The required return on equity commensurate with current conditions in the market for funds

Report prepared for WA Gas Networks

1 September 2010

STRATEGIC FINANCE GROUP
S F G   C O N S U L T I N G

Contents

STRATEGIC FINANCE GROUP

S F G   C O N S U L T I N G

Executive summary and conclusions

Instructions and background

1. The Strategic Finance Group: SFG Consulting (SFG) has been engaged by WA Gas Networks (WAGN) to examine the return on equity that is commensurate with the prevailing conditions in the market for funds. This is in the context of National Gas Rule 87(1) which requires that the allowed regulatory return must be commensurate with prevailing conditions in the market for funds.

2. In this report, we use a range of approaches to estimate the return that is expected on equity investments in other comparable firms. Throughout this report, we use the term "comparable" to describe other energy infrastructure businesses that might reasonably be considered to be investment alternatives to a business like WAGN. In this sense, an investor in WAGN would forego the opportunity of instead investing in one of the alternative "comparable" businesses. We do not suggest that any of the businesses that we consider is a close replica of WAGN. Rather, our view is simply that when determining whether a proposed allowed return is commensurate with prevailing conditions in the market for funds, one important consideration is whether that allowed return is commensurate with the return that is available from the investment alternatives of these other comparable firms.

Conclusions

3. Our key conclusions are as follows:

    a. The expected dividend yield on the set of comparable firms is approximately 10.5% p.a. We obtain this estimate from the forecasts set out in the research reports of equity analysts from major broking houses. We examine forecasts for the same set of comparable firms that are traditionally used by regulators to estimate equity beta and credit ratings. We note that the forecasts are consistent across time (2010-2012), across firms, and across broking houses;

    b. The forecast dividend yields on comparable firms have been quite stable at this level over recent times;

    c. The dividend yields that are available on new equity raised by the set of comparable firms are substantially higher than 10.5% on average. This implies that our estimated dividend (based on traded prices for existing shares) is, if anything, conservative;

    d. The dividend yield is only one component of the return available to shareholders. Shareholders may also benefit from stock price appreciation or capital gains. If stock prices are assumed to increase at a real rate of 0-1% p.a., and if expected inflation is 2.5% p.a., the combined return from dividends and capital gains would be in the range of 13-14%;

    e. We apply a simultaneous estimation technique to jointly estimate the required return on equity and expected long-term growth. This is done in a way that reconciles an analyst's dividend and long-term growth forecasts with that same analyst's price target. This analysis also produces estimates in the range of 13-14% for the required return on equity (from dividends and capital gains) for the set of comparable firms; and

STRATEGIC FINANCE GROUP
SFG CONSULTING

4.   An important consideration when determining whether a proposed regulatory return on equity, r_e, is consistent with the National Gas Rules is a comparison between that allowed regulatory return on equity and the return on equity that is available to investors in other comparable firms. Final estimates of the total required return on equity that are below even the current dividend yield on comparable firms are not consistent with prevailing conditions in the market for funds. This requires either:

   a.   A revision to one or more input parameters, so that the revised values (selected from within the range that is considered to be reasonable) produce an estimate of the required return on equity that *is* consistent with current conditions in the market for funds; or

   b.   A detailed explanation as to why the proposed estimate of the required return on equity can be, in light of the apparent evidence to the contrary, considered to be already consistent with current conditions in the market for funds.

STRATEGIC FINANCE GROUP
S F G C O N S U L T I N G

1. Legal and economic context

Overview and context

5.   The regulatory estimate of the required return on equity, r_e, is an estimate of the expected return that is required by potential equity investors before they will commit the required amount of equity funding to the benchmark regulated firm.

6.   The National Gas Rule (NGR) 87(1) requires that:

> The rate of return on capital is to be commensurate with prevailing conditions in the market for funds and the risk involved in providing the Reference Service.[1]

7.   Consequently, under the Rules, the allowed return must be commensurate with the return that is required to attract funds, given the prevailing conditions in the market.

8.   An important consideration when determining whether a proposed return on equity, r_e, is consistent with the Rules is a comparison between the allowed regulatory return on equity and the return on equity that is available to investors in other comparable firms. For example, if the allowed return on equity were materially lower than the return on equity available from other comparable firms, that allowed return would not be commensurate with prevailing conditions in the market for funds, as required by Rule 87(1).

9.   Consequently, it is important to estimate the expected return on equity that is presently available to investors in firms that are comparable to the benchmark firm that is the subject of regulation.

Use of CAPM

10.   We also note that NGR 87(2)(b) provides that:

> In determining a rate of return on capital a well accepted approach that incorporates the cost of equity and debt, such as the Weighted Average Cost of Capital, is to be used; and a well accepted financial model, such as the Capital Asset Pricing Model, is to be used. [2]

11.   In this regard, we note that the Capital Asset Pricing Model (CAPM) is an economic model that takes the form of a mathematical equation. One inserts estimates of certain parameters into the CAPM formula and the output is an estimate of the required return on equity. The resulting estimate of the required return on equity is *conditional* on the values of the various parameter estimates that have been used as inputs in the CAPM formula.

12.   As with any such formula, the reliability and reasonableness of the output depends completely on the inputs that have been used in the formula. If unreasonable or inaccurate estimates of the input parameters are inserted into the formula, the resulting output will also be unreasonable or inaccurate.

---

[1] National Gas Rules Version 4, Rule 87(1).
[2] National Gas Rules Version 4, Rule 87(2)(b).

STRATEGIC FINANCE GROUP
S F G   C O N S U L T I N G

13.   In the context of the CAPM, there is considerable uncertainty about the values that should be used as the inputs to the formula. This is particularly the case for the estimates of beta and market risk premium (MRP). If unreasonable estimates of these input parameters are inserted into the formula, the resulting output will also be unreasonable. Symmetrically, if the resulting output is demonstrably unreasonable, one would be led to question whether the values used for the input parameters are reasonable.

14.   In our view, an important step when using the CAPM is to consider the reasonableness of the resulting output (i.e., the estimated required return on equity). If, for some reason, the resulting output is considered to be unreasonable, this should lead to a re-examination of the input parameters that were inserted into the CAPM formula.

15.   To determine whether the output from the CAPM formula is reasonable, and whether it is commensurate with prevailing conditions in the market for funds, one important consideration would be a comparison between the CAPM estimate of the required return on equity and the return on equity that is available to investors in other comparable firms. For example, if the CAPM estimate was materially lower than the return on equity available from other comparable firms, that estimate would not be reasonable or commensurate with prevailing conditions in the market for funds – notwithstanding that it is an estimate that was produced by using the CAPM formula.

