

E5/14

2 December 2009

Murray Reynolds
Economists
Economic Services Branch
Commerce Commission
PO Box 2351
WELLINGTON 6140

NPB@comcom.govt.nz

POST-WORKSHOP SUBMISSION: WEIGHTED AVERAGE COST OF CAPITAL

Pursuant to Part 4 of the Commerce Act the Commerce Commission (Commission) is in the process of developing an Input Methodology for the weighted average cost of capital (WACC) that will apply to Electricity Distribution Businesses (EDBs). As part of that process the Commission has published revised draft Cost of Capital Guidelines, a "Straw Person" example of how it might calculate a WACC for an EDB, and held a two-day workshop on 12 and 13 November 2009 ("the workshop"). Following the workshop the Commission called for further submissions.

This letter and the attachments provide Unison's post-workshop submission on the Cost of Capital Guidelines and the WACC Input Methodology.

The following documents are appended to this letter:

- A report detailing Unison's position on the major issues associated with the WACC; and
- A paper from Mr Andrew Shelley of CRA International discussing leverage and the CAPM.

Our report also refers to the following documents that have previously been submitted to the Commission:

- The letter dated 24 November 2009 from Mr Greg Morgan to the Commission regarding the Commission's cost of capital data request;
- Dr Alex Sundakov's report *Submission on Input Methodologies: Regulatory Cost of Capital*, 13 August 2009;
- The report from CRA International, *WACC for Electricity Lines Businesses under an Administrative Settlement*, prepared for Unison Networks Ltd, 30 June 2006; and
- The report from CRA International, *Review of the Commerce Commission's Intention to Declare Control of Unison*, Final Report, Prepared for Unison Networks Limited, 28 October 2005.

In summary, Unison's position on the major issues is:

1. The Input Methodology for the WACC for EDBs is separate from the Cost of Capital Guidelines, and decisions made on the Input Methodology should not necessarily be reflected in a narrowing of the scope of the guidelines.
2. The New Zealand economy is not a closed economy, and most parameters employed in the WACC formula reflect that. It is not appropriate to assume a closed economy when setting the assumption about the ability to utilise imputation credits. Foreign investors should be recognised.
3. Unison does not support the Commission's "NPV=0" framework. Previous submissions from Unison and our expert advisors have highlighted why we do not believe that the NPV=0 rule is consistent with a workably competitive market.
4. The risk-free rate should be set using the longest-dated New Zealand government bond available, i.e. 10 years.
5. The cost of debt should be set using a benchmark credit rating of BBB or BBB+, reflecting the likely circumstances of most EDBs. A benchmark credit rating of A is not appropriate.
6. The cost of debt should reflect the actual forward-looking costs of debt to EDBs. Preliminary figures from our cost of debt model suggest that the debt premium is in the order of 295-307 bps for a BBB+ rated utility against the 5 year risk-free rate, reducing to 233-245 bps against the 10 year risk-free rate. For a BBB rated utility the debt premium is in the order of 308-322 bps against the 5 year risk-free rate, reducing to 246-260 bps against the 10 year risk-free rate. All figures include issuance costs and are based on a swap rate of 5.65%.
7. The issue raised at the workshop about the potential for firms to seek a high leverage because of the resulting small increase in the WACC based on the simplified Brennan-Lally model does not recognise the realities faced by any firm seeking debt finance. Covenants restrict our ability to obtain facilities for more than 60% of the book value of our assets. The closer that actual borrowings are to the maximum of 60%, the higher is the economic opportunity cost of utilising those funds. This effect far outweighs any impact on the regulated WACC, and as a consequence actual borrowings are kept below the 60% maximum.
8. The Commission has not presented a compelling reason to change from its previous estimate of an asset beta of 0.5 for a company subject to a five-year price cap. The asset beta for EDBs should therefore be set at 0.5.
9. The Commission should use blume-adjusted betas to compensate for the empirical fact that the CAPM understates returns for low beta companies.
10. The Commission has not published any analysis of how it or its experts arrive at a market risk premium (MRP) of 7.0%. Prior to the GFC, our analysis of the 7.0% figure suggested that a more reasonable estimate for New Zealand was 7.7%.
11. Equity markets remain fragile and volatile in the wake of the global financial crisis (GFC). Equity investors require compensation for the higher levels of risk that they bear. Given the asymmetric consequences of a WACC that is too low, the Commission should err on the side of caution and utilise a higher MRP for the first regulatory period. At a minimum the adjustment should be the 0.5% increment adopted by the AER, converted to a tax-adjusted to market risk premium for New Zealand. The minimum level for the MRP should, therefore, be 8.2%.

