Some comments on the notes circulated by Dinesh Kumareswaran and Graham Partington

I've found the notes circulated by Dinesh and Graham to be very helpful for gaining a better understanding of their views. I'll just briefly comment on a couple of matters they raise that (i) the Board has indicated are of priority and (ii) are scheduled for discussion this (as opposed to next) week.

1 Appropriate term for the allowed return on equity

Dinesh

- In Martin's original analysis, date t cashflows are (correctly) discounted at the date t expected return, i.e., the expected return investors require on cashflows received at date t. Dinesh's refutation consists of arguing that date t cashflows should instead be discounted at the date $t+s$ expected return.

- I agree that (for a suitable choice of t and s), if true, this would justify setting the allowed return equal to the 10-year rate rather than the 5-year rate. But such a mis-match between cashflows and discount rates contradicts basic finance theory and would allow for limitless arbitrage opportunities. In the absence of some compelling reason for overturning the standard paradigm, date t cashflows *must* be discounted at the date t expected return.

- Far from being compelling or "overwhelming", the anecdotal observation that some practitioners claim to use the 10-year rate in their CAPM applications isn't very persuasive at all; corporate finance research has repeatedly demonstrated that firms regularly use simplified heuristics as an approximation to a more complex approach. So even if the claims are to be taken at face value, all it tells us is that practitioners sometimes apply a 10-year rate to *all* future cashflows (including those off in the distant future) as an approximation to using (mostly unobservable) matched-year rates. It certainly doesn't imply that a set of year 1-5 cashflows alone should be discounted at a 10-year rate.

- Thus, I cannot agree that Dinesh's analysis successfully refutes Martin's. The thing is quite simple: if future cashflows are *correctly* discounted, then the only allowed rate that is guaranteed to satisfy the NPV=0 principle (both during the regulatory period and over the asset life) is the rate with a term equal to the length of the regulatory period.

Graham

- Graham's argument is more challenging to respond to because he doesn't attempt to provide a formal rebuttal of Martin's analysis, but I think the underlying point he makes is very similar to Dinesh's. Although much is made of the term structure of expected equity returns, I believe this is a red herring.[1] Instead, the crucial paragraph seems to be:

> "I stress that the calculation of V_0 will always give A as long as discount rate is the same in the numerator and denominator of equation (4). *A critical assumption, therefore, is that those discount rates are the current market expected returns.* If so V_0 will equal the market value of the allowed cash flows and the NPV = 0 criterion will truly be satisfied. Otherwise, it will not be satisfied." (emphasis added)

- Graham then goes onto cite the same practitioner anecdotes as Dinesh, the implication apparently being that the "current market expected return" relevant to network assets is approximately equal to k_{e02} (rather than k_{e01}) and therefore that Martin's equation (4) should actually be:

$$V_0 \approx \frac{(Ak_a + DEP_1) + (A - DEP_1)}{1 + k_{e02}}$$

which implies:

$$V_0 \approx A \qquad \text{iff } k_a = k_{e02}$$

- So as with Dinesh, Graham's conclusion follows logically from his assumption. But that assumption — that date t cashflows are discounted at the date $t + s$ expected return — is, for the reasons explained above, very difficult to sustain.

2 The use of multiple estimators of beta

- Dinesh agrees with Martin that it is desirable to supplement domestic beta estimates with those from comparable foreign firms in order to "reduce the estimation error". However, this advantage is by no means a given. Making use of foreign firm beta estimates reduces sampling error but introduces intrinsic variation, i.e., firms that are simply different beasts to the "typical" Australian network.

[1] The term structure is captured by the series of term-dependent rates $(k_{e01}, k_{e02}, k_{e03}, ..., k_{e0n})$ which are observable at date 0, not the set of current and future 1-period spot rates $(k_{e01}, k_{e12}, k_{e23}, ..., k_{e(n-1)n})$ which are mostly random variables from the perspective of time 0.

- While the error resulting from intrinsic variation decreases with the number of firms in the sample, it does not disappear as that number becomes arbitrarily large. Thus, the introduction of foreign firms can increase or decrease estimation error, depending on whether the reduction in sampling error is less or greater than the rise in intrinsic variation error, which in turn depends on the magnitude of their respective error volatilities.
- In practice, the number of available foreign firms is likely to be small and/or drawn from a small number of markets. In this case, intrinsic variation error will not only be large, but is also unlikely to have zero mean.

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