
COMMERCE COMMISSION

**Input Methodologies
(Electricity Distribution Services)
Draft Reasons Paper
June 2010**

Submission

Cost of Capital

Report to Major Electricity Users' Group

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1. Introduction

- 1.1 The Major Electricity Users' Group ("MEUG") has asked Ireland, Wallace & Associates Limited ("IWA") to review the Input Methodologies (Electricity Distribution Services) Draft Reasons Paper ("Draft Reasons Paper") specifically related to cost of capital issues. These relate to the Commerce Commission's ("Commission") draft decisions on the cost of capital model, leverage and debt premium.
- 1.2 IWA had advised MEUG for its prior submissions to the Commission which are contextual to this submission.¹
- 1.3 This submission sets out reasons for disagreement with draft decisions and proposes amendments that would materially better meet the Part 4 Purpose Statement and purposes of Input Methodologies. Suggested Amendments to the Draft Input Methodology (Electricity Distribution Services Input Methodology Determination 2010 ("Determination")) are identified.

2. Disputed Draft Decision

- 2.0 The Draft proposes to adopt the simplified Brennan-Lally Capital Assets Pricing Model (B-L CAPM) in conjunction with a notional leverage assumption of a standardised 40% in the cost of capital formulation.^{2 3}
- 2.1 The Commission erred in choosing its so-called "status quo" cost of capital model because the derived cost of capital materially increases with leverage. The appropriate cost of capital model is the unlevered cost of capital which is indifferent to leverage (cost of capital is a flat line).
- 2.2 The Draft formulation has secured a flat line model but has elevated the line, without empirical validation, by reference to a point on a rising line which the Commission acknowledges to have an unsubstantiated and questionable theoretical base.
- 2.3 The practical consequences are material and adverse for the consumers who must be protected by the regulatory price path setting mechanism. There is no evidence that the direction or degree of bias or error is necessary to serve any regulatory purpose.

¹ <http://www.comcom.govt.nz/assets/Imported-from-old-site/industryregulation/Part4/ContentFiles/Documents/comcom-inputmethodologiesdiscussionpapermeugsubmission-jul2009.pdf>
<http://www.comcom.govt.nz/assets/Pan-Industry/Cost-of-Capital/Cross-Submission-on-Revised-Draft-Guidelines/MEUG-by-Ireland-Wallace-cros-subs-WACOMMISSION-8898781.pdf>
<http://www.comcom.govt.nz/assets/Pan-Industry/Cost-of-Capital/Submissions-on-CoC-Workshop/MEUG-Ireland-Wallace-Associates-Post-Workshop-Submission-on-Cost-of-Capital.pdf>

² Draft Reasons Paper, 6.5.1 and 6.5.2

³ Draft Reasons Paper, 6.3.3 "Cost of capital" refers to post-tax cost of capital.

3. Discussion

“The Anomaly”

- 3.1 Using B-L CAPM the derived cost of capital increases as leverage increases. The Commission recognises that this outcome of the draft cost of capital methodology is unsatisfactory.⁴

“The Commission considers that the relationship between cost of capital and leverage when applying the simplified Brennan-Lally CAPM is a **significant matter** as the effect of leverage on the cost of capital estimate **can be substantial**. Therefore, the Commission considers that **accepting the anomaly is not an appropriate solution**.”⁵
[emphasis is ours]

- 3.2 That outcome of B-L CAPM/cost of capital is variously described by the Commission as “counter-intuitive” (9 times), “anomaly” (8 times) and “shortcomings” (twice).⁶
- 3.3 Despite the Commission stating that accepting the anomaly is not a solution the Draft decision does not overtly modify the formula or counter the anomaly. Instead it fixes a key variable (a notional leverage at 40%). That stratagem has a pragmatic intent but it undermines the purpose of the cost of capital model. This issue is discussed later.
- 3.4 Dr Lally’s advice to the Commission (on responding to recognition of the anomaly) proposed two options: setting cost of capital as either the status quo or the unlevered cost of capital (which is also termed by the Commission as “zero leverage”). Instead of using the term ‘status quo’ we think it is more instructive to term it the “counter-intuitive leverage” approach and the ‘zero leverage’ approach is better described as the “independent of leverage” approach. Dr Lally’s advice to the Commission was:

