Energex

Supplementary Response to AER Draft Decisions re return on equity and Gamma

February 2015

energex

positive energy

On 30 January 2015 Energex made submissions to the AER in response to the AER's Issues Paper on the Queensland electricity distributor regulatory proposals for the period 2015-16 to 2019-20. Energex made submissions on some of the key issues associated with the rate of return raised by the AER in the Issues Paper including the AER's reference to its Draft Decisions for the NSW and ACT energy network businesses (the **Network Businesses**). Energex foreshadowed in that submission that it was undertaking further analysis which would be presented to the AER in the coming weeks. The Draft Decisions are clearly significant in this context. Given the timing and complexity of the Draft Decisions, it was not possible to fully consider them in time for the lodgement of the 30 January submission. Energex is lodging this further information to supplement its submissions in response to the AER's Issues Paper.

1 Return on equity

1.1 Summary

The National Electricity Rules (**NER**) require the return on equity to be estimated such that it contributes to the achievement of the rate of return objective, having regard to prevailing conditions in the market for equity funds. The NER also require that regard be had to relevant estimation methods, financial models, market data and other evidence.

The NER relating to the return on equity have recently been amended, most importantly with the explicit intention of ensuring that the AER takes relevant estimation methods, models, market data and other evidence into account when estimating the required return on equity.[1] In making these changes to the NER, the Australian Energy Markets Commission (**AEMC**) considered that a high quality rate of return estimate would be one that uses all relevant evidence and methods, and that such an approach would be best placed to achieve the National Electricity Objective (**NEO**) and the revenue and pricing principles.[2]

Energex considers that it is clear that what is now required under the NER is an approach to estimating the return on equity that is not tied to a single model or estimation procedure (as was previously required under the NER, being the Capital Asset Pricing Model (**CAPM**)[3]). There is no longer any requirement or predisposition to using the CAPM to estimating the return on equity. Not only do the amendments to the NER remove such a requirement or predisposition, the amendments and the reasons given for them indicate that there should not be continued exclusive reliance on the CAPM.[4]

The approach to estimating the return on equity must take into account all relevant evidence, and where that evidence is relevant and probative as to the required return on equity, give it a direct role in the estimation process. This is the interpretation that best achieves the NEO, as it ensures that the return on equity properly reflects the return required to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers.

The method that the AER has proposed to adopt in the Draft Decisions will not deliver a return on equity estimate that reflects prevailing market conditions and which contributes to the achievement of the rate of return objective and the NEO. The AER's proposed approach is affected by critical errors of fact and errors of logic, including:

- the AER's foundation model approach appears to proceed on the incorrect assumption that one return on equity model will be superior to others;

[1] AEMC, *Rule Determinations: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012; National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, 29 November 2012, p. 57.
[2] AEMC, *Rule Determinations: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012; National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, 29 November 2012, p. 56-57.
[3] NER version 52; NGR version 13.
[4] See in particular: AEMC, *Rule Determinations: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012; National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, 29 November 2012, p. 57.

- the AER has erred in concluding that the Sharpe Lintner CAPM (**SLCAPM**) is superior to other relevant return on equity models;
- the AER has incorrectly concluded that its application of the SLCAPM will deliver an unbiased return on equity estimate;
- the AER has failed to adequately have regard to all relevant estimation methods, financial models, market data and other evidence – specifically, the AER has identified certain material as relevant but then failed to give it any meaningful role in its estimation of the return on equity. In several cases, the AER's method and reasons for rejecting this other evidence (or relegating it to an indirect role) are illogical and unreasonable. For example, the AER's concern that the dividend discount model (**DDM**) leads to "very high" estimates (relative to the SLCAPM) reflects an unreasonable treatment of this evidence;
- the AER has erred in its estimation of the SLCAPM equity beta. Neither the AER's range nor its point estimate are supported by empirical evidence;
- an implicit or necessary finding made by the AER is that adopting the top of its range for the SLCAPM equity beta will adequately correct for any bias or other deficiencies in the SLCAPM. There is no evidentiary basis for this finding;
- the AER has failed to take into account relevant and current evidence in relation to the market risk premium (**MRP**), and therefore its estimate of this parameter will not reflect prevailing market conditions;
- the AER has misinterpreted evidence from the Wright approach, by treating this as an alternative implementation of the CAPM rather than as evidence in relation to the MRP;
- the AER's method of adjusting for the value of imputation credits is incorrect. As a result, the AER's return on equity estimate is not consistent with the estimate of the value of imputation credits; and
- the AER has erred in concluding that its return on equity estimate is consistent with other market evidence.

Energex's original regulatory proposal supported the application of a multi-model approach, as applied by the Network Businesses that are subject to the Draft Decisions. The multi-model approach uses all relevant models to derive an estimate of the required return on equity, while other relevant evidence is used to determine the best estimate of each parameter within these models.

However, to the extent that the AER continues to apply the SLCAPM as the foundation model, in its own proposal Energex has demonstrated how it needs to be applied in order to satisfy the requirements of the NER and NEL and provide a return on equity estimate that reflects prevailing market conditions. This involves giving other relevant models and evidence a more prominent role in estimating the SLCAPM's parameters. As would be expected, this results in the same outcome that would apply under the multi-model approach because it ensures that these other relevant estimation methods, financial models, market

data and other evidence are ascribed an appropriate role (and degree of influence) in estimating the required return on equity.

In contrast to the AER's approach, Energex's approach to estimating the SLCAPM, which achieves the same outcome as the multi-model approach submitted by the Network Businesses subject to the Draft Decision, provides for a return on equity that is sufficient to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers.

Accordingly, Energex considers that its approach to estimating return on equity is clearly preferable in terms of making a contribution to the achievement of the NEO.

1.2 Requirements of the NER and Law

The key aspects of the NER and National Electricity Law (**NEL**) relating to the return on equity are summarised below:

- Clause 6.5.2 of the NER requires that the return on equity be estimated such that it contributes to the achievement of the rate of return objective. The objective is that the rate of return for a service provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of standard control services.

- In estimating the return on equity, regard must be had to the prevailing conditions in the market for equity funds.[5]

- Regard must also be had to several relevant matters, including:[6]
  - relevant estimation methods, financial models, market data and other evidence;
  - the desirability of using an approach that leads to the consistent application of any estimates of financial parameters that are relevant to the estimates of, and that are common to, the return on equity and the return on debt; and
  - any interrelationships between estimates of financial parameters that are relevant to the estimates of the return on equity and the return on debt.

- Clause 6.5.2 of the NER requires consistency between the approaches to estimating the rate of return and the value of imputation credits;[7]

- As with all of its economic regulatory functions and powers, when assessing Energex's proposal under the NER and NEL, the AER is required to do so in a manner that will or is likely to contribute to the achievement of the NEO.[8] Further, where there are two or more possible decisions in relation to Energex's proposal that will or are likely to contribute to the achievement of the NEO, the AER is

[5] NER, clause 6.5.2(g)
[6] NER, clause 6.5.2(e)
[7] NER, clause 6.5.2(d)(2)
[8] NEL, s 16(1)(a)

required to make the decision that the AER is satisfied will or is likely to contribute to the achievement of the NEO to the greatest degree;[9]

- To the extent the AER's decision on the return on equity involves the exercise of a discretion, the AER must take into account the revenue and pricing principles in section 7A of the NEL.10 The revenue and pricing principles include that a service provider should be provided with a reasonable opportunity to recover at least its efficient costs and a price or charge for the provision of a direct control network service should allow for a return commensurate with the regulatory and commercial risks involved in providing the direct control network service to which that price or charge relates;

- Clause 6.5.2 of the NER was amended in November 2012 to remove any requirement or preference in favour of a particular model. These changes to the NER were directed at ensuring that all relevant models and market data are taken into account, in order to ensure that best estimate of the rate of return is arrived at. The AEMC was clearly seeking to avoid formulaic rate of return estimation driven by a single model or estimation method, such as the SLCAPM.[11] The AEMC observed that all financial models (including the SLCAPM) are based on certain theoretical assumptions and all have varying degrees of weaknesses, and as such, no one model can be said to provide the right answer.[12] The AEMC therefore considered that estimates are likely to be more robust and reliable if they are based on a range of estimation methods, financial models, market data and other evidence.

- Energex considers that it is clear that what is now required under the NER is an approach to estimating the return on equity that is not tied to a single model or estimation procedure. The approach to estimating the return on equity must take into account all relevant evidence, and where that evidence is relevant and probative as to the required return on equity, give it a direct role in the estimation process;

- This is the interpretation that best achieves the NEO, as it ensures that the return on equity properly reflects the return required to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers.

It is in this context that Energex makes these submissions responding to the AER's Draft Decisions, which are directly relevant to its own proposal in relation to the return on equity, which is currently being considered by the AER.

[9] NEL, s 16(1)(d)(i)
[10] NEL, s 16(2)(a)(i)
[11] AEMC, *Draft Rule Determinations: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012; National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, August 2012, p. 47.
[12] AEMC, *Draft Rule Determinations: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012; National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, August 2012, p. 48.

1.3 Response to the AER Draft Decision

1.3.1 Outline of the AER's reasoning

The AER's Draft Decisions in relation to the return on equity are based on the following reasoning:

1 The AER considers that the SLCAPM should be used as the foundation model to estimate the return on equity. Energex understands that the AER's reasons for adopting this approach are as follows:

(a) the SLCAPM is the current standard asset pricing model of modern finance both in theory and in practice;[13]

(b) the SLCAPM is superior to all other models considered by the AER, in terms of estimating the return on equity of the benchmark efficient entity;[14]

(c) use of the SLCAPM as the foundation model will not result in a downward biased estimate of the cost of equity capital;[15]

(d) use of alternative models will not lead to an outcome which better achieves the rate of return objective.[16] The AER expresses a number of concerns in relation to these alternative models.