Other financial models

16.   We also note that NGR 87(2)(b) uses the CAPM as one example of a "well accepted financial model." If a well accepted model other than CAPM is used to estimate the required return on equity, the same issues about testing for reasonableness would apply. That is, the estimate of the required return on equity from *any* such model is conditional on the input parameter estimates used in the model. No model is capable of automatically correcting for inappropriate or inaccurate input parameters. Consequently, the resulting estimates of the required return on equity should not be mechanically adopted before considering whether they are reasonable and commensurate with the prevailing conditions in the market for funds.

Checks for reasonableness

17.   There is debate and uncertainty about what data and what statistical processes should be used to produce estimates of the input parameters. Reasonable minds may differ on these questions and this will result in different estimates of the required return on equity.

18.   In our view, having adopted a particular data set, chosen a particular statistical method, and produced a particular estimate of the required return on equity, there is no guarantee that this is commensurate with current conditions in the market for funds. For example, if the available data set is too small there is a high probability of spurious results, the statistical method that is chosen may fail to correct for known biases, and so on.

19.   For these reasons, it is our view that any estimate that is produced (using a particular data set and a particular statistical method) should not be mechanically adopted, but should be examined for reasonableness and consistency with the current conditions in the market for funds. For example:

   a.   An estimate of the required return on equity that is lower than the required return on debt for the same firm is nonsensical and must be rejected on the basis that the data or statistical methods that have been used have produced an estimate that defies common sense and is clearly inconsistent with the current conditions in the market for funds;

b. An estimate of the required return on equity that is at historical lows at a time when financial markets are in severe crisis also must be rejected – the particular process that has been used has produced an estimate that is inconsistent with current conditions in the market for funds.

20. Our view is that these sorts of checks for economic reasonableness should be performed on any estimate of the required return on equity and that estimates produced in a CAPM (or other well accepted financial model) framework are not exempt from this.

21. Moreover, our view is that our estimates of the returns that would be available to investors in comparable firms should also be used to assess economic reasonableness. Questions should be raised about any estimate that is substantially below the sort of return that investors might reasonably expect to receive from comparable firms.

22. In summary, our view is that all of the evidence, all of the estimates, all of the checks and tests for economic reasonableness should be considered in a holistic manner. It is inappropriate to mechanically estimate a set of parameters, insert them into a pricing formula, and then to adopt the result without question.

STRATEGIC FINANCE GROUP
SFG CONSULTING

2. Estimates of the required return on equity for comparable firms

Overview and context

23.   The expected return on equity available to investors in comparable firms has three possible components:

   a.   Dividends;

   b.   Capital gains; and

   c.   Dividend imputation franking credits.

24.   We begin by focusing on the return that is available from cash dividends.
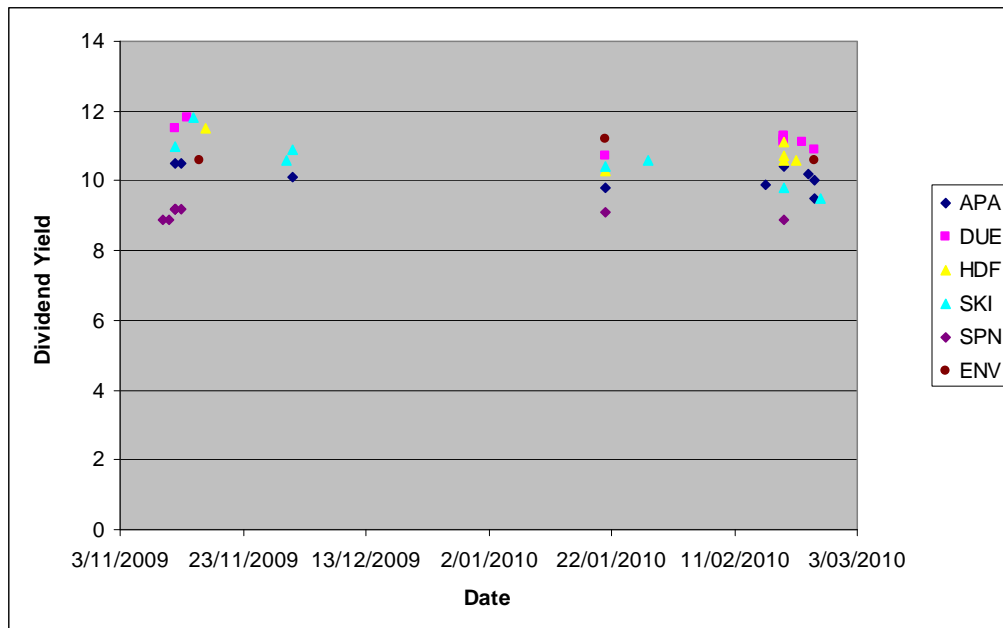
Broker research reports

25.   Equity research analysts from broking houses produce research reports on individual firms on a regular basis. These research reports contain many pieces of information including a forecast of the dividend yield of the particular firm for each of the following three to four years, and a 12-month forecast of the firm's stock price.

26.   We have obtained broker research reports from a number of broking houses including:

   a.   Macquarie Bank;
   b.   UBS;
   c.   Wilson HTM;
   d.   Morgan Stanley;
   e.   Credit Suisse;
   f.   Ballieu Research;
   g.   Goldman Sachs JB Were;
   h.   JP Morgan;
   i.   RBS Morgans; and
   j.   Merrill Lynch.

27.   These reports cover a number of energy infrastructure firms that are engaged in gas and electricity distribution:

   a.   APA Group (APA);
   b.   Hastings Diversified Utilities Fund (HDF);
   c.   Envestra (ENV);
   d.   Spark Infrastructure (SKI);
   e.   SP Ausnet (SPN); and
   f.   DUET Group (DUE) – a part-owner of WAGN.

28.   We note that none of these firms is an exact replica of WAGN, but among all listed firms for which data is available, these are the firms that investors are most likely to consider when assessing the opportunity cost of a capital investment in WAGN. We note in this regard that this same set of firms is usually used as the basis for the estimates of equity beta and credit rating in regulatory determinations. Moreover, in this report, the focus is on dividend yield forecasts and there is little variation in this variable across firms. Consequently, the inclusion or exclusion of a particular firm (on the basis of it being more or less comparable to WAGN) does not have a material effect on the outcomes of the analysis in this report.

STRATEGIC FINANCE GROUP
S F G   C O N S U L T I N G

Dividend yield forecasts

29.   Figure 1 below sets out the most recent dividend yield forecast for 2010 for each firm in the comparables set. The dividend yield is defined as the dividend per share divided by the price per share. For each firm, a number of different broking houses have made forecasts. The dates on the horizontal axis represent the dates on which the various forecasts were made. In each case, we have the most recent forecast from each broker for each firm. The average forecasted 2010 dividend yield (across all firms and all brokers) is 10.4%.

