EBIT in its 2010 Annual Accounts.[5]

Table 2. AIAL - Asset and EBITDA split between identified and non-identified Airport activities				
	2010		2009	
	$m	% Total	$m	% Total
Assets				
Identified Airport Activities	1,383.58	42.4%	1,383.62	44.8%
Non- Identified Airport Activities	1,878.48	57.6%	1,704.53	55.2%
Total assets	**3,262.06**	**100.0%**	**3,088.15**	**100.0%**
EBIT				
Identified Airport Activities	89.166	38.7%	89.048	55.3%
Non- Identified Airport Activities	140.976	61.3%	71.963	44.7%
Total EBITDA	**230.142**	**100.0%**	**161.011**	**100.0%**
Source: AIAL 2010 Annual Report and AIAL's Disclosure Financial Statements				

In summary Tables 1 and 2 suggest AIAL's identified Airport activities is presently between 40% and 55% of AIAL's total business activities based on asset, EBIT and revenue measures.

3.5 Passenger and Aircraft Statistics

Table 3 summarises AIAL's total passenger and aircraft statistics for the 2009 to 2011 years.

Table 3. Passenger and aircraft statistics	2011		2010		2009	
	Number	% Total	Number	% Total	Number	% Total
Passenger movements						
Total international passengers	**7,781,819**	**56%**	**7,415,792**	**55%**	**7,359,611**	**57%**
Total domestic passengers	**6,042,468**	**44%**	**6,032,410**	**45%**	**5,598,077**	**43%**
Total Passenger movements	**13,824,287**	**100%**	**13,448,202**	**100%**	**12,957,688**	**100%**
Aircraft movements						
International aircraft movements	43,782	28%	42,697	28%	40,756	26%
Domestic aircraft movements	110,508	72%	112,274	72%	116,032	74%
Total aircraft movements	**154,290**	**100%**	**154,971**	**100%**	**156,788**	**100%**
MCTOW (maximum certified take-off weight)						
International MCTOW	4,007,728	70%	3,923,988	69%	4,075,946	70%
Domestic MCTOW	1,682,824	30%	1,746,912	31%	1,774,079	30%
Total MCTOW (tonnes)	**5,690,552**	**100%**	**5,670,900**	**100%**	**5,850,025**	**100%**
Source: AIAL 2010 and 2011 Annual Reports						

[5] We have not sighted AIAL's Disclosure Statement for 2011 to enable us to determine the split between identified Airport Activities and non- identified Airport Activities for the 2011 year.

Total passenger movements for the 2011 and 2010 years were 13.82 million and 13.45 million respectively or an annual increase of 2.8%. Of these passenger movements circa 55%-56% were "international" passenger movements and circa 44%-45% were "domestic" passenger movements.

For the 2011 year, 72% of aircraft movements were domestic and 28% of aircraft movements were international. However, only 30% of MCTOW was from domestic aircraft and 70% of MCTOW was from international aircraft.

4 Definition of WACC

4.1 Post-tax definition of WACC

The post-tax definition of WACC is:

$$WACC = k_e \frac{E}{V} + k_d (1 - t_c) \frac{D}{V} \qquad (1)$$

k_e = cost of equity capital

k_d = cost of debt

E/V = "market" value of equity/total firm value

D/V = "market" value of debt/total firm value

t_c = corporate tax rate

4.2 Vanilla definition of WACC

The vanilla definition of WACC is:

$$WACC = k_e \frac{E}{V} + k_d \frac{D}{V} \qquad (2)$$

Where terms are as defined above.

Under the building block model it is important that the definition of cash flows to be discounted or applied in a building block model is consistent with the definition of the cost of capital employed.

Cost of Equity

The cost of equity capital model ("CAPM") currently used by the NZ Commerce Commission ("Commerce Commission" or "Commission") in its IM Reasons Paper is:

$$k_e = R_f (1 - T_i) + \beta_L (TAMRP)$$

Where, in addition to the terms already defined:

R_f	=	The risk free rate
T_i	=	The average (across equity investors) of their marginal tax rates on ordinary income
$ß_L$	=	Levered beta
TAMRP	=	Tax-Adjusted Market Risk Premium

This is also Auckland UniServices' preferred version of the CAPM, under New Zealand's dividend imputation system, to determine the cost of equity capital.

5 Key Parameter Inputs to estimate the Cost of Capital

5.1 Risk Free Rate

5.1.1 Term of the risk free rate

The Commission's decision in its IM Reasons Paper (2010, para. 6.1.12) is that the term of the risk-free rate will be five years under an information disclosure regime for airports. This matches the typical term of NZ airport's pricing agreements with its customers. The Commission draws on work by Lally (2004), who offers a theoretical model to show that if the term structure of interest rates is upward (downward) sloping then allowed regulated revenues will be too high (low) if using a rate of return longer than a regulated or price review period.

A term of five years is consistent with the AIAL' proposed price re-set period of five years.

Our view

In our view the Commission's position that the term of the risk free rate should match the regulatory review period does not accord with, inter-alia (see Auckland UniServices 2009, 2010):

- Normal commercial practice. We understand AIAL does not seek debt finance that matches a regulatory review period (see section 5.2.1 titled "AIAL's debt maturity profile"). Rather AIAL's funding decision will reflect considerations with respect to inter-alia:
  - Forecast capital commitments;
  - Funding availability, cost and refinancing risk. Prudent firms will have debt maturing at different profiles or times than a regulatory review re-set date;
  - Rating requirements including liquidity margins required; and
  - The impact of financial reporting standards with respect of debt maturities and hedging decisions.

- The Matching Principle. Firms that are required to finance assets with expected lives greater than a regulatory review period will seek to borrow term debt with a maturity greater than a

typical regulatory or price review period. Much of AIAL's infrastructure assets have expected lives much greater than a regulatory review period;

- Consistency with the intercept term of the risk free rate in the CAPM and term of the risk free rate in the market risk premium (see discussion below).

5.1.2 Consistency with the intercept term of the risk free rate in the CAPM and term of the risk free rate in the MRP / TAMRP

In the Commission's Recommendations paper (2008, para. 36-37) there was disagreement between Dr Lally, Professor Myers and Professor Franks on whether or not the first term of r_f (intercept term) in the CAPM should equal the term to maturity of r_f in the market risk premium (MRP) or tax-adjusted market risk premium (TAMRP) of the CAPM. [6]

The assumption of consistency between the maturity of the first term of r_f in the CAPM and the term of r_f in the MRP /TAMRP (second term of the CAPM) is important, given historical estimates of the MRP / TAMRP generally show the estimate is higher measured relative to bills than long-term bonds.

In our view the same measure of the risk free rate should be used consistently within the CAPM.[7] Thus, where the measure of the TAMRP is measured relative to long-term bonds the first term of r_f in the CAPM should also be measured against long-term interest rates.

In this respect the Commission in its IM Reasons Paper (2010, para E7.42) states its current TAMRP has been calculated against a five year rate rather than a 10 year rate. However, in para. E 7.42 the Commission also states:

> *"In previous decisions the Commission has used an estimate of the TAMRP above the 10 year risk free rate. The IM continues the approach of estimating only one TAMRP covering lengths of all regulatory periods".*

---

[6] The Brennan-Lally CAPM may be restated as follows:

$E(R_j) = R_{f\ intercept} \times (1\text{-}Ti) + \beta[E(R_m) - R_{f\ MRP} \times (1\text{-}Ti)\ ]$; or
$E(R_j) = E(R_m) + (R_{f\ intercept} - R_{f\ MRP}) \times (1\text{-}Ti)$ if $\beta = 1$

If the firm has a beta of one and exactly matches the risk of the market portfolio, its expected rate of return should also equal the market rate of return. However this result will not be achieved if $R_{f\ intercept}$ does not equal $R_{f\ MRP}$.

Dr Lally acknowledges that under his recommended approach, two different risk-free rates may arise in the CAPM formula. Dr Lally argues that this is a pragmatic modification of the CAPM to preserve the NPV = 0 principle.

[7] See Boyle, Evans and Guthrie (2006) for a more detailed explanation as to why consistency in the measurement of the risk free rate term in the CAPM is a necessary condition.

It is not clear to us how the Commission concludes a TAMRP referenced to a five year rate of 7.0% is consistent with its prior decisions, where it has also tended to use a 7.0% TAMRP referenced to a 10 year rate.

5.1.3 Australian regulatory practice

The Australian Energy Regulator ("AER") (2009) considered the appropriate term for the risk free rate in the CAPM in its recent regulatory decision on the cost of capital for electricity transmission and distribution network service providers. The AER concluded (p173) that:

> "*...despite the strong conceptual arguments for a term matching the length of the regulatory period on the equity side, the AER considers it is reasonable and appropriate to take a cautious approach on this matter and retain a 10-year term assumption. This reflects the AER's concern that refinancing risk not be increased for the sector, which is particularly important given current market conditions*".

The AER also noted that matching the term of the risk free rate to the regulatory period would under-compensate the efficient energy network by way of the term premium on the credit spread component of the cost of debt.

5.1.4 Conclusion on the term of the risk free rate

We acknowledge there are plausible theoretical arguments with respect to the equity side of the cost of capital that the term of the risk free rate should match the regulatory review period (Lally 2004), albeit that the observed behaviour by firms indicate that the assumptions underlying Lally's analysis fail to fully capture key elements of the real world in which firms operate.