12. The AER's estimate of a market risk premium of 6.5% converts to a tax-adjusted market risk premium for New Zealand of between 8.6% and 9.1%, depending on the assumptions adopted regarding the long-term average risk-free rate. We note that Synergies, in its 31 August 2009 report for Vector, has separately estimated an appropriate tax-adjusted market risk premium for New Zealand is 9.0%.
13. The WACC range should be estimated using Monte Carlo analysis, specifically including correlations between parameters such as the positive correlation between debt premium and leverage. The existing methodology for estimating the WACC range is only suitable if there are no correlations.
14. A correction should also be made for model error. If the Commission elects not to use blume-adjusted betas to correct the under-estimation inherent in all forms of the CAPM, then it is appropriate to add the margin of 1% to 3% previously suggested by Professor van Zijl.
15. Having regard to the potential costs of under-investment, the 80th percentile is the appropriate point on the WACC range for a firm subject to rate-of-return regulation. For firms subject to five-year price cap regulation the appropriate range should be plus or minus 10 percent either side of the 80th percentile. Our recommended WACC range for the PO adjustment is, therefore, a lower bound at the 70th percentile and an upper bound at the 90th percentile.
16. The proposal to lower the benchmark leverage in the event that the WACC fails the financeability test renders the test meaningless. The Commission should develop a straw man example to illustrate its proposed approach to the financeability test and should consult on the details of that test.

At the workshop Unison's representatives undertook to provide the Commission with information on the cost of debt, including issuance costs and a model for calculating the cost across the range of debt options that are available to firms in real world workably competitive markets. We have constructed the model but are still in the process of documenting it and confirming parameter estimates with our Treasury advisors. The model will be provided to the Commission when this process is completed.

Unison has reviewed the submissions from the Electricity Networks Association and Vector Limited, and supports the points made in these submissions.

Please contact me directly on 06 873 9301 if you require further information on this submission.

Yours sincerely



Ken Sutherland
Chief Executive



Post-Conference Submission on the Weighted Average Cost of Capital

2 December 2009

1. Introduction

Pursuant to Part 4 of the Commerce Act the Commerce Commission (Commission) is in the process of developing an Input Methodology for the weighted average cost of capital (WACC) that will apply to Electricity Distribution Businesses (EDBs). As part of that process the Commission has published revised draft Cost of Capital Guidelines, a "Straw Person" example of how it might calculate a WACC for an EDB, and held a two-day workshop on 12 and 13 November 2009 ("the workshop"). Following the workshop the Commission called for further submissions.

This report provides the detail of Unison's submission.

The report is structured as follows:

- Section 2 covers framework issues including the simplified Brennan-Lally Model's assumption of a closed economy;
- Section 3 discusses the term of the risk-free rate;
- Section 4 discusses the cost of debt;
- Section 5 covers the impact of leverage on the WACC and the constraints that prevent firms from increasing their borrowings beyond a reasonable level;
- Section 6 discusses the cost of equity, particularly the asset beta and the market risk premium;
- Section 7 addresses the topics covered in the workshop session on "estimating the cost of capital", including estimating the WACC range, selecting a point on the range, and compensating for model error; and
- Section 8 provides comments on the financeability test.

2. Framework Issues

2.1 Guidelines and the Input Methodology

The “straw person” that was issued for consideration at the workshop (“the workshop”) was focussed on the weighted average cost of capital (WACC) that might be specified in an Input Methodology for the cost of capital for electricity distribution businesses (EDBs). Unison sees a clear distinction between the Cost of Capital Guidelines and any Cost of Capital Input Methodology. The Guidelines may permit a range of approaches, whereas an Input Methodology must necessarily be specific. Decisions made in respect of the Input Methodology for EDBs should not necessarily be reflected back in a narrowing of the scope of the Guidelines.