Figure 1. Dividend yield estimate: 2010

Source: Various broker research reports.

30.   Figure 2 below sets out the most recent dividend yield forecast for 2011 for each firm in the comparables set. The average forecasted 2011 dividend yield (across all firms and all brokers) is 10.5%.

Figure 2. Dividend yield estimate: 2011

Source: Various broker research reports.

31.   Figure 3 below sets out the most recent dividend yield forecast for 2012 for each firm in the comparables set. The average forecasted 2011 dividend yield (across all firms and all brokers) is 10.6%.
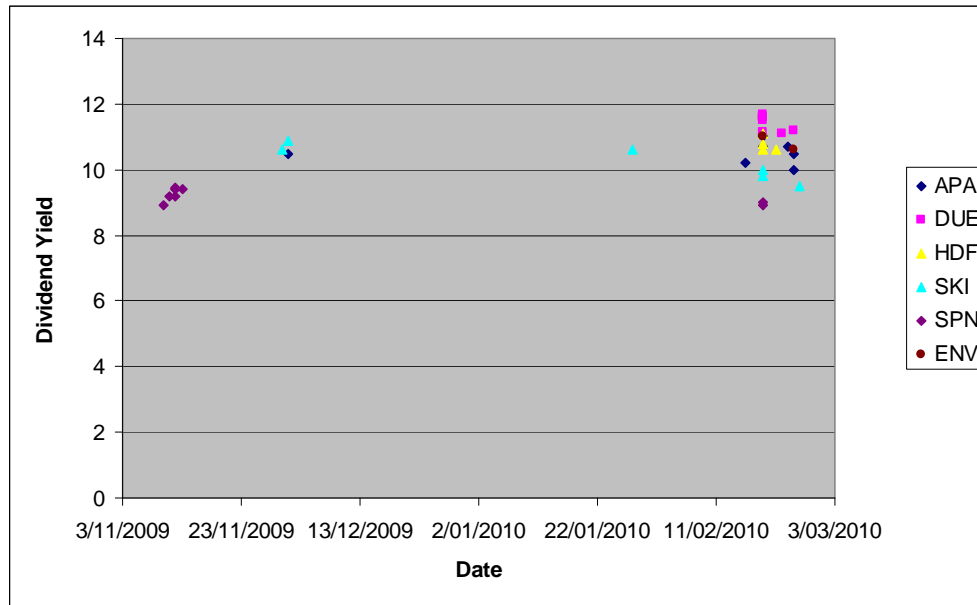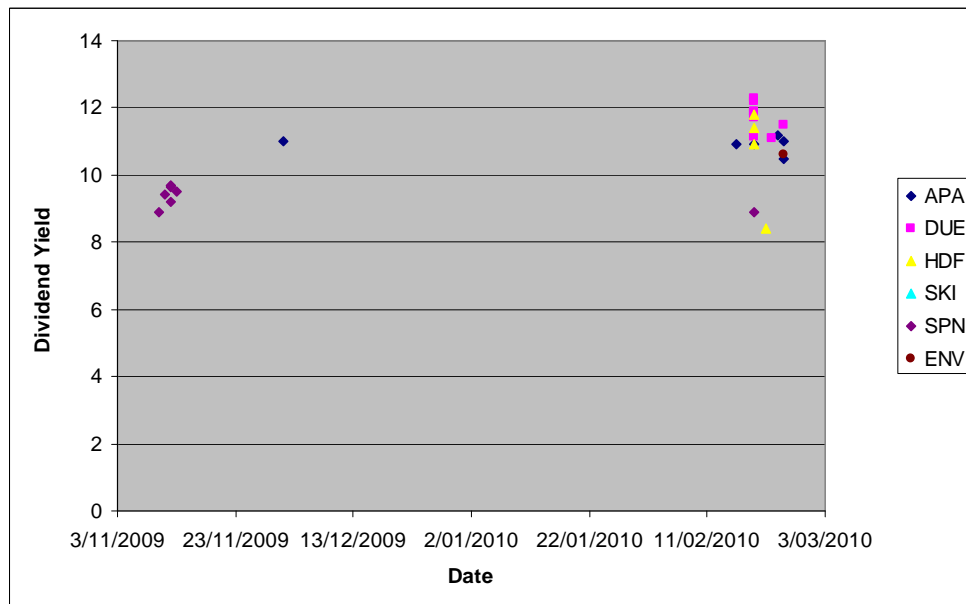
Figure 3. Dividend yield estimate: 2012


Source: Various broker research reports.

32.   Table 1 below summarises the dividend yield forecasts by firm and year. Each cell contains the average dividend yield forecast across brokers.

STRATEGIC FINANCE GROUP
S F G   C O N S U L T I N G

Table 1. Average dividend yield by firm and year

	2010	2011	2012	Average
APA	10.1	10.5	10.9	10.5
DUE	11.2	11.4	11.7	11.4
ENV	10.8	10.8	10.6	10.7
HDF	10.8	10.8	10.6	10.7
SKI	10.6	10.2		10.4
SPN	9.1	9.2	9.4	9.2
Average	10.4	10.5	10.6	10.5

Source: Various broker research reports.

33.   The average forecasted dividend yield (across all firms and all years) is 10.5%. That is, the broker research reports suggest that investors should expect to receive a return in the form of dividends of 10.5% p.a. across the set of comparable firms. This would be one consideration that would be made by investors when deciding whether the allowed return on equity for the regulated firm is sufficient to convince them to commit the requisite amount of equity capital.

34.   Figure 4 shows the consensus dividend yield forecast (i.e., the mean across all broking firms) for each of the comparable firms over recent months. The figure illustrates that there is some variation over time as the broking houses revise their forecasts of future dividends and as stock prices change. Nevertheless, there is reasonable stability in the dividend yield forecasts around our mean estimate of 10.5%. In other words, there is nothing unusual about the most recent data to indicate that that the current estimate of 10.5% is out of the ordinary in any sense.

Figure 4. Consensus dividend yield forecasts for comparable firms

Source: Bloomberg.

