



Cost of Capital

Report for Post-Workshop Submission

Report to BARNZ

28 November 2009

About NZIER

NZIER is a specialist consulting firm that uses applied economic research and analysis to provide a wide range of strategic advice to clients in the public and private sectors, throughout New Zealand and Australia, and further afield.

NZIER is also known for its long-established Quarterly Survey of Business Opinion and Quarterly Predictions.

Our aim is to be the premier centre of applied economic research in New Zealand. We pride ourselves on our reputation for independence and delivering quality analysis in the right form, and at the right time, for our clients. We ensure quality through teamwork on individual projects, critical review at internal seminars, and by peer review at various stages through a project by a senior staff member otherwise not involved in the project.

NZIER was established in 1958.

Authorship

Prepared by: Brent Layton

Quality approved by: Johannah Branson

Date: 28 November 2009

Version: 2

Acknowledgements:

8 Halswell St, Thorndon
P O Box 3479, Wellington
Tel: +64 4 472 1880
Fax: +64 4 472 1211
econ@nzier.org.nz
www.nzier.org.nz

NZIER's standard terms of engagement for contract research can be found at www.nzier.org.nz.

While NZIER will use all reasonable endeavours in undertaking contract research and producing reports to ensure the information is as accurate as practicable, the Institute, its contributors, employees, and Board shall not be liable (whether in contract, tort (including negligence), equity or on any other basis) for any loss or damage sustained by any person relying on such work whatever the cause of such loss or damage.

Contents

1. Introduction.....	1
2. General comments	1
2.1 The appropriate risk free rate.....	1
2.2 Leverage	2
2.3 Real options	4
2.4 The market risk premium (MRP).....	6
2.5 The asymmetry of social costs.....	6
2.6 Allowances for asymmetric risks.....	7
3. Specific responses.....	7
3.1 The Commission's requests.....	7
3.2 Firm specific v industry wide parameters.....	8
3.3 Difficulty of finding comparable companies.....	9
3.4 Selecting the point on the range	9

Tables

Table 1 Activity differences between regulated airports, 2008.....	9
--	---

1. Introduction

On 12th and 13th November 2009 the Commerce Commission (the Commission) held a workshop on the cost of capital. I attended the workshop as an expert at the request of BARNZ and Air New Zealand. Ms Kristina Cooper represented BARNZ and Mr Sean Ford, Air New Zealand. The Commission has invited interested parties to make submissions on any matter raised during the workshop. It has also identified matters on which it would particularly like to receive submissions and matters on which workshop participants undertook to respond to it.

BARNZ has asked me to prepare an independent expert's report for it to append to its post-workshop submission to the Commission. It has requested that my report cover not only the items on which I undertook to respond to the Commission, but also the following topics which were discussed during the workshop:

- the appropriate risk free rate
- leverage
- real options
- the market risk premium (MRP)
- the alleged asymmetry of social costs and
- allowances for asymmetric risk.

I deal with each of these topics in turn in the next section. In the course of doing this I address many of the matters on which the Commission has specifically sought feedback. In section 3, I address the issues on which I undertook to provide the Commission with more information.

2. General comments

2.1 The appropriate risk free rate

At the workshop, a number of experts and representatives of regulated industries and companies argued in favour of the Commission using, for the risk free rate, the interest rate on government stock for as long a term as possible and preferably for a term of at least ten years. To the extent a justification was provided, it was couched in terms of the assets of regulated companies being long-lived and so it is prudent for them to be financed with long-dated debt, when market conditions make it possible to do this.

I remind the Commission of two other salient factors when selecting the term for the risk free rate. Firstly, as the Commission's own panel of experts on the cost of capital identified, the correct conceptual approach to use in the capital asset pricing model (CAPM) is to choose a risk free rate with a duration equivalent to the period between

the portfolio re-assessments or re-balancings undertaken by investors.¹ This period is short. Indeed, many professional portfolio managers, who arguably have the most impact on asset values, can be considered as continuously rebalancing their portfolios.