2.2 Simplified Brennan-Lally Model and the Assumption of a Closed Economy

As we have previously submitted, we do not believe that the closed economy assumptions of the simplified Brennan-Lally model are reasonable. New Zealand is not a closed economy, but is partially integrated into the international capital markets. A number of key parameters in the WACC are set using market data, which by virtue of the existence of foreign investors is not representative of the value that those parameters would have in a closed economy. The risk-free rate is set given demand for New Zealand government stock from foreign investors. The price of New Zealand equities is set given demand for those equities from foreign investors; ergo any historical market risk premium that takes account of the actual performance of the New Zealand market will include the effect of those investors. The debt risk premium observed on New Zealand corporate bonds is set in a market where foreign investors may be active. The only logically consistent approach to the CAPM is to acknowledge that foreign investors are active in the New Zealand market, and to therefore reflect that fact in the assumptions made about the ability of investors to utilise imputation credits. We therefore recommend that a more complete version of the Brennan-Lally model is employed or, as suggested by Professor Bowman at the workshop, that the Officer model as employed by Australian regulators is used.¹

3. Term of the Risk-Free Rate

There was agreement among participants at the workshop that the term of the risk-free rate should be the longest dated instrument available in New Zealand.

Professor Bowman noted at the conference that the Commission’s position of adopting a term for the risk-free rate that is equal to the length of the regulatory period is not consistent with standard commercial practice (p. 127, lines 3-5). We agree with this statement and note that this is not just standard commercial practice for regulated firms, but for firms in other markets that can be considered to be workably competitive.

Several participants also mentioned that the strategy of duration matching was the appropriate basis for setting the risk-free rate (see, for example, Mr Shelley (p. 125, lines 15-22), Professor Bowman (p. 126, lines 10-21). Unison has previously submitted material to the Commission highlighting the principle of duration matching and its

¹ If the Officer model was used the parameter gamma should be set at a level that recognises the participation of foreign investors in the New Zealand market. It would not be appropriate to set gamma equal to one, as this assumes that all investors are able to fully utilise imputation credits.

application to the weighted average cost of capital.² It is appropriate for the Commission to reflect this in selecting the longest dated Government bond available in New Zealand as the instrument for the risk-free rate.

As a practical matter, the letter from Mr Greg Morgan notes that Unison has always sought to obtain longer term financing, subject to the constraints of the finance that is available in the market and the constraints of prudent financial risk management policy.

4. The Cost of Debt

There was a general consensus among participants at the workshop that the cost of debt should be forward-looking and reflect the actual debt costs faced by a firm.³

Professor Bowman also noted (p. 127, lines 8-20) that the incompleteness of the market imposes short-term financing on regulated firms, and that this imposes additional costs of refinancing risks. While the term of the risk-free rate should set at the longest-dated Government bond, the cost of debt should be calculated so that it takes account of the costs actually faced by the firm. The various parties that referred to in the previous paragraph all supported this position, and specifically that refinancing risks should be taken into account. We also note that Dr Lally supported this view, stating that (p. 136, lines 9-16):

I think the proposition that in the presence of refinancing risk firms might want to borrow for ten years, that's fine, and therefore the swap costs to bring it back to five years need to be taken account of by the Regulator. I don't think that proposition is controversial, I think that's generally accepted.

Unison considers that issuance costs should be included in the cost of debt rather than the cash flows. The "headline" cost of debt does not accurately capture the true cost of each source of debt: issuance costs must be added to obtain a true picture of the cost of each source. This point was supported by Mr Shelley (p. 154, lines 8-14) and Mr Redmayne (p. 153, lines 7-21).

The Commission's strawperson example suggested a wide range for the benchmark credit range. Unison considers that the appropriate range is BBB to BBB+, as that is the range where we expect most EDBs would lie. We also note that BBB+ is the benchmark credit rating adopted by the Australian Energy Regulator.⁴ There is a substantial reduction in debt margin when moving from BBB+ to A, and it is not appropriate to include that reduction in margins when most EDBs are unlikely to be able to attain that rating.