STRATEGIC FINANCE GROUP
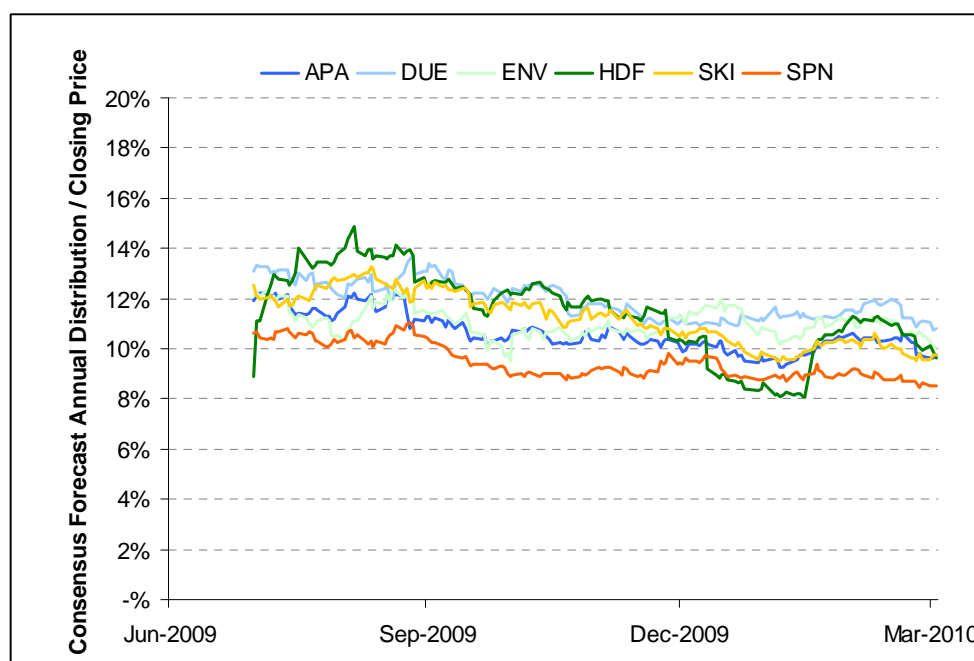
S F G   C O N S U L T I N G

Evidence from recent capital raisings

35.   Another source of data that is used to estimate the implied forward-looking required return on equity comes from actual equity capital raisings. Over the last year, four of the firms in the set of comparables have raised equity and a summary of these transactions is set out in Table 2 below. All of these capital raisings were substantial in size, relative to the pre-issue market cap of the firms, and all were issued at substantial discounts.

Table 2. Average dividend yield by firm and year

Company	Ann. Date	Amount raised	Issue price	Raising as % of market cap	Disc. to close	Dividend guidance provided
Envestra	22-Dec-08	$111m	$0.30	22%	45%	Expectation that current dividend is to be maintained post issue.
DUET Group	1-Apr-09	$265m	$1.30	23%	24%	The Board's expectation now is that the FY2009 final distribution will be 10 cents per Stapled Security and that the FY2010 full-year distribution is expected to be 20 cents per Stapled Security. This distribution guidance reflects the dilutionary impact of the issue of new securities.
SP AusNet	11-May-09	$408m	$0.78	22%	13%	Distribution guidance for FY10 is 8.0 cpss. Distributions beyond FY10 to be determined based on Operating Cash Flow after funding 100% of maintenance capital expenditure and a portion of growth capital expenditure.
Hastings Diversified Utilities Fund	1-Jul-09	$250m	$0.90	99%	24%	Post the Equity Raising FY2009 distribution guidance has been maintained in line with the most recent guidance of $0.12 per security, implying a 13.3% annualised yield on the offer price of $0.90 per New Security.

Source: Macquarie Capital ECM database, Dealogic.

36.   The key piece of information from these capital raisings is the forward-looking dividend yield relative to the offer price. This is the dividend yield on their investment in new shares in the firm that subscribers to the equity issue can expect to receive. This is then an estimate of the dividend yield that the firm must offer in order to attract the requisite amount of equity capital. The forward-looking dividend yield estimates are set out in Figure 5 below.

STRATEGIC FINANCE GROUP

S F G   C O N S U L T I N G

Figure 5. Forward-looking dividend yields from equity capital raisings
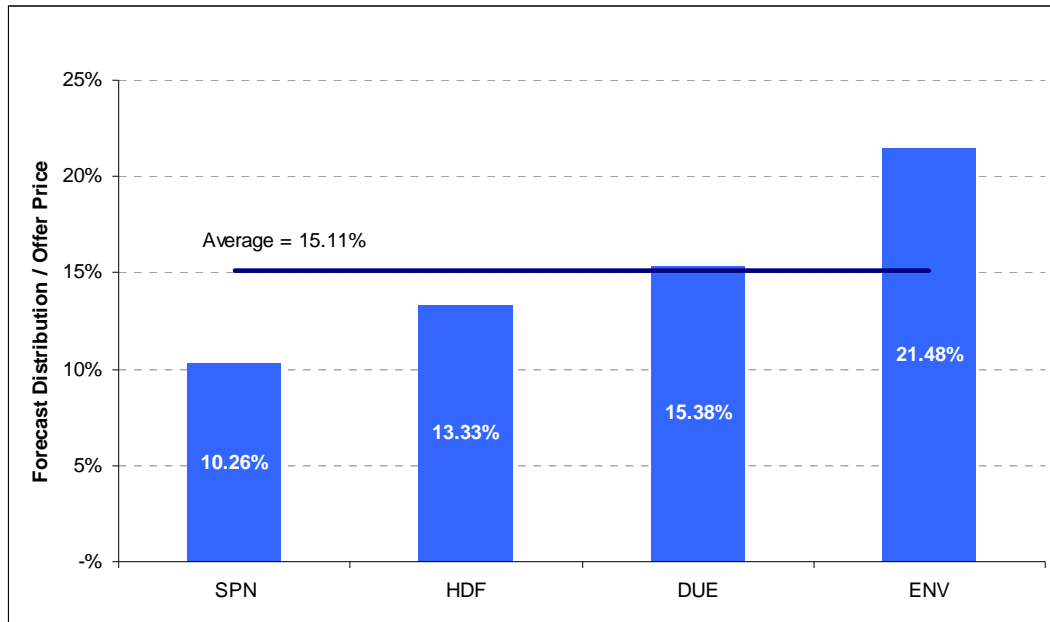
Source: Macquarie Capital ECM database, Dealogic.

37. The forward-looking dividend yields available to providers of new equity to comparable firms over the last year averages more than 15%. The yield in relation to SP Ausnet was 10.3% and yields on other firms were substantially higher than that.

38. There are few observations (four) and they occurred in response to the events unfolding in relation to the Global Financial Crisis. For this reason, we are careful not to place undue reliance on these forward-looking dividend yields. Rather, we note that they are all at or above our trading yield estimate of 10.5%. Consequently, we conclude that if anything is to be drawn from the results in Figure 5, it is that our trading yield estimate of 10.5% may be somewhat conservative.

Capital gain forecasts

39. Figure 6 below shows the most recent forecasted stock price appreciation for each firm in the comparables set. In each case, the forecasted price appreciation is calculated by comparing the current stock price with the broker's 12-month price target. The dates on the horizontal axis represent the dates on which the various forecasts were made. In each case, we have the most recent forecast from each broker for each firm. The average forecasted stock price appreciation (across all firms and all brokers) is 11.3%. This is further summarised in Table 3 below.