Secondly, as Dr Lally has correctly pointed out, unless the duration of the risk free rate in the intercept term in the CAPM is equivalent to the regulatory period, then the NPV=0 principle is likely to be violated.² The preservation of the NPV=0 principle is very important, especially when the regulated firms are subject to only an information disclosure regime, as are the regulated airports. This is because provision of information on a basis consistent with this principle will facilitate “interested persons to determine whether the purpose of [Part 4 of the Commerce Act 1986] is being met.”³ In particular, it will help interested persons, many of whom will not possess financial expertise, to determine whether “suppliers of regulated goods or services are limited in their ability to extract excessive profits.”⁴

In short, given that the yield curve normally slopes upwards as the term increases, the Commission’s proposal to set the term of the risk free rate equivalent to the length of the regulatory period means WACC will be generally higher than it strictly should, other things equal. This concession may be to the long-term benefit of consumers if it facilitates interested persons determining if the purpose statement is being met because it allows them to use NPV=0 as the yardstick. For the Commission to go further and accede to the requests to use a rate for an even longer term appears to me to be contrary to the balancing of interests of consumers and producers implicit in the purpose statement in section 52A of the Commerce Act.

2.2 Leverage

The considerable amount of discussion at the workshop about the impact of increasing leverage increasing the WACC when the simplified Brennan-Lally model is used has been followed up by a note from the Commission⁵ and a very useful paper from Dr Lally.⁶ Dr Lally’s paper concludes:

¹ J Franks, M Lally and S Myers, *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, December 2008, p.12. Hereinafter, WACC Experts’ Report.

² WACC Experts’ Report, p.12.

³ Commerce Act 1986, s. 53A.

⁴ Commerce Act 1986, s. 52A(1)(d).

⁵ Commerce Commission, *Effects of Leverage on WASS Under Two Different CAPMs*, November 2009.

⁶ M Lally, *WACC and Leverage*, 17 November 2009

... there are some deficiencies in the WACC model currently employed by the Commerce Commission, but these are not readily correctable, leaving the choice between the status quo (which overstates WACC) and a simplified alternative in the form of setting WACC equal to the unlevered cost of capital (which would understate WACC).⁷

I concur with Dr Lally's general conclusion. However, I note that when the debt premium is high, as it is likely to be in times of financial strain, the effect of leverage on WACC will increase significantly. This is very relevant to any inclination the Commission may have to temporarily raise the market risk premium because of the global financial crisis (GFC). I also note that using the simplified Brennan-Lally model will encourage excessive leverage among regulated firms if the leverage used in calculating WACC for a firm is the firm's own leverage, or an average of the leverage in the industry, and not some other benchmark level. This encouragement will be accentuated when debt premiums are high, when the financial system is under strain. In other words, setting leverage to calculate WACC equal to a firm's own leverage will have the socially undesirable outcome of encouraging excessive leverage by firms providing essential infrastructure. This encouragement would be particularly strong when the financial system is under strain and the potential for social costs is the greatest.

In the New Zealand investment environment of full imputation credits attaching to dividends, no capital gains taxes, and corporate and marginal personal investor tax rates the same, WACC should not vary with the level of leverage. In the circumstances common in other jurisdictions the usual result is that WACC declines with leverage. However, when the simplified Brennan-Lally capital asset pricing model for the cost of equity is used to calculate WACC, increased leverage results in increased WACC; a surprising and anomalous result.

The only option open to the Commission, if it wants to continue with the simplified Brennan-Lally model and avoid an outcome that is inconsistent with the circumstances in which regulated firms operate, is to set leverage equal to zero for regulatory purposes. This would be tantamount to the Commission disregarding leverage and leaving that to be a matter of choice for the regulated entities. This is a logically consistent position for the Commission to hold, but one which could understate WACC, although by an uncertain amount.⁸

The other options open to the Commission are to adopt an alternative model or tolerate some inconsistency of the outcome with New Zealand circumstances. Given the widespread use of the current model in New Zealand, which was confirmed by responses at the workshop, I do not favour a change in model at this time. My opinion on this was shared by the overwhelming majority at the workshop. Adopting a position which it knows to be inconsistent with the circumstances is hard for a

⁷ M Lally, *ibid.*, p.7.