Commissioner Mazzoleni asked how the Commission might practically be able to estimate the cost of debt from other sources when it appears that the relevant information is not publicly available (p. 145, lines 4-7). Unison undertook to provide the

² CRA International, WACC for Electricity Lines Businesses under an Administrative Settlement, 30 June 2006, Sections 2.2.2 and 2.2.3, pp. 5-8.

³ See, for example, to Mr Greg Morgan, Unison Networks (p. 144, lines 23-33); Mr Allan Carvell, Vector Networks (p. 127, line 30 to p. 128, line 2, p. 144, lines 15-22); Mr Norris (p. 147, lines 4-10); Mr Robertson (p. 148, lines 23-30)

⁴ Australian Energy Regulator (2009) *Review of the weighted average cost of capital (WACC) parameters*, Final Decision, May.

Commission with a model for calculating the cost of debt, and to specifically identify where the Commission would be able to obtain the relevant data.⁵

As noted by Mr Morgan and Mr Carvell (p. 145, line 29-33 and p. 146, lines 7-22), most of the data required by the Commission can be sourced from Treasury advisory firms. We have spoken to our Treasury advisors, Asia-Pacific Risk Management (APRM), about where the Commission may be able to obtain the data required for modelling the forward-looking cost of debt. APRM have confirmed that they would be happy to discuss the Commission’s requirements directly with the Commission.

The model that we will provide to the Commission covers bank debt, private placements, retail bonds, and what we have termed “international bonds”. Consistent with our position that long-term bonds are the optimal source of funding, the model allocates funds to long-term bonds to the extent that such bonds would be available to an entity of the specified size, and to the extent that the allocation does not create undue refinancing risk. Preliminary figures from our model suggest that the debt premium is in the order of 295-307 bps for a BBB+ rated utility against the 5 year risk-free rate, reducing to 233-245 bps against the 10 year risk-free rate. For a BBB rated utility the debt premium is in the order of 308-322 bps against the 5 year risk-free rate, reducing to 246-260 bps against the 10 year risk-free rate. All figures include issuance costs and are based on a swap rate of 5.65%.

Figure 1: Preliminary Estimate of Debt Margin with 50% Leverage and Indicated Credit Rating

	Firm Size (\$m)		
	250	500	750
<i>5 Year Risk-Free Rate (annualised 5.12%, October 2009)</i>			
BBB+	295	305	307
BBB	308	314	322
<i>10 Year Risk-Free Rate (annualised 5.74%, October 2009)</i>			
BBB+	233	243	245
BBB	246	252	260

Note: Both calculations assume a weighted average rate of 5.65%.

5. Leverage and the WACC

The attached paper from Mr Andrew Shelley addresses several theoretical points concerning leverage and the WACC, most notably that the WACC does not take account of financing constraints faced by a firm, and therefore is at most an approximation to the firm’s true cost of capital. Unison’s bank debt has covenants requiring that the debt does not exceed 60% of debt plus equity. Exceeding 60% is a default event. Such factors have a much larger impact on our decisions around appropriate leverage than do any considerations of the potential impact on allowed regulated returns.

⁵ Mr Greg Morgan, Unison Networks (p. 145, lines 8-9), Mr Andrew Shelley (p. 154, lines 26-29).

Faced with such a covenant Unison would not immediately borrow up to the 60% limit just to take advantage of a small (~27 bps) increase in the WACC. As part of prudent risk management, a proportion of funds remains undrawn in order to provide a buffer for contingencies.

Unison's actual debt level also takes account of operational contingencies (such as storm or earthquake damage), planned acquisitions, and the cost of debt. In periods when new debt is relatively costly we may elect to run at a relatively low level of leverage within the target range, whereas in periods when debt is relatively cheap we may elect to run at a higher level of leverage within the target range.

6. The Cost of Equity

6.1 Asset Beta

Unison is concerned that the Commission's "straw person" analysis departs significantly from positions previously established by the Commission, particularly in the gas price control decisions, and yet provides no reasons for doing so.

In particular, we note that that the Commission's analysis differentiated between US rate-of-return regulated firms with an asset beta of 0.30 and UK five-year price-capped firms with an asset beta of 0.50.⁶ The DPP is equivalent to the UK five-year price-cap regime so the asset beta of 0.50 should be adopted.