2 An equity beta of 0.7, when applied in the SLCAPM, will deliver a return on equity that contributes to achievement of the rate of return objective. The AER considers that:[17]

(a) a reasonable range for the equity beta is 0.4 to 0.7;

(b) additional information taken into account by the AER – specifically empirical estimates for international energy networks and the theoretical principles underpinning the Black CAPM – indicate that an equity beta at the top of this range is appropriate.

3 An MRP of 6.5% reflects prevailing market conditions and contributes to achievement of the rate of return objective.[18] The AER's approach differs from the approach employed by the Network Businesses and Energex in that:

(a) the AER does not agree that the Wright approach should be used to estimate the MRP. This is because the AER considers that the Wright approach is an alternative implementation of the CAPM, designed to produce information at the return on equity level;

[13] Draft Decision, [3-27].
[14] Draft Decision, [3-27], [3-47].
[15] Draft Decision, [3-47].
[16] Draft Decision, [3-27].
[17] Draft Decision, [3-30]
[18] Draft Decision, [3-29].

(b) the AER does not agree that independent valuation reports should inform MRP estimation (only the overall return on equity);

(c) the AER adopts a different interpretation of the historical excess returns data;

(d) the AER does not agree with SFG's construction of the DGM;

(e) the AER takes into account survey evidence and conditioning variables.

4 The return on equity estimate from the SLCAPM is broadly supported by:[19]

(a) estimates using the Wright approach;

(b) estimates from other market participants, including practitioners and regulators, particularly estimates used in Grant Samuel's recent report for Envestra;

(c) the fact that it is above the prevailing return on debt; and

(d) the fact that the regulatory regime to date has been supportive of investment.

This reasoning is based on a number of errors of fact and logic, which are described in detail below. As a consequence of these errors, the return on equity determined by the AER will not contribute to the achievement of the rate of return objective and does not reflect prevailing conditions in the market for equity funds. For reasons discussed below, the return on equity derived from the AER's approach will be below what is required to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers.

1.4 Choice of return on equity models

1.4.1 The foundation model approach

The AER's 'foundation model' approach appears to proceed on the assumption that one return on equity model will be demonstrated to be clearly superior to others, such that it can be used as the 'foundation model'. This can be seen from the AER's rate of return guideline, which, for the return on equity, provides that a model be used as a "foundation model".[20] This approach may be characterised as being "cart before horse" as whether or not one model or estimation method will emerge as standing "head and shoulders" above all others cannot be determined until all relevant material has been identified and assessed.

The assumption that there will be one model or estimation method that is clearly superior to all others, and the finding that in fact there is one such model (the SLCAPM), is not supported by the evidence before the AER. On the contrary, a detailed examination and

[19] Draft Decision, [3-32] – [3-34].

[20] AER, *Rate of Return Guideline*, December 2013, pp 12-13.

comparison of the sources of information reveals that each return on equity model has strengths and weaknesses, and that no one model can said to be superior to others. In such circumstances, where there is no basis upon which to distinguish between the sources of information, it is incorrect and unreasonable to adopt a "foundation" model approach.

After considering the strengths and weaknesses of various models, SFG concludes:[21]

> *"Because all of the models have different strengths and weaknesses along different dimensions, it is impossible to identify one superior model that alone would out-perform the combined evidence of all of the relevant models."*

The recent changes to Clause 6.5.2 of the NER were at least partly driven by a recognition that the NER should not prescribe a particular model, because no one model can be said to be clearly superior. The AEMC explicitly recognised that all financial models (including the SLCAPM) are based on certain theoretical assumptions and all have varying degrees of weaknesses, and as such, no one model can be said to provide the right answer.[22] The AEMC therefore considered that estimates of the return on equity are likely to be more robust and reliable if they are based on a range of estimation methods, financial models, market data and other evidence.[23]

The AER's foundation model approach – which presupposes the superiority of one model – appears to run contrary to the AEMC's intent. Through its foundation model approach the AER seeks to lock in one model, largely to the exclusion of others. While the AER states that it has taken into account information from two other models, it is done so only to inform its estimation of foundation model parameters but even then the way it which it has applied these models assigns them little if any practical weight. Ultimately the AER has only had regard to the return on equity estimate from one model – its foundation model – while the return on equity estimates of all other relevant models have been disregarded.

In summary, Energex considers that the AER's starting premise – that a superior model can be identified – is, at least at this stage given the existing models and their various stages of development, both factually incorrect and contrary to the stated intent of the recent rule changes. There is no evidence to support this premise, and the evidence before the AER points to a contrary conclusion.

As it has previously submitted, Energex's application of a 'modified' SLCAPM in its regulatory proposal does not mean that Energex endorses the SLCAPM as the superior model, nor does it endorse sole reliance on this model as a foundation model. Instead, it has focussed on what return on equity estimate satisfies the requirements of the NER and NEL having regard to prevailing market conditions and how this can be estimated using all relevant models and evidence to inform the parameters of the SLCAPM.

---

[21] SFG, *The required return on equity for regulated gas and electricity network businesses*, June 2014, [370] referred to in SFG *The required return on equity: Initial review of the AER drat decisions* January 2015 p46.
[22] AEMC, *Draft Rule Determinations: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012; National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, August 2012, p. 48.
[23] AEMC, *Draft Rule Determinations: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012; National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, August 2012, p. 48.

1.4.2 The AER has erred in finding that the SLCAPM is the clearly superior model

The AER states that the SLCAPM is the clearly superior model to use as the foundation model.[24] However no evidence is cited in support of this statement, and Energex is not aware of any evidence that supports this view.

The evidence before the AER in fact shows that the SLCAPM has known weaknesses. In particular, as discussed below, the SLCAPM is known to produce downwardly biased estimates of the required return on equity for low-beta stocks.

Energex notes that neither Handley nor McKenzie and Partington, in their reports for the AER, state that the SLCAPM is superior to other models. Energex is not aware of any expert report before the AER which expresses this view.

Indeed McKenzie & Partington observe:[25]

> *"…the [SLCAPM] has its weaknesses, but these are well documented and in many cases can either be diagnosed or perhaps compensated for in empirical practice."*

As discussed below, it is not clear whether the AER has sought to compensate for the known weaknesses of the SLCAPM, as suggested by McKenzie & Partington, or whether it has simply ignored them. To the extent that the AER has sought to compensate for these weaknesses, by taking the upper bound of its equity beta range, it cannot reasonably be satisfied it has adequately compensated for their effect, because it does not seek to analyse or quantify this effect.

McKenzie & Partington also state:[26]

> *"The final estimate of the expected return on equity may have regard to a broad range of relevant material including a range of multifactor models such as the Fama and French (1993) and the APT of Ross (1976), inter alia. Many of these competing models nest this foundation model and so potentially make more use of available information."*

Certainly McKenzie and Partington do not appear to view the SLCAPM as superior to all other models. Rather they acknowledge the weaknesses of the model and recommend that any estimate of the return on equity may take into account a wider range of models, including the Fama French model (**FFM**).

Associate Professor Handley also acknowledges the critical weakness of the SLCAPM, noting:[27]

> *"An apparent weakness of the Sharpe-CAPM is the empirical finding, for example by Black, Jensen and Scholes (1972) and Fama and French (2004), that the relation*

---

[24] Draft Decision, [3-171].
[25] Michael McKenzie and Graham Partington, *Report to the AER – Part A: Return on Equity*, October 2014, p 9.
[26] Michael McKenzie and Graham Partington, *Report to the AER – Part A: Return on Equity*, October 2014, p 9.
[27] John C Handley, *Advice on the Return on Equity: Report prepared for the Australian Energy Regulator*, 16 October 2014, p 5.

between beta and average stock returns is too flat compared to what would otherwise be predicted by the Sharpe-CAPM – a result often referred to as the low beta bias."

As noted by SFG in its report accompanying Energex's regulatory proposal, there is substantial evidence demonstrating that the SLCAPM provides a poor fit to the observed data.[28] Some of the key empirical evidence demonstrating weakness in the SLCAPM is summarised in Table 1 below.

Table 1: Summary of key empirical evidence in relation to SLCAPM performance

Study	Key conclusions
Black, Jensen and Scholes (1972)[29]	Black, Jensen and Scholes (1972) tested the SLCAPM theory against empirical data. Their results indicated that the empirical relationship between systematic risk exposure and returns was not consistent with SLCAPM theory. The relationship in the empirical data indicated a higher intercept and flatter slope than that indicated by the SLCAPM. The authors conclude that their results appeared to be strong evidence favouring rejection of the traditional form of the asset pricing model (i.e. the SLCAPM).
Friend and Blume (1970)[30]	The empirical analysis by Friend and Blume (1970) indicates that low-beta stocks generate higher returns than the SLCAPM would suggest and high-beta stocks tend to generate lower returns than the SLCAPM predicts.
Fama and Macbeth (1973)[31]	Fama and Macbeth (1973) empirically test the assumption of the SLCAPM that the return on a zero-beta asset will be equal to the risk-free rate. Consistent with the earlier findings of Black, Jensen and Scholes (1972), they conclude that this assumption is not supported by the empirical data.
Rosenberg, Reid and Landstein (1985)[32]	The study by Rosenberg, Reid and Landstein, as well as other studies identified a number of SLCAPM anomalies, where stock-specific characteristics seemed related to differences in returns. In particular, the book equity value divided by the market equity value (book-to-market ratio) appeared to be related to variation in returns.
Fama and French (1992)[33]	Fama and French (1992) demonstrated relationships between returns and book-to-market and size factors which are not accounted for in the SLCAPM.

