

Telecom New Zealand Limited

The Weighted Average Cost of Capital to be Applied in
Calculating the Cost of the Telecommunication Service
Obligation for the Period 1 July 2003 to 30 June 2004

17 September 2004

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Telecom New Zealand Limited
PO Box 570
Level 9
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WELLINGTON

Attention: Mr A Srzich

Dear Sir

We present our report which provides our estimate of the Weighted Average Cost of Capital ("WACC") applicable to Telecom New Zealand Limited's ("Telecom") obligation under the Telecommunication Service Obligation ("TSO") for the period 1 July 2003 to 30 June 2004.

We would be pleased to discuss these matters with you further, if required.

Yours faithfully



Murray Coppersmith
Partner



John Redmayne
Director

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1. Introduction

Scope of Report

1.1. The purpose of this report is to provide our estimate of the WACC to be applied in calculating the net cost of Telecom's obligations under the TSO for the period 1 July 2003 to 30 June 2004. The focus of this report is to provide our estimates of the input parameters to our WACC calculation and our resulting WACC estimate.

1.2. We have not set out in this report a fully detailed analysis of the various issues that arise in deriving our input parameters as that reasoning is already well documented in various reports we have previously provided to you (and hence to the Commerce Commission – "the Commission"). Accordingly this report should be read in conjunction with our earlier cost of capital reports in order to obtain a comprehensive view on our position on regulated telecommunication business cost of capital matters.

Approach

1.3. In preparing this report we have used and relied on discussions with management of Telecom and the following sources of information:

- Reports previously issued by the Commission on WACC estimation, including various report on the TSO and the TSLRIC¹ Principles Paper;
- New Zealand interest rate data from Bloomberg; and
- Share price and market index data from various service providers.

Background Knowledge

1.4. WACC theory is a specialist technical subject. It is not the purpose of this report to provide a detailed discussion on the theory underpinning WACC and its components. In presenting our supplementary comments, we have assumed that readers of this report have a basic understanding of the theory underpinning WACC and how WACC and its components are derived.

1.5. Furthermore, we have assumed readers are familiar with the contents of:

- Our letter to Telecom "Application of a TSLRIC Pricing Methodology – Discussion Paper", 15 August 2002;
- Our report "Telecom New Zealand Limited, The Cost of Capital to be Applied in Calculating the Cost of the Telecommunication Service Obligation", 22 August 2002;
- Our report "Telecom New Zealand Limited, The Cost of Capital to be Applied in Calculating the Total Service Long Run Incremental Cost of Interconnect Services", 11 April 2003;

¹ Total Service Long Run Incremental Cost.

- Our report “Telecom New Zealand Limited, Comments on the ‘TSO Weighted Average Cost of Capital’ report prepared by the Commerce Commission dated 19 May 2003”, 13 June 2003;
- Our report “Telecom New Zealand Limited, The Weighted Average Cost of Capital to be Applied in Calculating the Cost of the Telecommunication Service Obligation for the Period 1 July 2002 to 30 June 2003”, 9 September 2003;
- Our report “Telecom New Zealand Limited, Comments on the TSO Cost of Capital estimate in the “Draft Determination for TSO Instrument for Local Residential Service for period between 1 July 2002 and 30 June 2003”, Commerce Commission, 30 June 2004”, 13 August 2004;
- Our report “Telecom New Zealand Limited, The Cost of Capital to be Applied in Calculating the Total Service Long Run Incremental Cost of Interconnect Services”, 27 August 2004;
- The cost of capital related material within the Commerce Commission report “Application of a TSLRIC Pricing Methodology - Discussion Paper”, 2 July 2002;
- Commerce Commission report “TSO Weighted Average Cost of Capital”, 19 May 2003;
- The cost of capital related material within the Commerce Commission report “Draft Determination for TSO Instrument for Local Residential Service for period between 20 December 2001 and 30 June 2002”, 27 June 2003;
- The cost of capital related material within the Commerce Commission report “Determination for TSO Instrument for Local Residential Service for period between 20 December 2001 and 30 June 2002”, 17 December 2003;
- The cost of capital related material within the Commerce Commission report “Telecommunications Act 2001, Implementation of TSLRIC Pricing Methodology for Access Determinations under the Telecommunications Act 2001, Principles Paper”, 20 February 2004; and
- The cost of capital related material within the Commerce Commission report “Draft Determination for TSO Instrument for Local Residential Service for period between 1 July 2002 and 30 June 2003”, 30 June 2004.

