
COMMERCE COMMISSION

**Input Methodologies Discussion Paper
Submission**

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 Discussion Paper" (IM) consultation documentation¹ specifically related to cost of capital issues. These relate to the Commission's preliminary views on the cost of capital model (WACC), leverage (L), debt premium (p) and normal profits.

1.2 IWA had advised MEUG for its submissions to the Commission in 2005² and 2007³. The Commission responded to those submissions.⁴

1.3 This submission revisits the previous issues raised by MEUG and IWA. It is now appropriate for IWA to reassess the Commerce Commission's responses to MEUG's previous submissions.

2. Approach

2.1 The Commission has requested discussion of alternative views and reasons for believing that they better meet the purpose of Part 4 of the Commerce Act and therefore, assist it in moving to reduce uncertainty for suppliers and customers.

2.2 References to the "Revised Draft Guidelines on Cost of Capital" (RDG) and "Experts' Recommendations on the Appropriate Cost of Capital Methodology" will be made by paragraph numbers prefixed by "RDG" and "Experts" respectively.

2.3 The Gas Authorisation Decision⁵ related to WACC is used to illustrate arguments made and is summarised in Appendix Table B.

2.4 To avoid confusion the post tax WACC has been adopted for this report. It is noted that the vanilla WACC, preferred by the Commission, properly applied produces the same result.

¹ Input Methodologies Discussion Paper (IM), Revised Draft Guidelines on Cost of Capital (RDG); and, Experts' Recommendations on the Appropriate Cost of Capital Methodology (Experts).

² IWA letter to MEUG related to the Commerce Commission's Draft Cost of Capital Guidelines, attached to MEUG submission, 2nd December 2005, <http://www.comcom.govt.nz/IndustryRegulation/Gas/CommissionReportsandDocuments/ContentFiles/Documents/MEUG%20WA%20Report.pdf>

³ MEUG submission to the Commission on draft decisions paper, Authorisation for the Control of Supply of Natural Gas Distribution Services by Powerco Ltd and Vector Ltd <http://www.comcom.govt.nz/IndustryRegulation/Gas/CommissionReportsandDocuments/ContentFiles/Documents/MEUG%20submission.pdf>

⁴ The Weighted Average Cost of Capital for Gas Pipeline Businesses, a report prepared by Dr M Lally for the Commerce Commission, 28 October 2008, p 139 and footnote 116.

⁵ Authorisation for the Control of Supply of Natural Gas Distribution Services by Powerco Ltd and Vector Ltd, Commerce Commission, 30 October 2008.

3. Argument

3.1 The Commission proposes to adopt a non-zero L ratio as a parameter in its WACC formulation. As a result WACC is too high and normal profit is overstated. Potential consumer prices are likely to be materially overstated if the Commission adopts its preferred WACC formulation and application.

3.2 The Commission should ignore capital structure assumptions; L and p, as they are not required for the calculation of WACC.

3.3 Recommended changes are proposed which would be more consistent with the purpose statement of Part 4 of the Commerce Act 1986, as contained in Section 52A and the Commission's principles of sound regulatory practice for cost of capital. The proposed changes would simplify the input methodologies and thereby provide greater certainty to suppliers and customers.

4. Issues and Discussion

4.1 WACC increases as a function of increasing L (and related p) under the Commission's preliminary view for estimating WACC.

4.2 To illustrate how WACC relates to L and p the formula from the Gas Authorisation Decision⁶ is simplified to:

$$WACC = ku + p(1 - .3)L$$

where, *ku* is the unlevered cost of equity, *p* the debt premium, .3 the tax rate adopted for a segment of the decision and *L* the leverage ratio, i.e. debt/(debt+equity).

Given *L* = 40% and *p* = 2.7% the WACC mid-point is 8.582%.

Other things equal, if *L* is changed from 40% to 0% then WACC is just cost of equity, *ku*, i.e. 7.826%.

By changing *L* the WACC decreases by 0.756% points. Relative to WACC of 7.826% and assuming *L* = 0% the Commission's WACC assuming *L* = 40% is marked up 1.097 times, i.e. 8.582%/7.826%

4.3 Reflecting different times in the example of Unison⁷ the markup of WACC was 1.046 times.

⁶ The Weighted Average Cost of Capital for Gas Pipeline Businesses, a report prepared by Dr M Lally for the Commerce Commission, 28 October 2008, p 83.