[28] SFG, 2014 ENERGEX *Estimating the required return on equity,* August, p.7. Refer also: SFG, *The required return on equity for regulated gas and electricity network businesses*, June 2014, [46]–[60].
[29] Black, F., M.C. Jensen, and M. Scholes, 1972, "The Capital Asset Pricing Model: Some empirical tests," in *Studies in the Theory of Capital Markets*, Michael C. Jensen, ed., New York: Praeger, 79–121.
[30] Friend, I., M. Blume, 1970, "Measurement of Portfolio Performance under Uncertainty," *American Economic Review*, 60, 561–75.
[31] Fama, E.F., J.D. MacBeth, 1973, "Risk, return, and equilibrium: Empirical tests," *Journal of Political Economy*, 81, 607–636.
[32] Rosenberg, B., K. Reid, and R. Lanstein (1985), "Persuasive evidence of market inefficiency," *Journal of Portfolio Management* 11, 9-17.
[33] Fama, E.F. and K.R. French (1992), "The cross-section of expected stock returns," *Journal of Finance* 47, 427-466.

Brealey, Myers and Allen (2011)[34]	A recent study by Brealey, Myers and Allen confirms the findings of earlier studies, such as the study by Black, Jensen and Scholes (1972), that the pattern of empirical data is not consistent with what the SLCAPM would predict.
NERA (2015)[35]	Based on Australian data, and using both in-sample and out-of-sample tests, NERA conclude that there is evidence of bias in the SLCAPM. NERA states that the evidence indicates that the SLCAPM significantly underestimates the returns generated by low-beta portfolios and overestimates the returns generated by high-beta portfolios. In other words, the model has a low-beta bias. The extent to which the SL CAPM underestimates the returns to low-beta portfolios is both statistically and economically significant.

The body of empirical literature relating to identified weaknesses in the SLCAPM, and the development of alternative models to overcome the well-recognised deficiencies in this model, is discussed at some length by the Nobel Prize Committee, in the explanatory material accompanying the award of the Nobel Prize for contributions to this field.[36] The Committee observes that by the end of the 1970s, the empirical support for the SLCAPM was increasingly being questioned in a number of studies, including those referred to above.

In light of the above evidence, the AER cannot rationally conclude that the SLCAPM is superior to all other models. The evidence clearly shows that the SLCAPM has weaknesses and that there are alternative models available, some of which have been designed to address such weaknesses.

1.4.3 The AER has erred in finding that the SLCAPM will produce unbiased estimates

The AER considers the issue of potential bias in the SLCAPM in the Draft Decision, but concludes:[37]

> "*We do not consider the use of the SLCAPM as the foundation model will result in a downward biased estimate of the cost of equity capital*."

Elsewhere in the Draft Decision the AER states that:[38]

> "*There is no compelling evidence [that] the return on equity estimate from the SLCAPM will be downward biased given our selection of input parameters*."

It is not entirely clear from these statements whether the AER has found that:

[34] Brealey, R.A., S.C. Myers, and F. Allen, 2011, *Principles of Corporate Finance*, 10th ed., McGraw-Hill Irwin, New York, NY, USA.
[35] NERA, *Empirical Performance of Relevant Models for Estimating the Return on Equity*, February 2015.
[36] Economic Sciences Prize Committee of the Royal Swedish Academy of Sciences, *Understanding Asset Prices: Scientific Background on the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2013*, 14 October 2013, section 7.
[37] Draft Decision, [3-171].
[38] Draft Decision, [3-47].

1 in general, the SLCAPM will produced unbiased estimates of the required return on equity (**Finding 1**); or

2 to the extent that the SLCAPM may produce biased estimates, the AER's selection of input parameters adequately corrects for any bias (**Finding 2**).

It must be that the AER has made Finding 1 or Finding 2, in order for it to be satisfied that its approach will deliver a return on equity which contributes to achievement of the rate of return objective.

Energex considers that Finding 1 would involve a critical error of fact. Empirical evidence clearly demonstrates that the SLCAPM will lead to downward biased estimates of the return on equity for low-beta stocks. This empirical evidence includes the work of Black, Jensen and Scholes (1972), Friend and Blume (1970) and Fama and Macbeth (1973) referred to above.[39]

Further evidence of bias in SLCAPM estimates of the return on equity is provided with this submission. The accompanying expert report by NERA, using Australian data, demonstrates that that there is evidence of bias in the SLCAPM. [40] NERA concludes that the evidence indicates that the SLCAPM significantly underestimates the returns generated by low-beta portfolios and overestimates the returns generated by high-beta portfolios. In other words, the model has a low-beta bias. The extent to which the SL CAPM underestimates the returns to low-beta portfolios is both statistically and economically significant.

If the AER has made Finding 2 – i.e. if the AER acknowledges that there is bias in the SLCAPM but believes that it has corrected for this bias – Energex considers that there can be no reasonable basis for such a finding. The AER does not seek to quantify the effect of such bias, nor does it make any transparent adjustment to its SLCAPM parameter estimates to correct for bias.

The AER does make an adjustment to its equity beta estimate, from what it refers to as "the best empirical estimate" of this parameter. However it is not clear whether this adjustment is intended to correct for bias in the SLCAPM. In any event, given that the AER does not seek to quantify the effect of SLCAPM bias, it cannot reasonably be satisfied that this adjustment adequately corrects for such bias.

Indeed the AER appears to acknowledge that its equity beta estimate should be adjusted upwards to correct for bias in the SLCAPM, but says it cannot ascertain by how much it needs to adjust its estimate. The AER does not calculate a specific uplift to its beta to correct for SLCAPM bias, but instead makes an arbitrary upward adjustment in the hope that this will adequately account for the issue that it has identified. The AER states:[41]

> *"We consider the theoretical principles underpinning the Black CAPM demonstrate that market imperfections could cause the true (unobservable) expected return on equity to*

[39] SFG, 2014 ENERGEX. *Estimating the required return on equity,* August .
[40] NERA, *Empirical Performance of Relevant Models for Estimating the Return on Equity*, February 2015.
[41] Draft Decision, [3-266].

vary from the SLCAPM estimate. For firms with an equity beta below 1.0, the Black CAPM may predict a higher expected return on equity than the SLCAPM. We use this theory to inform our equity beta point estimate, and consider it supports an equity beta above the best empirical estimate implied from Henry's 2014 report. ***However, while the direction of this effect may be known, the magnitude is much more difficult to ascertain.*** *We do not consider this theory can be used to calculate a specific uplift to the equity beta estimate to be used in the SLCAPM."* [emphasis added]

Ultimately, the AER adopts the top of its selected range for the SLCAPM equity beta – in effect, the AER makes an upward adjustment to the equity beta, from what it refers to as the "best empirical estimate" to the upper limit of its range. However given that the AER has not sought to quantify the effect of SLCAPM bias, it cannot reasonably be satisfied that choosing the top of its equity beta range will adequately correct for such bias.

Energex considers that selecting the top of the AER's equity beta range will not adequately correct for the bias in the SLCAPM indicated by Black CAPM theory. If the AER's parameter estimates are used in the Black CAPM along with the best available estimate of the zero-beta premium, the return on equity estimated by the Black CAPM is above the return on equity estimated by the AER using the SLCAPM (and adopting the upper limit of its equity beta range). Table 2 below shows that even if the AER's lower bound beta value is used in the Black CAPM, the resulting return on equity estimate is still above the AER's SLCAPM estimate using the upper bound beta value. If the AER's "best empirical estimate" of beta is used in the Black CAPM, the resulting return on equity estimate is significantly above the AER's SLCAPM estimate using the upper bound beta value. This indicates that if the AER were to properly adjust its SLCAPM beta estimate to account for the bias in the SLCAPM indicated by Black CAPM theory, the resulting beta would need to be higher than 0.7.

Table 2: Comparison of SLCAPM and Black CAPM return on equity estimates[42]

Model	Return on equity estimate
SLCAPM – equity beta 0.7; MRP 6.5%	8.1%
Black CAPM – equity beta 0.4 (AER lower bound); MRP 6.5%	8.2%
Black CAPM – equity beta 0.5 (AER "best estimate"); MRP 6.5%	8.5%
Black CAPM – equity beta 0.7 (AER upper bound); MRP 6.5%	9.1%

The approach submitted by the Network Businesses addresses the effect of bias by employing the SLCAPM along with other relevant models (the multi-model approach) to estimate the return on equity. In its regulatory proposal, Energex put forward a modified approach to estimating the return on equity using the SLCAPM which would take into account the effect of bias in the SLCAPM. This uses an equity beta that is properly adjusted to account for the limitations of the SLCAPM. Based on advice from SFG, the equity beta was effectively adjusted so that the limitations of the SLCAPM are accounted for in the same

[42] All calculations are based on a risk-free rate of 3.55% (as used in the Draft Decision) and a Black CAPM zero-beta premium of 3.34% (as estimated by SFG).

way as if the other relevant models were used in combination with the SLCAPM (i.e. the multi-model approach), some of which have been specifically developed to overcome this issue of bias. This is preferable to the AER's approach, which clearly does not properly account for the effect of SLCAPM bias.

1.4.4 Matters considered by the AER in assessing SLCAPM bias

The AER does not undertake any empirical testing for bias in the SLCAPM, nor does it appear to consider the available research on this issue (i.e. the research referred to above).

