CIAL's Weighted Average Cost of Capital:

Update

Report to BARNZ

6 September 2012

Futures Consultants Limited

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1. Introduction

Christchurch International Airport Limited (CIAL) has provided the Board of Airline Representatives in New Zealand (BARNZ) and airlines with an update of its proposal for the reset of aeronautical charges for the period ending 30 June 2017.[1] The update incorporates CIAL's responses to the submissions made by BARNZ and the airlines on its previous proposal.

BARNZ has asked me to reconsider my estimates of CIAL's weighted average cost of capital (WACC) in light of CIAL's revised proposal and to update my estimates to 1 September 2012, taking into account recent movements in interest rates and the premiums for corporate debt over the risk free interest rate.

2. Comparison of WACC estimates

The table on the next page sets out three sets of estimates of CIAL's WACC parameters and resulting WACCs. The estimates in the second column are those made by PwC Australia and adopted by CIAL in its revised proposal to reset aeronautical charges. The notional date for the estimates is 31 March 2012.[2]

There is nothing in either the PwC Australia letter setting out these estimates[3] or in CIAL's revised proposal that has convinced me to adopt PwC Australia's estimates of the parameters, or its method of estimation. In section 3 below I consider PwC Australia's arguments to support their use of 6.00% for the risk free rate when calculating the costs of equity instead of the current government stock rate. I reject their arguments and demonstrate why their approach leads to outcomes inconsistent with the operation of a market for financial assets.

The estimates in the third column are taken from the Commerce Commission's (Commission's) determination of the cost of capital for CIAL for information disclosure purposes for the year ended 30 June 2013.[4] This year started on 1 July 2012.

The estimates in the fourth column are my preferred estimates. I have adopted the same parameters and estimation methods as the Commission, except:

- the risk free rate and debt premium have been updated to be based on market interest rate data for the month of August 2012, whereas the Commission's estimates of these parameters use interest rate data for the month of June 2012;
- the risk free rate has been calculated by annualising the daily five-year government stock interest rates during August 2012 published by the

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[1] CIAL, *Proposal for the Reset of Aeronautical Charges for the period ending 30 June 2017*, 31 July 2012. Hereinafter "CIAL's Revised Proposal".

[2] CIAL's Revised Proposal, pp. 8 – 11.

[3] Letter from Jeff Balchin, PwC Australia to Neil Cochrane, CIAL, 12 July 2012.

[4] Commerce Commission, *Cost of capital determination for information disclosure year 2013 for Transpower, gas pipeline businesses and specified airport services (with a June year-end) [2012] NZCC 20*, 30 July 2012.

Reserve Bank of New Zealand on its website.[5] I have chosen to use publicly available rates rather than the Bloomberg rates used by the Commission, which are only available to subscribers. I prefer the publicly available rates of

	PwC Australia's Parameters	Commerce Commission's Parameters	Futures Consultants' Parameters
	Mid-point CIAL July Response 31 March 2012	Mid-point 1 July 2012 NZCC 20	Mid-point with updated risk free rate 1 September 2012
Leverage (L)	26%	17%	17%
Debt premium (p)	2.35%	2.18%	1.68%
Debt issuance cost (d)	0.35%	0.35%	0.35%
Risk free rate (r_F) for calculation of cost of debt	4.31%	2.78%	3.06%
Cost of debt (r_D)	7.01%	5.31%	5.09%
Risk free rate (r_F) for calculation of cost of equity	6.00%	2.78%	3.06%
Asset Beta (β_A)	0.70	0.60	0.65
Tax adj. market risk premium (TAMRP)	7.50%	7.00%	7.00%
Tax Rate – Corporate (T_C) and Investor (T_I)	28%	28%	28%
Cost of equity (r_E)	11.41%	7.04%	7.69%
$WACC^V$ (vanilla)	10.27%	6.75%	7.24%
$WACC^{PT}$ (post tax)	9.76%	6.49%	7.00%

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[5] Accessed from http://www.rbnz.govt.nz/statistics/exandint/b2/index.html .

the Reserve Bank in the light of the recent evidence that interest rates of a similar nature and derivation to Bloomberg's have been subject to systematic and material manipulation by banks for their own gain over an extended period of time;[6]

- for the same reason, to calculate the debt premium estimate I have used the publicly available yields for Auckland International Airport Limited (AIAL) bonds published daily by the New Zealand Stock Exchange,[7] instead of Bloomberg's subscriber only rates, which the Commission uses. I have also used in these calculations the five year government stock rates published daily by the Reserve Bank; and
- I have used an asset beta estimate of 0.65 instead of the Commission's estimate of 0.60. As I explained in my previous report on CIAL's WACC,[8] leisure based travel is more sensitive to income movements than business travel. As a result, the higher percentage of leisure travel through CIAL warrants a slightly higher asset beta for aeronautical assets as CIAL's returns are likely to be more strongly correlated with movements in the overall market. An uplift of 0.05 points may be justifiable. If this is applied to the Commission's 0.60, the result is an asset beta for CIAL to 0.65.