1.6. In reaching our conclusions, we have taken into consideration the arguments put forward to the Commission at the various Commission conferences, as well as the content of the Commission’s various reports and draft and final rulings. This report contains our current views on critical WACC issues, many of which have previously advised to the Commission, and remains consistent with our previous position.

Disclaimers

1.7. Our report has been prepared to assist Telecom in its submission to the Commission in relation to the WACC applicable to interconnect services.

1.8. We accept no responsibility to any other party other than Telecom to whom our report is addressed, and, except that the report can be submitted for consideration by the Commission, unless specifically stated to the contrary by us in writing, it should not be copied to any third party without our prior, written permission. We accept no responsibility for any reliance that may be placed on our report should it be used for any purpose other than stated above.

1.9. We reserve the right, but will be under no obligation, to revise or amend our report and the opinions contained therein if any additional information, which was in existence on the date of this report but was not brought to our attention in preparing our report, subsequently comes to light.

2. Risk Free Rate

Discussion

2.1. We set out below the yields for the various maturities of government stock on issue as at 30 June 2003 (being the day immediately prior to the commencement of the relevant TSO net cost period) and the average yield for each of these maturities over the preceding six months:

Maturity	Coupon %	Semi-annual Yield as at 30 June 2003 %	Semi-annual Yield One Month Average %	Annualised One Month Average %
15-Apr-04	8.00	4.876	4.848	4.907
15-Feb-05	6.50	4.871	4.793	4.851
15-Feb-06	6.50	4.905	4.816	4.874
15-Nov-06	8.00	4.929	4.841	4.900
15-Jul-09	7.00	5.109	5.042	5.106
15-Nov-11	6.00	5.277	5.180	5.247
15-Apr-13	6.50	5.329	5.232	5.300
15-Apr-15	6.00	5.403	5.284	5.354

2.2. We understand that the life of the assets used to provide the TSO services is typically in excess of the longest maturity bond in the above table (which has a maturity of approximately 12 years). We therefore continue to consider that the best approach, and the only approach consistent with forward looking long-run incremental cost, is to use the yield on the longest maturity, actively traded bond – in this case the 15 April 2015 bond.

2.3. We note that in its previous TSO WACC assessments the Commission has used average government bond yields measured over the one month prior to the relevant TSO net cost period. We consider the averaging process used by the Commission for the purpose of estimating the TSO WACC to be reasonable.

PwC's Estimate

2.4. Based on the average yield for the 2015 government bond over the one month immediately prior to 1 July 2003, we estimate an appropriate long term risk free rate, after converting to an annualised yield, as being 5.354%, say, 5.4%. Consequently, we have recommend using a risk free rate input in the 1 July 2003 to 30 June 2004 TSO WACC calculations of 5.4%.

3. Debt Premium and Gearing

Discussion

3.1. Our analysis to date demonstrates that it is difficult to quantify any material risk difference between Telecom (and for that matter most other integrated telecommunications companies) as a whole and the TSO activities. It is therefore reasonable to conclude that any risk differential, if in fact it exists, is unlikely to have any material effect on the TSO WACC via the debt premium input estimate.

3.2. The Commission has previously used a target gearing of 30% in estimating the TSO WACC. This level of gearing is close to the average level of Telecom's actual gearing over the five years to 30 June 2003. As at 30 June 2003 Telecom's market based gearing was not significantly higher, being approximately 35%. It is therefore debatable as to the extent to which actual gearing of 30% would have lead to any substantial reduction in Telecom's observed debt premium.

3.3. We consider that an assumed gearing level of 30% and use of Telecom's actual debt premium as at June 2003 are reasonable parameter estimates for the TSO WACC.

3.4. Telecom has undertaken detailed analysis of its overall weighted average debt margin (including all facility fees) over ten year New Zealand Government Stock as at 30 June 2003. At that date it advises that its overall weighted average debt margin was 159 basis points.

PwC's Estimate

3.5. For the purpose of our estimate of the TSO WACC as at June 2003 we have used an assumed gearing ratio (debt to debt plus equity) of 30% and a (rounded) debt margin estimate of, say, 1.6%.

4. Investors' Tax Rate

Discussion

4.1. Having regard to the mix of investor types in the New Zealand market and their taxation status PricewaterhouseCoopers estimates that the weighted average investors' tax rate had a value of 0.28 in June 2003.