When using the simplified Brennan-Lally CAPM in conjunction with the simplified beta gearing model, WACC ... rises with leverage and therefore implies that leverage is undesirable. However, the use of debt by companies is typical. This implies that companies are acting irrationally or that there is some deficiency in the models used to estimate WACC. This paper shows that 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 simple alternative in the form of setting WACC equal to the unlevered cost of capital (which would understate WACC). Choosing between these two options is a judgment matter for the Commission.⁷

- 3.5 The Commission did not choose either of Dr Lally’s solutions. Under the Draft model the Commission has increased the derived cost of capital to what the flawed model would produce but fixed it at a leverage level for a notional 40% leverage. It would be flat under the “independent of leverage” approach. Under the Draft derived cost of capital it is also a flat line for all levels of

⁴ Draft Reasons Paper, 6.3.42, 6.3.43 and Draft Reasons Paper, 6.3.44 “... New Zealand firms ... Boards and managements do not believe that leverage (at least up to a certain point) increases the cost of capital.”

⁵ Draft Reasons Paper, 6.5.22

⁶ The Concise Oxford English Dictionary: counter-intuitive is defined as “contrary to intuition or to common sense expectation”; anomaly as “something that deviates from what is standard, normal, or expected and, shortcoming as “a failure to meet a certain standard; a fault or defect”.

⁷ Draft Reasons Paper, 6.5.21 footnote 408. Lally, Report on WACC and Leverage, supra n 405, p. 7

leverage. This is supportable. It reflects the fundamental assumption of tax neutrality between returns on equity and debt as they are treated equally at the investor level.⁸ But the level of the flat line in the Draft model has been set by the application of a flawed rising line.

- 3.6 The Commission proposes adopting a notional leverage for cost of capital and independently a debt premium based on a credit rating standard.

“As the notional leverage will apply across all industries regulated under Part 4 and a higher level of leverage leads to a higher cost of capital, the Commission considers that in line with erring on the side of caution, it is appropriate to adopt the upper bound estimate of the range, i.e. 40%.”⁹

The Commission range was 25% to 40%.¹⁰ “...erring on the side of caution ...” means erring on the side of suppliers. The Commission’s reasoning does not show that the risks of setting the rate too low exceed the risks of setting it too high. That preference is not explored with any systematic evaluation.

“Mitigation”

- 3.7 In its justification:

“The Commission recognises the significance of this aspect of the cost of capital when applying the simplified Brennan-Lally CAPM, and has sought to mitigate the effects thereof, at least to some extent, by adopting a level of leverage that is invariant across services and over time.”¹¹

- 3.8 Instead of either of Dr Lally’s solutions the Commission has opted for what it presumably sees as the “middle ground”. That does limit the impact of the rising line, especially at times of high debt premiums. But as a “quick and dirty” solution it caps the rise by freezing the variable that is the main focus of the formula. It does not directly relate to the debt premium. That is related to a benchmark credit rating.

- 3.9 Actual leverage above the notional leverage of 40% gets implicit compensation at the derived cost of capital rate (inclusive of the debt premium related to notional leverage). That higher cost of capital, under the counter-intuitive leverage approach, relative to the independent of leverage cost of capital formulation, is maintained whatever the leverage. In effect the cost of capital is marked up from 5.98% to 6.5% and flat lined at 6.5% for both higher and lower actual leverage.¹² Derived cost of capital is therefore indifferent to leverage. The Commission approach adopts the counter-intuitive cost of capital derived for a 40% leveraged firm and applies it in an “independent of leverage” cost of capital model thereafter.

