Grant Samuel's Cost of Equity Capital

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The Directors
TransGrid
180 Thomas Street
Sydney NSW 2000

Dear Directors

Cost of Equity Capital

1 Introduction

TransGrid operates the high voltage electricity transmission network in New South Wales and the ACT. TransGrid is a New South Wales State Owned Corporation. TransGrid's operations are regulated by the Australian Energy Regulator ("AER"). One aspect of that regulation is the determination of the allowable return on capital used in the "building block" model that generates TransGrid's maximum allowed revenue. The rate of return is set by the AER on a rolling five year basis and TransGrid's next reset decision is due in April 2015.

TransGrid proposes to make submissions to the AER in relation to its allowable rate of return. In connection with that submission, it has asked Grant Samuel & Associates Pty Limited ("Grant Samuel") to prepare this letter setting out how Grant Samuel, as a leading market practitioner, estimates the cost of equity capital for the purposes of company valuations and advisory services to its clients and the issues that are taken into account in doing so.

The Grant Samuel Group is an Australian owned investment banking group specialising in corporate finance advisory services. One of its activities is the preparation of company valuations and independent expert reports ("IERs"). Since its inception, Grant Samuel and its affiliates have prepared more than 500 public expert reports, including:

- reports for the vast majority of the largest and most complex transactions in Australian corporate history such as:
  - the restructuring of the Westfield Group (in progress);
  - the takeover offers for GrainCorp, AXA, Foster's Group, Qantas, Coles Group, Origin Energy, Multiplex and St. George Bank;
  - the arrangements between Telstra and the Commonwealth regarding the National Broadband Network; and
  - the reincorporation of News Corporation in the United States; and
- reports for numerous transactions in the energy and infrastructure sectors such as:
  - APA Group's offer for Envestra (in progress);
  - APA Group's offer for Hastings Diversified Utilities Fund;
  - the internalisation of DUET;
  - the restructuring of Alinta Energy;
  - Brookfield's acquisition of Prime Infrastructure;
  - the recapitalisation of Babcock & Brown Infrastructure;
  - the offer by Singapore Power and Babcock & Brown for Alinta; and
  - the merger of Alinta and AGL.

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2 The CAPM in Context

We set out below some of our views on the limitations of any analysis of the cost of equity capital because it is fundamental to informing our general approach and the kinds of judgements we make.

Firstly, it is imperative that anyone estimating or considering the cost of equity capital always bear in mind the fact that it is not an observable number that can ever be "discovered" or "proved" (no matter how many studies are conducted) and there is no "correct" rate. Any estimate is therefore fundamentally a judgement rather than a calculation and the overriding objective is to estimate a rate that generates a value for the asset that is, as far as practically possible, consistent with market prices (which are observable), whether that rate fits a particular theory or not.

The conventional approach is to use theoretical models such as the capital asset pricing model ("CAPM") to determine a rate. However, it needs to be recognised that such models do no more than infer a rate from other data using one particular theory about the way in which security prices behave. The usefulness of any estimate therefore depends on the efficacy of the theory and the robustness of the data.

While the theory underlying the CAPM is rigorous, the practical application is subject to very substantial shortcomings and limitations. There is a tendency to overlook these shortcomings and to regard the rates calculated using CAPM as inviolate. To do so, is to misunderstand the limitations of the model. CAPM involves:

- **a model that has questionable empirical validity:** The CAPM has been subject to intense criticism over many years with numerous empirical studies demonstrating that it does not accurately portray movements in individual share prices and has limited explanatory power. There are also competing formulations such as the Sharpe-Lintner, Black, Brennan-Lally, Officer or Monkhouse which can give different results;

- **simplifying assumptions and approximations:**
  - the CAPM is a single period model but has been adapted to a multiperiod model (usually annually). Theoretically it should use a forecast of the risk free rate for each period in question (annual is no more correct than any other period). In practice, two simplifying approximations are usually made:
    - government bonds are used as a proxy for a risk free asset (at least in developed countries); and
    - the current long term rate (typically 10 years) is used rather than, say, interpolated rates for each year. The difference can be material if the yield curve has a significant slope;
  - it assumes investors are diversified and therefore are not (and should not be) concerned with the specific risk of a particular investment. Behavioural economics and our own experience over 25 years suggests while this may be theoretically sensible it doesn't actually reflect how investors behave or how they price risk; and
  - it ignores all investor taxes, which may or may not have an impact in the real world. Even where models do attempt to reflect this it is based on assumed averages which may not be accurate or appropriate given the diversity of individual tax positions;