Rather, the AER states that in considering the issue of potential bias in its SLCAPM estimate, it took into account:[43]

- whether there is evidence that previously determined rates of return have discouraged investment;
- whether the equity risk premium appears appropriate;
- if anything the AER is doing appears inconsistent with common practice;
- if input parameters appear reasonable.

The first of these considerations – whether previously determined rates of return have discouraged investment – is irrelevant and does not provide any basis for finding that the SLCAPM is unbiased. This is not an approach that is used in academic studies or market practice to test for model bias. Rates of return in previous periods have been estimated with different input parameters (in particular, a higher equity beta) and in different market conditions (with higher prevailing risk-free rates). Therefore levels of investment in past periods under different rate of return settings does not provide a rational basis for concluding that the SLCAPM, as applied by the AER in the Draft Decision, will produce unbiased estimates of the return on equity for the forthcoming period.

The appropriateness of the equity risk premium and consistency with common practice (the second and third considerations) are discussed in section 1.7 below. In short, Energex does not consider that the evidence presented in the Draft Decision supports the AER's view that its allowed equity risk premium is reasonable and consistent with market practice.

Finally, the reasonableness of input parameters used by the AER is discussed in sections 1.5 and 1.6. For reasons set out below, Energex does not consider that the AER's choice of parameter estimates is supported by the empirical evidence. However even if these parameter estimates were reasonably based, this would not alleviate the issue of bias in the SLCAPM. The empirical evidence shows that the SLCAPM will produce biased estimates of the return on equity even with the best estimates of each parameter.

In short, none of the considerations referred to by the AER support a finding that its SLCAPM estimate of the return on equity will be unbiased.

[43] Draft Decision, [3-50].

1.4.5 The AER has erred in its findings in relation to other available models

The AER raises a number of concerns with the other available return on equity models. Given these concerns, the AER decides to give these alternative models either no role in its determination of the return on equity, or a very limited role.

The key concerns raised by the AER are:

- alternative models are sensitive to input assumptions and choices around estimation periods and methodologies;
- some alternative models are not empirically reliable;
- some alternative models are not designed to estimate ex ante returns;
- some alternative models (particularly the FFM) lack theoretical foundation;
- some alternative models (particularly the Black CAPM) are not widely used by market practitioners, academics or regulators;
- some alternative models produce return on equity estimates that appear "very high".

For reasons discussed below, Energex considers that each of these concerns is unfounded. In several cases, the AER's method and reasons for rejecting this other evidence (or relegating it to an indirect role) are illogical and unreasonable and/or apply equally to the SLCAPM.

1.4.5.1 Complexity and sensitivity of models to assumptions

A key concern raised by the AER in relation to alternative return on equity models is that they are sensitive to inputs assumptions and methodological choices. For example the AER considers that the DGM is highly sensitive to assumptions around the risk free interest rate and growth rate of dividends.[44] In relation to the FFM, the AER identifies a range of different methodological choices which might lead to different results.[45]

Simply observing that a return on equity model is sensitive to input assumptions and methodological choices does not provide a basis for rejecting that model or giving a very limited role. All return on equity models—including the SLCAM—are sensitive to input assumptions. This is why it is important to estimate all model parameters as accurately as possible.

The same concern could be expressed in relation to the SLCAPM. Clearly the results produced by the SLCAPM could vary widely depending on one's choice of input parameters and the methodologies used to estimate those parameters. Just based on the AER's ranges for the equity beta and MRP set out in the Draft Decision (and holding the risk-free rate

[44] Draft Decision, [3-60].
[45] Draft Decision, [3-55].

constant), the return on equity produced by the SLCAPM could range from 5.6% to 9.1%.[46] This wide range of values arises due to different approaches that could be taken to estimating the MRP, and different methodological and data choices which could be made in estimating the MRP or beta.

1.4.5.2 Reliability of empirical estimates

A particular concern raised by the AER in relation to the Black CAPM is that estimates of the return on equity will be unreliable, because there is no reliable method to obtain an estimate of the zero-beta premium.

The AER's concern appears to be that, because different estimation techniques have produced varying estimates of the zero-beta premium, it cannot rely on any empirical estimates of this parameter. The AER states:[47]

> *While we consider SFG's latest estimate of the zero beta premium appears more plausible, we remain of the view that the large range of zero beta estimates by consultants for the NSPs indicates the model is unsuitable to use to estimate the RoE of our benchmark efficient entity.*

Besides noting that it is 'plausible', the AER has not sought to test the robustness or reliability of SFG's proposed value for the zero-beta premium. Instead, the AER has dismissed SFG's estimate on the basis that there are other differing estimates, some of which are 'implausible'.

Energex considers that this is an illogical and unreasonable approach to assessment of the proposed Black CAPM parameter values and return on equity estimate. The AER cannot reasonably conclude that *all* estimates of the zero-beta premium are unreliable, just because *some* estimates of this parameter appear implausible. The same logic could be used to dismiss just about any return on equity model, including the SLCAPM, to the extent that some estimates of the MRP or equity beta are considered unreliable.

In using all relevant models and evidence to inform population of the SLCAPM for the purpose of Energex's regulatory proposal, the SFG analysis on which it relied used SFG's estimate of the zero-beta premium and required return on equity from the Black CAPM in estimating the return on equity. It is noted that SFG's estimate of the zero-beta premium has also been applied by the Network Businesses.

The AER must consider SFG's estimates and assess whether adopting these estimates would (either alone or in combination with other models or methods) contribute to the achievement of the rate of return objective. The AER cannot simply reject a proposal on the basis that there are other estimates of Black CAPM parameters (which have not been relied upon) which the AER considers to be implausible.

---

[46] That is, adopting a range for the MRP of 5.1% - 7.8% and a range for the equity beta of 0.4 – 0.7.
[47] Draft Decision, [3-183].

Instead of seeking a reliable estimate of the Black CAPM zero-beta premium, the AER has effectively assumed this to be zero (by relying solely on the SLCAPM to estimate the return on equity). Energex considers that this is an unreasonable approach, in circumstances where the AER has identified the Black CAPM to be a relevant model. Given that the Black CAPM is clearly a relevant model, a proper examination should be undertaken into what the best estimate for the zero-beta premium is and this value should be used unless it is so unreliable that assuming a value known to be incorrect (a zero value) is a preferable outcome.

1.4.5.3 Lack of theoretical foundation

The AER has again raised a concern in relation to the theoretical foundation for the FFM.

Energex notes that this concern has been addressed in original proposals submitted by the Network Businesses and the supporting expert reports of SFG[48], as well as in Energex's Response to Issues Paper.[49] As explained by SFG, the general theoretical foundation for the FFM is the same as for the SLCAPM, in that both models posit that there is a linear relationship between the expected return of a particular stock and the expected return of a mean-variance efficient portfolio. The only difference is that the CAPM (as implemented in practice) assumes that the relevant stock market index is mean-variance efficient, whereas the FFM posits that the stock market index needs to be supplemented by two additional factor portfolios to produce a mean-variance efficient benchmark.

The basis for development of the FFM was in studies documenting the empirical failings of the SLCAPM. These studies documented that when the stock market index is used as the only factor the model does not fit the data, but when the additional FFM factors are included the model does fit the data.

The theoretical and empirical foundation for the FFM is discussed at some length by the Nobel Prize Committee, in the explanatory material accompanying the award of the Nobel Prize to Eugene Fama for contributions to this field.[50]

1.4.5.4 Models not designed to estimate ex ante returns

The AER expresses a concern in relation to the FFM that the model "*is not clearly estimating ex ante required returns*".[51]

It is curious that this criticism is only levelled at the FFM, given that theoretical foundation for the FFM is the same as for other asset pricing models, including the SLCAPM and Black CAPM. The key objective of all asset pricing models is to explain the cross section of stock returns. The basis for development of the FFM (and also the Black CAPM) was in studies documenting the failure of the SLCAPM to adequately explain variations in returns.

---

[48] SFG, *The Fama-French model*, 13 May 2014, pp 27-30; SFG, *Using the Fama-French model to estimate the required return on equity,* February 2015.
[49] SFG *The required return on equity: Initial review of the AER draft decisions* January 2015 p45
[50] Economic Sciences Prize Committee of the Royal Swedish Academy of Sciences, *Understanding Asset Prices: Scientific Background on the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2013*, 14 October 2013, section 7.
[51] Draft Decision, [3-52].

The reason for using any asset pricing model is that the historically observed relationships between returns, risk and other factors may be expected to continue in future. In this regard, the rationale for using the FFM is no different to the rationale for the SLCAPM or Black CAPM.

1.4.5.5 Models not widely used

The AER's concern that alternative models are not widely used has been addressed at length in the proposals submitted by the Network Businesses and by Energex in its Response to Issues Paper. SFG notes that the FFM has gained acceptance among corporate finance practitioners and courts, as well as academics.[52] SFG also observes that both the Black CAPM and DDM are commonly used in rate of return regulation cases in other jurisdictions.[53]

In relation to the FFM, the Nobel Prize Committee recently observed that:[54]

> *"Empirically, the Fama-French approach has provided an effective way to simplify and unify the vast literature on the cross section of stock returns, and their method has been widely used both as a reference model for academic research and as a practical guide for professional investors."*

While it is true that these alternative models are yet to gain acceptance among Australian regulators, it is clear that they are widely used by academics, market practitioners and overseas regulators and that they are market respected.

1.4.5.6 "Very high" return on equity estimates

A further concern raised by the AER in relation to the DDM is that:[55]

> *"The very high RoE estimates from SFG's DGM model, equating to an equity beta of 0.94 in the SLCAPM, appear inconsistent with the low risk nature of regulated natural monopoly businesses with very low elasticity of demand for their services, and the results in Professor Olan Henry's 2014 report."*

The AER appears to be suggesting that, because the return on equity estimates produced by the DDM are higher than those produced by the SLCAPM (with the AER's preferred parameter values), the DDM estimates cannot be relied on.