- 3.10 This is illustrated in **Chart 1**. Line “A” is the counter-intuitive cost of capital. Line “C” is the independent of leverage or flat line cost of capital. Line “B” is

⁸ Draft Reasons Paper 6.3.33 and 6.3.34

⁹ Draft Reasons Paper, 6.3.45

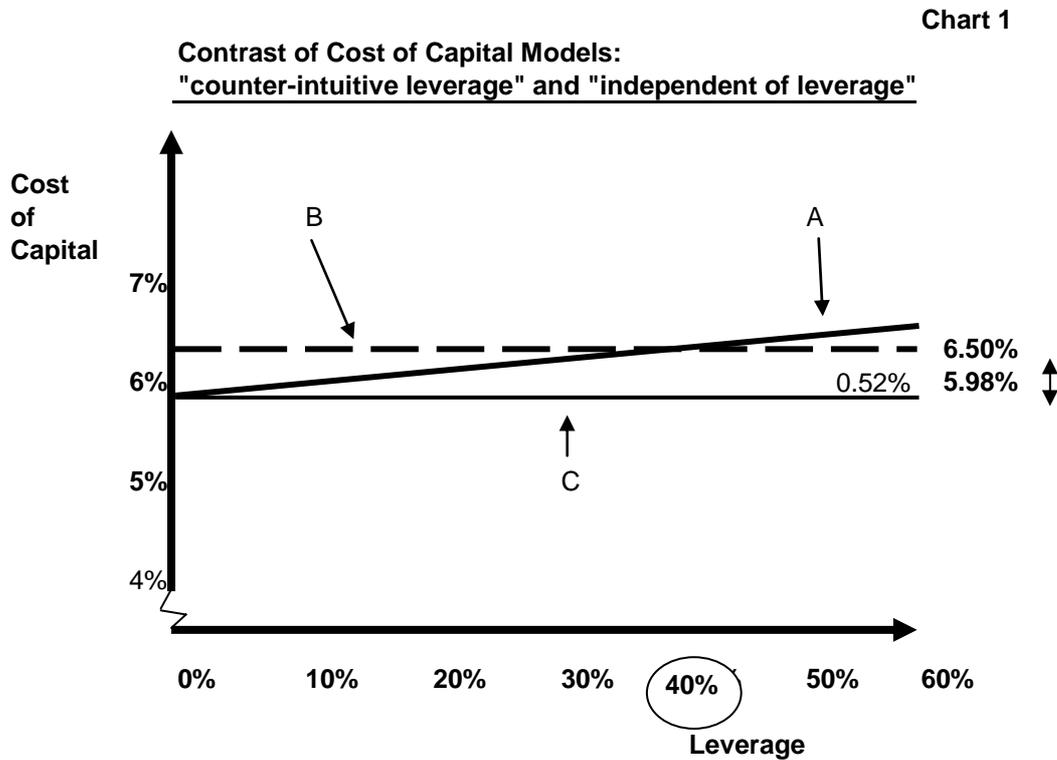
¹⁰ Draft Reasons Paper, 6.5.60

¹¹ Draft Reasons Paper, 6.3.45

¹² Draft Reasons Paper, Table 6.1 p226. The Commission debt margin excludes 0.3% increment for debt issue costs and the margin is fixed irrespective of leverage. Including the total debt costs cost of capital increases to 6.5%.

the effective cost of capital derived by the Commission. It is set at the upper bound referred to by Dr Lally for 40% leverage.¹³ Dr Lally believes that true cost of capital lies on (or presumably between) lines “A” and “C”.

- 3.11 The Commission selected the point on line “A” at 40% leverage. As a result line “B” is a flat line (the 6.5% derived cost of capital is independent of leverage) parallel with line “C”.