4.2. We note that in New Zealand different corporate finance practitioners appear to be using investors' tax rate values of 0.20, 0.28 and 0.33, which values have a mean of 0.27. We also note that Lally and Marsden (2004)² estimate that the investors' tax rate (as defined comprehensively) has had a value of 0.275 since 2000.

PwC's Estimate

4.3. We consider that a reasonable investors' tax rate estimate for use in the Brennan-Lally CAPM as at June 2003, and one that also closely accords with best practice in New Zealand, is 28% (i.e. 0.28).

² Lally, M. and A. Marsden (2004). "Tax-adjusted market risk premiums in New Zealand: 1931–2002", Pacific-Basin Finance Journal, 12, 291– 310.

5. Asset Beta

Discussion

5.1. In analysis previously provided to you (refer in particular to Appendices A and C of our report dated 13 June 2003) we set out our reasoning and analysis on why the TSO asset beta must be the same, or at most 0.05 less, than the asset beta for a wireline/PSTN business. Accordingly, it remains our view that an objective estimate of the asset beta for a wireline/PSTN business provides the preferred basis for estimating the asset beta appropriate for the TSO WACC. One source of such an estimate is Telecom's own asset beta.

5.2. We have obtained estimates of Telecom's own asset beta for rolling five year periods from July 1998 through until June 2003. Our estimates of Telecom's asset beta over this period (degeared using the average D/E ratio over the five year period the equity beta has been estimated) varied in the range 0.78 to 0.95 with an average of 0.87.

5.3. In our previous reports (refer our reports dated 22 August 2002, 13 June 2003 and 13 August 2004) we provided you with a comprehensive analysis and commentary on other estimates of a wireline/PSTN and hence the TSO asset beta, including:

- a) analysis of the asset betas for overseas integrated telecommunications firms:- weighted average 0.70, simple average of 0.83 and median of 0.73;
- b) a "full-information" segmental beta analysis to derive an asset beta for wireline activities of 0.72 to 0.94 (point estimate 0.80). This range is inclusive of the effects of regulation and, in our view the mid- to top end of this range is applicable to the risk attributes of the TSO services;
- c) an estimate of the extent by which US telecommunications firm betas should be adjusted upwards, due to industry market capitalisation differences, before being used as comparators in the New Zealand market. Our estimate, using the Lally and Swidler methodology, is that the US RBOC betas (upon which the Commission seeks to rely) should be multiplied by a factor of 1.8 to 2.0 times before they can be considered valid comparators in the New Zealand market. We estimate that using the US RBOC asset beta data range of 0.36 to 0.41 previously cited by the Commission (paragraph 70 of the Commission's 19 May 2003 TSO WACC Paper) and applying the Lally and Swidler methodology results in a US RBOC asset beta range relevant to the New Zealand market of 0.71 to 0.74;
- d) a review of the approach taken by other regulators and, in particular, commentary on why the analysis undertaken by the ACCC on the asset beta for wireline/PSTN activities (upon which the Commission has sought to rely³) is seriously flawed; and

³ Refer paragraph 141 of the Draft '02-'03 TSO Determination.

- e) an objectively based reconciliation of the asset betas of US rate of return regulated electric utilities (upon which the Commission has also sought to rely⁴) with the asset beta for wireline/PSTN activities, demonstrating why the Commission's attempt to anchor off its wireline/PSTN beta estimate off the former is inappropriate.

PwC's Estimate

5.4. In conclusion, it remains our view that the asset beta appropriate for the TSO WACC, inclusive of any so called "insurance effect", is in the order of 0.80 (mid-point), within the range 0.75 to 0.85.

⁴ Refer paragraph 236 of the '01-'02 TSO Determination.

6. Tax Adjusted Market Risk Premium

Discussion

6.1. PricewaterhouseCoopers estimates that the Tax Adjusted Market Risk Premium (“TAMRP”) had a value of 7.5% as at June 2003. This is still our current TAMRP estimate and this figure has been used by PricewaterhouseCoopers in its corporate finance work since June 2002⁵. We note that our TAMRP estimate is consistent with using our investor tax rate input of 28% (i.e. use of a higher investor tax rate, such as the Commission’s 33% estimate, would require an upward adjustment to our TAMRP estimate).