The Commission has not demonstrated that there is a persuasive reason to depart from its previous reasoning. Unison has relied on the Commission's prior analysis and position in forecasting likely allowed revenues and rates of return, and therefore has indirectly relied on that analysis for financing decisions. It would be inappropriate for the Commission to resile from that analysis without providing reasons.

Unison also notes that there was discussion at the workshop about the poor predictive power of the CAPM.⁷ The Commission's advisor, Dr Lally, agreed but noted that part of the problem is likely to be that the market portfolio is imprecisely specified, and part is also likely to be that the estimates of equity betas are imperfect [Dr Lally, p. 37, lines 8-33].

Both of the factors mentioned by Dr Lally may be true, but they do not alter the fact that given the current specification of the CAPM returns for low beta companies are higher than predicted by the CAPM. One way to correct for this downward bias would be to employ Blume adjusted betas. Blume adjusted betas might not be part of a clean theoretical model, but they more accurately reflect the returns that are actually earned by firms in real world workably competitive markets.

6.2 Market Risk Premium

There is little doubt that the market risk premium has increased as a result of the global financial crisis (GFC). The exact magnitude of that increase is unknown and for how long the increase persists is also unknown. Professor Bowman suggested that the increase in the market risk premium might be at least equal to the increase in the debt premium. This is certainly a plausible outcome, as debt holders rank above equity holders in the

⁶ Commerce Commission, 2008, *Authorisation for the Control of Supply of Natural Gas Distribution Services by Powerco Ltd and Vector Ltd*, Decisions Paper, 30 October, p. 173.
<http://www.comcom.govt.nz/IndustryRegulation/Gas/CommissionReportsandDocuments/authorisation.aspx>

⁷ See, for example, Mr John Redmayne p. 19, lines 14-19.

event that a firm gets into financial difficulties. The risk borne by equity holders is therefore larger than the risk borne by debt holders.

It could be argued that a significant proportion of this additional risk is non-systematic and therefore should not be compensated by the CAPM. We do not agree that the risk should not be compensated. Part of the reason for the existence of the debt premium is to compensate holders of debt for default risk, regardless of whether that risk is systematic or non-systematic. It seems likely that observed equity market returns also include a component to compensate for the equivalent of default risk.

Furthermore, the GFC has demonstrated that there is an element of default risk that is systematic. Markets and economies have fallen, and firms have failed, and they have done so in a highly correlated way. Previous assumptions about the extent to which such risks are non-systematic have had to be re-examined. As noted in Dr Sundakov's report, risks which were thought to be diversifiable turned out not to be, and idiosyncratic risks matter (p. 8). It is therefore highly plausible that even within the strict confines of the CAPM, which only rewards systematic risk, that there has been a permanent repricing of risk.

The task facing the Commission is to set an MRP that is reasonable for the next five years, but at the same time to avoid unnecessary volatility in MRP at each reset. The pre-GFC arguments that the high price of equity reflected a permanent reduction in risk have been proven to be wrong in hindsight, with many of the factors that were argued as contributing to lower risk actually contributing to greater risk in the event of the GFC. We would be loathe to see future Commission's reducing the MRP on the basis of equally tenuous arguments. We therefore consider that this is another area where the Commission should apply the "compelling evidence" test. In our view there is compelling evidence that the MRP has increased, both as a result of the arguments we have advanced above and as a result of the increase in market volatility.

There is also strong evidence that the financial markets are not returning to normal with any rapidity. While the historically high debt premium on corporate bonds in the BBB to BBB+ range has eased throughout the year, markets were again rocked by the announcement on 25 November 2009 that Dubai World, one of Dubai's three big state-owned investment companies, would be restructured and would seek a six-month freeze on repayments of US\$60 billion (\$84.6 billion) in debt.