STRATEGIC FINANCE GROUP
S F G   C O N S U L T I N G

Figure 6. Forecasted price appreciation from broker research reports
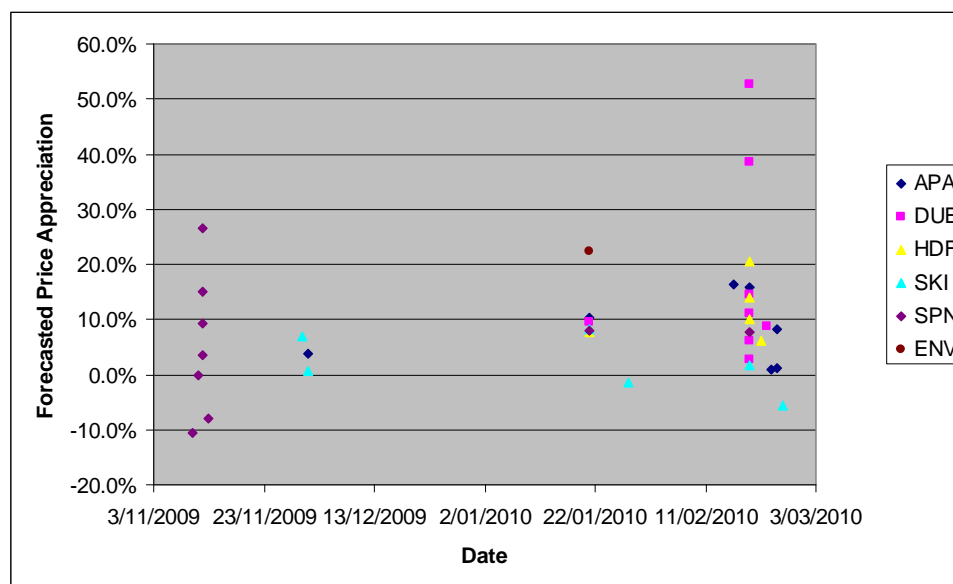
Source: Various broker research reports.

Table 3. Average forecasted price appreciation

	2010
APA	8.1%
DUE	18.1%
ENV	22.4%
HDF	11.7%
SKI	1.8%
SPN	5.7%
Average	11.3%

Source: Various broker research reports.

40. In our view, the forecasted price appreciation estimates are less reliable and should receive less weight than the dividend yield forecasts for a number of reasons:

    a. The price appreciation forecasts are for a 12-month horizon only, whereas the dividend yield forecasts extend out at least three years;

    b. The dividend yield forecasts are tightly clustered – there is relatively little variation across firms, across time, or across brokers. There is more variability in the price appreciation forecasts; and

    c. In general, price appreciation is more difficult to forecast, whereas dividends tend to be much more stable over time. That is, forecasts of future dividends are always likely to be more accurate than forecasts of future stock price changes simply because they are more predictable.

41. For these reasons, we place little weight on the forecasts of price appreciation other than to note that they are uniformly positive on average. That is, the equity research analysts are of the view that the stock prices of the comparable firms will be increasing over time. This implies that the

STRATEGIC FINANCE GROUP

S F G C O N S U L T I N G

return in the form of dividends (i.e., the dividend yield forecasts above) must be considered to be an absolute lower bound for the return available to shareholders in the comparable firms – shareholders will receive the dividend yield and there is expected to be some stock price appreciation in addition to that.

42.   Rather than extrapolating the forecasted one-year stock price appreciation forward through time, we consider a very conservative range of 0-1% for real stock price appreciation. Note that under standard long-term equity valuation models, the growth rate in stock prices is the same as the growth rate in dividends. Consequently, the range of 0-1% real can be thought of as a growth rate in stock prices or dividend payments. The lower end of this range reflects no real growth in which case stock prices and dividends would only increase to keep pace with inflation. The upper end of the range reflects growth of only 1% real, which can be compared with forecasted real growth of 2.5 to 3.5% across the broad economy.[3]

43.   A common estimate for long-run expected inflation is 2.5% -- the mid-point of the target band adopted by the Reserve Bank of Australia. I note that short-term inflation expectations are sometimes recovered by comparing the yields on inflation-protected and standard Commonwealth Government Securities. However, this approach is subject to estimation error as the inflation protected bonds are in relatively short supply and the approach can only yield short-term forecasts. For this reason, we adopt 2.5% as the estimate of forecasted inflation in the remainder of this report.

44.   Consequently the range for nominal growth in share prices or dividends is 2.5% to 3.5%. Although we do not place substantial weight on the share price appreciation forecasts in Table 3 for the reasons set out above, we do note that that a range of 2.5% to 3.5% is certainly not high relative to the values set out in that table.

Implications for the 87(1) test and reasonableness

45.   If investors expect a dividend yield of 10.5% (on average) from comparable firms, and if the expected return in the form of capital gains is considered to be in the range of 2.5% to 3.5% p.a., this amounts to a combined return on equity in the range of 13% to 14% from comparable firms. Consequently, when determining whether a proposed allowed return on equity is commensurate with current conditions in the market for funds, one important consideration is the 13-14% return on equity that investors might reasonably expect to be able to obtain on equity investments in comparable firms.

46.   We also note that this same consideration should be applied when determining whether the estimate of the required return on equity from CAPM (or other well accepted financial model) is reasonable. As set out above, it is our view that estimates of the returns that would be available to investors in comparable firms should be used to assess the economic reasonableness of any formula-based estimate of the required return on equity. Questions should be raised about any estimate that is substantially below the sort of return that investors might reasonably expect to receive from comparable firms.

47.   In summary, our view is that all of the evidence, all of the estimates, all of the checks and tests for economic reasonableness should be considered in a holistic manner. It is inappropriate to mechanically estimate a set of parameters, insert them into a pricing formula, and then to adopt the result without question.

---

[3] OECD Economic Outlook, http://www.oecd.org/dataoecd/7/0/20209193.pdf, GDP growth forecasts for 2010 and 2011 are 2.5% and 3.5% respectively.

STRATEGIC FINANCE GROUP
S F G   C O N S U L T I N G

48.   We do not suggest that the CAPM (or other well accepted financial models) should be abandoned in favour of technique set out above. Our view is that the CAPM or other well accepted financial model must be used, consistent with Rule 87(2). However, the estimate of the required return on equity should be compared with the returns that are apparently available from other comparable firms.

49.   If there is a substantial divergence between the model's estimate and the returns available on comparable firms, one should be led to re-examine the values of the input parameters that were used in the model.

50.   If the original input parameter values and the original estimate of the required return on equity are to be maintained, the proponent should explain why the proposed estimate should be considered to be commensurate with prevailing conditions in the market for funds.