⁸ *Loc. cit.*

regulator to justify, and the Commission's decision will be open to merits review in the High Court. The Commission is between a rock and a hard place.

In my opinion, the Commission's practical response should be to look to the overall purpose of the regime in Section 52A(1). This requires a balancing of the interests of consumers and producers. The Commission could follow this objective by retaining the simplified Brennan-Lally model and setting a moderate benchmark leverage (say 30%) to be used in working out WACC in each industry, even though this gives rise to some inconsistency. Its justification would be ensuring there will be no underinvestment, as this would not be in the long term interests of consumers. In addition, if it pursues this approach, the Commission should recognise when balancing the various factors, including the market risk premium, and deciding on the WACC to be permitted, that the chosen model tends to overstate WACC and will do so by a significant margin when the debt premium is high.

2.3 Real options

There were appeals at the workshop for the Commission to provide regulated firms with a return on real options. A real option is the right of a firm to undertake some business decision. Typically, it is the right to make, abandon, expand or shrink a capital investment.

There is no obligation on a firm to take up the option, just the opportunity to do so. The real option value of a project or firm is always higher than its net present value (NPV), especially in projects or firms with major uncertainty. This is because the NPV framework assumes that management is passive and does not modify projects as circumstances change, whereas, under the real options approach, management has the flexibility to respond to changed circumstances.

As far as I could determine, the advocates of this approach did not provide the Commission with any practical guidance as to how it could identify or value real options among the firms it is required to regulate. Nor did they identify other regulators that have allowed a return on a real option. The closest that the proponents came to providing valuation guidance was Professor Guthrie's suggestion that the premium at which some electricity distribution companies have traded to their ODV reflects the value of the real options they contain.⁹ Several lines companies have exchanged at over twice their ODV value.

Even when allowance is made for the vagaries of valuation estimates and that some of these date back to 2004, Professor Guthrie seems to be suggesting that real options can constitute 50% of a line company's value and possibly more. What these real options are and why they should be worth hundreds of millions of dollars in an industry with very static technology is not clear to me, and it was not made clear by Professor Guthrie or others at the workshop. I think a more likely principal explanation of these premiums to ODV is that purchasers of line companies

⁹ Commerce Commission, *Cost of Capital Workshop Transcript*, p.70.

considered the regulatory regime applied to them particularly accommodating in terms of the net returns relative to efficient costs permitted.

As regards regulated firms like airports that are subject to information disclosure only, or firms subject to the negotiate/arbitrate regime, the Commission making allowances for real options has no relevance. A regulated airport is currently allowed to set charges “as it thinks fit” and there is no legal constraint on the return it can earn. As regards whether the Commission should consider allowing a return on real options under the default and customised price path (DPP and CPP) regimes I am sceptical for the following reasons. Firstly, if a real option existed at both the beginning and end of a regulatory period, then it was not “used and useful” during the regulatory period and so current users of the firms services not paying for any return on the “asset” is appropriate.

Secondly, if a real option existed at the beginning of a regulatory period but not at the end then either it “vanished” during the period or was used. If it “vanished” or wasted away, there is no justification for charging existing users of the regulated activity. If it was “used”, either the asset was sold, used to provide lower operating expenses or used to create a new service. If it was sold, this is a capital transaction and current users should not pay (or receive) compensation for this. The DPP and CPP allow the regulated entity to retain operating cost savings and do not impose constraints on revenue from new services. So if exercise of the real option lowered operating expenses or created a new activity, the regulated entity will receive a return under the DPP or CPP process, at least until the next regulatory reset, and possibly afterwards if it can convince the Commission this would be to the long-term benefit of consumers.

Thirdly, if a real option did not exist at the beginning of the regulatory period but did at its end, it was created or acquired during the regulatory period but not used during it. It has not been “used and useful” to consumers during the current regulatory period and so it is appropriate they do not pay for it.