- **the use of historical data as a proxy for estimates of forward looking parameters:** The CAPM theory is based on expectations but these are virtually impossible to obtain, at least with any accuracy or reliability. There are attempts to estimate forward looking market risk premiums and betas but these are of little practical use and give highly variable results. Accordingly, historical data (primarily observed equity market premiums and betas) is invariably used as a proxy for the future. However, to state the obvious, the future is not necessarily the same as the past. Companies (and markets) are in a constant state of change and there are plenty of examples of companies making changes that fundamentally alter the risk profile of their businesses and impact their beta during the measurement period. Similarly, while it can be argued that investors are likely to expect that, on average, equity markets will deliver premium returns consistent with the long run average, it is clear that attitudes to risk and the "price of risk" fluctuate substantially over time (see below);

- **data of dubious statistical reliability:**
  - the measurement of historical beta factors is subject to very high levels of statistical error and tends to be unstable. Measurements often vary widely depending on source (e.g. betas from Ibbotson, Barra, RMS or Bloomberg), time period, sampling frequency and methodology (e.g. ordinary least squares or Scholes-Williams). The standard errors for betas can be quite significant (greater than 0.2 for many companies). The following table shows the ± one standard error range for measured betas of selected Australian utilities[1] (which are amongst the lowest for the Australian market):

Australian Utilities – Beta			
Company	**Beta (OLS)**		
	Low	**High**	**Spread**
AGL	0.24	0.57	0.33
APA	0.39	0.68	0.29
SP AusNet	0.31	0.60	0.29
DUET	0.23	0.58	0.35
Spark	(0.09)	0.26	0.35
Envestra	0.38	0.70	0.32

At the one standard error level, there is only 68% confidence that the "true" beta lies somewhere in the range. At a 95% confidence level, the spread would be twice as wide.

Even for the utilities industry as a whole the standard error is 0.1, which means that at the 95% confidence level you can only assume the true industry beta is somewhere between 0.3 and 0.7.

We have also witnessed on numerous occasions measured betas changing materially over time, even in a period as short as 6-12 months;

- the measurement of beta for an individual company is seldom regarded as reliable enough to be the sole source and, in cases where the subject company is not listed, a measurement is not available. Accordingly, the analysis is often undertaken by reference to other companies in the same industry and the industry as a whole as well as the subject company (if it is listed) in order to avoid one-off issues and to increase confidence in the output. However, none of these other companies is likely to be exactly comparable to the entity for which the discount rate is being calculated and the comparable companies may operate in very different markets. In any event, the data seldom yields a tight and consistent range from which a precise estimate can be derived; and
- some practitioners estimate equity betas by converting observed equity betas of comparable companies into asset betas and then reconverting them back to equity betas using the subject company's actual or target gearing. However:
  - there are alternative formulas for this process that give different answers;
  - many practitioners use the latest gearing ratios but this is not correct. The de-gearing adjustment should be based on the gearing over the same period as the beta measurement. Given the usual volatility in equity values over such a period, the result may be materially different and, in any event, it is still very imprecise with a high margin for error (e.g. debt measures are only available periodically and are backward looking rather than contemporaneous). Our experience is that they fluctuate materially over time; and
  - the target debt/equity ratio of the subject company is a subjective estimate.

  This approach of ungearing and regearing betas simply compounds the data measurement variations or errors by overlaying yet another set of what are very rough estimates; and
- the measurement of the historical risk premium is particularly problematic. It is typically taken over a long period of time to even out the volatility of equity markets and reflect an assumption

[1] Source: Risk Measurement Services, Sirca Ltd (December 2013).

that if the average over a long period is, say, 6% then rational investors would not expect to earn any more over a reasonable investment horizon. However:

- there are multiple different outcomes for the historical market risk premium depending on time period, basis (over bonds or bills) and method (arithmetic or geometric averages);
- the methodology is inflexible and clearly fails when markets change. The average of, say, 50 years of data will not move much even with 2-3 years of "new" data. This does not accord with the reality of financial markets;
- the longer the period of measurement (and therefore the greater the "robustness" of the average) the more likely it is to reflect economic and market circumstances that have little resemblance to the present. Is it really likely that investor returns prior to World War II are relevant to the kinds of returns investors expect today ?; and
- the historical data also contains a logical contradiction: when the equity return required by investors is lower than the returns implied by market prices, investors respond by bidding the price of equities higher. A rising market translates to a higher measured risk premium – contrary to the lower return expectations driving the upwards movement in prices.

The failings of standard measures of risk premium are evident from the period since the global financial crisis. Typical risk premium measures based on historical data are around 6% in Australia but often are lower in markets such as the United States. The graph in Appendix 1 shows the spread between yields of lowly rated corporate bonds in the United States and US treasury bonds. The corporate bonds represent a weak credit but are not in distress. The graph shows actual market evidence that the premium required by investors in these bonds skyrocketed during the height of the global financial crisis but even during later periods it fluctuated significantly. In August 2011, the premium went from around 4% to over 6% (in a period of a few weeks) and peaked at 8%.