3. Another approach for estimating the required return on equity

Overview and context

51.　The approach set out in the previous section has the advantages of being (a) quite straightforward, and (b) based directly on observable published forecasts from equity analysts. However, dividend yield forecasts are only available 3-4 years in advance and 12-month price targets have an even shorter horizon. A more complete approach would model dividends over a much longer time horizon and would then estimate the discount rate that reconciled the present value of the forecasted dividend stream with current prices. A number of such approaches appear in the valuation literature and are used in practice.

52.　The valuation literature contains a number of papers that use valuation models to back out an implied cost of equity from traded market prices. These papers are usually based on the familiar dividend discount model or the residual income model. Lundholm and O'Keefe (2001) show that these two valuation frameworks are, in effect, identical and are really just different ways of expressing the same thing. In essence, the approach is to take forecasts of future dividends or earnings and to back out the discount rate that reconciles these forecasted cash flows with current market prices. This is then considered to be the implied cost of equity.

53.　When applying this approach, one requires forecasts of future dividends or earnings. It is common to use forecasts from equity analysts for the first two or three years of the forecast period, and then to assume a level of perpetual growth. That is, dividends or earnings are assumed to follow consensus forecasts for 2-3 years and then to grow at a constant rate thereafter.

54.　Some papers set the perpetual growth rate on the basis of historical averages. The problem with this approach is that the implied cost of equity is then *conditional* on the assumed perpetual growth. If growth is assumed to be high, the implied cost of equity will be high and conversely if growth is assumed to be low. Moreover, there is nothing to ensure that the growth level that is assumed by the researcher is in any way consistent with the expected growth that is embedded into current market prices.

55.　The alternative approach is to try to simultaneously estimate growth and the cost of equity. The problem with this approach is that dividends and earnings are based on analyst forecasts, and this may not be reflected in the current stock price. Suppose analysts are generally of the view that a particular stock is undervalued. In other words, the average analyst has valued the stock and believes that it is worth more than the current stock price. In this case, reconciling the analysts' forecast of dividends or earnings with the current stock price requires a higher discount rate than that which the analyst believes to be appropriate. It may be that the stock is indeed undervalued – that the present value of dividends or earnings is indeed higher than the current stock price. But it may be that analysts are systematically optimistic about the stock. In either case, there is a disconnect between the analysts' forecasts and the current stock price and the implied cost of equity will be a biased estimate.

56.　There are two ways around this problem. First, the sample could be restricted to those firms for which analysts have neither a "buy" nor "sell" recommendation – that is, firms that the analysts believe to be broadly trading at fair value. But this restricts the usefulness of the approach. The alternative is to reconcile the future dividends or earnings that have been forecast by the analysts with the target stock prices set by the same analyst. Under this approach, it does not matter whether the current stock price is under- or over-valued because it is not used. It also does not matter that analysts might be systematically optimistic and pessimistic about a particular stock,

because that same optimism or pessimism will be reflected in the dividend or earnings forecast *and* the target price for that stock.

57.   A summary of the relevant research in this area is set out in Table 4 below.

Table 4. Key literature on the cost of capital implied by market prices

Reference and data period	Growth assumption
Papers where long-term growth assumptions are imposed on the analysis	
Gordon and Gordon (1997): 1983 – 1993	After a three-year explicit forecast horizon, it is assumed that each firm's ROE will revert to its cost of equity capital over varying lengths of time (0, 5, 7, 10, 20 and infinity years)
Claus and Thomas (2001): 1985 – 1998	After the explicit forecast horizon (5 years), long-term residual income for all firms is assumed to grow at the expected inflation rate (defined as the risk-free rate less 3 per cent)
Gebhardt, Lee and Swaminathan (2001): 1979 – 1995	After the explicit forecast horizon (2 years), a firm's ROE is assumed to gradually revert to historical industry median ROE over 12 years
Gode and Mohanram (2003): 1984 – 1998	In a residual income model, a firm's expected ROE in the 3rd year is assumed to gradually revert to the historical industry median ROE on a straight-line basis by the 12th year. In the Ohlsson-Juettner model, after adopting an explicit forecast horizon of 5 years,[4] company earnings are assumed to grow at the long-term economic growth rate of 3 per cent.
Fama and French (2002): 1951 – 2000	Long-term growth equals historical dividend growth or historical earnings growth.
Chen, Jorgensen and Yoo (2004): 1993 – 2001	Residual income remains constant into perpetuity after 2 years; ROE to historical industry median ROE over 12 years.
Botosan and Plumlee (2005): 1983 – 1993	Assume that the market's expectations for dividends per share over the next three years and the median long-term terminal stock price exactly match those of Value Line analysts
Papers where long-term growth assumptions and the cost of capital are jointly estimated	
Easton (2004): 1981 – 1999	OLS regression and price-earnings growth (PEG) model applied to portfolios formed according to their PEG ratio.
Easton, Taylor, Shroff and Sougiannis (2002): 1981 – 1999	OLS regression and residual income applied to broadly defined stock portfolios (for example, the Dow Jones Industrial Average, financials)

Residual income model

58.   We have applied the residual income model of Ohlson (1986) as set out in Fitzgerald, Gray, Hall, and Jeyaraj (2010):

$$V_0 = BVPS_0 + \sum_{t=1}^{T} \frac{(ROE_t - r_e) \times BVPS_{t-1}}{(1+r_e)^t} + \frac{(ROE_T - r_e) \times BVPS_{T-1} \times (1+g)}{(r_e - g) \times (1+r_e)^T}$$

---

[4] In calculating their "short-term" growth rate, Gode and Mohanram (2003) use an average of the growth rate between EPS_1 and EPS_2 and the annualised five year growth estimate from the I/B/E/S consensus files. As such, they effectively use consensus analyst earnings forecasts for 5 years.

STRATEGIC FINANCE GROUP
S F G   C O N S U L T I N G

where V_0 is the estimated value per share; $BVPS_0$ is the current book value per share provided by Worldscope; $BVPS_t = BVPS_{t-1} + EPS_t - DPS_t$ where DPS_t is estimated as the historical dividend payout ratio multiplied by EPS_t; r_e is the cost of equity capital; ROE_t is the expected ROE in year t, computed from analyst EPS forecasts for two years and then estimated to revert to a long-term ROE assumption (ROE_T) over the remaining years of the explicit forecast period; g is the perpetual growth in residual income after the explicit forecast period; and T is the length of the explicit forecast period (ten years, including two years of explicit EPS forecasts and eight years of derived EPS forecasts).

59.   Our approach is then to simultaneously estimate perpetual growth (g), the long-tern return on book equity (ROE_T), and the cost of equity capital. (r_e). For each stock, we choose values of these parameters that best reconcile the analyst forecasts earnings with the analyst target prices for that same stock. The details of the estimation method are set out in Fitzgerald, Gray, Hall, and Jeyarav (2010).