Finally, if a real option did not exist at either the beginning or the end of a regulatory period but did at some point during it, it was created or acquired during the regulatory period and used during it. The same analysis as was applied above to a real option that existed at the beginning of the period and was used during it applies, so the Commission does not need to authorise any additional payment if the DPP or CPP regime applies.

In short, under either the DPP or CPP regulatory regime the Commission does not need to authorise any additional returns to cover a return on real options. Either the appropriate return is already available to the regulated entity or the real option was not “used and useful” to those paying charges during the period, and so no additional charge is justified.

2.4 The market risk premium (MRP)

There were suggestions at the workshop that the Commission should raise its (after tax) market risk premium in light of the global financial crisis (GFC). I do not think an uplift in this critical variable is justified, especially given that the use of the simplified Brennan-Lally model already gives an uplift to WACC, especially when the debt premium is high, as it has been as a result of the GFC.

The use of a risk free rate of a term equal to the regulatory period and not a short-term rate, as conceptually indicated by the CAPM, is a further concession to regulated firms that the GFC has accentuated. The GFC has led to very loose liquidity conditions that have dragged down short-term rates and pushed up inflationary expectations and hence medium and longer term rates. The slope of the yield curve has steepened. This has made the concession of using a longer rate more valuable to regulated firms and more detrimental to their consumers.

If the Commission is of a mind to raise the MRP in response to the GFC, I urge that it signal when in the future it will revise the value of this variable, and that this date be not later than the end of 2010. The Commission must be careful it does not lock in a higher rate than is justified to the detriment of consumers. It should bear in mind that its own expert panel considered the current 7% to be reasonable late last year and one expert even noted at that time that 7% was generally higher than other regulators adopted.¹⁰

2.5 The asymmetry of social costs

The Commission recognises that if the allowed rate of return is set too high, consumers will be charged too much and there is a risk that the firm may over-capitalise. The Commission also recognises that, if the allowed rate of return is set too low, incentives for the firm to undertake efficient wealth enhancing-investments will be distorted. “As a general principle, the Commission considers that the social costs of setting allowed returns too low likely outweigh the social costs of setting them too high.”¹¹ “Reflecting this view, the Commission often selects a WACC estimate above the midpoint of the estimated range when setting allowed rates of return.”¹²

In my view, however, there is no justification for the Commission to use an estimate above the midpoint when setting the WACC for airports for information disclosure purposes. The regulated airports are subject to information disclosure only and not to the DPP or CPP regimes. Moreover, each airport is by law allowed to set prices “as it thinks fit”.¹³ Since each airport can set its WACC and its own capital expenditure

¹⁰ WACC Experts’ Report, p.22.

¹¹ Commerce Commission, *Revised Draft Guidelines: The Commerce Commission’s Approach to Estimating the Cost of Capital*, June 2009, p.13.

¹² Commerce Commission, *ibid.*, p.52.

¹³ Airport Authorities Act 1966, s. 4A(1).

programme when establishing charges as it thinks fit, the possibility of under-investment by airports in regulated assets is significantly reduced. Moreover, airports' major customers, the airlines, have a strong incentive to support necessary capital expenditure and so efficient under-investment is unlikely.

Rather, the risk and danger is that the level of investment will be above the optimal. This would be to the detriment of the long-term interests of consumers. The very chunky nature of some airport investment in things such as new runways, new terminals and major expansions of terminals means that it can take many years of organic growth to fully utilise an investment undertaken too early for demand or built too large for realistically specified growth. So over-investment can have long lasting adverse impacts to airport consumers. On the other hand, under-investment in airport infrastructure becomes quickly and readily apparent as it gives rise to congestion. Given that the costs of congestion fall upon an airport's major customers, the airlines, there is usually little difficulty in the parties agreeing the need for investment. Moreover, the significant local authority ownership in all regulated airports makes their managements vulnerable to "political" pressure to build iconic portals for the cities and regions they serve.

2.6 Allowances for asymmetric risks

As with the asymmetry of social costs, an uplift in the allowed WACC to recognise the potential for asymmetric risks to lead to under-investment in assets by the regulated entity is not relevant to the airports, which are subject to information disclosure only. The argument to support an uplift focuses on the disincentive to a firm to invest if the regulatory regime stops it earning more than WACC, but the commercial reality it faces means it could earn less than WACC. A firm in these circumstances can perceive that it is better off not investing, even if society would be better off if it did, and this is dynamically inefficient.