From the table it can be seen that using the PwC Australia/CIAL preferred parameters the cost of debt to CIAL is 7.01%, the cost of equity 11.41%, the vanilla WACC is 10.27% and post-tax WACC 9.76%. If the Commission's parameters are adopted, the cost of debt is 5.31%, cost of equity 7.04%, the vanilla WACC is 6.75% and post-tax WACC is 6.49%.

Using my preferred parameters, the cost of debt is 5.09%, less than for the other two sets of parameters because of the significantly lower debt premium estimate I derive from publicly available sources compared with those derived by PwC Australia/CIAL and the Commission from private subscriber only sources.

Using my preferred parameters, the cost of equity is 7.69%, slightly higher than the Commission's due to my adopting a higher asset beta. My estimates of vanilla and post-tax WACC are 7.24% and 7.00%, respectively. Both these estimates are significantly below those of PwC Australia/CIAL but approximately 0.5% higher than the Commission's estimates for the same parameters. If the Commission's standard approach to calculating percentile values for WACC is adopted, the 25th and 75th percentiles for vanilla WACC using my preferred parameters are 6.23% and 8.25%, respectively. For post-tax WACC, the corresponding percentiles are 5.99% and 8.01%. These percentile estimates are also approximately 0.5% higher than the Commission's estimates for the same parameters but between 2.75% and 3.00% below those of PwC Australia/CIAL.

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[6] See http://online.wsj.com/article/SB10001424052702304299704577503974000425002.html , http://www.myfinances.co.uk/investments/2012/08/16/libor-scandal-barclays-rbs-and-hsbc-to-be-investigated-in-us and http://www.deathandtaxesmag.com/187218/jpmorgan-now-part-of-libor-fraud-investigation/

[7] Accessible from https://www.nzx.com/markets/NZDX/bonds .

[8] Futures Consultants Limited, *CIAL's Weighted Average Cost of Capital*, 11 May 2012, pp. 8-9.

3. The risk free rate

In my May 2012 report to BARNZ on CIAL's proposed WACC, I criticised PwC Australia's advice to set the risk free rate for calculating the cost of equity at 6.00% instead of adopting the Commission's approach to estimating this parameter. The Commission's approach involves using the linearly-interpolated, annualised, yield to maturity on New Zealand government bonds with a five year term to maturity.

If CIAL had of adopted this approach in its initial proposal, the risk free rate would have been set at the then current rate of 3.61%, instead of at the 6.00% adopted by CIAL, on the advice of PwC Australia. Since then the risk free rate has fallen with the Commission measuring it at 2.78% at the start of July 2012 and I calculating it to be 3.06% at the start of September 2012. The differences between 6.00% and these more current risk free rates are very material and result in very material increases in the estimates of WACC.

In a letter to CIAL dated 12 July 2012 Jeff Balchin of PwC Australia has defended the use of 6.00%. The key elements of his argument are:

- "use of the current spot government interest rates will lead to a material understatement of the costs of equity and that the risk free rate drawn from "normal market" conditions will result in a materially better estimate of the cost of equity";[9]
- "there is considerable support in the theoretical and empirical finance literature for the proposition that the cost of equity does not move one-for-one with government interest rates";[10] and
- "there is also considerable regulatory precedent in the UK and US for ignoring transitory movements in government interest rates when estimating costs of equity for regulatory purposes".[11]

The first and third points are essentially the same: that the current government stock interest rates are the result of abnormal market conditions and transitory movements and so should be ignored. I agree that it would be wrong to use the current spot rate if the government stock market was clearly in disequilibrium as a result of, for example, some unexpected shock. This is clearly not the case at present, however.

Rates are currently lower than they have been for some considerable number of years, but they have been trending downwards for several years in an orderly manner and there is nothing to suggest the market is in a state of disequilibrium or undergoing "transitory movements". The following graph of New Zealand five year government stock rates over the last 10 years does not reflect the gyrations one would expect if the market was out of equilibrium.