“Intuition”

- 3.12 The Commission should follow its own intuition and statements and adopt the cost of capital outcome of the B-L CAPM/cost of capital formulation where cost of capital is indifferent to the way the Electricity Distribution Services sector finances its business reflecting the assumption of tax neutrality. If “adjustments” are deemed necessary by the Commission then adjustments to this base line cost of capital (cost of capital indifference to leverage) must be generally supported and justified by empirical evidence and tested logic.
- 3.13 The default cost of capital (line “C” in Chart 1) should be adopted otherwise. The Commission has instead adopted the formulaic result of the B-L CAPM/cost of capital formula despite its acknowledged “counter-intuitive/anomaly/shortcoming(s)” (line “A” in Chart 1) as its base line.
- 3.14 In choosing the counter-intuitive leveraged model the Commission has claimed that the step up in the derived cost of capital resulting from 40% leverage somehow compensates for suspected inadequacies in the model. Arguments that line C is too low (that the B-L CAPM formula systematically

¹³ See para. 3.4.

understates derived cost of capital) include less than full imputation credit utilisation assumption,¹⁴ low asset beta effects,¹⁵ liquidity costs, equity issue costs and other factors. None of these are quantified. The Commission states:

“The Commission has not been able to identify any objective basis on which to correct for the underestimation.”¹⁶

3.15 The Commission recognises other qualitative factors which would be expected to lower cost of capital or benefit capital providers as leverage increases. They are not incorporated into the chosen cost of capital model.¹⁷ The reasons do not indicate whether the Commission has tried a net calculation (considering unquantified positive that factors to offset unquantified negative factors). It is not explained why the outcome is to leave the cost of capital to line “B” when the point of intersection of A and C is least cost.

3.16 The cost of capital mark up in the Commission example is 0.52% points. This result has been derived directly from an unjustified cost of capital formula that it says is counter-intuitive.

3.17 The Commission has not provided a convincing case for the counter-intuitive leveraged cost of capital. The empirical unreliability of their conclusion is obvious from its own statement that:

“In practice, businesses would not set out to include debt in their capital structure unless they believed that doing so would lead to the cost of capital remaining unchanged or decreasing, not increasing.”¹⁸

3.18 In other words it is highly likely that leverage in New Zealand results in a real flat or downward sloping line like virtually every other country I am aware of.

3.19 The Commission has not justified the wedge between counter-intuitive leveraged and independent of leverage cost of capital models (Lines A-C in Chart 1) at 40% leverage (0.52% in this case) by empirical evidence or tested logic.

The crude “work around”

3.20 The Commission’s justifications illustrate the danger of purporting to apply a flawed model ‘fixed’ with a “quick and dirty” patch. The Commission claims a collateral benefit in its “mitigation solution”. It suggests that its mitigation mechanism creates a disincentive to over-gearing a firm.

3.21 Setting aside the question whether consumers are systematically adversely affected by uncompensated capital expenditure (they may benefit) that Commission “mitigation solution” does not provide an incentive to restrain leverage given the cost of capital markup of +0.52% in this case. Consumers are not partially protected as the Commission proclaims. The notional 40% flat

¹⁴ The Commission has not defined “partial”.

¹⁵ Asset beta issues are a parameter not a model issue.

¹⁶ Draft Reasons Paper, 6.5.31

¹⁷ Draft Reasons Paper, 6.5.10

¹⁸ Draft Reasons Paper, 6.5.11

line would only discourage over-gearing in the way the Commission suggests, if in fact the costs of borrowing increased the firm's cost of capital above line "B" such a consequence assumes, and is explicable only if in fact a rising line (Line A) better represents the true cost of capital than a flat line. But the Commission has repeatedly acknowledged the anomaly of a rising line, and has purported not to accept its validity. Only one of those priorities can be right, if either.

- 3.22 The recourse to this secondary justification of the chosen mitigation mechanism illustrates the dangers of a crude 'work around' to compensate for a design flaw in the model.
- 3.23 Even if the Commission was right to be wary about creating incentives for over-gearing and it was right in assuming that firms would be penalised for moving up the leverage curve past 40% the mitigation mechanism does not necessarily constrain. Part 4 53Q(1) provides for supplier options to change from a default price path to a customised price path. This mechanism enables potential "de-stressing" of a supplier under financial distress potentially at the expense of customers. Shareholders, directors and management and debt providers given normal governance arrangements have joint interests in avoiding financial stress anyway.