This is an irrational and illogical approach to assessing the reliability of DDM estimates of the return on equity. This approach assumes that the SLCAPM estimates are accurate and reliable, and thus can be used as the benchmark to test the plausibility or reliability of

---

[52] SFG, *The Fama-French model*, 13 May 2014, pp 17-22 referred to in SFG *The required return on equity: Initial review of the AER draft decisions* January 2015 p45

[53] SFG, *The required return on equity for regulated gas and electricity network businesses*, 6 June 2014, p 40 referred to in SFG *The required return on equity: Initial review of the AER draft decisions* January 2015 p45

[54] Economic Sciences Prize Committee of the Royal Swedish Academy of Sciences, *Understanding Asset Prices: Scientific Background on the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2013*, 14 October 2013, p. 40.

[55] Draft Decision, [3-189].

estimates from other models. Adopting similar logic, one could conclude that the SLCAPM is unreliable because it produces estimates that are "very low" when compared to the DDM and other models.

Alternatively, it may be that the AER considers that an implied equity beta of 0.94 would be "too high", because it is above its own estimate of that parameter. However there are two problems with such reasoning:

- first, this assumes that the AER's equity beta analysis is correct, and that any estimate which differs from its estimate of 0.7 must be incorrect. The AER appears to consider that its estimate is more likely to be correct, because it accords with their assumption that energy businesses are in general "low risk".

  However simply asserting that energy businesses are generally "low risk" does not provide a basis for preferring one equity beta estimate over another, particularly where both of these estimates are less than one. If the AER believes that energy network businesses are "low risk", all this would indicate is that the equity beta is likely to be less than one.

  In any event, Energex does not agree that low elasticity of demand for energy services indicates that network businesses are "low risk". It is well recognised that the relevant risks to a business include both operating and financial risks. Even if the AER considers the operating risk of energy networks to be relatively low (compared to the average firm), it must be recognised that financial risk is relatively high, due to high leverage. Therefore the AER cannot reasonably conclude that overall, energy network businesses are "low risk".[56]

- more fundamentally, there is an implicit assumption that the SLCAPM will deliver unbiased estimates of the return on equity. If the SLCAPM is in fact delivering downward biased estimates (as indicated by the empirical evidence referred to above) then the implied equity beta needed to deliver a DDM-equivalent result must include an uplift to account for this bias. In other words, if there is a bias in the SLCAPM that is not accounted for in the AER's equity beta of 0.7, this will contribute to a higher equity beta being needed to deliver a DDM-equivalent result.

The AER is required to have regard to all relevant estimation methods, financial models, market data and other evidence.[57] The AER cannot reject relevant financial models simply on the basis that the results they produce are inconsistent with the results of the AER's preferred model. Where two or more relevant models produce conflicting results, it is incumbent on the AER to assess each of the models on their merits and on that basis decide how their results are to be taken into account in determining the return on equity.

When faced with two models which produce differing results there are three possible hypotheses:

[56] This issue is discussed further in the ENA's submission to the AER equity beta issues paper (ENA, *Response to the Equity Beta Issues Paper of the Australian Energy Regulator*, 28 October 2013, pp 14-20).
[57] NER, clause 6.5.2(e)(1)

1 The model producing the lower estimate is accurate and unbiased, while the other model is upwardly biased or has been incorrectly applied;

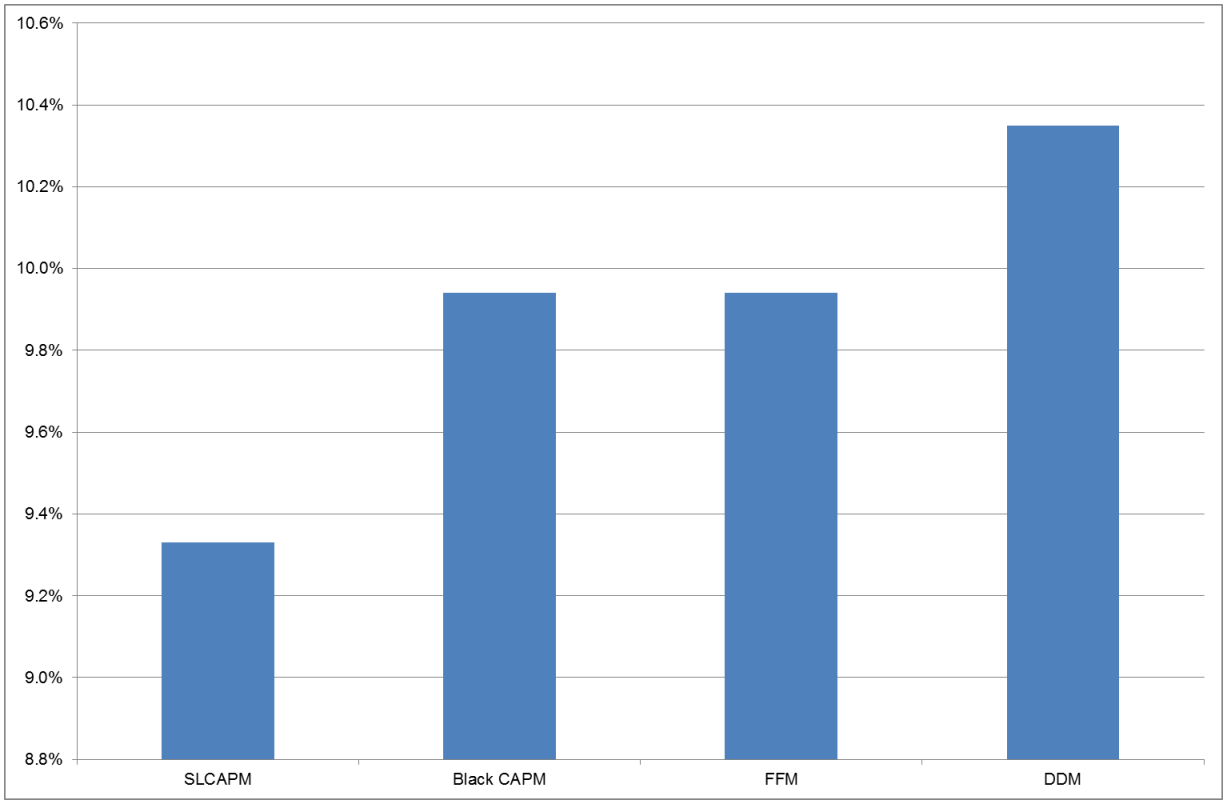
2 The model producing the higher estimate is accurate and unbiased, while the other model is downwardly biased or has been incorrectly applied; or

3 There is a degree of error or imperfection in both models, and the correct outcome lies somewhere between or outside the two.

The AER has clearly not tested these possible hypotheses. Rather, the AER appears to have assumed that the first hypothesis is correct – i.e. that the SLCAPM is reliable and the DDM is not – without any rational basis. This is despite other evidence that suggests that either the second or third hypothesis is more likely to be correct. As noted above, there is empirical evidence that the SLCAPM will produce downwardly biased estimates of the SLCAPM for low-beta stocks.

In any event, it is not clear that the DDM return on equity estimate is "very high", when compared to the results of other relevant models. As shown in Figure 1 below, SFG's updated DDM estimate is only 0.6% above the FFM and Black CAPM estimates. It should be noted that the SLCAPM estimate is below the FFM and Black CAPM estimates by the same margin (0.6%). Thus, it could similarly be said that the SLCAPM estimate appears "very low" when compared to the results of the other three models.

Figure 1: Return on equity estimates from relevant models[58]



1.5 Determination of the SLCAPM equity beta

The AER concludes that an equity beta of 0.7, when applied in the SL-CAPM, will deliver a return on equity that contributes to achievement of the rate of return objective. The AER finds that:

- a reasonable range for the equity beta is 0.4 to 0.7;
- additional information taken into account by the AER – specifically empirical estimates for international energy networks and the theoretical principles underpinning the Black CAPM – indicate that an equity beta at the top of this range is appropriate.

This section addresses each of these findings.

1.5.1 The AER has erred in its determination of the equity beta range

The AER considers that the empirical studies show "*an extensive pattern of support*" for an equity beta within a range of 0.4 to 0.7.[59] This finding is inconsistent with the body of evidence before the AER, including evidence from the AER's own consultant.

[58] SFG, *The required return on equity for the benchmark efficient entity*, February 2015, section 5.

Professor Henry, in his report for the AER, does not recommend a range for the equity beta of 0.4 to 0.7. Rather, Professor Henry concludes, based on his analysis of Australian data only (as instructed by the AER):[60]

> *"In the opinion of the consultant, the majority of the evidence presented in this report, across all estimators, firms and portfolios, and all sample periods considered, suggests that the point estimate for β lies in the range 0.3 to 0.8."*

Energex notes that Professor Henry does not appear to have been asked for his opinion as to the best estimate of the equity beta for the relevant benchmark business. Rather, Professor Henry appears to have been asked to undertake a confined empirical analysis using a defined dataset containing nine specified Australian businesses.[61] However even this confined analysis does not support the AER's equity beta range.