However, in a further study Lally (2007) considers the appropriate term of the risk free rate in a regulatory price control environment with the presence of corporate debt. He concludes that to ensure the NPV = 0 criterion for equity holders is satisfied, the term of the risk free rate should match the time period of the regulatory cycle. This, nevertheless, requires that the firm match the duration of debt to the time period of the regulatory cycle. Lally (2007, p80) notes that failure of the firm to match its duration of debt to the regulatory cycle:

> *"... lead to cash flows to equity holders whose net present value will tend to be negative, and will also inflict interest rate upon equity holders"* (emphasis added).

In summary we consider it prudent to adopt a conservative position and follow the view of the AER (2009) in the use of a long term Government bond to proxy for the risk free rate.

In addition we consider that there are strong arguments to support the view that:

- The term of the risk free rate in the CAPM should match the expected duration or life of the underlying assets. For infrastructure assets this suggests a term for the risk free rate greater than 5 years; and
- The same measure of the risk free rate should be used consistently within the CAPM.

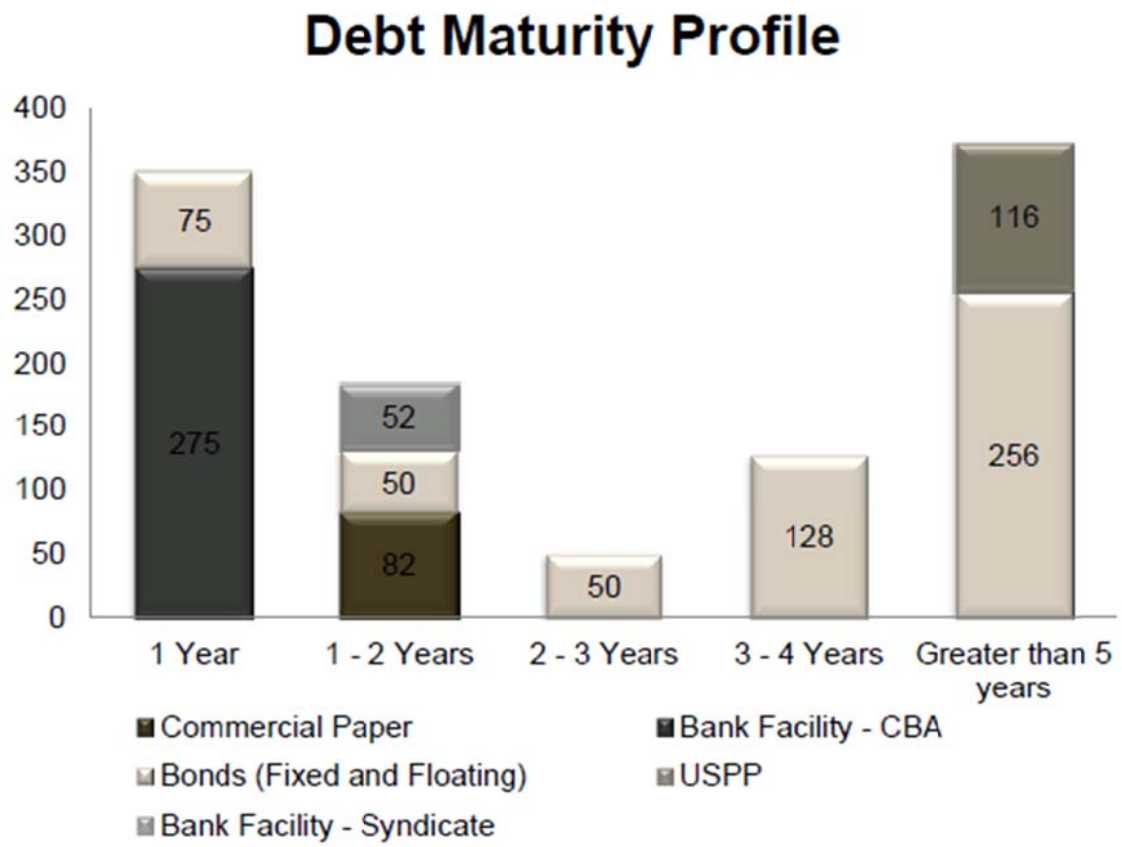
Our estimate of the risk free rate as at 1 September 2011 is **4.63% p.a**. (based on 9.7 year Government stock yields for the bond maturing 15 May 2021 - see Appendix 1). This compares to an interpolated risk free rate of 4.02% for a five year term (also see Appendix 1).

5.2 Debt Premium and Debt Issuance Costs

5.2.1 AIAL's debt maturity profile

The figure below shows the debt maturity profile for AIAL as at 30 June 2011.

Figure 1



Source: Auckland International Airport Ltd – FY 2011 Annual Results 2011 – Full Investor Information Pack, Slide Presentations, page 16. Sourced from the website of Auckland International Airport Ltd.

As at 30 June 2011 the recent issues of long tenor 10 and 12 year debt under a US Private Placement issuance extended AIAL's average debt maturity to 4.16 years. The average interest expense for the 2011 year was 6.58%.[8]

Figure 1 also suggests that as at 30 June 2011 the weighted average of the original term to maturity date of AIAL's debt would be likely to exceed five years or a term greater than the period of the price re-set date for AIAL's aeronautical services.

5.2.2 Debt premium as the difference between the corporate borrowing rate and the risk-free rate using publicly traded bonds

The Commission's approach in its IM Reasons Paper (2010) and Decision No. 709 is to determine the debt premium by reference to traded NZD vanilla bonds issued by an airport with a "five year" remaining term to maturity.

In Auckland UniServices (2009, 2010) submissions to the Commerce Commission we expressed the view that the Commission's approach to determine the cost of debt and debt premium should be adopted with caution. The reasons include: [9]

- In the NZ bond market traded bond yields may not be representative of the cost of debt for firms. This is due to the small size of the bond market, the lack of analyst coverage and the role that small retail investors play in setting prices;
- Secondary market retail bond trades are generally for small volumes. The market price may be significantly different from what professional investors and intermediaries believe is "fair value";
- The impact of brokerage costs; and
- Spreads on traded corporate bonds in the New Zealand market also appear low by international standards.[10]

We further note that the Commission in its IM Reasons Paper (2010, para. 6.3.9) suggests that regulated firms could manage the effective term of debt finance through the use of interest rate swaps. However, entering into an interest rate swap exposes each party to counter-party risk. We also doubt a firm would wish to have all interest rate swap transactions maturing on a price re-set date.

Overall we recommended that the Commission seek independent treasury advice on the debt risk premium for Airports.

[8] AIAL's Annual Report for 2011, page 46.
[9] See Auckland UniServices (2009, Section 4.2).
[10] See Auckland UniServices (2009, section 4.2).

5.2.3 Conclusion on debt premium for AIAL

In preparing this report we are not privy to information from AIAL's bankers on the likely debt premium the Company would face if it were to access debt markets in the current economic environment.

Thus:

- Notwithstanding our reservations on the use of the traded bond market to estimate a firm's debt premium,; and
- Evidence that AIAL sources its debt finance from a variety of debt markets, with a weighted average original term to maturity that may exceed five years (being the current period between price re-set dates);

we determine the debt premium for AIAL using its traded bond yields with maturity dates Nov 2015 and 2016[11] over the month of August 2011.

Our analysis in Appendix 2 finds that the debt premium for AIAL bonds for the month of August 2011 was **1.63%** over matching Government stock bond yields, using the approach set out in the Commission's IM reasons Paper (2010).

We use this debt premium in our calculation of the post-tax and vanilla WACC for AIAL's aeronautical assets.

5.3 Debt issuance Costs

The Commission's decision in its IM Reasons Paper (2010, para 6.3.35) is to include debt issuance costs in the cost of capital calculation for airport services. The Commission concludes an appropriate allowance for debt issuance costs on publicly traded bonds is 0.35% per annum.

We agree with the Commission's decision to include debt raising costs in the cost of debt and not as an allowance in the expected cash flows.

The relevant debt issuance costs when using traded bond yields to estimate the debt premium are the costs to publicly issue the debt into the secondary market.

[11] In calculating the debt premium we place most weight on the premium observed for AIAL's 2016 maturity bonds, given some evidence of non-trading in the 2015 maturity bonds.

5.3.1 Debt issuance costs for AIAL

On 28 October 2009 Auckland Airport issued a prospectus[12] for an offer of fixed rate bonds with the ANZ as joint lead manager and organizing participant. The brief terms of this offer were:

Table 4: Issuer	**Auckland International Airport Ltd**
Principal amount offered	$125,000,000
Interest rate	7% per annum
Opening date of offer	29 October 2009
Closing date of offer	27 November 2009
Maturity date	27 November 2014
Status	Unsubordinated and unsecured
Underwriting	Not underwritten

Auckland Airport's bond prospectus of October 2009 states (page 31) that:

> *"11. Issue expenses*
>
> *Applicants pay no fees or charges to invest in the Bonds. The issuer will pay brokerage on new applications of 0.75% to NZX Participants for applications carrying that NZX Participant's stamp. NZX participants in the Book Build may also be paid a Firm allocation fee of 0.25% of the issue price in respect of Bonds allocated pursuant to the Firm Allocation.*
>
> *Issue expenses, including brokerage, legal, accounting, audit, registry, printing, distribution and promotion expenses, joint lead manager and other fees to be incurred, are estimated to be $1,710,000 in relation to the initial Series of Bonds and are payable by the Issuer . The Issuer will incur further issue expenses at the time of issue of each further Tranche of Bonds."*

The estimated issue expenses in Auckland Airport's bond prospectus as a proportion of the Principal amount offered was 1.368%.[13] If this cost is amortised over 5 years at a discount rate of 7.0% p.a. (equal to the coupon rate on the bonds), the equivalent cost in expected present value terms is $403,180 per annum[14] or 0.32% p.a. as a percentage of the principal amount offered.