6.2. We are aware that in New Zealand other corporate finance practitioners have recently been using TAMRP estimates in the range 7% to 8%. In our opinion this information should carry considerable weight, not because these practitioners necessarily have superior forecasting skills, but because they are routinely confronted with having to advise on real transactions. In other words their TAMRP estimates must align with market expectations or else their valuation advice would be noticeably out of line with capital markets transaction pricing.

6.3. We note that if the Commission is to base its TSO WACC calculation off a short term risk free rate (which we do not agree with as being a fair and reasonable approach), then an upward adjustment is required to any TAMRP estimate based off a long term risk free rate.

PwC’s Estimate

6.4. We consider that a TAMRP estimate of 7.5% is appropriate for use in the PwC simplified specification of the Brennan-Lally CAPM as at June 2003.

⁵ Refer PricewaterhouseCoopers, “New Zealand Equity Market Risk Premium”, September 2002.

7. Summary and Conclusion

Summary

7.1. Set out below is a summary of inputs to our TSO WACC estimate as at June 2003:

			Section
R_f	risk free rate	5.4%	2
m	debt premium	1.6%	3
$R_d = R_f + m$			
R_d	cost of debt, before taxes	7.0%	
D	market value of debt	30%	3
E	market value of equity	70%	3
V	market value of the firm, $D + E$	100%	
β_a	asset beta	0.75 – 0.85	5
$\beta_e = \beta_a \left(1 + \frac{D}{E} \right)$			
β_e	equity beta	1.07 – 1.21	
T_I	investors' effective tax rate	28%	4
$TAMRP$	tax adjusted market risk premium	7.5%	6
$R_e = R_f(1 - T_I) + \beta_e TAMRP$			
R_e		11.9% - 13.0%	
T_c	corporate tax rate	33%	

$$WACC = R_d(1 - T_c) \frac{D}{V} + R_e \frac{E}{V}$$

7.2. On the basis of the above inputs, we calculate that a reasonable post-corporate tax nominal WACC for the TSO net cost determination for the period 1 July 2003 to 30 June 2004 falls in a range of 9.8% to 10.5%, with a mid-point estimate of 10.1%.

Adjustments to the WACC

7.3. The WACC we have estimated in this report is applicable to determining a required rate of return on assets employed to provide the TSO services, before allowing for the documented shortcomings of the Capital Asset Pricing Model ("CAPM") or for asymmetric risks.

7.4. As practitioners we are aware of the shortcomings of the CAPM, but continue to use it as a tool where it is applied to “typical” companies. However, Fama and French (2003)⁶ document that the CAPM performs particularly badly as a tool for predicting expected returns for companies with low betas or with high book-to-market ratios (i.e. low price-to-net-asset ratios). The Commission’s use of a very low asset beta (at least to date in the case of the TSO WACC), together with the application of cost based “pricing” (that implicitly forces the price-to-net-asset ratio to be 1.0) means that its reliance on the CAPM as the basis for estimating the WACC for the TSO is highly questionable.

7.5. Asymmetric risks may be significant and we note that an upward adjustment will need to be made to our WACC estimate for these. The detailed reasoning for and estimation of such an adjustment is beyond the scope of our engagement.

7.6. Furthermore, it would be prudent to allow some margin over and above our mid-point WACC estimate in order to mitigate the investment incentive risks to the TSO service provider that are posed by the regulatory WACC being set too low⁷.

Conclusion

7.7. After considering the above, we believe an appropriate WACC to be applied in determining the TSO net cost for the period 1 July 2003 to 30 June 2004 lies in the range 9.8% to 10.5%. For the purpose of a point estimate, we recommend the mid-point of our range, being 10.1%. This point estimate reflects an asset beta of 0.80 and is based on the other inputs discussed above, but is before any allowance for:

- Asymmetric risks;
- The documented failings of the CAPM, particularly when applied with/to extreme situations; and
- The risks arising from setting the regulatory WACC too low.

⁶ Fama, Eugene F. and French, Kenneth R., "The Capital Asset Pricing Model: Theory and Evidence" (August 2003). CRSP Working Paper No. 550; Tuck Business School Working Paper No. 03-26. <http://ssrn.com/abstract=440920>. Analysis of this paper suggests that the TSO WACC would need to be adjusted upwards by an increment of 2.0% or more as a consequence of the CAPM’s shortcomings.

⁷ This risk is acknowledged by the Commission in paragraph 150 of the Draft '02-'03 TSO Determination.