⁷ The MEUG submission example of Unison (2005) demonstrated that the Commission's WACC of 7.34% (*L* 40% and *p* 1.2%) compared to WACC of 7.02% (*L* 0%). The difference is 0.32% points. This is equivalent to 1.046 times WACC of 7.02%.

4.4 WACC is at its lowest when $L = 0\%$. WACC provides the supplier/owner with the appropriate risk adjusted return at the least opportunity cost.

4.5 The Commission states:

... the cost of capital is the minimum rate of return necessary to attract capital to an investment .[RDG 60] [IM 8.2]

4.6 The assumptions of the Commission preferred WACC model assume tax neutrality. There are no significant tax advantages which favour equity or debt financing of a business.

4.7 The intuition is that WACC should be indifferent to L when in fact the application of the Commission's preferred WACC for different levels of L demonstrates that it is not. Based on the Gas Authorisation Decision WACC is too high by 9.660%.

4.8 There are apparent conflicts in statements made by the Commission and some of the experts relating to WACC models. Dr Lally has acknowledged the upward slope of the Commission's preferred WACC model. The Commission may not have realised the material impact of L on WACC in the current market as evidenced by the Gas Authorisation Decision.

4.9 The Commission states that firm value is only sensitive to L at extreme levels. Under the Commission preferred WACC, the Commission asserts that there is no net tax advantage from borrowing for investment grade L levels. However, the Commission's proposed WACC model does not support these views. Firm value declines as L increases.

4.10 The Commission states:

Indeed, in Section 4.4 of the Revised Draft Guidelines, the Commission notes that it is often argued that the value of the firm is only sensitive to leverage at extreme levels. As such, the Commission considers that an optimal leverage approach will not be possible, or relevant, in practice. [IM 8.35]

Section 4.4

In practice, it is often argued that the value of the firm is only sensitive to leverage at extreme levels. Indeed the impact on the cost of capital is likely to be even more muted with the simplified Brennan-Lally CAPM, where marginal tax rates for corporations and investors are assumed equal, because any net tax advantage from borrowing is eliminated (Franks et al, 2008). Therefore, provided firms' actual gearing levels lie within reasonable bounds (i.e. consistent with a reasonable investment grade), any errors arising from applying a uniform leverage ratio to all firms within an industry will be slight. [RDG 199.]

4.11 The Commission also suggests that WACC is largely unaffected by changes in L and p in this statement:

This is because a higher spread might well simply reflect a higher leverage, in which case the higher spread would largely be offset by the effect of the higher leverage in reducing the weighting of the cost of equity in the WACC calculation. [IM 8.65]

4.12 Professors Myers and Franks:

Professor Myers and Franks appear to be referring to WACC based on the classical CAPM when Professor Myers:

... argues that, in practice, the relationship between WACC and leverage appears to be 'flat' except at extremely high or low debt ratios, and the Commission should not intervene except at these extremes. [Experts 116]

Professor Franks recommends that, since the tax benefit of debt is not the sole determinant of capital structure, and because there are reasons to believe that not all the tax benefits of debt accrue to shareholders (...), the Commission should be cautious about clawing back (and distributing to consumers) all the tax advantages of leverage. [Experts 118]

4.13 Professor Myers recognises there are no net tax advantages from borrowing adopting Brennan-Lally CAPM:

Furthermore, if the Commission adopts the simplified Brennan-Lally CAPM, and marginal tax rates for corporations and investors are the same, there is no net tax advantage from borrowing. If the classical CAPM is adopted, tax advantages from borrowing may exist, but it should be recognised that taxes are only one consideration among many when firms select their capital structure. Most firms do not fine-tune their debt ratios to minimise tax (...). [Experts 117]

4.14 Which CAPM model is referred to? Consider: ... *the Commission does not claw back all the tax benefits of leverage;*

Recommendation 70 The Panel recommends that, in general, the Commission not provide any explicit adjustment for financial distress costs, provided: (a) regulated firms operate at reasonable gearing levels; (b) the Commission does not claw back all the tax benefits of leverage; ... [Experts p43]

4.15 Dr Lally recognises WACC increases with leverage but arguably not its significance.

Any errors resulting from imposing a uniform leverage level on all firms within an industry would be slight when the simplified Brennan-Lally CAPM is used because the allowed WACC is almost invariant to leverage in that case. [Experts 124]

4.16 If debt has a net advantage to suppliers/owners the Commission's WACC model shows the opposite. As L increases, WACC increases and therefore levels of normal profit (or capital charge). Hence, higher customer prices result than would have otherwise been the case if WACC was invariant to L.

