



LECCG



Weighted Average Cost of Capital

Presented on behalf of
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A. The CAPM

The Model

- 1. Agreement with the Commission's definition of **WACC**:

$$WACC = k_e(1 - L) + k_d(1 - t_c)L$$

- 2. Agreement with the Commission's use of the post tax form of the **CAPM** – but as a starting point:

$$k_e = R_f(1 - t_c) + \beta_e TAMRP$$

- 3. This implies that:

$$WACC = R_f(1 - t_c) + \beta_a TAMRP + d(1 - t_c)L$$


Disagreement on estimation

- 1. **Asset Beta: given that**

$$\beta_e = \beta_a [1 + L / (1 - L)]$$

the “average” New Zealand company has an asset beta of around 0.8

- 2. **TAMRP: The Commission gives equal weight to all the different methods of estimation; our preference is to rely on relevant long term evidence of realised rates**
- 3. **Risk free rate: practice is to match financing to the term of the investment and use of a short term rate is mathematically inconsistent with use of a long term rate in the TAMRP**

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- **4. Leverage: What is optimal is best inferred from practice and hence a range of around 0.55 to 0.65 is indicated**
 - **5. Debt Premium: this is an empirical issue and for a level of leverage of around 60% a premium of around 1.7% applies**



Compensation

The effect of use of ICAPM is uncertain and we do not accept that use of the post tax form of the CAPM provides compensation for uncertainties in estimation.



B. Margin over WACC



FACT 1

THE CAPM ISN'T A VERY RELIABLE MODEL OF EXPECTED RETURNS

- **Academics no longer believe in the CAPM.**
- **No obvious alternative, but important to remember it can really only be regarded as a starting point**



FACT 2

EVEN IF THE CAPM IS A RELIABLE MODEL OF EXPECTED RETURNS, THE WACC IS AN INCOMPLETE MEASURE OF THE COST OF CAPITAL

- WACC process applies CAPM insights to physical investments.
- But outcomes to physical investment have an additional, and asymmetric, risk.

$$(V_{\text{after}}^{\text{firm}} - V_{\text{before}}^{\text{firm}}) = (V_{\text{project}} - I) + (V_{\text{after}}^{\text{assets}} - V_{\text{before}}^{\text{assets}})$$

- Why? Market frictions and foregone options lower the expected profits from existing assets.
- These don't involve the firm writing out a cheque, but are nevertheless real costs of physical investment.



FACT 3

EVEN IF THE CAPM IS A RELIABLE MODEL OF EXPECTED RETURNS, AND THE WACC IS A COMPLETE MEASURE OF THE COST OF CAPITAL, USING NPV TO IDENTIFY EXCESS PROFITS IS FRAUGHT WITH PROBLEMS

- NPV > 0 equivalent to returns being higher than WACC, i.e., 'excess' returns.
- But WACC is an expected return, so NPV = 0 simply indicates whether the firm did better or worse than expected.
- In efficient markets (assumed by CAPM), NPV calculated using market values can't tell us *anything* about excess profits (Boyle and Guthrie, 2002).
- In other circumstances, NPV can tell us something, but only very noisily.



CONCLUSION

- **Facts 1-3 together imply a healthy margin above WACC.**
- **Don't know exactly what it is, but we know what it isn't - ZERO.**
- **Use of the 75th percentile a nudge in the right direction, but may not be sufficient.**