Results for comparable firms

60.   We have applied the approach set out above to the set of comparable firms that was analysed in the previous section. We have used two data sets for this purpose: analyst forecasts from the I/B/E/S database [5] and the set of broker research reports that was used in the previous section. The results from both analyses are set out below.

61.   Table 5 displays the results from the I/B/E/S data. The results suggest that the average implied required return on equity is 13.6% p.a., which is consistent with the range of 13-14% derived above. Note that there is not a new estimate every quarter for every firm. We include a new estimate for a firm only when we have three or more analysts making a report within the quarter. If fewer than three analysts revise their forecasts in a particular quarter, we do not report an estimate for that firm in that quarter.

Table 5. Estimates of the cost of equity capital for listed energy network businesses from 1 October 2006 to 31 December 2009 derived from I/B/E/S data (%)

Quarter	r_f	Cost of equity capital						Equity risk premium					
		APA	DUE	HDF	SPN	SKI	Avg	APA	DUE	HDF	SPN	SKI	Avg
31Mar07	5.9	7.0	16.0				11.5	1.1	10.1				5.6
30Jun07	6.1						.						
30Sep07	6.1	9.0	15.0	15.0			13.0	2.9	8.9	8.9			6.9
31Dec07	6.2				17.0		17.0				10.8	.	10.8
31Mar08	6.2	13.0	16.0			12.0	13.7	6.8	9.8			5.8	7.4
30Jun08	6.5												
30Sep08	6.1												
31Dec08	4.9		17.0				17.0		12.1				12.1
31Mar09	4.3	12.0	16.0				14.0	7.7	11.7				9.7
30Jun09	5.1	13.0	20.0		12.0	10.0	13.8	7.9	14.9		6.9	4.9	8.7
30Sep09	5.5	7.0	7.0	20.0		11.0	11.3	1.5	1.5	14.5		5.5	5.7
31Dec09	5.5				11.0		11.0				5.5		5.5
Average	5.7	10.2	15.3	17.5	13.3	11.0	13.6	4.7	9.9	11.7	7.7	5.4	8.0

---

[5] I/B/E/S is a commercial database of analyst forecast data that is commonly used in academic and practitioner research.

STRATEGIC FINANCE GROUP
S F G   C O N S U L T I N G

62.   Table 6 reports the implied return on equity using the broker research reports that were used in the previous section. The results suggest that the average implied required return on equity is 14.0% p.a., which is also consistent with the estimated range of 13-14% above.

63.   We note that the dispersion across firms is greater in this case as we have a smaller sample of analyst forecasts. We also note that the degree of variation across firms is not dissimilar to the variation that is obtained when estimating equity betas. Even after equity betas are re-geared to be on a comparable basis, there is often substantial variation across firms. This then leads to substantial variation in estimates of the cost of equity, as is also the case in Table 6 below. In both cases, it is important to consider the set of estimates in totality. For example, when estimating beta for use in the CAPM, it is common even for an individual company that is one of the firms in the comparable set to adopt an equity beta that is an average across the portfolio, rather than the individual estimate for that particular firm. This recognises that individual estimates are imprecise, and that the imprecision can be reduced by considering the sample of comparables as a whole.

64.   Consequently, we focus on the average implied cost of equity, which is 14%. We note that the average across the sample is not dissimilar to the results for the I/B/E/S data above and with the estimate from the previous section.

Table 6. Estimates of the cost of equity capital listed energy network businesses from 12 November 2009 to 25 February 2010 derived from individual analyst reports (%)

Firm	r_e
APA	14%
DUE	17%
HDF	17%
SKI	4%
SPN	18%
Average	14%

Conclusions

65.   In light of the two sets of results set out in this section, we conclude that a reasonable range for the return on equity (from dividends and capital gains) that investors might reasonably expect to be able to obtain from comparable firms is 13-14%. Consequently, when determining whether a proposed allowed return on equity is commensurate with current conditions in the market for funds, one important consideration is the 13-14% return on equity that investors might reasonably expect to able to obtain on equity investments in comparable firms.

Potential bias in analyst forecasts

66.   We note that there is empirical evidence that the earnings forecasts of equity analysts are somewhat optimistic on average.[6] One approach that has been used to infer the required return on equity is to solve for the discount rate that equates the present value of forecasted earnings (or dividends) with the current stock price. If the forecasted earnings series is systematically optimistic, a higher discount rate will be needed to reconcile their present value with the current stock price. This point is made by Easton and Sommers (2007) and others.

---

[6] See, for example, Easton and Sommers (2007), Dugar and Nathan (1995) and Richardson, Teoh, and Wysocki (2004).

STRATEGIC FINANCE GROUP

S F G   C O N S U L T I N G

67. But this is *not* what we have done in the analysis set out above. We are well aware of the documented forecast bias and have used a methodology that is not contaminated by it. Our approach is to reconcile the future earnings forecasts of an individual analyst with the present target stock price of that same analyst. We then aggregate over all analysts and all stocks in our sample. The resulting estimates of the required return on equity are not contaminated by any optimism bias because individual analyst earnings forecasts are reconciled with the present value target price of the same analyst. Consequently, even if an individual analyst does suffer from an optimism bias, that same bias is present in their earnings forecasts and target price.

68. The mistake that has been made by previous research is to attempt to reconcile analyst forecasts of future earnings with current observable stock prices. This apples-with-oranges comparison does result in upwardly biased estimates of the required return on equity – but it should be clear that this is not what we have done.

4. Application to Draft Decision

69.   The ERA recently released its Draft Decision on WAGN's proposed access arrangements. In that Draft Decision, the ERA proposed to use the Sharpe-Lintner CAPM to estimate the required return on equity. The ERA further proposed the following point estimates:

$$r_e = r_f + \beta \times MRP$$
$$= 5.16\% + 0.8 \times 6\%$$
$$= 9.96\%.$$

70.   We note (from above) that the current dividend yield on the set of comparable firms is presently 10.5%. Consequently, the only requirement for investors to be able to earn a higher return from the comparable firms (relative to the return that is available from WAGN's regulated assets) is that the comparable firms do not cut their dividend payments in the future. That is, even if investors forecast zero stock price appreciation in the comparable firms (not even maintaining their real value), they will still obtain a higher return from comparable firms than would be available from WAGN's regulated assets. This raises questions about whether the ERA's estimate of the required return on equity is commensurate with prevailing conditions in the market for funds.

71.   In its Draft Decision, the ERA does recognise that its estimates of the CAPM input parameters are subject to some uncertainty. The ERA notes that it has previously considered that a reasonable range for MRP is 5-7%[7] and that equity beta estimates in past regulatory decisions have ranged between 0.8 and above 1.0.[8] These ranges produce estimates of the required return on equity as set out in Table 7 below.