4.17 Dr Lally claims other arguments justify a rising WACC. That is fine except it must be demonstrated that the additional capital charges that result from L are exceeded by benefits. Further it must be explained how customers are beneficiaries resulting from higher prices which can simply be avoided by adopting L = 0%.

4.18 Dr Lally justifies WACC increasing with L by

... a number of arguments favouring debt that are not embodied in the WACC model used here. And that "... firms have significant debt levels suggests that the net effect is advantageous."^{8 9}

... the use of promised rather than expected yields on debt within WACC implicitly represents some recognition of financial distress costs. [Experts 189] [Refer RDG 280]

4.19 The Commission must clearly state the logic and evidence to support its preliminary view that its WACC model is appropriate for its purposes and thereby clarify and resolve apparent inconsistencies identified above.

4.20 The Commission's preferred WACC model appears to be incomplete as WACC increases with L given an acceptance of tax neutrality. If there are other factors that need to be considered in calculating WACC these should be explicit.

5. Normal Profits: a re-specification

5.1 The concept of "normal profit" underpins the Part 4 Purpose Statements and application of the Act.

5.2 The definition of a normal profit can be derived from the following statement:

⁸ MEUG (2007) argued for leverage of zero on the grounds that it leads to the minimum level for WACC. This statement is consistent with the WACC model used here. However there are a number of arguments favouring debt that are not embodied in the WACC model used here.¹¹⁶ Furthermore, the fact that most firms have significant debt levels suggests that the net effect is advantageous. Thus, leverage of zero is not optimal. ... I favour estimating the optimal level for leverage by examination of the actual leverage level of firms in the relevant industry.

Footnote 116: "These include potentially lower agency costs for debt than for equity up to some level of debt, greater financial flexibility from debt, and the advantages in signalling management's views about the future cash flows of the firm. For a discussion of these additional issue[r]s, see Copeland et al (2005, Ch.15). These additional benefits from debt cannot be specified with any great confidence, and are therefore not generally formally considered in specifying the cost of capital.

⁹ The Weighted Average Cost of Capital for Gas Pipeline Business, prepared by Dr M Lally for the Commerce Commission, 2008, p 139 and footnote 116.

The Commission therefore intends applying the principle of promoting allocative efficiency within the constraint that the firm has the opportunity to recover its efficiently incurred costs, including the risk-adjusted cost of capital (i.e., a minimum constraint on expected revenue). [IM 2.44]

- 5.3 A normal profit is equivalent to a capital charge (the costs of capital), an *efficiently incurred cost*. The appropriate WACC is the least cost of providing suppliers/owners with the risk adjusted return.
- 5.4 A normal profit is therefore WACC times Regulated Assets (or similar measure of capital).
- 5.5 For the purpose of establishing an ex ante normal profit, the appropriate WACC rate should therefore assume $L = 0\%$.
- 5.6 The Commission’s preliminary view is that WACC should be established by reference to a credit rating benchmark. When L is non-zero, WACC increases as a function of increasing L .

Hence, there are two potential normal profits: $L = 0\%$ and $L = > 0\%$.

5.7 To illustrate the effect of the two WACC alternatives, the Gas Authorisation Decision (for WACC) and the aggregate Regulated Assets¹⁰ (for capital base) are referenced. Appendix 1 Table B sets out the assumptions, calculations and results.

Table A

Regulated Assets				\$12,000m
ex ante Normal Profit [40%]	L = 40% P = 2.7%	WACC	8.582%	\$1,030m
ex ante Normal Profit [0%]	L = 0%	WACC	7.826%	\$939m
Economic Profit			+0.756%	\$91m

5.8 At $L = 0\%$, the normal profit decreases by \$91m per annum as a result of the decrease in WACC of 0.756%, i.e. 7.826% instead of 8.582%.