Such events have had dramatic impacts on stock markets. On 30 November 2009 Reuters reported:⁸

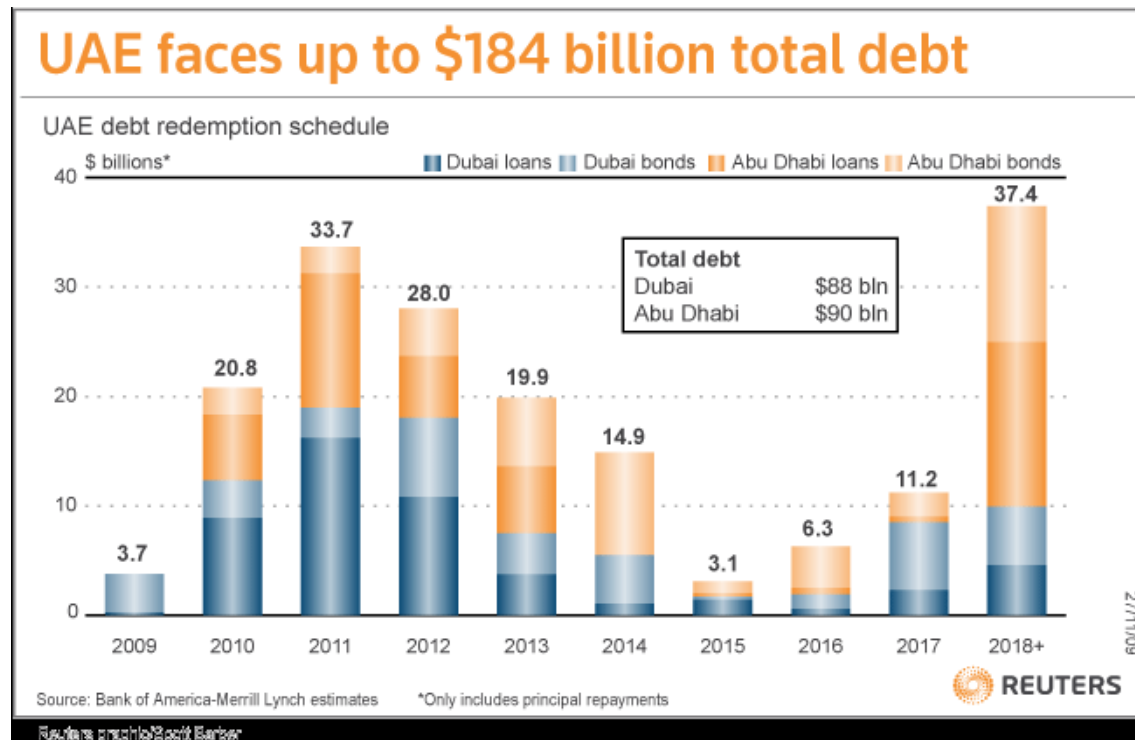
The VDAX-NEW volatility index .VIXI jumped about 8 percent and has gained nearly 30 percent in five days. The higher the index, which is based on sell and buy options on Frankfurt's top 30 stocks <0#.GDAXI>, the lower the market's appetite for risky assets such as equities.

Volatility in market returns is a key driver of returns required by equity investors, with the Merton model predicting that required returns on the market portfolio are directly proportional to market volatility.

Although markets rallied after news that Abu Dhabi was to offer emergency liquidity to Dubai World, the chart below shows that there remains a substantial risk through to 2013 that a similar crisis could re-emerge in the United Arab Emirates. This problem is

⁸ Reuters, "European shares fall on Dubai fears, banks slip", 30 November 2009. <http://www.reuters.com/article/marketsNews/idUSGEE5AT1ES20091130>

note isolated to the UAE. Any such crisis would again rock global stock markets and cause tightening liquidity in the debt markets.



Source: Reuters. http://graphics.thomsonreuters.com/119/ME_DBTSK1109.gif.

It is impossible to predict with any accuracy how long the effects of the global financial crisis will last, just as it is impossible to predict the future recovery of the global economy. Our view is that the return required by investors will remain high for at least the next few years, before possibly beginning to decline as economies and firms reach sustainable levels of growth. Given the asymmetric consequences of a regulated rate of return that is too low, the Commission should be cautious when setting the MRP. It is better to err on the side of caution and set an MRP that might be too high for the next five years than it is to err on the side of optimism and set an MRP that is too low.