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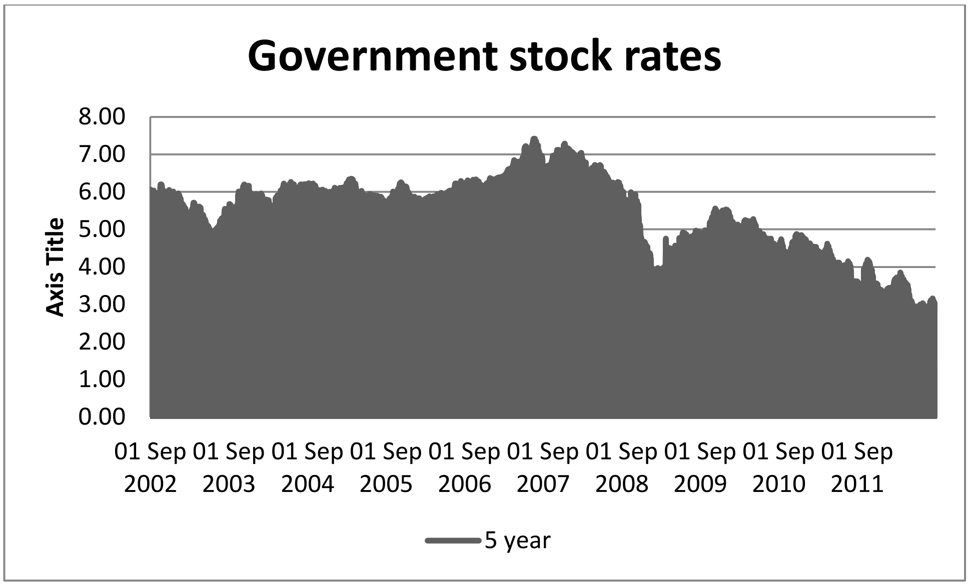
[9] Letter from Jeff Balchin, PwC Australia to Neil Cochrane, CIAL, 12 July 2012, p. 3.

[10] Loc. cit.

[11] Loc. cit.



The second point – that the cost of equity and the risk free rate are not necessarily perfectly linked with a 1% point increase in one leading to the same increase in the other – is implicit in the formula of the cost of equity. The requirement for the two variables to move one-for-one is for the corporate tax rate to be zero. This is not the case in the New Zealand economy. In short, the statement of this mathematical tautology by PwC Australia provides no justification at all for CIAL not using the current government stock rate for the risk free rate for the cost of equity.

The origin of the 6.00% estimate is not set out explicitly in the recent letter from PwC Australia to CIAL. However, it was previously justified by PwC Australia on the grounds that this figure was approximately the daily historical average yield to maturity on 10-year New Zealand government stock over the 10 years prior to 20 December 2011. According to the data published by the Reserve Bank of New Zealand, the daily historical average yield to maturity on 10 year New Zealand government stock over the 10 years prior to the end of August 2012 was 5.65%. Even if PwC Australia wish to continue with their unjustified departure from using the current 5 year risk free rate they should adjust the average. The failure to make the adjustment underlines the ad hoc nature of PwC Australia adopting an arbitrary 6.00% for the risk free rate because it did not like the outcome.

PwC Australia has failed to adequately address my argument that the cost of equity used in calculating WACC is derived from the capital asset pricing model (CAPM). This is a model about how investors allocate their assets in order to maximise their wealth in the long run and the consequential relative returns they require on different classes of assets depending on how correlated the returns on them are to returns on all assets, or the market portfolio. A corollary of PwC Australia's view is that when interest rates on essentially riskless assets, like New Zealand government stock, are historically low, investors require a larger absolute return over the returns available to them on these riskless assets to hold a market portfolio. I cannot think of any logic that would explain why and how investors would be able to achieve this outcome, and PwC Australia have not attempted to provide one.

In fact, the notion that opportunity cost is an important determinant of returns when alternatives are being considered suggests the PwC Australia proposal is fundamentally flawed.

To understand why, consider an investment that is very close to providing the same returns as the risk free asset, government stock. An asset with an asset beta of, say, 0.01, would be such an asset.

Assume further that the current government stock rate is 3.00% and the corporate tax rate is 28% and the tax adjusted market risk premium (TAMRP) is 7.0%. For simplicity, assume leverage is 0%. The post-tax cost of equity on the “near-bond” is 2.23% using the standard approach for calculating WACC and using 3.00% pre-tax as the risk free rate. This is marginally above the post-tax return on government stock of 2.16%. Using PwC Australia’s approach, however, and setting the risk free rate at its arbitrary 6.00%, the return on the near-bond with the asset beta of 0.01 would be 4.39%, or over twice the 2.16% on the bond to which it is very similar.

Clearly risk-arbitrage would not allow such a situation to continue for long; investors would seek to sell the “bond” and buy the “near bond” and double their return. The result would be to push up interest rates on “bonds” and push down interest rates on “near bonds” until they were nearly equal. One could apply the same argument to an equity that is close to the near bond with, say, a 0.02 asset beta, and so on. The obvious implication is that PwC Australia’s proposition is inconsistent with the operation of a financial market in which investors seek to maximise their returns. There may be precedents and regulators may have been persuaded by the self-interested arguments of monopoly providers, but PwC Australia’s argument is fundamentally flawed and I have demonstrated this by highlighting the absurdity of valuation it gives rise to when applied to the valuation of very low beta equities.