"Precedent"

- 3.24 The Commission is cementing itself into an indefensible construct with an ad hoc repair to the proposed counter-intuitive leverage cost of capital methodology. A cost of capital model that materially rises with leverage is internationally novel as far as I can determine.¹⁹ Generally a cost of capital is assumed to be level or downward sloping for prudent leverage. The world view reflects a workably competitive market. Valuations do not reduce as firms borrow prudently.
- 3.25 The Commission has a responsible role in setting rigorous and robustly derived standards for the New Zealand capital markets. The process of regulating some \$12 billion of utility assets is highly influential. With the proposed draft status quo cost of capital model the Commission is sanctioning the notion that "less debt is better as value increases" or conversely "value decreases with debt". This is not the outcome expected in the New Zealand workably competitive capital markets.
- 3.26 The default cost of capital option should be the cost of capital based on an independent of leverage cost of capital approach.
- 3.27 If it is thought essential to set a level for the flat line B higher than the lowest point of the line derived from the counter-intuitive leverage model, it should be the result of a disciplined process. If that is not possible, because the evidence is not available, or adequate theory has not been developed, then the allowance to "err on the side of caution" should be clearly identified as such. It

¹⁹ See footnote 428. Under the Officer model in the presence of high debt premiums there may be a slight increase in cost of capital.

is better to signal that the adjustment is arbitrary, and a work in progress, than to invite the market to develop expertise and certainty in applying a flawed model by exploiting a non-sequitur. That is important to avoid people misdirecting themselves with a faulty model. It is important because the Determination should focus future efforts on finding answers to the right questions.

- 3.28 Cost of capital methodology cannot be based long term on an anomaly. It determines a very large economic cost. If adjustment is required for an unknown that is obscured empirically, the right factor must be refined or revised as logical or empirical evidence is found.
- 3.29 There is a risk that instead participants will be diverted into researching and debating and lobbying over the level of leverage that best matches industry or particular firm leverage norms. If an adjustment is deemed appropriate then variations should be made based on sound empirical evidence or logic.

“Cost of Capital Independent of Leverage”

3.30 The application of the counter-intuitive leverage model does not reflect its tax assumptions as cost of capital rises with leverage. The model only reflects its assumptions at when there is no debt (see Chart 1: lines “A” and “C” intersect at zero leverage). Cost of capital is simply the unlevered cost of equity.

3.31 The Commission confirms this view:

“Setting a zero leverage

An advantage of setting leverage equal to zero and using the simplified Brennan-Lally CAPM to estimate the expected cost of equity capital (hence also the cost of capital) would be that the allowable regulatory rate of return would be invariant to the leverage choice of a supplier. This is consistent with capital structure theory (see paragraphs 6.5.8 to 6.5.10).”²⁰

“In submissions on the RDG and IM Discussion Paper, Ireland, Wallace (IWA) and Associates (for MEUG) noted that in the simplified Brennan-Lally model the cost of capital is sensitive to leverage and is lowest when leverage is equal to zero. On this basis, they argue that on efficiency grounds (i.e. the lowest cost of capital constitutes an appropriate benchmark), the best estimate of the efficient cost of capital structure for regulated firms, if the Brennan-Lally model is being used, is to assume zero leverage.”²¹

3.32 The Commission rightly observes that firms do have debt in their capital structure which would be expected in workably competitive markets. The Commission seems to dismiss zero leverage because it is not commonly observed, and states that there are other factors that the draft cost of capital methodology does not reflect. Then the Commission proceeds to apply mechanically a flawed B-L CAPM/cost of capital formulation with notional leverage of 40% anyway.