The Commission is still faced with the problem of assessing what is an appropriate value for the market risk premium. Unison is concerned that neither the Cost of Capital Guidelines nor the Straw Person contain a detailed analysis of the relevant data sources and how the estimate of 7.0% has been obtained. Unison has previously submitted that the appropriate MRP for the New Zealand market is at least 7.7% based on the same data sources that the Commission has used to obtain an MRP of 7.0%.⁹

In its recent decision the AER adopted a market risk premium of 6.5%, an increase of 0.5% previously adopted. At the most basic level, ignoring the effect of the AER's assumption that not all investors can utilise imputation credits, the relationship between the Australian market risk premium and the New Zealand tax-adjusted market risk premium (TAMRP) is given by the equation:

⁹ We refer, for example, to CRA International, *WACC for Electricity Lines Businesses under an Administrative Settlement*, 30 June 2006, Section 3.1, pp. 9-11.

$$TAMRP = Rm - Rf(1 - t_i)$$

$$= (Rm - Rf) + Rf \cdot t_i$$

where Rm is the average return on the market portfolio, Rf is the average risk-free rate, $(Rm - Rf)$ is the equivalent of the Australian market risk premium, and t_i is the tax rate on investment income.

An increase in the Australian market risk premium translates directly into an increase in the New Zealand TAMRP. A minimum estimate of the appropriate MRP is therefore equal to the pre-GFC MRP of 7.7% plus the GFC adjustment of 0.5%, giving a value of 8.2%.

The average secondary market yield on 10 year New Zealand government bonds over the 1990s was 7.12%, and since January 1985 was 8.73%. The tax rate is 30%. Given these assumptions, the Australian market risk premium of 6.5% translates into a TAMRP of between 8.6% and 9.1%.¹⁰ This is consistent with Synergies Economic Consulting's estimate of the TAMRP for New Zealand of 9.0%, based on a benchmarking exercise against the US MRP with adjustments for the small size of New Zealand companies and the New Zealand share market.¹¹

Unison considers that even before the global financial crisis there was no basis for an MRP less than 7.5%. Global markets continue to remain fragile, and investors require compensation for the risks that they bear. The MRP should therefore be increased above the 7.5% level. At a minimum the MRP should be 8.2%. This is still well below the levels that can be justified by other means, including the calculation above and analyses showing that New Zealand as a small market of small companies should have a higher MRP than large countries.

7. Estimating the Cost of Capital

7.1 Estimating the WACC Range

At the workshop Commissioner Duignan raised the question of whether Monte Carlo analysis, if it was used, would be used just to test the shape of the WACC distribution, or whether it would be applied with correlation constraints imposed on variables (p. 212, lines 3-13). Mr Shelley responded that he had constructed a Monte Carlo model for the WACC and that if there were no correlations then Dr Lally's approach to estimating standard errors and the WACC distribution is appropriate (p. 221, line 31 – p. 222, line 9).

Mr Shelley's model applied the following assumptions:

- The risk-free rate is known with certainty and has a value of 6.0%;
- The tax rate is known with certainty and has a value of 30%;
- The MRP has a mean of 7.0%, a standard deviation of 1.5%, and has a log-normal distribution;
- The asset beta has a mean of 0.40, a standard deviation of 0.10, and has a normal distribution;

¹⁰ We note that at the workshop Mr Balchin referred to a 6.0% MRP translating to a 7.8% tax-adjusted market risk premium, although he seems to have used a slightly different translation (p. 181, lines 9-11).

¹¹ Synergies Economic Consulting, *WACC Review: Final*, Report prepared for Vector, 31 August 2009.

- Leverage has a mean of 50%, a standard deviation of 15%, and has a beta distribution (i.e. has a minimum value of 0 and a maximum value of 1);
- The debt premium has a mean of 3.0%, a standard deviation of 0.5%, and has a log-normal distribution.

Given those assumptions the mean and the 80th percentile generated by the Monte Carlo analysis were virtually identical to the mean and 80th percentile generated applying Dr Lally's methodology.

It is appropriate, however, to consider cases where correlations might arise. It is likely, for example, that debt premiums will have a positive correlation with leverage because debt from a highly levered firm is likely to be riskier than if the same firm had low leverage. The impact of such correlations can be relatively easily analysed through the use of Monte Carlo analysis.