The AER's finding as to appropriate beta range is also inconsistent with estimates from SFG based on a larger sample of businesses. SFG estimates an equity beta of 0.82 based on a broader sample of businesses, including international businesses.[62]

For reasons previously explained, Energex considers that the dataset used for estimating the equity beta should include international businesses. As noted by the AER, there is a trade-off between increasing the sample size (thus improving the reliability of estimates) and ensuring that only businesses that are comparable to the benchmark entity are included. In this case, Energex considers that it is clearly preferable to broaden the sample to include international businesses. As noted by SFG:[63]

- a sample including domestic businesses only is too small, meaning that the resulting statistical estimates are likely to be unreliable. The set of Australian businesses that Professor Henry was instructed to use includes only nine businesses, of which five are no longer listed (and therefore can no longer be used to estimate beta). Professor Henry reports some evidence of instability in his study based on Australian data only, possibly due to the small sample size.[64] SFG states that the estimates based exclusively on the small sample of domestic comparators are statistically unreliable;[65]
- due consideration has been given to the comparability of international businesses, and SFG has concluded that the businesses included in its sample are sufficiently comparable such that they can be appropriately used as part of the dataset to estimate the equity beta range.

---

[59] Draft Decision, [3-267].
[60] Olan T Henry, *Estimating β: An update*, April 2014, p 63.
[61] Olan T Henry, *Estimating β: An update*, April 2014, p 4.
[62] SFG, *Beta and the Black Capital Asset Pricing Model*, February 2015, section 4. In this report SFG provides updated estimates using the same methodology as in its previous report (SFG, *Equity beta*, 12 May 2014). These updated estimates are identical to SFG's original estimates.
[63] SFG, *Regression-based estimates of risk parameters for the benchmark firm*, 24 June 2013 referred to in SFG 2014 ENERGEX. *Estimating the required return on equity,* August p82.
[64] Olan T Henry, *Estimating β: An update*, April 2014, p 62.
[65] SFG, *Beta and the Black Capital Asset Pricing Model*, February 2015, [31].

Energex further notes that simply confining the dataset to businesses operating in Australia may not lead to the most representative sample. A number of the businesses in the AER / Henry sample bear characteristics which do not align with the AER's conceptual definition of the benchmark efficient entity (e.g. Hastings Diversified Utilities Fund is not a 'pure play' energy network business). This makes it all the more important that the sample be broadened to ensure robust and reliable estimates of the equity beta.

The AER states that it has taken into account international evidence in its determination of a point estimate for beta. However it is clear from the Draft Decision that international evidence has at best a marginal role in the AER's decision. Rather than seeking to determine the best estimate from international evidence, or even a reasonable range, the AER derives a very wide range of estimates from a variety of international studies and then cross-checks its chosen point estimate against this wide range.

Given the paucity of data for Australian businesses, international data should be given a direct role in estimation of the equity beta. This means that comparable international businesses should be included in the sample used to estimate beta, alongside domestic businesses.

Energex considers that if the SLCAPM is being estimated independently as part of a multi-model approach, the best evidence of the SLCAPM equity beta for the benchmark efficient entity is SFG's estimate based on a broader sample, including both Australian and international businesses. As Energex's proposed approach used other relevant models and evidence to inform the parameters of the SLCAPM, which includes the application of the SLCAPM beta of 0.82, this would result in a 'composite' beta estimate of 0.91.

This evidence does not support the AER's range for the equity beta of 0.4 to 0.7.

1.5.2 The AER has erred in its determination of the beta point estimate

In relation to the point estimate for the equity beta, the AER concludes: [66]

- "the best empirical estimate" of the SLCAPM equity beta from Henry's report is 0.5;
- the theory of the Black CAPM points to an estimate of the SLCAPM beta that is above the best estimate indicated by Henry's analysis;
- international empirical estimates also provide "limited support" for an equity beta point estimate towards the top of the AER's range.

This conclusion is affected by several errors of fact and logic, which are discussed below.

[66] Draft Decision, [3-268]-[3-269].

1.5.2.1 The AER's view as to the "best empirical estimate" is not supported by evidence

There does not appear to be any evidence for the AER's statement that "the best empirical estimate" of the SLCAPM equity beta is 0.5.

Professor Henry does not recommend that a value of 0.5 be adopted, nor does his report refer to 0.5 as the "best empirical estimate". Rather, as noted above, Professor Henry recommends a range of 0.3 to 0.8, based on his analysis of Australian data only (as instructed by the AER).[67]

As discussed above, Energex considers that the best empirical estimate of the SLCAPM equity beta is SFG's estimate of 0.82, based on a broader sample including both Australian and international businesses. This assumes that the return on equity estimate from the SLCAPM is being used along with estimates from other relevant models as part of a multi-model approach. If the AER proposes to continue to only rely on the SLCAPM is its sole foundation model, the composite beta estimate of 0.91 must be applied in order to arrive at an outcome that is consistent with the requirements of the NEL and NER.

1.5.2.2 The AER's adjustment to the "best empirical estimate" is highly arbitrary

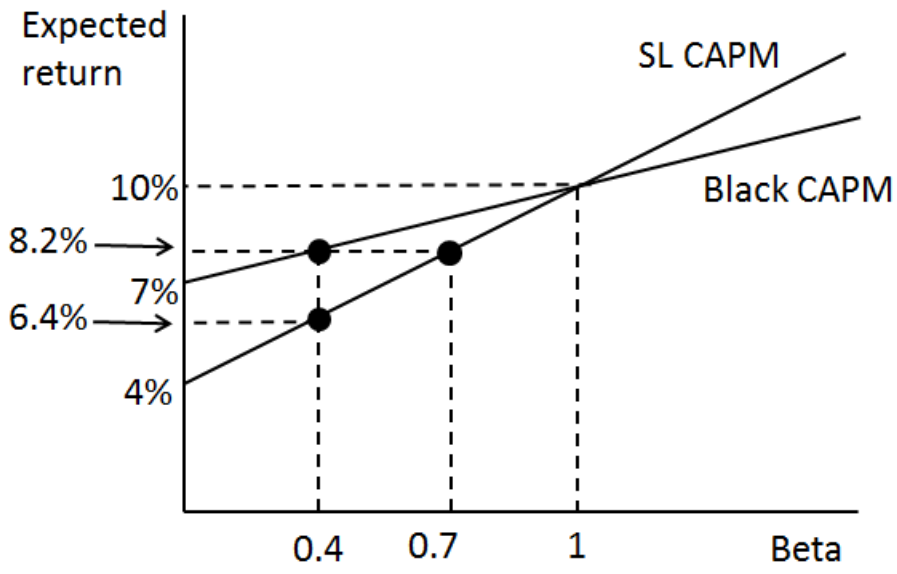
The AER states that the theory of the Black CAPM points to an estimate of the SLCAPM beta that is above the best estimate indicated by Henry's analysis. This appears to be the reason for the AER's adjustment from the "best empirical estimate" of 0.5 to a final point estimate of 0.7.

It should be noted that the theory of the Black CAPM does not say anything about the equity beta to be used in the SLCAPM, *per se*. What the theory of the Black CAPM indicates is that one of the key assumptions of the SLCAPM – that all investors can borrow or lend as much as they like at the risk-free rate – may not hold. It is this constraining assumption of the SLCAPM which leads to the empirical result that the SLCAPM will tend to underestimate the required return on equity for low-beta stocks and overestimate the required return on equity for low-beta stocks.

The theory of the Black CAPM is illustrated in Figure 2 below. The Black CAPM line indicates the relationship between beta and the expected return where the constraining assumption of the SLCAPM is relaxed.

[67] Olan T Henry, *Estimating β: An update*, April 2014, p 63.

Figure 2: Illustration of SLCAPM and Black CAPM relationships[68]



Energex understands that what the AER is in fact doing is seeking to make an adjustment to the equity beta to account for the SLCAPM bias that is indicated by Black CAPM theory. That is, while Black CAPM theory does not say anything about adjusting the equity beta to account for SLCAPM bias, this parameter is being used by the AER as the adjustment tool to account for this bias. In the example in Figure 2 above, if the best estimate of the equity beta was 0.4, the AER would use an equity beta of 0.7 in the SLCAPM because this would deliver the return corresponding to an equity beta of 0.4 used in the Black CAPM.

However in this case the adjustment made to the AER's "best empirical estimate" estimate of beta is highly arbitrary. The AER cannot reasonably be satisfied that adjusting the equity beta estimate from 0.5 to 0.7 will adequately account for bias in the SLCAPM, because it has not sought to quantify the effect of this bias.

Indeed the AER acknowledges that it does not know by how much it needs to adjust its equity beta estimate to account for the issues indicated by Black CAPM theory – i.e. the effects of low-beta bias in the SLCAPM. The AER notes that *"while the direction of this effect may be known, the magnitude is much more difficult to ascertain".*[69]

Clearly the magnitude of the AER's adjustment is limited by its definition of the equity beta range. Since the AER caps its range at 0.7, the adjustment to the equity beta can take the point estimate no higher than 0.7. Of course if the AER had adopted the recommendation of its consultant for an equity beta range of 0.3 to 0.8, its adjustment to account for Black CAPM theory and international evidence would have taken the point estimate to 0.8. Thus, the problem of arbitrariness in the AER's adjustment is compounded by the error in its construction of the equity beta range.

[68] Source: SFG, 2014 ENERGEX. *Estimating the required return on equity,* August p77 Figure 12.
[69] Draft Decision, [3-266].

In fact, the evidence shows that the AER's arbitrary adjustment to its equity beta estimate is not sufficient to address the issues it has identified. As noted above, it is clear that choosing the top of the AER's equity beta range will not correct for the low-beta bias in the SLCAPM indicated by Black CAPM theory – if the AER's parameter estimates are used in the Black CAPM along with the best available estimate of the zero-beta premium, the return on equity estimated by the Black CAPM is above the return on equity estimated by the AER using the SLCAPM (see Table 2 above). Similarly, if international evidence were to properly taken into account, this would yield an equity beta well above 0.7 – SFG estimates an equity beta of 0.82 based on a sample including both domestic and international businesses.[70]

Therefore, the AER cannot reasonably be satisfied that its equity beta estimate of 0.7, when used in the SLCAPM, will lead to a return on equity that contributes to the allowed rate of return objective. The AER's determination of its point estimate is highly arbitrary and is affected by errors in the interpretation of key evidence. The evidence shows that the best estimate of the SLCAPM equity beta is in fact higher than 0.7.