Standby and other Debt Underwriting costs to maintain an Investment Grade Credit Rating

Auckland UniServices (2010, pages 30-31) also expressed the view that an increment to debt issuance costs should be allowed for standby and other debt underwriting costs to maintain an investment grade credit rating.[15]

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[12] Auckland International Airport Ltd, 2009, Prospectus for an offer of Fixed Rate Bonds, 28 October 2009.
[13] Calculated as $1,710,000 / $125,000,000.
[14] Calculated using a discount rate with half-year discount factors. For example, the first year equivalent payment of $403,180 is discounted at $(1.07)^{0.5}$. The sum of the discounted or present value of expected payments of $403,180 each year over a 5-year period equals the estimated issue expenses of $1,710,000.
[15] We also recommended that the Commission seek independent treasury advice on debt issuance and standby costs for Airports.

Based on our discussions with AIAL we consider an increment to debt issuance costs of 12.5 basis points per annum would be reasonable for standby and underwriting costs.[16]

5.3.2 Conclusion on debt issuance costs

We conclude an appropriate allowance for debt issuance costs is **0.425%** (comprising a debt premium of 30 basis points and an allowance for standby and underwriting costs of 12.5 basis points).

5.4 Market Risk Premium

5.4.1 Introduction

The tax-adjusted market risk premium ("TAMRP") under the Brennan-Lally CAPM is:

$$TAMRP = E[R_m] - R_f (1 - T_1)$$

Where: $E[R_m]$ = expected market return
R_f = risk free rate
T_1 = weighted average investor tax rate on ordinary income

The standard market risk premium ("MRP") is $E[R_m] - R_f$.

5.4.2 Historical evidence of Dimson et al. (2010) on the MRP

Dimson et al. (2010) provide a comprehensive study on the historical market risk premiums for 19 developed countries over the period 1900 – 2009. Table 5 below summarises the arithmetic mean market risk premium relative to bill and long-term bonds over this period for the US, UK and other countries (including NZ) in the Asia-Pacific region.

[16] We assume a prudent debt management policy would be to arrange a standby facility for 20% of an entity's total debt facilities. If the standby cost for this facility was between 50 to 75 basis points per annum, then the cost spread over all debt facilities would be between 10 and 15 basis points per annum.

Table 5: Mean Arithmetic Market Risk Premium 1900- 2009.		
Country	**MRP - measured relative to bills**	**MRP - measured relative to bonds**
Australia	8.3%	7.9%
New Zealand	5.8%	5.5%
Japan	9.1%	9.2%
South Africa	8.2%	7.2%
United Kingdon	6.0%	5.2%
Unites States	7.1%	6.3%
Average of 19 countries	**6.96%**	**6.09%**
Source: Dimson et al. (2010).		

In estimating the market risk premium we place most weight on historical estimates to determine the ex-ante or forward looking risk premium (see Auckland UniServices 2009, 2010). Ibbotson and Chen (2003) argue, based on a decomposition of historical equity returns into supply factors of inflation, earnings, dividends, the price to earnings ratio, dividend payout ratio, book value, return on equity and GDP, that the forecast arithmetic MRP (relative to long-term bonds) is around 6.0% for the United States.[17] Similarly Mehra (2003) on the equity risk premium puzzle concludes that the MRP is likely to be similar to what it has been in the past.

5.4.3 Conversion of MRP to TAMRP

Table 6 below calculates an estimate of the TAMRP based on the historical average of the MRP reported for the 19 counties examined by Dimson et al. (2009). We then add an increment of 1.7% to convert the standard MRP to the TAMRP. Lally and Marsden (2004) report a difference for New Zealand of 1.7% over the period 1930 – 2002 between the standard and tax-adjusted market risk premiums.

Table 6		
Average historical MRP for the world capital markets 1900-2009. Source Dimson et al. (2010)		
	Estimate relative to bills	**Estimate relative to bonds**
Standard MRP	6.96%	6.09%
Add: Increment for the difference between the MRP and TAMRP	1.70%	1.70%
TAMRP	**8.66%**	**7.79%**

Based on the historical evidence of Dimson et al. (2010) the "equivalent" historical TAMRP measured relative to bills is 8.66% and measured relative to long-term bonds is 7.79%.

[17] The equity risk premium puzzle refers to the inability of standard economic models to explain why the MRP has been so high in many developed countries such as the United States.

5.4.4 Impact of the global credit crisis on the TAMRP

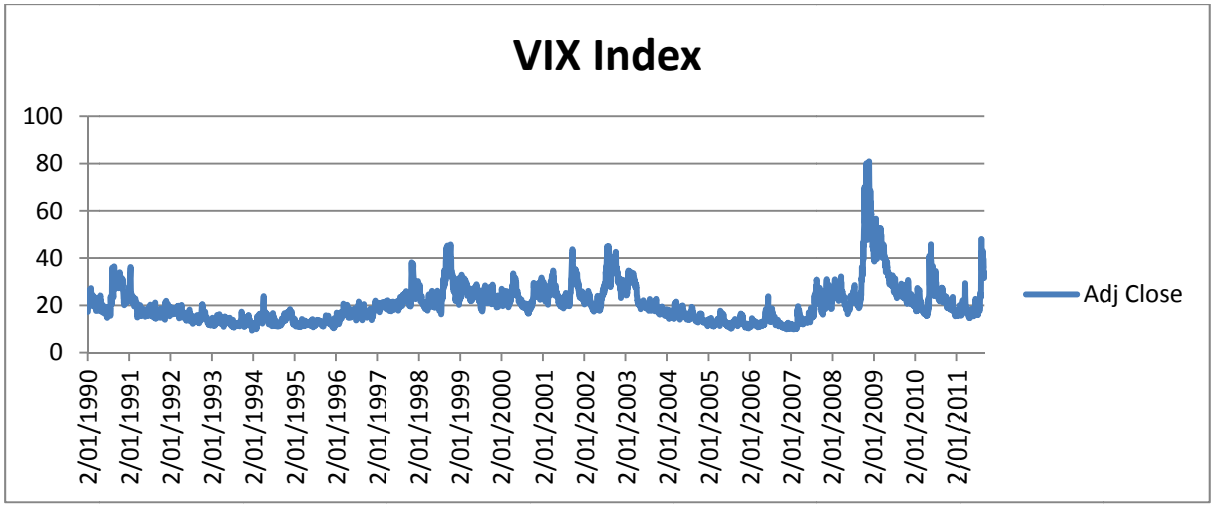
Due to the impact that the global financial crisis has had on debt and equity markets, the Commission in its IM Reasons Paper (2010) intends to temporarily increase the TAMRP to 7.5% for the financial year ends falling in the calendar years 2010 and 2011. Thereafter the TAMRP will revert to the Commission's long-term estimate of 7%.

VIX and bond markets

In Figure 2 below we plot the VIX index for the period between January 1990 and August 2011. Figure 2 shows that the VIX index peaked in late 2008 / early 2009 during the period of intense turmoil in financial markets that followed the collapse of Lehman brothers. While the VIX index declined during the latter part of 2009, its level during this time was still above the levels observed in mid-2003 to mid-2007.

However, the recent instability in the Eurozone, US and concerns over default by Greece and other European countries has seen the VIX index rise sharply.

Figure 2:



Source: Yahoo Finance

A number of academic studies argue that the MRP is positively related to market volatility. For example Merton (1980) derives an expression for the market risk premium as proportional to market volatility. Overall we conclude that over a short-to-medium term time horizon (5 years or less), the market risk premium is likely to have increased.

However, over a long-term time horizon (5 years and greater) we consider that the market risk premium is more likely to return to its long-term historical averages.

5.4.5 Conclusion on the TAMRP

We adopt a point estimate for the TAMRP measured relative to long-term bonds of **7.5%.** This reflects a longer-term view.

5.5 Asset and Equity Beta

To convert an asset beta to an equity beta we use the following formula (consistent with the approach adopted by the Commerce Commission in its IM Reasons Paper, 2010).

$$\beta_L = \beta_A (1 + D/E) \quad (3)$$

Where:

β_L = levered or equity beta

β_A = asset beta

D/E = ratio of debt to equity (based on "market" values)

5.5.1 Overview of approaches to estimating equity beta

The basic approaches to estimating systematic risk are:

- Direct estimation;
- First principles; and
- Comparable companies.

5.5.2 Direct Estimation

An estimate of AIAL's equity beta using two years (weekly return data) and five years (monthly return data) for the period ending 25 August 2011 is provided in Table 7 below. The data and beta estimate is sourced from Bloomberg and NZ First Capital.

Table 7: Bloomberg estimates of AIAL's beta

	2 yr (weekly)	5 yr (monthly)
Equity beta (raw)	1.11	0.86
t statistic	8.96	5.03
R^2	0.440	0.308
Average Debt / Equity ratio over time period of measurement	40.5%	37.9%
Asset beta	0.79	0.62
Average asset beta	**0.71**	

The debt to equity ratio is taken as the average market D/E ratio[18] over the last two and five years to derive the asset beta estimates.