7.2 Selecting a Point on the Range

At the conference there were two themes in the discussion of the appropriate way to select a point on the WACC range.

The first theme was that, given a statistical range and the costs of having a WACC that is too low, it is appropriate to select a point on the upper end of the range in order to allow for parameter error. Professor van Zijl referred to a loss function analysis that he has previously submitted to the Commission. Dr Lally supported the loss function analysis and stated that he considered the loss function analysis indicates that "the 75th percentile is probably the lower bound on what you would choose" (p. 225, lines 8-14). We agree, and note that the Commission has previously suggested the use of the 80th percentile.

We note that the upper bound of the WACC is to be used by the Commission in the P0 reset process, with firms being allowed to earn projected profits as high as the upper bound without being subject to a P0 reset. However, EDBs subject to the DPP will not face rate of return regulation but a weighted average price cap. A WACC from the upper end of the WACC range – the exact point being informed by loss function analysis – would be appropriate as the point estimate of WACC for a rate-of-return regulated firm. A firm subject to incentive regulation should then be able to earn a return either side of that point estimate. If the 80th percentile is the appropriate point estimate for a rate-of-return regulated firm, then the appropriate range might be a lower bound of the 70th percentile and an upper bound of the 90th percentile.

The second theme in the discussion of the appropriate way to select a point on the WACC range was the discussion of model error, and the consequent need to widen the WACC range. This issue is discussed below.

7.3 Correcting for Model Error

We further note that this process assumes that we have the "right" model and that the only source of uncertainty is parameter error. There was clear acceptance, however, that the choice of model also introduced error. Dr Guthrie considered that there was a significant risk of making it appear that it was possible to determine the adjustment with a degree of precision that is simply not possible, and suggested that the range could be set by using "all minimums" to derive the lower-bound WACC and "all maximums" to derive the upper-bound WACC. In an earlier submission Professor van Zijl suggested

adding a margin of 1% to 3% specifically to account for model error.¹² In the absence of more detailed analysis to identify the magnitude of model error we recommend that the Commission adopts Professor van Zijl's approach, particularly if the Commission elects not to correct under-estimation bias in the CAPM by way of blume-adjusted betas.

8. Financeability Test

Unison is concerned that the financeability test as discussed on the second day of the workshop is meaningless. According to Dr Lally's description, the financeability test will be solely focussed on whether a benchmark firm with the benchmark leverage will meet relevant criteria (p. 170, line 29 to p. 171, line 7). The Commission proposes that if all parameters are correct then it will reduce the benchmark leverage. This action turns the entire test into a farce. Reducing benchmark leverage will always return the benchmark firm to the point where relevant cash flow metrics are met, and hence no other action will ever be required. We strongly recommend that leverage is fixed at the benchmark range, and not reduced below the range if financeability tests are not met.

Unison has submitted at length in the past on financeability tests,¹³ and suggests that the approach adopted by CRA should form the strawman for the financeability test. Given that the Commission intends to apply the test for a benchmark firm, it will be necessary to develop a strawman for small, medium, and large sized companies, and to consult on the assumptions that will be used for calculating cash flow, including assumptions about capital expenditure and the rate of asset cost inflation.

When the Cost of Capital Input Methodology is applied to a CPP then it is appropriate that it takes account of the regulated firm's specific circumstances, including actual leverage and capital expenditure.

¹² Van Zijl, T. (2007) *Response on behalf of Vector Limited to the Commerce Commission's Estimate of WACC in the Draft Authorisation for the Control of Supply of Natural Gas Distribution Services by Powerco Limited and Vector Limited*, LECG, 26 November.

¹³ CRA International (2005) *Review of the Commerce Commission's Intention to Declare Control of Unison*, Final Report, Prepared for Unison Networks Limited, 28 October. See also CRA's analysis for Vector in Evans, L., A. Shelley, J. Hornby, and J. Mellsop (2007) *Comments on Commission's Draft Decisions Paper on Supply of Gas Distribution Services*, Final Report, Prepared for Vector Limited, CRA International, 29 November.