1.6 Determination of the MRP

The AER's approach to determining the MRP differs from that proposed by the Network Businesses and Energex, in that:

- the AER does not agree that the Wright approach should be used to estimate the MRP;
- the AER does not agree that independent valuation reports should inform MRP estimation (only the overall return on equity);
- the AER adopts different estimates of the MRP from historical data;
- the AER does not agree with SFG's construction of the DGM;
- the AER takes into account survey evidence and conditioning variables; and
- the AER does not appear to adjust its MRP estimate for changes in market conditions since publication of the Rate of Return Guideline.

This section addresses each of these points in turn.

1.6.1 The AER has incorrectly used the Wright approach

The AER does not take into account the Wright approach when estimating the MRP, because it considers that the Wright approach should inform the overall return on equity only.

[70] SFG, 2014 ENERGEX. *Estimating the required return on equity,* August p 82

The AER refers to the Wright approach as an alternative implementation of the SLCAPM designed to provide information at the return on equity level.[71]

This is an incorrect interpretation of Wright's work. Wright did not develop an alternative implementation of the SLCAPM. Wright simply proposed an alternative method of estimating the MRP for use in the SLCAPM – as the difference between the historical average market return and the current risk free rate – on the basis that market returns may be more stable over time than excess returns.[72]

Associate Professor Handley, in a passage referred to in the Draft Decision, clearly describes the Wright approach as an alternative method of estimating the MRP, rather than as an alternative return on equity model. Handley describes the Wright approach as follows:[73]

> *"Wright adopts an alternative non-standard approach to estimating the MRP. Rather than treating the MRP as a distinct variable he suggests estimating the return on the market – by estimating the real return on equity and combining this with a current forecast of inflation to give an estimated nominal return on equity – and the risk free rate separately."*

At [3-62] of the Draft Decision, the AER sets out a formula, which it says represents the Wright approach to implementing the SLCAPM (referred to as the 'Wright SLCAPM'). However the formula set out by the AER is simply the standard SLCAPM, as originally specified by Sharpe and Lintner.[74] It is clear from this that the Wright approach does not involve an alternative model for estimating the overall return on equity. Rather, the Wright approach represents an alternative method for estimating the MRP parameter.

In fact, the Wright approach to estimating the MRP would appear to be more aligned with the conventional SLCAPM specification, because it seeks to estimate the MRP as the difference between two distinct parameters (the market return and risk-free rate). This is in contrast to other methods which seek to estimate the MRP as a parameter in its own right.

It is therefore incorrect for the AER to reject the Wright approach on the basis that it is not a measure of the MRP. The Wright approach clearly provides relevant information in relation to the required market return and the MRP, and it would be an error for the AER to disregard it when estimating the MRP.

1.6.2 Use of independent valuation reports

The AER considers independent valuation reports to be relevant, but only to assessing the overall return on equity. Further, due to perceived limitations, the AER considers that only

---

[71] Draft Decision, [3-37] and [3-62].
[72] Wright, S., *Review of Risk Free Rate and Cost of Equity Estimates: A Comparison of U.K. Approaches with the AER*, 25 October 2012.
[73] John C Handley, *Advice on the Return on Equity*, 16 October 2014, p 17.
[74] Sharpe, W., 1964, "Capital asset prices: A theory of market equilibrium under conditions of risk," *Journal of Finance*, 19, 425–442.

"limited reliance" should be placed on this material, and that it should be used in a "directional role" only.[75]

Ultimately it is not clear what practical effect, if any, independent valuation reports have on the AER's decision on the return on equity. As a consequence of their relegation to an overall return on equity "check" role, they appear to have little or no practical impact on the final estimate. The AER retains its original parameter estimates and model choice once it completes its cross-check against the results of independent expert reports.

Energex considers that independent valuation reports provide relevant evidence of the required market return and MRP applied by market practitioners. Therefore, evidence from these reports as to the MRP applied by market practitioners should be given a direct role in estimating the MRP.

Incenta has updated its review of independent expert reports. Incenta observes that that the market rate of return estimated by independent experts has remained relatively constant in recent times, notwithstanding declines in the 'spot' risk free rate.[76] This implies that the MRP used in these reports, and/or the uplifts used by independent experts, has increased as the risk-free rate has declined.

1.6.3 Historic excess return estimates

The AER does not accept the adjustment to the historical returns data proposed by NERA. Based on an analysis of the historical data without NERA's adjustments, the AER estimates an MRP of 6.3% for the period 1883 to 2013.[77]

NERA explains in detail why its adjustments to the historic data are necessary and addresses each of the AER's concerns with its proposed adjustments.[78] For the reasons set out in NERA's report, Energex considers that these adjustments are necessary.

NERA provides updated estimates of the historic excess return, with its adjustments to the dataset. NERA reports that for the period 1883 to 2013, the average MRP (adjusted for the value of imputation credits) is 6.56%.[79]

1.6.4 Use of DDM estimates

The AER adopts a different construction of the DDM to that used by SFG, and as a result derives a wider range of estimates for the market return and MRP.

SFG clearly explains each of the points of difference between its approach and the AER's, and explains why it has taken the approach that it has.[80] In particular, SFG clearly explains

[75] Draft Decision, [3-71].
[76] Incenta, *Further update on the required return on equity from independent expert reports*, February 2015.
[77] Draft Decision, [3-195] (Table 3-39).
[78] NERA, *Historical Estimates of the Market Risk Premium*, February 2015.
[79] NERA, *Historical Estimates of the Market Risk Premium*, February 2015.
[80] SFG, *Share prices, the dividend discount model and the cost of equity for the market and a benchmark energy network*, February 2015.

the reasons for its choice of long term growth assumption, its estimation approach and dataset. For the reasons set out in SFG's report, Energex considers that SFG's approach to implementing the DDM is clearly preferable to the AER's.

However even adopting the AER's preferred construction of the DDM, it is clear that both the market return estimated by the DDM and the implied MRP have increased significantly over the past twelve months. Table 3 shows the change in return on market estimates from the AER's DDM between the Rate of Return Guideline (December 2013) and the Draft Decision (November 2014).

Table 3: AER dividend discount model estimates of the required return on the market

	Growth rate (%)	Two stage model (%)	Three stage model (%)
Guideline	4.0	9.65	10.20
	4.6	10.21	10.65
	5.1	10.68	11.02
Draft Decisions	4.0	10.15	10.55
	4.6	10.75	10.95
	5.1	11.25	11.35

Source: AER Rate of Return Guideline Appendices, p. 87; Draft Decision, Attachment 3, p. 200. Return on market estimates are derived by adding the AER's reported MRP estimates to the prevailing risk free rate (4.2% at the time of the Guideline and 3.55% at the time of the Draft Decision).

SFG has updated its estimates of the required return on the market portfolio using its preferred construction of the DDM. SFG reports that the best estimate of the expected market return at the current time is 11.37%.[81] Energex notes that this is very close to the estimate produced by the AER's three-stage model using a growth rate of 5.1%.

Based on a current risk-free rate of 2.64%,[82] this implies a current MRP of 8.73% using the DDM.

1.6.5 Use of survey evidence and conditioning variables

The AER appears to give material weight to survey evidence, despite evidence as to the limitations of this evidence (and concerns previously expressed by the Tribunal in this regard).

[81] SFG, *Share prices, the dividend discount model and the cost of equity for the market and a benchmark energy network*, February 2015, [48].
[82] Risk-free rate is a placeholder estimate, based on a January averaging period.

SFG considers that survey responses do not provide relevant evidence for the purpose of estimating the MRP. SFG observes that that the surveys on which the AER relies do not satisfy the criteria previously set out by the Tribunal (e.g. some are two-page magazine articles that were completed by audiences that had been "primed" by the author) and that the evidence suggests that participants are simply regurgitating the historical excess return estimates.[83]

In relation to conditioning variables, SFG notes that in aggregate these do not provide a clear signal as to the prevailing market return or MRP.[84] The government bond yield and credit spreads would indicate elevated risk premiums, whereas the dividend yield and implied volatility do not.

Therefore, Energex did not propose to give any role to either survey evidence or conditioning variables in estimating the prevailing market return or MRP in its regulatory proposal and remains of this view.

1.6.6 Impact of changes in market conditions on the MRP estimate

Energex notes that the AER's estimate of the MRP has not changed since publication of its Rate of Return Guideline, despite apparent changes in prevailing market conditions.

In particular, the risk-free rate has fallen significantly, from 4.1% at the time the Guideline was published, to 3.55% at the time of the AER's Draft Decision (and further since the AER's Draft Decision). This in itself indicates that market conditions may have changed and that the MRP may now be higher than it was at the time the Guideline was published.

As noted above, forward-looking estimates from the DDM indicate that the market return and MRP have increased significantly since the Guideline was published. This is clear even from the AER's DDM estimates.

The approach taken in the proposals submitted by the Network Businesses and Energex to estimating the MRP takes into account changes in prevailing market conditions. Each of the estimation methodologies can be updated for recent data in order to derive a current estimate of the MRP.

However Energex is concerned that the AER's methodology is not similarly responsive to changes in market conditions. This is likely be due to the fact that the AER's approach fails to take into account a number of relevant estimation methodologies which will provide an indication of current market conditions, such as the Wright approach and evidence from independent expert reports.