²⁰ Draft Reasons Paper, 6.5.27

²¹ Draft Reasons Paper, 6.5.28

- 3.33 The discussion indicates why the Commission thinks that the true cost of capital rises with leverage but gives no explanation why it should go to their chosen level equivalent to nominal leverage of 40% derived from the flawed model.
- 3.34 The Commission concludes that:
- “A zero level of leverage is the optimal leverage position under the simplified Brennan-Lally model. However, in practice suppliers’ actual capital structure includes a portion of debt and therefore, in the interests of maintaining a relationship with suppliers’ actual capital structure, it is preferable that the notional leverage should be greater than zero. Further, if zero leverage were applied and it was considered to be an underestimate of the cost of capital, then a margin would have to be added. There is presently no theoretical framework or precedent for calculating such a margin. Also, a zero leverage assumption would reduce the cost of capital to just the cost of equity capital.”²²
- 3.35 There are several unexplained assumptions and potential non-sequiturs in this reasoning. It appears the Draft does assume that zero leverage would underestimate the cost of capital. Why? Secondly, the cost of equity capital is in the Commission’s mind lower for zero leverage than any alternative. Why? If true, as the Commission points out elsewhere, why would a firm borrow? The reasoning is incomplete and inconsistent with the Commission’s reasoning elsewhere. But it is consistent with support for the proposed counter-intuitive leverage model despite the acknowledgment of its flaws.
- 3.36 The intuition elsewhere supported by the Commission is that the derived cost of capital should be indifferent to leverage reflecting its tax neutrality assumptions.²³ Hence, whether the notional leverage is defined at zero, 1% or 40% the cost of capital would not change (just the weighting between the cost of debt and the cost of equity change).
- 3.37 The Commission also argues that a zero leverage assumption is not appropriate because:
- “... there is no regulatory precedent by overseas regulators or the Commission, for setting leverage equal to zero.”²⁴
- 3.38 We agree there is no precedent for zero leverage. That is hardly surprising. Other regulators assume slopes go down if they are not level. In those circumstances their concern would be that a ‘zero leverage’ model could set WACC too high. We may have contributed to the Commission being misled, by our earlier focus on zero leverage. It was our shorthand way of emphasizing that regulators should assume least cost financing in an efficient market. If B-L CAPM/cost of capital was being used, the least cost point in that model is at leverage equals zero. If the model worked conventionally so that the line was flat, then leverage choice is immaterial.
- 3.39 Regulatory precedent will not be found for zero leverage because the cost of capital formulation generally results in a declining (or at most flat) cost of

²² Draft Reasons Paper, 6.5.38

²³ See para. 3.17

²⁴ Draft Reasons Paper, 6.5.32

capital curve. If the cost of capital is a flat line then leverage can be any number for a prudent firm including zero. “Zero leverage” is a convenient expression because the cost of capital can be estimated without reference to its financing policies.

- 3.40 The adoption of the draft cost of capital methodology creates a new precedent in the regulatory arena. Derived cost of capital rises with leverage which is counter-intuitive to its tax neutrality assumptions.

“Conflict with Vanilla WACC”

- 3.41 The Commission suggests that zero leverage would somehow compromise the Commission use of a vanilla WACC or cost of capital. How can that be when there is no issue with a 40% notional leverage and presumably with 1% or any other leverage but not for 0%?

“... when a vanilla WACC is used it is worth noting that a zero leverage assumption would, if used consistently in calculating tax costs, have an additional implication. In calculating tax costs, the leverage assumption ensures that suppliers of regulatory services recognise these benefits through the tax deduction for interest. The assumption of zero leverage would result in no tax deduction for interest and therefore a higher regulatory tax allowance. Thus, if an estimate of tax costs is used to set or monitor suppliers’ prices, a supplier’s expected revenues would increase as a result of a zero leverage assumption used to calculate tax costs (all else being equal).²⁵”

“Other Issues”

- 3.42 The Commission has estimated asset betas and leverage generally based on market values. An inconsistency arises when EDBs leverage is considered. Leverage that is derived from considering market values is to be applied to the EDBs asset base which is largely derived based on ODV valuations.