The difference of \$91m can be interpreted as an ex ante economic profit or rent per annum. It is the amount that exceeds the minimum risk adjusted return required by supplier/owner at $L = 0\%$.

5.9 The revenue effect is equivalent to \$130m per annum being \$91m grossed up at the tax rate of 30%.

¹⁰ IM Section 5: Appendices.

Customers potentially pay the additional normal profit (or economic profit) in increased prices (potentially embedded in allowable return and price paths).

5.10 What benefits from L justify the extra \$91m cost (increased customer prices of \$130m per annum)?

Prices that are closer to the long run marginal costs of supplying services at the requisite quality will increase allocative efficiency, overall welfare and the long-term benefits to consumers. This is equivalent to saying that consumers should pay for costs that they cause, and as a result, the concept of 'cost-causality' is an important consideration for the Commission. [IM 2.39]

5.11 Causality of the cost does not arise from demand on services by customers resulting from a change in L. Price changes are directly related to L and p. The service, output and quality are unchanged.

5.12 Dr Lally's suggestion that the net effect of debt is advantageous begs quantification, despite his acknowledged difficulties of doing so, relative to the extra \$91m per annum above an efficient normal profit as illustrated based on the Gas Authorisation Decision example. [Refer to footnote 8 on page 6]

5.13 If the Commission is not convinced the net benefits of L can be reasonably rationalised or measured, then it should revert to $L = 0\%$ for its purposes.

5.14 The valuation effect is \$1,057m derived from discounting a future constant perpetual cash flow (in this case \$939m) at the two WACC rates. The implied value transfer from customers to suppliers/owners and is equivalent to 8.81% of the Regulated Asset base of \$12,000m.¹¹

5.15 An alternative perspective of the implied value transfer example in 5.14 above is: if $NPV = 0$ based on the Commission's preferred WACC of 8.582% then $NPV = + \$1b$ if the WACC rate of 7.826% applied reflecting $L = 0$.

5.16 The implication of setting the regulatory WACC too high is that it invites capital arbitrage. For example, Horizon Energy, a NZX listed company could repay debt by issuing equity to reduce L. Horizon's price path would have included an ex ante WACC based on a non-zero L. Under the Commission's proposed WACC, Horizon shareholders would "bank" a gain by avoiding a higher opportunity cost of capital (WACC). Alternately it may share the gain with customers by reducing prices. Horizon shareholders would still receive a risk adjusted return reflecting $L = 0\%$.

5.17 The probability of bi-pass or stranding of assets is increased by the Commission's preference for a non-zero L. New entrants can set prices to recover a lower efficient WACC based on $L = 0\%$ and thereby undermining the incumbent who has set prices (consistent with a price path) incorporating the higher Commission's ex ante WACC reflecting L.

¹¹ Refer to Appendix Table B.

5.18 The significance of the WACC and its sensitivity to L and p appears to have not been fully appreciated by the Commission. The Experts also seemed to have assumed that any upward slope if there is one is trivial. Based on the Gas Authorisation Decision as an example the effect of the change in L is demonstrated to be arguably material. The difference in WACCs of 0.756% is equivalent to 9.660%, i.e. 0.756%/7.826%.

5.19 The Commission cited an opinion on the meaning of significance:

For regulated firms, there is a direct relationship between the cost of capital and regulated prices via the allowed rate of return. (There is no such direct link for unregulated firms.) As a result, the cost of capital can have a significant bearing on the earnings of regulated businesses. For example, Grout (1995, p.386) estimated that if shareholders in regulated utility companies in the UK were permitted to earn just an additional 1% on equity, the combined profit to those firms would increase by around £562 million. Hence, the economic implications of errors in cost of capital can be substantial. [RDG 64.]

The sensitivity of a 1% change in the return on equity is cited and compares to the WACC difference of 0.756% on debt *plus* equity – not just equity.

6. Evaluation

6.1 The Commission is concerned about whether changes to its preliminary view would make it more consistent with the purpose statement of Part 4 of the Commerce Act 1986, contained in Section 52A (“Part 4”).