One thing we can be certain of is that investors in equities would have required even higher premiums over this same period. The data also clearly indicates:

- risk premiums can change rapidly over time; and
- risk premiums can vary by a significant amount (i.e. it is not a matter of incremental changes of less than 1%); and

- **unresolved issues:** There is not unanimous agreement as to how the model should adjust for factors such as taxation. The CAPM was developed in the context of a "classical" tax system. Australia's system of dividend imputation has a significant impact on the measurement of net after tax returns to domestic investors.

  In our view, there is no compelling evidence that gamma "exists". The adoption of a gamma factor (of, say, 0.5) must, by definition, mean that companies in the Australian market are valued such that:

  - domestic investors (who can use franking credits) earn a higher return that their cost of capital; and
  - offshore investors earn less than their required return.

  As such there should be no offshore investors in Australian equities. This is patently untrue.

  In our view, the evidence clearly demonstrates that:

  - marginal prices are not set using any value for gamma; but that
  - domestic investors enjoy a higher after tax return than comparably taxed offshore investors.

It is easy to over-engineer the process and to credit the output of models with a precision it does not warrant. Too often, people are captured by the accumulation of data and its apparent sophistication. A mechanistic application of formulae derived from theory can obscure the reality that any cost of capital estimate or model output should be treated as a broad guide rather than an absolute truth.

3 Our Approach

When we undertake a corporate valuation using discounted cash flow ("DCF") analysis, the starting point is to calculate a weighted average cost of capital ("WACC")[2] using CAPM and current or standard parameters:

- the current 10 year bond rate;
- equity betas from several sources (typically Bloomberg and AGSM and/or BARRA/Ibbotson) and measured against local and global indices. We do not ungear/regear betas but we do examine sector wide debt/equity ratios for use in estimating WACC;
- standard market risk premium of 6%; and
- no adjustment for gamma (see the earlier discussion). We assume the company incurs a full corporate tax charge subject to any other specific adjustment (e.g. allowances, carry forward tax losses).

The next step is to consider a broad range of other evidence. We typically review:

- current market conditions and sentiment (including volatility);
- other measures of risk premiums (such as the bond premiums discussed earlier);
- the difference between current bond rates and long term averages;
- analyst estimates of WACC for the entity or its peers; and
- alternative measures of the cost of equity capital such as the Gordon Growth Model ("GGM") or perpetuity model under which:

$$\textit{Cost of Equity} = \frac{\textit{Dividend (Year 1)}}{\textit{Market Price}} + \textit{Long Term Dividend Growth Rate}$$

$$= \textit{Dividend Yield} + \textit{Long Term Dividend Growth Rate}$$

In its December 2013 paper, *Rate of Return Guideline*, the AER proposed using the GGM as an input for assessing the risk premium (presumably using aggregate market data and then deducting the bond rate). However, we believe it can be a very useful direct measure of the cost of capital, particularly for entities in the infrastructure and utilities sector where cash flows are stable, distributions are well established and consistent, growth rates are reasonably predictable and the securities are priced on a yield basis.

Data can be examined for the subject entity (if listed) as well as any peer group entities.

The advantages of this approach are that:

- it uses current, actual market prices; and
- it effectively deals with the tax issues of pass through structures as yields reflect the actual tax status of distributions.

We have found this methodology insightful over the past few years (and at least as useful as CAPM derived estimates). When listed energy infrastructure entities were trading at yields of circa 8% and with clear expectation for steady inflation type growth in distributions of around 3% (i.e. 11% cost of equity) it was abundantly clear that CAPM based calculations of 7-8% were completely unrealistic.

[2] The WACC formulation we use is: $WACC = (Re \times E/V) + (Rd \times (1-t) \times D/V)$, where E/V = the proportion of equity to total value, D/V = the proportion of debt to total value, $V = D + E$, Re = the cost of equity capital, Rd = the cost of debt capital and t = the corporate tax rate.

We then form an overall judgement as to what we consider to be a sensible commercial outcome. We do not make a mechanistic or standardised adjustment as some practitioners do (e.g. adding "alpha" of, say, 1% to the calculated WACC). We believe our approach delivers a better outcome as the issues of individual entities can be quite different and the circumstances can change quickly over time.

The adopted rate can be materially different to a calculated WACC. The following table sets out data from a selection of recent independent expert reports ("IERs") that we have completed, showing:

- the WACC (based on our formulation[2]) calculated using "standard" CAPM variables to determine the cost of equity; and
- the WACC we adopted for the purposes of the valuation in the IER.