- 3.43 Based on Vector’s sale price of its Wellington Network the transaction price was equivalent to 1.97 times ODV.²⁶ The current Horizon Energy Distribution transaction involving Marlborough Lines implied ODV multiple is about 1.4 to 1.5 times.

- 3.44 To be consistent a 40% leverage based on ODV really is 20% based on an ODV multiple of 2 or 30% based on an ODV multiple of 1.5.

The inconsistency illustrated highlights why the Commission should avoid financing issues by adopting the independent of leverage cost of capital approach.

- 3.45 The Commission cites the New Zealand Treasury endorsement of the use of the simplified B-L CAPM for estimating cost of equity for Crown Entities and State-Owned Enterprises.²⁷ It does not go on to note that in many uses it is

²⁵ Draft Reasons Paper, 6.5.33

²⁶ “Chairman and CEO’s addresses to special shareholder meeting to vote on the sale of Wellington electricity network”, 16 June 2008, page 5.

²⁷ Draft Reasons Paper, 6.3.51

with no leverage. The Cost of Capital Handbook provides guidance on model choice of cost of capital model includes for:

- Value-based reporting: simplified B-L CAPM with no leverage.
- Capital Budgeting: simplified B-L CAPM with no leverage.
- Output prices in non-contestable markets but with no preferred approach:
either, simplified B-L CAPM with no leverage, or simplified B-L CAPM with leverage, or full B-L CAPM with leverage.
- Valuation: as for Output pricing.

The simplified B-L CAPM independent of leverage cost of capital formulation is supported by The Treasury.

3.46 The New Zealand Treasury has also adopted the simplified B-L CAPM independent of leverage for estimating the Crown’s opportunity cost of capital for Cost Benefit Analysis”.²⁸

4.0 Proposed Changes to the Draft Decision

- 4.1 Given that the Commission is unable to confidently correct errors it identifies with the counter-intuitive leverage model the base case cost of capital should simply be the unlevered cost of equity (Chart 1: line “C”). It is generally accepted by practitioners in New Zealand that cost of capital for prudent leverage is the same irrespective of how a firm is financed by debt or equity. If the cost of capital warrants adjustment by the Commission, it should be based on evidence and precedent. The default cost of capital should be the independent of leverage cost of capital approach which assume a flat cost of capital for prudent leverage rather than the Commission’s counter-intuitive leverage model.
- 4.2 For its purposes the Commission should disregard the regulated sector financing policies as they are irrelevant for price/quality regulation. How the firms estimate the cost of equity and cost of debt is of no concern of the Commission.
- 4.3 The Commission should remove the leverage constraint (a notional leverage of 40%) that purports to mitigate potential financial distress risk as it is not necessary or effective.
- 4.4 Input parameters and model application should be based on unbiased estimates including notional leverage. The Commission can reflect its preferences in estimating a plausible cost of capital range within which it can choose a point estimate.

²⁸ The Treasury: “Public Sector Discount Rates for Cost Benefit Analysis”, July 2008

5.0 Amendments to the Determination

5.1 Chapters on Cost of capital are in SUBPART 5 (pages 31-35), SUBPART 1 (pages 45-48) and SECTION 5 (pages 73-79) of the Determination. The proposed amendments apply to all subparts and section.

“Methodology for estimating the cost of capital”

[Paragraphs: 2.5.2, 4.1.2 and 5.3.31]

(3) a new term, “ra” is the cost of capital and is estimated by

$$r_f(1-T) + B_a * TAMRP$$

(substitutes for, “re” is the cost of equity and is estimated by $r_f(1-T) + B_e * TAMRP$)

“Fixed WACC parameters”

[Paragraphs: 2.5.3, 4.1.3 and 5.3.32]

(1) Leverage is 0% (previously 40%)

(4) The asset beta is 0.34 (“Ba”)

(substitutes for, “The equity beta is 0.57”)

(5) The debt issuance cost percentage is 0% (previously 0.3%)