6.2 A second concern is that any change complies with its regulatory principles when estimating cost of capital of consistency, flexibility and cost effectiveness (“WACC principles”). [RDG 29]

6.3 A final consideration is whether the social costs of setting allowable rates too low are likely to outweigh the costs of setting them too high (“social net benefit”). [RDG 59]

6.4 Estimating an ex ante WACC is a separate and prior step for the Commission’s determination of an allowable rate of return, application of NPV = 0 principles and for ex post performance monitoring.

6.5 The Commission can improve Part 4 outcomes, better satisfy WACC principles and not adversely affect social net benefit by simply assuming L = zero for calculating ex ante WACC. Just one change is required to better achieve Part 4 Purpose outcomes.

The reasons are:

6.5.1 The outcome in competitive markets can be better aligned by the normal profit reflecting the efficient (least cost) WACC. To do otherwise locks into ex ante WACC economic profits (rents) in the Commission’s benchmarking including NPV = 0 and for ex post performance monitoring. The consequence is an assumption of a higher WACC than the competitive benchmark required risk and reward.

6.5.2 The price path and consumer prices (reflected in the allowable return) will be higher than required as the Commission's proposed WACC is too high.

6.5.3 Incentives for investment are confused by two potential WACCs: one based on the Commission's proposed WACC: $L > 0$, and the other an "efficient" WACC assuming $L = 0$. Setting $L = 0$ mitigates potential bi-pass and stranding of assets. Ex ante WACC should be an "efficient cost" rather than one determined as a function of a level of L set by the Commission.

6.6 The Commission proposes the WACC competitive benchmark includes a standardised L determined by reference to a predefined credit rating. The Commission also proposes to relate a p to the credit rating and L . The WACC model preferred by the Commission should be subject to a wider check that it is reasonable, realistic and appropriate.

6.6.1 WACC models are taxation dependent. For instance using the L related to US companies most likely reflects the use of the classical WACC model, whereby there is arguably some tax benefit to L . Value increases as a function of increasing L for sound credit risks within limits. The Commission's proposed WACC operates differently. WACC rises with L . Value decreases with L . Based on the Commission's preferred WACC model, shareholder value is maximised at $L = 0\%$.

6.6.2 However, as already stated, tax neutrality implies that WACC should be independent of L . But it isn't.

6.6.3 If non-New Zealand credit ratings are sampled for determining L then recognition of the WACC model and tax assumptions differences must be made.

6.6.4 Not all companies are significant borrowers. 8 (of 67) companies listed on the NZX have 5% or less debt to capital.¹² An inspection of a sample of the 26,000 companies and industry groupings shows there is wide variation in capital structures among international companies – many of which are debt free.¹³

6.6.5 In 2008 the Crown (The Treasury) adopted $L = 0\%$ for the WACC to be used for discount rates for cost-benefit analysis in the public sector.¹⁴

6.6.6 Airways Corporation of New Zealand Limited assumes $L = 0\%$ for pricing services and measuring economic performance.¹⁵

6.6.7 Cameron Partners in a submission to the Commission recommended a WACC model that is indifferent to the way the business is financed.¹⁶

¹² http://www.pwc.com/en_NZ/nz/cost-of-capital/CostofCapitalmar2009.pdf

¹³ http://pages.stern.nyu.edu/~adamodar/New_Home_Page/

¹⁴ <http://www.treasury.govt.nz/publications/guidance/costbenefitanalysis/discount rates/discount-rates-jul08.pdf> and, "Treasury Circular 2008/13", 19 August 2008

¹⁵ <http://www.airways.co.nz/documents/Pricing-Information-Pack.pdf> Appendix F

¹⁶ Cameron Partners submission Draft Cost of Capital Guidelines, 2nd December 2005,

<http://www.comcom.govt.nz/IndustryRegulation/Gas/CommissionReportsandDocuments/ContentFiles/Documents/MEUG%20Cameron%20and%20Partners%20sub.pdf>

Cameron Partners recommend a non-zero debt beta (B_d) be included in the WACC formulation.