AIAL's "average" asset beta when measured across 2 years weekly returns and five years monthly returns is 0.71.

5.5.3 First Principles

Factors that impact on the sensitivity of returns to real economic and GNP shocks and hence a company's beta includes the nature of the service, pricing structure, duration of contracts, market power, regulation and operating leverage (see Lally, 2000).

Nature of the service / nature of the customer

The demand for aeronautical services will be driven by aircraft movements and passenger numbers. Passenger income elasticity of demand[19] may provide some information on the likely beta for an airport company.

In our view New Zealand residents travelling internationally or offshore on leisure are likely to have a high income elasticity of demand. The income elasticity of demand is also likely to be relatively high for New Zealand residents travelling internationally on business.

Total Passenger Statistics

Table 8 below shows that international passengers accounted for 55% - 57% of total passenger movements in the 2009 to 2011 years.

Table 8. Passenger statistics	2011		2010		2009	
	Number	% Total	Number	% Total	Number	% Total
Passenger movements						
International arrivals	3,401,737	25%	3,260,315	24%	3,193,443	25%
International departures	3,420,464	25%	3,287,375	24%	3,200,144	25%
International passengers excluding transits	6,822,201	49%	6,547,690	49%	6,393,587	49%
Transits and transfers	959,618	7%	868,102	6%	966,024	7%
Total international passengers	**7,781,819**	**56%**	**7,415,792**	**55%**	**7,359,611**	**57%**
Total domestic passengers	**6,042,468**	**44%**	**6,032,410**	**45%**	**5,598,077**	**43%**
Total Passenger movements	**13,824,287**	**100%**	**13,448,202**	**100%**	**12,957,688**	**100%**
Source: AIAL Annual Reports						

However, we understand the passenger movement data in Table 8 must be interpreted with some caution. This is because:

- Total international passengers include international (non-NZ resident) passengers and also NZ residents travelling offshore; and

[18] The market value of equity is proxied by AIAL's market capitalisation of equity. The market value of debt is proxied by the net book value of debt.
[19] This is defined as the change in demand arising from a change in consumer income.

- Total domestic passenger movements include some international (non-NZ residents) travelling internally within NZ.

International Passenger movements

Table 9 summarises overseas visitor arrivals by purpose of visit for the years 2009 and 2011.

Table 9. Overseas visitor arrivals by purpose of visit						
Purpose of visit	**2011**	**%**	**2010**	**%**	**2009**	**%**
Business/conference	490,811	14.5%	455,027	14.0%	451,161	14.2%
Holiday/vacation	766,700	22.6%	750,406	23.1%	730,327	23.0%
Education/medical	87,708	2.6%	80,245	2.5%	79,530	2.5%
Visiting friends/relatives	574,788	17.0%	572,283	17.6%	552,583	17.4%
Other	1,466,464	43.3%	1,390,475	42.8%	1,367,084	43.0%
Total	**3,386,471**	**100%**	**3,248,436**	**100%**	**3,180,685**	**100%**
Source: Statistics New Zealand and AIAL 2010 and 2011 Annual Report						

For the 2010 and 2011 years there were 3.25 and 3.39 million international visitors respectively. The most popular reasons (except for "Other") for coming to New Zealand was holiday/vacation and to visit friends/relatives.

Passengers arriving at Auckland

Table 10 provides a breakdown of overseas visitor arrivals into Auckland by country of last permanent residence for the years 2009 to 2011.

Table 10. Passengers arriving at Auckland by country						
	2011		2010		2009	
Country of last permanent residence	**Arrivals**	**%**	**Arrivals**	**%**	**Arrivals**	**%**
New Zealand	1,589,069	46.9%	1,498,484	46.1%	1,466,236	46.1%
Australia	649,017	19.2%	633,228	19.5%	575,249	18.1%
United Kingdom	188,779	5.6%	209,407	6.4%	225,786	7.1%
United States of America	154,772	4.6%	155,056	4.8%	153,230	4.8%
People's Republic of China	128,064	3.8%	101,246	3.1%	104,721	3.3%
Japan	63,724	1.9%	62,567	1.9%	62,174	2.0%
Germany	50,814	1.5%	51,319	1.6%	49,189	1.5%
Korea	47,232	1.4%	48,346	1.5%	49,272	1.5%
Canada	42,139	1.2%	41,673	1.3%	41,705	1.3%
India	30,177	0.9%	26,453	0.8%	25,308	0.8%
Hong Kong	22,223	0.7%	23,001	0.7%	20,302	0.6%
Fiji	20,295	0.6%	22,184	0.7%	26,851	0.8%
Other	400,166	11.8%	378,472	11.6%	380,662	12.0%
Total	**3,386,471**	**100.0%**	**3,251,436**	**100.0%**	**3,180,685**	**100.0%**
Source: Statistics New Zealand and AIAL 2010 and 2011 Annual Report						

For the 2011 year 46.9% and 19.2% of international arrivals were from passengers resident in New Zealand and Australia respectively. A total of 33.9% were passengers resident in countries outside NZ and Australia.

In our view the NZ economy is likely to have greater correlation with the Australian economy compared to many other international economies. The high reliance on Australasian residents will increase AIAL's systematic risk under a domestic CAPM.

Pricing Structure

The proposed price review period starting 1 July 2012 will be for a period of 5 years. Over this period we understand AIAL's pricing policy is to fix prices. It is therefore exposed to demand and other shocks that impact on revenues and returns over this period. This includes volume risk from unexpected changes in aircraft movements, aircraft weight and passenger numbers and cost shocks.

AIAL also faces inflation risk over the price review period where the prices for the Airlines are set in nominal terms.

Right to adjust charges

We understand that AIAL 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 AIAL's aeronautical business.

However, based on our discussions with AIAL we understand that:

(i) AIAL 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 AIAL'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 AIAL's intention to recover any historical shortfall in revenues from an unexpected drop in aircraft or passenger movements.

Any review of prices may also 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). We understand AIAL's building block model will not seek to factor expectations of these types of events into its building block model for consultation purposes.

Market Power

AIAL 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 AIAL's aeronautical assets may be more closely correlated to the economy compared to smaller domestic airports.

Nature of Regulation

At present AIAL is not subject to price control but only an information disclosure regime.

In our view the recent information disclosure regime in NZ and the potential threat of price monitoring and/or price control poses some restraint on AIAL. It also exposes AIAL to asymmetric risks. This may occur if the Commerce Commission were to seek to impose price control or other penalties where ex-post returns were considered to be too high but with no compensation if ex-post returns were below expectations.

Operating Leverage

AIAL has relatively high operating leverage. However, the impact on beta when benchmarked to comparative companies will depend on AIAL's operating leverage relative to its comparators and this is likely to be very difficult to accurately determine.

Asset optimisation and asset stranding

We understand that AIAL may be potentially exposed to risks from asset stranding and asset optimisation of their aeronautical assets. This may have systematic and non-systematic risk components. For instance, a systematic component will arise when a fall in demand due to a general negative economic shock means some aeronautical assets may potentially become redundant or surplus to requirements and optimised out of AIAL's aeronautical asset base at the next price review date.

Systematic risk of AIAL's Airfield and Terminal Assets

Current Split between the Airfield Income, PSC and TSC Charges

AIAL's aeronautical assets comprise both Airfield and Terminal assets.

Table 11 shows that for the 2011 year the revenue split between Airfield Income, the Passenger Service Charge and the Terminal Service Charge was 40.4%, 43.9% and 15.8% respectively.

Table 11. AIAL - Revenue split between identified and non-identified Airport activities

Revenue	2011		2010		2009	
	$m	% Total	$m	% Total	$m	% Total
Identified Airport Activities						
Airfield Income	72.529	40.38%	66.715	39.76%	70.458	42.84%
Passenger Services Charge	78.760	43.85%	73.252	43.66%	66.542	40.46%
Terminal services charge	28.342	15.78%	27.814	16.58%	27.47	16.70%
Total	**179.631**	**100.0%**	**167.781**	**100.0%**	**164.47**	**100.0%**

Airfield Income and Passenger Service Charges

In my view passenger movements are likely to be more correlated with the state of the NZ domestic economy compared to MCTOW. Thus, the Passenger Service Charge (PSC) component of AIAL's Terminal assets will have higher systematic risk than revenues to AIAL's Airfield assets based on MCTOW charges.

The TSC Component of Terminal Assets

We understand the TSC is subject to an "annual wash-up" whereby the charges in part reflect actual costs and recoveries. The TSC comprises three main components:

(i) A rental rate for the TSC space or building costs;
(ii) A capital cost for plant. The return on plant is a fixed rate charge (pre-tax) of the plant's capital cost. This is to provide both a return on capital and a return of capital;
(iii) Recovery of operating costs and expenses (e.g. electricity and other utility charges) to run the plant and occupy the space.

We understand that an annual wash-up mechanism exists whereby the Airlines incur the risks of cost under/overs to construct the plant and under/overs on operating costs and expenses to the extent they are agreed between AIAL and the Airlines.

AIAL bears risk of depreciation over the asset life of the plant and equipment and the risk that the cost of the TSC space bears little resemblance to the actual building costs. Historically the TSC space charge has not been consistently reviewed on an annual basis.

In our view the annual wash-up mechanism in respect of the plant capital costs and operating expenses will reduce AIAL's systematic risk with respect to the actual cost of plant investment and operating costs (other than depreciation and potentially the space costs) of the TSC.