Table 7. CAPM estimates of the cost of equity capital

Parameter	Draft Decision point estimate	Lower bound	Upper bound
Risk-free rate	5.16%	5.16%	5.16%
Equity Beta	0.8	0.8	1.0
Market risk premium	6%	5%	7%
Required return on equity	9.96%	9.16%	12.16%

72.   In our view, if one determines that the Sharpe-Lintner CAPM is to be used to estimate the required return on equity, one important consideration is whether the input parameter values that are adopted produce a final estimate that is consistent with prevailing conditions in the market for funds.

73.   In our view, final estimates of the total required return on equity that are below even the current dividend yield on comparable firms are not consistent with prevailing conditions in the market for funds. This requires either:

   a.   A revision to one or more input parameters, so that the revised values (selected from within the range that is considered to be reasonable) produce an estimate of the required return on equity that *is* consistent with current conditions in the market for funds; or

---

[7] Draft Decision, Paragraphs 590-592, p. 108.
[8] Draft Decision, Table 18, p. 134.

STRATEGIC FINANCE GROUP
S F G C O N S U L T I N G

b. A detailed explanation as to why the proposed estimate of the required return on equity can be, in light of the apparent evidence to the contrary, considered to be already consistent with current conditions in the market for funds.

5. Conclusions

74. Our key conclusions are as follows:

a. The expected dividend yield on the set of comparable firms is approximately 10.5% p.a. We obtain this estimate from the forecasts set out in the research reports of equity analysts from major broking houses. We examine forecasts for the same set of comparable firms that are traditionally used by regulators to estimate equity beta and credit ratings. We note that the forecasts are consistent across time (2010-2012), across firms, and across broking houses;

b. The forecast dividend yields on comparable firms have been quite stable at this level over recent times;

c. The dividend yields that are available on new equity raised by the set of comparable firms are substantially higher than 10.5% on average. This implies that our estimated dividend (based on traded prices for existing shares) is, if anything, conservative;

d. The dividend yield is only one component of the return available to shareholders. Shareholders may also benefit from stock price appreciation or capital gains. If stock prices are assumed to increase at a real rate of 0-1% p.a., and if expected inflation is 2.5% p.a., the combined return from dividends and capital gains would be in the range of 13-14%;

e. We apply a simultaneous estimation technique to jointly estimate the required return on equity and expected long-term growth. This is done in a way that reconciles an analyst's dividend and long-term growth forecasts with that same analyst's price target. This analysis also produces estimates in the range of 13-14% for the required return on equity (from dividends and capital gains) for the set of comparable firms; and

75. An important consideration when determining whether a proposed regulatory return on equity, r_e, is consistent with the National Gas Rules is a comparison between that allowed regulatory return on equity and the return on equity that is available to investors in other comparable firms. Final estimates of the total required return on equity that are below even the current dividend yield on comparable firms are not consistent with prevailing conditions in the market for funds. This requires either:

a. A revision to one or more input parameters, so that the revised values (selected from within the range that is considered to be reasonable) produce an estimate of the required return on equity that *is* consistent with current conditions in the market for funds; or

b. A detailed explanation as to why the proposed estimate of the required return on equity can be, in light of the apparent evidence to the contrary, considered to be already consistent with current conditions in the market for funds.

References

Botosan, C., and M. Plumlee, 2005. "Assessing alternative proxies for the expected risk premium," *Accounting Review,* 80(1): 21–53.

Bradshaw, B., 2004. "How do analysts use their earnings forecasts in generating stock recommendations?" *Accounting Review,* 79:25–50.

Chen, F., B.N. Jorgensen and Y.K. Yoo, 2004. "Implied cost of equity capital in earnings-based valuation: international evidence," *Accounting and Business Research,* 34: 323–344.

Cheng, Q., 2005. "What determines residual income?" *Accounting Review,* 80(1): 85–112.

Claus, J., and J. Thomas, 2001. "Equity premia as low as three percent? Evidence from analysts' earnings forecasts for domestic and international stock markets." *Journal of Finance,* 56(5): 1629–1666.

Dimson, E., P. Marsh and M. Staunton, 2006. "The worldwide equity premium: A smaller puzzle," European Finance Association Meetings, Zurich.

Dugar, A. and S. Nathan, 1995, "The Effect of Investment Banking Relationships on Financial Analysts' Earnings Investment Recommendations," *Contemporary Accounting Research*, (12), 131.

Easton, P., 2004. "PE ratios, PEG ratios, and estimating the implied expected rate of return on equity capital," *Accounting Review,* 79(1): 73–95.

Easton, P., G. Taylor, P. Shroff and T. Sougiannis, 2002. "Using forecasts of earnings to simultaneously estimate growth and the rate of return on equity investment," *Journal of Accounting Research,* 40(3): 657–676.

Easton, P. D. and G. A. Sommers, 2007, "Effect of Analysts' Optimism on Estimates of the Expected Rate of Return Implied by Earnings Forecasts", *Journal of Accounting Research*, (45), 983.

Fama, E., and K. French, 2002. "Equity risk premium," *Journal of Finance,* 57(2): 637–659.

Fitzgerald, Tristan, Stephen Gray, Jason Hall and Ravi Jeyaraj, 2010. "Unconstrained estimates of the equity risk premium," Working paper, The University of Queensland, http://ssrn.com/abstract=1551748.

Gode, D., and P. Mohanram, 2003. "Inferring the cost of capital using the Ohlson–Juettner model," *Review of Accounting Studies,* 8: 399–431.

Gordon, J., and M. Gordon, 1997. "The finite horizon expected return model," *Financial Analysts Journal,* 53(3): 52–61.

Gray, S., J. Hall, D. Klease and A. McCrystal, 2009. "Bias, stability and predictive ability in the measurement of systematic risk," *Accounting Research Journal,* 22(3): 220 – 236.

Loh, R., and M. Mian, 2006. "Do accurate earnings forecasts facilitate superior investment recommendations?" *Journal of Financial Economics,* 33(1): 3–56.

Lundholm, R., and T. O'Keefe, 2001. "Reconciling value estimates from the discounted cash flow model and the residual income model," *Contemporary Accounting Research,* 18(2): 311–335.

Ohlson, J.A., 1995. "Earnings, Books Values and Dividends in Equity Valuation," *Contemporary Accounting Research,* 11: 661–687.

Richardson, S., S. H. Teoh and P. D. Wysocki, 2004, "The Walk-down to Beatable Analyst Forecasts: The Role of Equity Issuances and Insider Trading Incentives", *Contemporary Accounting Research*, (21), 885.