As I have already noted, each airport has the right to set charges "as it thinks fit". There is nothing in the regulatory regime to stop an airport investing and earning more than WACC. There is no asymmetric risk as a result of the regulatory regime and no need for the regulator to consider any adjustment to deal with it.

3. Specific responses

3.1 The Commission's requests

The Commission has specifically asked me to respond on three matters:

- why, in the airport sector, firm specific parameter estimates should be used instead of industry wide ones¹⁴
- about the difficulty of finding comparable companies¹⁵ and

¹⁴ Commerce Commission, *Cost of Capital Workshop Transcript*, p. 42.

- selecting the point in the range for WACC.¹⁶

3.2 Firm specific v industry wide parameters

The three parameters used in the estimation of WACC by the simplified Brennan-Lally approach that can vary between firms are leverage, debt premium and beta.

Having heard the debate at the workshop on leverage, and read Dr Lally's very useful explanatory note on the topic provided by the Commission after the workshop,¹⁷ I now think that on balance the Commission should set a modest leverage rate and apply it to all firms in the industry. As I explained in section 2.2 above, using the actual firm specific leverage rates in conjunction with the simplified Brennan-Lally model will provide an incentive for regulated firms to adopt excessive levels of leverage, especially in times of financial distress, and this is not economically efficient.

In relation to the debt premium, I believe the most appropriate approach is to base the debt premium for a specific firm on an economy wide analysis of the debt premiums applicable to issuances by firms with a credit rating matching that of the firm for the relevant term. However, the results of this approach should be tempered by consideration of the debt premiums actually paid by the specific firm and if its actual debt premium is found to be lower, then this should be reflected in the debt premium set for this firm. Consumers should pay for only efficient costs actually incurred and if a firm can raise debt at a lower cost than the economy wide comparison suggests, this efficiency should be recognised in a lower WACC.

In relation to beta, the airports are a mixture of regulated and unregulated activities and the mix of regulated activities varies from airport to airport. As can be seen from Table 1, Auckland has a much greater proportion of its business in international passengers than Wellington or Christchurch. The proportion of revenue from the three regulated activities also varies between the airports. For this reason, I do not think it is desirable to treat the airports as homogenous when estimating beta.

¹⁵ Commerce Commission, *ibid.*, p. 201.

¹⁶ Commerce Commission, *ibid.*, p. 226.

¹⁷ M. Lally, *WACC and Leverage*, 17 November 2009.

Table 1 Activity differences between regulated airports, 2008
Percentage

	AIAL	WIAL	CIAL
International Passengers	57	12	28
Domestic Passengers	43	88	72
Regulated Revenue			
Airfield	38	48	33
Passenger Terminal	57	49	59
Aircraft & Freight	5	3	8

Notes: (1) AIAL = Auckland, WIAL = Wellington, CIAL = Christchurch

Source: Calculated from 2008 information disclosure statements

3.3 Difficulty of finding comparable companies

The “straw person” example discussed at the workshop related to electricity distribution companies. In Table 3 of that example, betas data for Contact Energy and TrustPower are included as comparators. In my opinion, this is inappropriate. Contact Energy and TrustPower are both generators and retailers of electricity. They are not involved in the provision of electricity lines distribution. The two industries are quite distinct. One is a contestable industry, the other is a natural monopoly. One is unregulated and the other is regulated. Electricity generation is subject to significant risks due to climatic conditions, lines distribution is not. Electricity sales are impacted by short-term movements in economic conditions, the provision of lines distribution services is not.

3.4 Selecting the point on the range

I have already made my comments in relation to this issue in commenting on the asymmetry of social costs and asymmetric risks in sections 2.5 and 2.6 above and do not repeat them here. My conclusion is that there is no justification for setting WACC beyond the midpoint of estimates in the case of airports, which are subject to information disclosure only.