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

We understand that AIAL is discussing with the Airlines (substantial customers) a move away from the TSC charge with a greater emphasis to be placed on the Passenger Service charge component of aeronautical pricing.

In our view any shift in pricing towards the PSC and away from the TSC will increase the overall systematic risk of AIAL's aeronautical assets.

5.5.4 Comparable Company Evidence

Appendix 3 provides an updated analysis of the comparative asset betas for the sample of airlines (including AIAL) used by the Commerce Commission in its IM Reasons Paper (2010) to estimate the asset beta for airports.

Table 12 summarises the results of this comparative evidence together with the beta estimates of the Commission for the period ending 31 May 2010 in its IM Reasons Paper (2010).

Table 12. Asset beta estimates	2 yrs Weekly		5 yrs Monthly	
	Mean	Median	Mean	Median
Comparative Company Estimates - Appendix 3	0.62	0.58	0.76	0.72
Commission - IM Reasons Paper (2010) - Table E19	0.62	0.62	0.72	0.70

The comparative company average (median) asset beta estimates range between 0.62 (0.58) and (0.70) 0.76.

The comparable company asset beta estimates using five year monthly data exceed the asset beta estimate using two years weekly data.

Multi-divisional betas

AIAL's direct beta estimate and comparative estimates of beta provides an estimate of AIAL's overall beta that comprises both identified airport and non-identified airport assets.

We agree with the Commission in its IM reasons Paper (2010) that a firm's overall beta reflects the betas of a firm's component parts. However, there are often considerable challenges in estimating pure play betas for firms with multiple business units and where the risk characteristics across business units differ.

In this respect part of AIAL's non-identified airport activities may also have lower systematic risk than both the MCTOW and PSC component of AIAL's aeronautical activities.

5.5.5 Conclusion on asset beta

In our opinion, first principles analysis suggests that AIAL is exposed to:

- Systematic volume risk from the nature of services provided; and
- Systematic risk from high operating leverage.

The direct estimate of AIAL's asset beta as at the end of August 2011 is between 0.79 and 0.62 using two years weekly data and five years monthly data respectively, with an overall average of 0.71.

We conclude that an appropriate point-estimate asset beta for AIAL's aeronautical assets is **0.65.**

This point estimate asset beta is below AIAL's recent estimate of its asset beta (0.71) using the average of two and five years data and also below the recent average beta estimates (0.69) of the comparative company sample using two and five years data.

This downward adjustment to AIAL's asset beta for its aeronautical assets reflects some allowance for lower systematic risk compared to the systematic risks of parts of AIAL's other business units.

5.6 Debt Betas and Impact on Cost of Capital

We agree with the Commission's draft decision that the debt beta should be set at zero (IM Reasons Paper, 2010, E9.26).[20]

6 Taxation

We assume

- An investor tax rate of **28**%; and
- A corporate tax rate equal to the statutory tax rate- viz. **28**% from 1 July 2011.

7 Leverage

7.1 Introduction

The leverage [net book value of debt/ (net debt plus market capitalisation of equity)] ratio for AIAL over the last 2 and 5 years has been between 27.5% and 28.8% respectively. AIAL's current S&P credit rating is A- (outlook stable).

Table 13. Leverage

Airport	Basis	Average last 2 yrs	Average last 5 yrs	Current S&P ratings
Auckland International Airport Ltd	Market value of equity, book value of debt	28.8%	27.5%	A-

Most infrastructure firms are observed in practice to adopt debt in their capital structure. This may be due to tax reasons, mitigation of agency costs by imposing discipline on managers and exercise of control over free cash flow, constraints on the availability of internal and new equity finance, information asymmetries and other market frictions.

Firms that adopt too much leverage will, however, face higher debt costs and higher potential financial distress costs. The firm's credit rating may also fall. These factors will limit the amount of debt any prudent firm will wish to adopt

[20] See Auckland UniServices' (2009) - in particular Appendices 2 and 3 of this report.

7.2 Errors in determining WACC assuming debt betas are zero in the simplified Brennan-Lally CAPM

To ensure the post-tax WACC is invariant to leverage under NZ's dividend imputation regime, a necessary assumption is to assume a non-zero debt beta.

The Commission considers that the relationship between cost of capital and leverage when applying the simplified Brennan-Lally CAPM is a significant matter, as the effect of leverage on the cost of capital estimate can be substantial.

However, as already noted, our point estimate asset beta of 0.65 for AIAL's aeronautical assets is below both:

- The "average" beta estimate across the combined two years weekly and five years monthly beta estimate of 0.69 for the sample of companies in Appendix 3; and
- Below the direct estimate of AIAL's asset beta of 0.71 (also being the average of two years weekly and five years monthly beta estimate).

If the asset beta for AIAL's identified airport activities is considered less than the beta (systematic risk) of the non-aeronautical assets, an upward adjustment to the target leverage position for AIAL's aeronautical assets is appropriate. This recognises that most infrastructure firms are observed in practice to adopt debt in their capital structure.

7.3 Conclusion on Leverage

We adopt a target leverage ratio of **30.0%** in the determination of WACC for AIAL's aeronautical assets.

This is marginally above the historical average leverage ratio for AIAL. It reflects a greater leverage ratio that we apply to AIAL's aeronautical assets compared to AIAL's non-aeronautical assets.

8 The Cost of Capital Range

8.1 Introduction

The Commission in its IM Reasons Paper (2010, E11) recognises that the cost of capital is an estimate and is uncertain. To reflect this uncertainty deriving a range for the WACC is appropriate. The Commission takes the view that:

- An appropriate range for the WACC is between the 25th to 75th percentiles; and
- In assessing profitability for the Airports the Commission considers an appropriate starting point for any assessments is the 50th percentile (mid-point) on the range.

The Commission only recognises parameter error in the determination of the WACC range. It does not include an allowance for model error.

Our view

In our view the WACC range should reflect:

- Uncertainty with respect to parameter error; and
- An allowance for model error due to (i) asymmetric risks and risks of asset stranding and optimisation (subject to these risks not being fully reflected in expectations of cash flows and/ or by way of an adjustment to the asset base), and (ii) market frictions and other firm resource constraints.

8.2 Allowance for Parameter Error

We consider an allowance for parameter error is important both in any "regulatory/ information disclosure" type setting and in the measurement of any excess returns where asymmetry of social consequences may arise.

In this respect the Government Policy Statement[21] on Infrastructure stated that the Commission should take into account the need for regulated businesses to have incentives to invest in replacement and new infrastructure assets for the long-term benefit of consumers.

The importance of airports to New Zealand's economy was discussed in Auckland UniServices' (2009) submission to the Commission.[22] AIAL is an integral part of New Zealand's travel markets, air transport freight and infrastructure in New Zealand and make a significant value-added contribution to New Zealand's economy through:

- Contribution to wider tourism services and tourism earnings;
- Domestic and international travellers who spend money at Auckland Airport;
- Contribution to employment and infrastructure of businesses that hub around AIAL's airport; and
- Contribution to the domestic regional employment and the multiplier effect of ongoing expenditure on infrastructure assets.

Prima-facie under-investment in AIAL's aeronautical assets have the potential to result in long-term adverse costs, including:

- Loss in earnings to airlines and other users of airports from:
  - Congestion and reduced flexibility to accommodate growth in passenger numbers and freight volumes;

[21] Minster of Commerce, 2006 (August), Statement to the Commerce Commission of Economic Policy of the Government: Incentives of regulated businesses to invest in infrastructure.
[22] Auckland UniServices (2009) – section 8.

  - Delays in passenger throughput and airfreight; and
  - Delays in lead times to bringing products to markets;
- Risks that New Zealand's connectivity for point to point services would be diminished; and
- The risk that NZ is not regarded as a world class tourist destination.

We also note that at the Commission's Cost of Capital Workshop held in Wellington, November 2009 that the Commission's adviser, Dr Lally noted: [23]

> *"I've never before expressed a view on this question to the Commission. Tony's analysis provides a framework, the loss function provides a framework for thinking about where you might choose in that distribution …..That kind of analysis, that loss function analysis, while it doesn't tell you what answer is it does suggest to me that the 75th percentile is probably the lower bound on what you might choose. And you could easily choose something well above that".*

We agree with Dr Lally that a WACC at the 75th percentile would likely be an appropriate lower bound to assess any profitability or measure of excess returns for AIAL's identified airport assets in the presence of asymmetry of social consequences. [24]

8.3 Calculation of the WACC Range

The 25th and 75th percentile WACC ranges proposed by the Commission are calculated using the Commission's analytical formula in the IM Reasons Paper (2010, E11.18).

In Auckland UniServices (2009) we recommended a study be undertaken to determine if material differences may arise in the WACC range under Monte-Carlo simulation compared to the analytical approach proposed by the Commission. This recognises that:

- Standard deviation of errors for each parameter input into the WACC calculation are likely to be high;
- Distribution of a number of the parameter inputs into the WACC calculation may not be normal; and

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[23] Cost of Capital Workshop Transcripts, page 225, lines 8-14.