Grant Samuel Discount Rate Selections

Published IER	Date of Report	Calculated WACC	Selected WACC
Hastings Diversified Utilities Fund	20 July 2012	6.3-6.8%	8.0-8.5%
DUET Group	2 October 2012	6.8-7.2%	9.0-10.0%
Australian Infrastructure Fund	3 December 2012	7.1-7.9%	8.5-9.5%
Clough Limited	4 October 2013	9.5-11.2%	11.0-12.0%
CFS Retail Property Trust Group	21 January 2014	6.9-7.6%	8.5-9.0%
Envestra Limited	28 February 2014	5.9-6.5%	6.5-7.0%
Westfield Group	31 March 2014	8.4-8.9%	9.0-9.5%

In our view, there is not much point in exercising judgement if you are not prepared to step away from the apparent comfort of calculated rates.

In these cases, the decision to adopt a higher rate was driven by the sharp fall in bond rates during 2011 and early 2012 (when they fell by over 2% to historically low and, in our view, unsustainable levels). Our rationale was similar to other practitioners who "normalise" the bond rate to long term levels and then add the standard premium (of, say, 6%), although the quantum of our adjustments may be different.

The rates we selected might sometimes seem on the high side. However, if they were overstated we would expect to see evidence that the valuations generated on this basis produced systematic undervaluation of assets in the context of either corporate transactions or relative to market prices (although we recognise that this is a joint hypothesis problem in so far as it also depends on the accuracy of the cash flow forecasts). We have seen no evidence of this, suggesting the upward adjustments were not unreasonable and were consistent with market conditions at the time.

As bond rates revert to normal levels and evidence of risk premium reductions emerge (and there has been evidence of this already) we expect that the extent of our adjustments would diminish.

4 Other Matters

We consent to this letter being provided to the AER and, if necessary, its publication subject to Grant Samuel being informed of, and agreeing to, the form and context in which it is to be published.

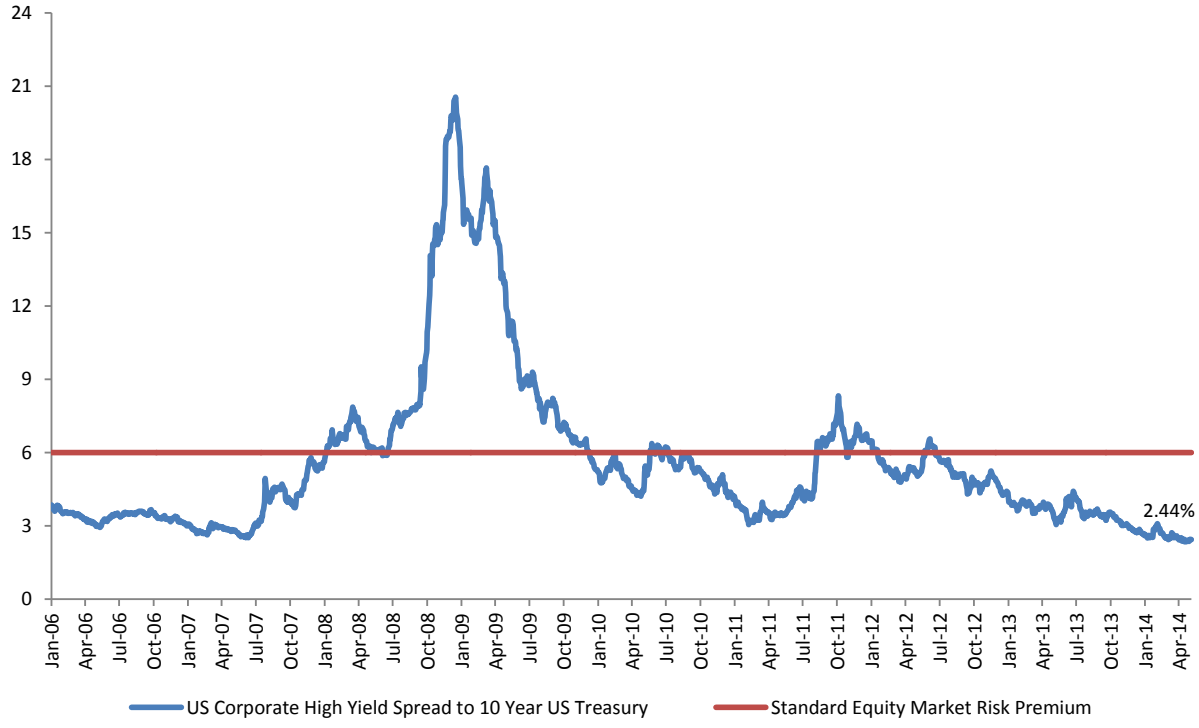
Yours faithfully
GRANT SAMUEL & ASSOCIATES PTY LIMITED

Ross Grant
Chairman

Stephen Wilson
Managing Director

Appendix 1

High Yield Bond Spreads in the United States



Source: Bloomberg – based on Barclays Capital US Corporate High Yield Index