6.6.8 The Commission's preferred WACC model appears to be contradictory and possibly incomplete. It is arguable whether WACC and L are positively related as the WACC model implies. If there are other factors that affect the price of capital they should be included in the analysis. Given tax neutrality, should WACC rise as a function of increasing L? The Commission's preferred WACC implies that value is maximised at zero debt.

7. Recommendations

The key recommendation is 7.1. All references to the WACC model, L, p and normal profits are affected by this fundamental recommendation. Answers to all relevant questions posed by the Commission have therefore not been referenced.

7.1 The Commission should adopt a default position of $L = 0\%$ for ex ante WACC determinations. If WACC is based on $L = 0\%$ the calculation of the cost of capital is simplified, as assessing the cost of debt is avoided. Also, greater certainty in the calculation of WACC is attained.

Supplier firms are able to proceed under a customised/individual price-quality path process and thereby able to present specific proposals to the Commission including arguments justifying WACC model and application including L. [IM Chapter 14]

The net benefits of debt claimed should be justified by the supplier/owner through the customised/individual price path process and not the Commission. The default position of $L = 0\%$ should apply. While agreeing with Dr Lally that there are many theories and sometime controversial views on capital structure, it beholds the Commission to consider them. If they can't be reasonably quantified or supported by relevant empirical evidence, then they should be dismissed by the Commission.

7.2 Normal Profits (and $NPV = 0$) be determined related to WACC based on $L = 0\%$.

7.3 WACC for ex post performance monitoring and information disclosure should also be related to WACC based on $L = 0\%$.

7.4 The WACC model preferred by the Commission should be subject to a sanity check given the apparent conflicts between the theoretical WACC model and the assumption of tax neutrality and market evidence.

7.5 If the Commission has any doubts, then it should adopt the default $L = 0$ in the determination of WACC.

Failure to make an allowance for the Bd [debt beta] adjustment ... leads to a WACC curve that is upward sloping – a clearly perverse result.

By adjusting WACC for the inclusion of debt beta the WACC becomes indifferent to capital structure. Accordingly the Commission should ... use an all-equity cost of capital that ignores the issue of capital structure altogether.

The response of the Commission/Dr Lally was that Cameron Partners incorrectly used a promise yield instead of an expected rate of return. See: The Weighted Average Cost of Capital for Gas Pipeline Businesses, a report prepared by Dr M Lally for the Commerce Commission, 28 October 2008, p 139.

7.6 The Commission's task is not easy when pre-eminent financial economists ask:

*How does a practitioner use the theory to determine optimal capital structure? The answer to this question is the Holy Grail of corporate finance. There is no complete answer, and the author of a sound, empirically validated theory will deserve the Nobel prize in economics.*¹⁷

7.7 The Commission can improve Part 4 outcomes, better satisfy WACC principles and not adversely affect social net benefit by simply assuming $L = \text{zero}$ for calculating ex ante WACC. Just one change is required to better achieve Part 4 Purpose outcomes.

¹⁷ Copeland, Weston and Shastri, "Financial Theory and Corporate Policy", 4th edition 2005, P611)

Appendix

TABLE B

Pro forma Analysis:
Regulated Assets and 2008 Gas Authorisation Decision:
Effect of change of leverage from 40% to 0%

1 CC "Regulated Assets"		\$m	
Transpower		2,200	
Lines		6,300	
Airports		2,000	
Gas		1,500	
Maui Developments		na	
Total		12,000	
	Gas Authorisation Decision 2008		
2 Leverage (L)		40%	0%
3 Debt Premium (p)		2.70%	0%
4 WACC	50th %tile	8.582%	7.826%
Change in WACC			-0.756%
Excess WACC			9.660%
5 Normal Profit effect ex ante			
Normal Profit/Capital Charge	\$m	1,030	939
Normal Profit change pa	\$m		(91)
6 Revenue effect			
Tax rate			30%
Revenue pa	\$m		(130)
7 Valuation effect			
Cash Flow in perpetuity, say	\$m	939	939
Valuation	\$m	12,000	10,943
WACC		7.826%	8.582%
Change in value	\$m		(1,057)
			-8.809%

Commerce Commission IM Section 5: Appendices

<http://www.comcom.govt.nz/IndustryRegulation/Gas/0Model.XLS>