[24] Dr Lally (2008, page 94) also stated in the Commission's Gas Authorisation that: "*In the context of assessing excess profits, it would be appropriate to choose a WACC value from above the 50th percentile (this margin is denoted type 1), because the consequences of judging excess profits to exist when they do not are more severe than the contrary error. In particular, judging excess profits to exist when they do not leads to unnecessarily incurring the direct costs of control (implementation and monitoring costs), damage to the Commission's creditability and the possibility that price control leads to prices that are controlled at too low a level to encourage the gas pipeline businesses to replace assets or expand their networks.*"

In his advice to the Commission Dr Lally (2008, Table 6) provided a percentile WACC distribution in the 50th to 95th percentile range.

- Correlations between the variables may be significant (for example between the debt risk premium and the market risk premium).

However, notwithstanding our reservations and disagreement to the Commission's approach to determine the WACC range, we adopt the Commission's analytical formula and the Commission's standard errors for each parameter estimate. This enables more transparent comparison between our WACC range and the Commission's WACC range prior to an allowance for model error.

The Commission's standard errors for the parameter inputs in WACC are provided in Table 14 below.

Table 14.

Equity Parameters	**Standard error of estimate**
Risk free rate	0%
Aggregate tax rates for investors on debt	0%
Asset Beta	0.16
TAMRP	1.50%
Debt margin parameters	
Debt margin	0.15%
Debt Issuance Costs	0.00%
Leverage parameters	
Debt to Value ratio	0%
Equity to Value ratio	0%

9 Adjustments to WACC for model error

9.1 Introduction

The Commission in its IM Reasons Paper (2010, E12) recognises that asymmetric risks can exist and be split between:

- Type I risks, i.e. infrequent events that can produce large losses e.g. natural disasters; and
- Type II risks, i.e. risks such as the threat of competitive entry or asset stranding from technical innovations, etc.

The Commission's decision is to:

- Make no adjustments to the cost of capital for Type I asymmetric risks on the basis that:
  - Airports do not self-insure against such risks; and
  - Airports are subject to information disclosure only.

- Make no allowance for Type II asymmetric risks on the basis that:

– Airports have not demonstrated they are subject to Type II asymmetric risks.

9.2 Asymmetric risks

The approaches to deal with or recognise asymmetric risks could take the form of a combination of: [25]

- An allowance in the expected cash flows under any building blocks approach; and/or
- Adding an increment to the WACC; and/or
- An adjustment to the value of the asset base; and/ or
- Ex-post protection.

Type I Asymmetric Risks

In our view AIAL faces exposure to Type I risks from extreme events such as SARs, Bird Flu, terrorist attacks and natural disasters such as earthquake or volcanic eruptions.

Type II Asymmetric Risks

The irreversible nature of much of AIAL's new investment in aeronautical assets exposes AIAL to potential asymmetric risks of asset optimisation and asset stranding. That is, AIAL may still be exposed to downside risk and loss where actual ex-post demand falls below the infrastructure capacity and assets are removed (either through asset optimisation or stranding) from the asset base.[26]

9.3 Increment to WACC for Biases in Cash Flow Forecast

Ruback (2011) provides a framework to adapt the DCF approach when cash flow forecasts are upwardly biased measures of expected cash flows.

In Ruback's (2011) model, expected cash flows equal forecast cash flows plus a missing downside component. The appropriate adjustment to the cash flow depends on whether the missing component of the cash flow is a temporary or permanent downside.

Ruback shows that when the omitted downside is temporary, the appropriate adjustment is to reduce the forecast cash flows and leave the discount rate unchanged. However, when the omitted downside is permanent, the appropriate adjustment is to decrease the forecasted cash flows and increase the

[25] 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 that 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.

[26] Boyle et al (2006) note that provided some demand shocks are systematic, stranding and optimisation risk will have a systematic component.

discount rate. In an extreme example, assuming perpetual cash flows and where if the downside occurs it is permanent and subsequent cash flows are zero, then the present value (PV) of the project is given by (Ruback, 2001, equation 10):

$$PV(X) = \frac{(1-\lambda)X}{k+\lambda}$$

where: E[X] = $(1 - \lambda)X$
E = expectations operator
X = forecast cash flows
λ = probability of the downside occurring
K = risk-adjusted cost of capital

In the case where the occurrence of the downside signals permanently lower cash flows (but not zero), Ruback (2011) shows that the downside cash flows should be discounted at the cost of capital and the difference between the base and downside forecasts should be discounted at a rate that equals the sum of the cost of capital and the probability that the downside will occur.

9.4 Market frictions and firm resource constraints

Market frictions exist in the real world. These include funding constraints, managerial constraints and financial distress costs. Firms also incur substantial costs to raise new equity.

These frictions can all lead to lost investment opportunities and their costs may impact on the overall cost of capital. The empirical evidence suggests firms and investors will typically apply a premium to WACC for asymmetric risks, market frictions and/or firm resource constraints. For example:

- Poterba and Summers (1995) report average hurdle premiums of approximately 5% in excess of WACC based estimates;
- Meier and Tarhan (2007) report that the hurdle rates for their sample firms exceed the WACC by premiums of approximately 5.3%;
- Mukherjee and Hingorani (1999) find that managers will add an increment to the discount rate for factors such as unsystematic risk and irreversible investment.
- Jagannathan and Meier (2002) show that where managerial resources are limited, a rational firm will apply a premium to WACC to undertake new investment;
- Boyle (2002) (quoting Froot, 1999) notes that reinsurers often require substantial risk premiums well in excess of CAPM rates of return to ensure against catastrophe risks; and
- Malkiel and Xu (2000) argue wealth constraints and other market restrictions on the type of assets able to be held by investors, means many investors are unable to form a diversified portfolio.

9.5 Conclusion on Model Error due to Biased Cashflows, Asymmetric Risks and other Market frictions

There is a substantial body of evidence that suggests managers of firms apply a premium to WACC in their investment decisions. Part of the premium may reflect an adjustment for managerial hubris and use of upward biased or overly optimistic cash flow estimates.

On the other hand an increment to the WACC may be justified where:

- The cash flows to be discounted do not fully reflect or make an adequate allowance for downside (Type I asymmetric) risks; and
- In the real world, where firms face Type II asymmetric risks, and/or other capital constraints due to limited managerial and other resources to undertake all positive net present value investments.

Overall, the empirical evidence suggests the margin to WACC applied by many firms is very large and that at least part of the increment to the discount rate likely reflects an adjustment for biased cashflows, together with project specific and other unsystematic risks.

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.

In the context of measuring AIAL's profitability or assessing any excess profits we consider an additional margin to WACC of up to 1% for AIAL's aeronautical assets would not be unreasonable, where under AIAL'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.

10 Conclusion on WACC

10.1 WACC Point Estimate

Our point estimate of the WACC for AIAL's aeronautical airport assets is summarised in Table 14 below, prior to any allowance for parameter and model error.

Table 15: WACC for AIAL's Aeronautical Assets		
	Auckland UniServices Ltd	Commerce Commission under IM Reasons Paper (2010) approach
Parameter	**Point estimate**	**Point estimate**
Risk free rate	4.63%	4.04%
Aggregate tax rates for investors on debt	28%	28%
Asset Beta	0.65	0.60
Equity Beta	0.93	0.72
TAMRP	7.50%	7.00%
Cost of equity	10.30%	7.95%
Cost of debt		
Debt margin	1.63%	1.63%
Debt Issuance Costs	0.425%	0.35%
Cost of debt pre tax	6.69%	6.02%
Corporate tax rate	28.0%	28.0%
WACC		
Debt to Value ratio	30.0%	17.0%
Equity to Value ratio	70.0%	83.0%
Point estimate Post-tax WACC (prior to any allowance for model error)	**8.65%**	**7.33%**
Point estimate Vanilla WACC (prior to any allowance for model error)	**9.21%**	**7.62%**

10.2 WACC Percentile Range

The 5th to 95th percentile range for the point estimate WACCs in Table 15 above are summarised in Table 16 below. This is prior to any allowance for model error.

Table 16: WACC Range							
Auckland UniServices Ltd							
Percentile	**5%**	**10%**	**25%**	**50%**	**75%**	**90%**	**95%**
Post-tax WACC	6.08%	6.65%	7.60%	8.65%	9.71%	10.66%	11.23%
Vanilla WACC	6.64%	7.21%	8.16%	9.21%	10.27%	11.22%	11.79%
Commerce Commission							
Percentile	**5%**	**10%**	**25%**	**50%**	**75%**	**90%**	**95%**
Post-tax WACC	4.94%	5.47%	6.35%	7.33%	8.32%	9.20%	9.73%
Vanilla WACC	5.22%	5.76%	6.64%	7.62%	8.60%	9.49%	10.02%

In the context of assessing AIAL's profitability or any measure of excess profits, we consider a WACC at the upper end of the percentile distribution (75th to 95th percentile) should be used to ensure there are appropriate incentives for investment in the presence of asymmetry of social consequences.

10.3 WACC Model Error

In the context of measuring AIAL's profitability or assessing any excess profits we consider an additional margin to WACC of up to 1% for AIAL's aeronautical assets would not be unreasonable, where under AIAL'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.

10.4 WACC range including an allowance for model error

In setting prices for AIAL's substantial customers under a building blocks model, AIAL will need to adopt a single point estimate of WACC.

We summarise in the table below our estimate of the WACC range including an allowance for model error between 0.15% at the 50th percentile distribution and 1.0% at the 95th percentile distribution.[27]

[27] We have calculated the model error for the 75th, 90th and 95th percentile range to conform to a standard normal distribution with 0.15% at the 50th percentile and 1.0% at the 95th percentile.

Table 17: WACC Range with Parameter and Model error				
Percentile	**50%**	**75%**	**90%**	**95%**
Post-tax WACC	8.65%	9.71%	10.66%	11.23%
Increment for Model error	0.15%	0.50%	0.81%	1.00%
Post-tax WACC including an allowance for model error	**8.80%**	**10.21%**	**11.47%**	**12.23%**
Percentile	**50%**	**75%**	**90%**	**95%**
Vanilla WACC	9.21%	10.27%	11.22%	11.79%
Increment for Model error	0.15%	0.50%	0.81%	1.00%
Vanilla WACC including an allowance for model error	**9.36%**	**10.77%**	**12.03%**	**12.79%**

11 Process to update the WACC just before prices are reset on 1 July 2012

In our view the process for AIAL to update the WACC prior to prices being reset on 1 July 2012 should be similar to the Commission's approach in its IM Reasons Paper (2010) and subsequent determinations on the Cost of Capital for Information Disclosure purposes for Airports.

Under this approach the following WACC methodology and parameters are determined and set prior to 1 July 2012:

- The use of Brennan-Lally model to determine the cost of equity capital, with the investor tax rate set equal to the corporate tax rate;
- The asset beta;
- Leverage;
- TAMRP; and
- The equity beta (based on asset beta and leverage)

The parameters to be determined on 1 July 2012 (or as close as practical to this date) would be:

- The risk free rate (based on the approach outlined in Appendix 1); and
- The debt risk premium (based on the approach outlined in Appendix 2).

In the event of a material or substantial change in market conditions or a change in tax legislation, debt issuance costs and the corporate tax may also require review.

12 Capitalisation of New Capital Expenditure into the Asset Base

12.1 Introduction

AIAL has also requested Auckland UniServices' view on how new capital expenditure should be "capitalised" at an appropriate cost of capital when incorporated into the aeronautical asset base, taking into account the practicality of implementation.

12.2 Capitalisation of New Capital Expenditure into the Aeronautical Asset Base

We understand the "basic" building block approach under AIAL's pricing model is:

Total expected cost to provide the service (to determine expected revenues)	=	Expected operating costs	+	Depreciation	+	Expected tax	+	Capital charge

The capital charge equals the invested 'capital' or asset value of AIAL's aeronautical assets × WACC.

Under AIAL's proposed building block model we also understand assets that are being built or under construction will not be included in the value of AIAL's aeronautical asset base until such time as the assets are commissioned and in use.

12.3 Quantification of Financing Costs

In a competitive market firms would expect to receive a return on capital employed that reflects a fair rate of return, taking into account that there may be some considerable period of time to construct the asset prior to its actual commissioning and earning of revenues.

A discounted cashflow ("DCF") valuation model commonly adopted in practice and that we understand will be conceptually similar to AIAL's proposed building block model with a price review every five years is (for simplicity cash flows are assumed to be derived at the end of each year, t = 1, 2, ... 5):

$$V_0 = \sum_{t=1}^{5} \frac{E[Rev_t - Cost_t - Depn_t](1-t_c) + E[Depn_t] - E[Capex_t]}{(1+WACC)^t} + \frac{E[V_5]}{(1+WACC)^5} \qquad (4)$$

where: V_0 = aeronautical asset base at time t = 0 years
E = expectations operator
Rev_t = revenues at time t
$Cost_t$ = operating costs at time t
$Depn_t$ = depreciation at time t
$Capex_t$ = new capital expenditure at time t
V_5 = aeronautical asset base at time t = 5 years

t_c = corporate tax
WACC = post-corporate tax WACC (assumed constant over each time period)

From equation 4, the present value ("PV") of expected capex at time t is:

$$PV\ E[Capex_t] = \frac{E[Capex_t]}{(1+WACC)^t}$$

If this capex is not expected to earn a fair rate of return until time t*, where $t < t^* \leq T$, then to ensure "equivalence" to PV $E[Capex_t]$ (consistent with the outcome in equation 4) we have:

$$PV\ E[Capex_t] = \frac{E[Capex_t][1+WACC]^{t^*-t}}{(1+WACC)^{t^*}}$$

This means that in the determination of financing costs to capitalize new capital expenditure that is not expected to earn a return on assets until commissioned into AIAL's asset base, the appropriate capitalization rate is AIAL's aeronautical post-corporate tax WACC.

Equation 4 further suggests that from a practical perspective the appropriate cost of capital applied to capitalise assets under construction is the post-corporate tax WACC set at the start of each pricing review period.

12.4 Conclusion of Capitalisation Rate

We conclude the appropriate financing cost to capitalise the expected costs of new assets to be included in AIAL's aeronautical assets once the assets are commissioned is the post-corporate WACC of the start of each pricing review period.

The Commission in its IM Reasons Paper (2010) also notes that deduction must be made for any income earned on assets while still works under construction. We agree that it would be appropriate to deduct expected income to be earned on assets under construction until such time as they are expected to be part of AIAL's aeronautical asset base.

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Appendix 1: Determination of the Risk Free Rate

Date	NZGB 6.5 04/15/13 Govt	NZGB 6 04/15/15 Govt	NZGB 6 12/15/2017 Govt	NZGB 5 03/15/19 Govt	NZGB 6 05/15/21 Govt
Maturity Date	**15-Apr-13**	**15-Apr-15**	**15-Dec-17**	**15-Mar-19**	**15-May-21**
31 Aug 11	3.088	3.619	4.186	4.363	4.542
30 Aug 11	3.068	3.625	4.195	4.375	4.554
29 Aug 11	3.054	3.616	4.185	4.366	4.543
26 Aug 11	3.042	3.607	4.177	4.357	4.532
25 Aug 11	3.074	3.643	4.212	4.38	4.553
24 Aug 11	3.066	3.636	4.201	4.38	4.546
23 Aug 11	3.018	3.58	4.144	4.337	4.498
22 Aug 11	2.961	3.531	4.098	4.273	4.445
19 Aug 11	2.966	3.54	4.106	4.268	4.453
18 Aug 11	3.019	3.594	4.16	4.338	4.508
17 Aug 11	3.008	3.593	4.163	4.34	4.514
16 Aug 11	3.005	3.595	4.192	4.381	4.542
15 Aug 11	2.995	3.585	4.163	4.354	4.516
12 Aug 11	3.41	4.085	4.135	4.324	4.483
11 Aug 11	3.41	4.085	4.12	4.301	4.469
10 Aug 11	3.41	4.085	4.163	4.352	4.527
09 Aug 11	2.855	3.481	4.085	4.285	4.47
08 Aug 11	3.41	4.085	4.147	4.338	4.499
05 Aug 11	3.23	3.877	4.235	4.425	4.591
04 Aug 11	3.41	4.085	4.408	4.591	4.758
03 Aug 11	3.41	4.085	4.411	4.604	4.771
02 Aug 11	3.41	4.085	4.561	4.753	4.923
01 Aug 11	3.425	4.045	4.606	4.797	4.967

Annualise Data

Maturity Date	**15/04/2013**	**15/04/2015**	**15/12/2017**	**15/03/2019**	**15/05/2021**
31 Aug 11	3.112	3.652	4.230	4.411	4.594
30 Aug 11	3.092	3.658	4.239	4.423	4.606
29 Aug 11	3.077	3.649	4.229	4.414	4.595
26 Aug 11	3.065	3.640	4.221	4.404	4.583
25 Aug 11	3.098	3.676	4.256	4.428	4.605
24 Aug 11	3.090	3.669	4.245	4.428	4.598
23 Aug 11	3.041	3.612	4.187	4.384	4.549
22 Aug 11	2.983	3.562	4.140	4.319	4.494
19 Aug 11	2.988	3.571	4.148	4.314	4.503
18 Aug 11	3.042	3.626	4.203	4.385	4.559
17 Aug 11	3.031	3.625	4.206	4.387	4.565
16 Aug 11	3.028	3.627	4.236	4.429	4.594
15 Aug 11	3.017	3.617	4.206	4.401	4.567
12 Aug 11	3.439	4.127	4.178	4.371	4.533
11 Aug 11	3.439	4.127	4.162	4.347	4.519
10 Aug 11	3.439	4.127	4.206	4.399	4.578
09 Aug 11	2.875	3.511	4.127	4.331	4.520
08 Aug 11	3.439	4.127	4.190	4.385	4.550
05 Aug 11	3.256	3.915	4.280	4.474	4.644
04 Aug 11	3.439	4.127	4.457	4.644	4.815
03 Aug 11	3.439	4.127	4.460	4.657	4.828
02 Aug 11	3.439	4.127	4.613	4.809	4.984
01 Aug 11	3.454	4.086	4.659	4.855	5.029
Average annualised	**3.188**	**3.808**	**4.264**	**4.452**	**4.626**
Start Date	**1-Sep-11**	**1-Sep-11**	**1-Sep-11**	**1-Sep-11**	**1-Sep-11**
Maturity date	**15-Apr-13**	**15-Apr-15**	**15-Dec-17**	**15-Mar-19**	**15-May-21**
Years	**1.62**	**3.62**	**6.29**	**7.54**	**9.71**

Required Maturity

Yrs	**Date**	**Days**	**Interpolated Rate**
5.0	31-Aug-16	1826	4.04

Appendix 2: Determination of the Debt Premium

Date	NZGB 6 04/15/15 Govt	NZGB 6 12/15/2017 Govt	aianz 7.25 11/07/2015 corp	aianz 8 11/15/2016 corp
Maturity Date	15-Apr-15	15-Dec-17	7-Nov-15	15-Nov-16
31 Aug 11	3.619	4.186	5.750	5.700
30 Aug 11	3.625	4.195	5.750	5.700
29 Aug 11	3.616	4.185	5.750	
26 Aug 11	3.607	4.177	5.750	
25 Aug 11	3.643	4.212	5.750	
24 Aug 11	3.636	4.201	5.750	
23 Aug 11	3.58	4.144	5.750	
22 Aug 11	3.531	4.098	5.750	
19 Aug 11	3.54	4.106	5.750	
18 Aug 11	3.594	4.16	5.750	
17 Aug 11	3.593	4.163	5.750	
16 Aug 11	3.595	4.192	5.750	5.680
15 Aug 11	3.585	4.163	5.750	5.680
12 Aug 11	4.085	4.135	5.750	5.680
11 Aug 11	4.085	4.12	5.750	5.680
10 Aug 11	4.085	4.163	5.750	5.700
09 Aug 11	3.481	4.085	5.750	5.700
08 Aug 11	4.085	4.147	5.750	5.700
05 Aug 11	3.877	4.235	5.750	5.700
04 Aug 11	4.085	4.408	5.750	5.700
03 Aug 11	4.085	4.411	5.750	5.700
02 Aug 11	4.085	4.561	5.750	5.700
01 Aug 11	4.045	4.606	5.750	5.700

Annualise Data

	NZGB 6 04/15/15 Govt	NZGB 6 12/15/2017 Govt	aianz 7.25 11/07/2015	aianz 8 11/15/2016 corp
Maturity Date	15-Apr-15	15-Dec-17	7-Nov-15	15-Nov-16
31 Aug 11	3.652	4.230	5.833	5.781
30 Aug 11	3.658	4.239	5.833	5.781
29 Aug 11	3.649	4.229	5.833	
26 Aug 11	3.640	4.221	5.833	
25 Aug 11	3.676	4.256	5.833	
24 Aug 11	3.669	4.245	5.833	
23 Aug 11	3.612	4.187	5.833	
22 Aug 11	3.562	4.140	5.833	
19 Aug 11	3.571	4.148	5.833	
18 Aug 11	3.626	4.203	5.833	
17 Aug 11	3.625	4.206	5.833	
16 Aug 11	3.627	4.236	5.833	5.761
15 Aug 11	3.617	4.206	5.833	5.761
12 Aug 11	4.127	4.178	5.833	5.761
11 Aug 11	4.127	4.162	5.833	5.761
10 Aug 11	4.127	4.206	5.833	5.781
09 Aug 11	3.511	4.127	5.833	5.781
08 Aug 11	4.127	4.190	5.833	5.781
05 Aug 11	3.915	4.280	5.833	5.781
04 Aug 11	4.127	4.457	5.833	5.781
03 Aug 11	4.127	4.460	5.833	5.781
02 Aug 11	4.127	4.613	5.833	5.781
01 Aug 11	4.086	4.659	5.833	5.781

Appendix 2: Determination of the Debt Premium – cont.

Interpolate NZ Govt stock to same maturity as AIAL Stock and determine debt premium						
	NZGB 6 04/15/15 Govt	NZGB 6 12/15/2017 Govt	aianz 7.25 11/07/2015	aianz 8 11/15/2016 corp	Debt Premium	
Maturity Date (interpolated)	7-Nov-15	15-Nov-16	7-Nov-15	15-Nov-16	7-Nov-15	15-Nov-16
31 Aug 11	3.7739	3.9956	5.833	5.781	2.059	1.786
30 Aug 11	3.7806	4.0036	5.833	5.781	2.052	1.778
29 Aug 11	3.7713	3.9938	5.833		2.061	
26 Aug 11	3.7623	3.9852	5.833		2.070	
25 Aug 11	3.7988	4.0213	5.833		2.034	
24 Aug 11	3.7908	4.0117	5.833		2.042	
23 Aug 11	3.7335	3.9540	5.833		2.099	
22 Aug 11	3.6843	3.9059	5.833		2.148	
19 Aug 11	3.6932	3.9145	5.833		2.139	
18 Aug 11	3.7482	3.9695	5.833		2.084	
17 Aug 11	3.7480	3.9709	5.833		2.085	
16 Aug 11	3.7559	3.9894	5.833	5.761	2.077	1.771
15 Aug 11	3.7416	3.9676	5.833	5.761	2.091	1.793
12 Aug 11	4.1375	4.1571	5.833	5.761	1.695	1.604
11 Aug 11	4.1343	4.1480	5.833	5.761	1.698	1.613
10 Aug 11	4.1435	4.1741	5.833	5.781	1.689	1.607
09 Aug 11	3.6413	3.8774	5.833	5.781	2.191	1.904
08 Aug 11	4.1401	4.1644	5.833	5.781	1.693	1.617
05 Aug 11	3.9918	4.1319	5.833	5.781	1.841	1.649
04 Aug 11	4.1964	4.3229	5.833	5.781	1.636	1.458
03 Aug 11	4.1971	4.3248	5.833	5.781	1.636	1.456
02 Aug 11	4.2295	4.4160	5.833	5.781	1.603	1.365
01 Aug 11	4.2070	4.4268	5.833	5.781	1.626	1.354
				Average	1.93	1.63
				Overall average	1.81	

Appendix 3 – Beta of Comparable Companies

No.	Company	Equity Beta		Net Debt Leverage Ratio		Net Debt / M Cap		Asset beta	
		2 year	5 year	2 year	5 year	2 year	5 year	2 year	5 year
1	Aerodrom Ljubljana	0.44	1.20	(4.2%)	(1.3%)	(4.0%)	(1.3%)	0.46	1.21
2	Aeroporto di Firenze	0.06	0.20	6.2%	4.4%	6.6%	4.6%	0.06	0.19
3	Aeroports de Paris	0.74	0.89	28.8%	26.3%	40.4%	35.7%	0.53	0.65
4	Airport Facilities	0.88	0.74	36.6%	33.7%	57.6%	50.9%	0.56	0.49
5	Airports of Thailand	1.14	1.27	43.5%	40.8%	76.9%	68.8%	0.65	0.75
6	AIAL	1.11	0.86	28.8%	27.5%	40.5%	37.9%	0.79	0.62
7	Australian Infrastructure	0.86	1.08	(5.5%)	(0.2%)	(5.2%)	(0.2%)	0.91	1.08
8	Beijing Capital International Airport	0.96	1.31	49.5%	24.5%	97.9%	32.4%	0.49	0.99
9	Flughafen Wien	0.71	0.83	43.4%	29.6%	76.6%	42.1%	0.40	0.58
10	Flughafen Zuerich	0.82	1.27	35.3%	35.0%	54.7%	53.8%	0.53	0.83
11	Fraport	0.96	0.88	39.1%	27.0%	64.2%	37.0%	0.58	0.64
12	Gemina	0.65	1.27	61.1%	59.7%	157.1%	148.1%	0.25	0.51
13	Grupo Aeroportuario del Centro Norte	0.90	1.03	6.7%	(4.9%)	7.2%	(4.7%)	0.84	1.08
14	Grupo Aeroportuario del Pacifico	0.75	0.79	(4.9%)	(4.9%)	(4.7%)	(4.6%)	0.79	0.83
15	Grupo Aeroportuario del Sureste	0.90	0.92	(65.0%)	(531.5%)	(39.4%)	(84.2%)	0.90	0.92
16	Kobenhavns Lufthavne	0.18	0.60	21.6%	18.0%	27.6%	22.0%	0.14	0.50
17	Guangzhou Baiyun International Airport	0.90	0.72	4.1%	5.9%	4.3%	6.3%	0.87	0.67
18	Hainan Meilan International Airport	0.77	1.35	(28.1%)	(25.1%)	(21.9%)	(20.1%)	0.98	1.68
19	Japan Airport Terminal	0.62	0.37	29.3%	17.6%	41.3%	21.3%	0.44	0.30
20	MAP Group	0.78	1.22	47.0%	52.5%	88.6%	110.6%	0.42	0.58
21	Malta International Airport	1.05	1.08	19.1%	20.3%	23.6%	25.5%	0.85	0.86
22	SAVE	0.47	0.83	16.0%	12.9%	19.0%	14.8%	0.40	0.72
23	Shanghai International Airport	1.06	0.90	6.8%	5.7%	7.3%	6.0%	0.99	0.85
24	Shenzhen Airport	0.71	0.82	(12.0%)	(10.0%)	(10.7%)	(9.1%)	0.80	0.90
25	Xiamen International Airport	0.96	0.51	(6.1%)	(5.9%)	(5.7%)	(5.6%)	1.02	0.54
	Mean	0.78	0.92	0.16	-0.06	0.32	0.24	**0.62**	**0.76**
	Median	0.82	0.89	0.19	0.18	0.24	0.21	**0.58**	**0.72**
	Standard deviation	0.27	0.30	0.28	1.11	0.45	0.44	**0.27**	**0.31**

Note: in the case of Grupo Aeroportuario del Sureste the net debt / mcap ratio has been constrained to zero (as this otherwise becomes a significant outlier)
Data Source: Bloomberg as provided by First NZ Capital dated 25 August 2011. Bloomberg stock equity betas are calculated against local indicies e.g. NZX50 for NZ, ASX200 for Australia