[83] SFG, *The required return on equity for the benchmark efficient entity*, February 2015, [118].
[84] SFG, *The required return on equity for the benchmark efficient entity*, February 2015, [123].

1.6.7 Conclusion on the MRP

For the above reasons, Energex does not agree with the AER's estimate for the MRP of 6.5%. This estimate does not reflect prevailing conditions in the market for equity funds and will not contribute to the achievement of the allowed rate of return objective. The AER's decision on the MRP is affected by a number of errors of fact, as described above.

Energex considers that a preferable approach is that set out by SFG. This approach takes into account all relevant evidence on the MRP and applies a transparent weighting to each estimate based on the relative strengths and weaknesses of each estimation approach. The reasons for SFG's weighting approach are set out in the expert report submitted with Energex's regulatory proposal.[85]

SFG has now updated its estimate of the MRP based on current data. SFG's current estimate, which is based on a January averaging period, is set out in Table 4 below.

Table 4: SFG estimates of market risk premium[86]

Estimation method	Market return	MRP	Weighting
Historical excess returns (Ibbotson)	9.20%	6.56%	20%
Historical real market returns (Wright)	11.64%	9.00%	20%
Dividend discount model	11.37%	8.73%	50%
Independent expert reports	9.57%	6.93%	10%
Weighted average	10.81%	8.17%	100%

The weighted average MRP estimate is higher than the update submitted by Energex on 30 January 2015 in response to the AER's Issues Paper on its regulatory proposal. That estimate of 7.92% was based on a December averaging period for government bond yield only as SFG had not then been able to update other parameter estimates.[87]

1.7 Assessment of the overall return on equity and ERP

The AER considers that its allowed equity risk premium (**ERP**)[88] and return on equity is broadly supported by a number of pieces of "cross-check" evidence. The "cross-check" evidence referred to by the AER includes:[89]

[85] SFG, 2014 ENERGEX. *Estimating the required return on equity,* August p57
[86] SFG, *The required return on equity for the benchmark efficient entity*, February 2015, Table 5. The risk-free rate assumed in these calculations is a placeholder estimate, based on a January averaging period.
[87] SFG, *The Required Return on Equity: Initial Review of the AER's Draft Decisions,* Report for Energex, January 2015, p.43.
[88] The ERP, as used in the Draft Decision, refers to the difference between the estimated cost of equity and the risk-free rate.
[89] Draft Decision, [3-32].

- estimates using the Wright approach;
- the ERP range from the recent Grant Samuel valuation report for Envestra; and
- ERP estimates from 'other market participants', including practitioners and regulators.

This section addresses each of the AER's 'cross-checks'.

1.7.1 Use of the Wright approach to support the AER's ERP estimate

As noted above, Energex considers that the AER has misinterpreted and misapplied the work of Professor Wright. Wright did not develop an alternative implementation of the SLCAPM for checking of the overall return on equity. Rather, Wright developed an alternative method for estimating the MRP.

Further, the way in which the AER has developed its ERP range from the Wright approach means that this 'cross-check' will almost certainly support the AER's ERP estimate. The AER derives a wide range of estimates from the Wright approach by using an equity beta range of 0.4 to 0.7 and a market return range of 10.1% to 12.8% in what it refers to as the 'Wright CAPM'. The AER then checks the reasonableness of its ERP estimate by confirming that it falls within the broad range of estimates derived from the 'Wright CAPM'.

Clearly if the AER had used its chosen point estimate of beta in the 'Wright CAPM', this cross-check would not support the AER's ERP estimate (Table 2). Even if the AER's lower bound value for the market return from Wright approach were to be adopted, the resulting ERP would be above the ERP allowed by the AER (4.59%, compared to 4.55% allowed by the AER). If a midpoint or upper bound value for the market return were to be taken from the Wright approach, the resulting ERP would be significantly higher than the AER-allowed ERP.

Table 5: Estimates of the ERP using the Wright approach[90]

Approach to estimating the ERP	ERP estimate
AER approach (equity beta 0.7; MRP 6.5%)	4.55%
Wright approach with lower bound R_e estimate (equity beta 0.7; R_e 10.1%)	4.59%
Wright approach with midpoint R_e estimate (equity beta 0.7; R_e 11.45%)	5.53%
Wright approach with upper bound R_e estimate (equity beta 0.7; R_e 12.8%)	6.48%

1.7.2 Use of the Grant Samuel analysis

The AER presents a wide ERP range from the Grant Samuel report for Envestra, and on this basis concludes that its ERP estimate is consistent with the range adopted by Grant Samuel.

The AER has made critical errors in its interpretation of the Grant Samuel report for Envestra. When these errors are accounted for, it is clear that this evidence does not support the ERP and return on equity estimate adopted by the AER.

This range of estimates referred to by the AER encompasses Grant Samuel's "lower bound" SLCAPM estimate with no imputation adjustment, as well as the upper bound with Grant Samuel's uplift and an imputation adjustment. The AER considers that it is difficult to determine how much of the uplift is attributable to the return on equity, and therefore presents a range of values with and without this uplift.[91]

However the Grant Samuel report clearly indicates that:[92]

- for the purposes of its analysis, Grant Samuel has not used the raw SLCAPM estimate of the return on equity. A fundamental aspect of Grant Samuel's analysis was to conclude that the calculated SLCAPM return on equity was not an appropriate benchmark and understated the realistic required rate of return on equity. This was one reason why Grant Samuel applied an uplift to its SLCAPM estimates. Therefore it is not appropriate to use Grant Samuel's "lower bound" SLCAPM estimate with no uplift;
- there is no allowance made by Grant Samuel for imputation credits in the return on equity estimate. Accordingly, for comparison with the AER's ERP estimate, an imputation adjustment must be made;
- the Grant Samuel WACC uplift is to account for factors likely to be affecting the return on equity (not the return on debt), including: repricing of risk by equity investors since the GFC; alternative models, such as the Gordon Growth Model,

[90] Estimates of the market return are the AER's estimates, as set out in Table 3-19 of the Draft Decision. All calculations are based on a risk-free rate of 3.55%.
[91] Draft Decision, [3-99].
[92] Grant Samuel, *Financial Services Guide and Independent Expert's Report to the Independent Board Sub-committee in relation to the Proposal by APA Group*, 3 March 2014, Appendix 3, pp 8-9.

currently indicating higher returns on equity than the SLCAPM; and evidence that brokers are currently adopting cost of equity estimates that are higher than indicated by the SLCAPM. Accordingly, it is clear that most (if not all) of this uplift should be attributed to the return on equity; and

- Grant Samuel adopted a WACC estimate at the lower end of its range (6.5% - 7.0%) for the purposes of its valuation of Envestra assets, in order to ensure that the fairness assessment for the APA proposal was robust. That is, Grant Samuel erred towards the lower end of its WACC range to ensure that its NPV valuation of the Envestra assets was conservative on the high side.

These issues are addressed in the accompanying clarification letter from Grant Samuel.

On a correct interpretation of the Grant Samuel report for Envestra, it is clear that it does not support the AER's ERP estimate. Incenta notes that range for the cost of equity implied by Grant Samuel's uplift factor was from 9.47% to 9.57%, with a respective ERP range of 5.27% to 5.37%, exclusive of any uplift for the value of imputation credits.[93] These Grant Samuel ranges compare with the AER's cost of equity of 8.75% and ERP of 4.55%.

1.7.3 ERP estimates from 'other market participants', including practitioners and regulators

The AER refers to an ERP range from market practitioners and other regulators. As it reflects a combination of regulatory decisions and practitioner views over a long timeframe, it is a very wide range. In itself, this wide range of values drawn from various sources over a number of years provides little information or guidance of the current required return on equity.

Energex considers that past decisions of the AER and other regulators should not be used as direct evidence of the required return on equity. These decisions are at best secondary evidence of the prevailing return on equity at previous points in time. However the return on equity in these decisions:

- will not reflect prevailing market conditions (rather, they will reflect market conditions at the time the decision was made); and
- may not be consistent with the rate of return objective, to the extent that they have been determined under different regulatory frameworks with different objectives.

Use of such decisions will also be circular where it is based on previous decisions the same regulator has made in relation to the return on equity.

Certainly, these past regulatory decisions should not be mixed with practitioner evidence under the banner of 'market evidence'. Decisions of regulators do not reflect the views of market practitioners as to the current required return on equity.

[93] Incenta, *Further update on the required return on equity from independent expert reports*, February 2015, p 25.

In relation to the independent valuation reports referred to by the AER (Table 3-20 of the Draft Decision), it is clear that the evidence from these reports does not support the AER's ERP estimate. Table 3-20 shows:

- the imputation-adjusted ERP in all but two of these reports is at least 5% - well above the ERP determined by the AER (4.55%);
- the imputation-adjusted ERP from the Grant Samuel report for Envestra is quoted as 4.47%. However this appears to be based on the midpoint of Grant Samuel's range of SLCAPM values, with none of the uplift used by Grant Samuel. The WACC value used as the basis for this estimate is 6.2%, which is well below the WACC range actually used by Grant Samuel (6.5% - 7.0%). As noted above, a fundamental aspect of Grant Samuel's analysis was to conclude that the calculated SLCAPM return on equity was not an appropriate benchmark and understated the required rate of return on equity. This was one reason why Grant Samuel applied an uplift to its SLCAPM estimates. Incenta notes that on a correct interpretation of this report, the relevant range for the ERP is 5.27% to 5.37%, exclusive of any uplift for the value of imputation credits.[94] This is clearly does not support the AER's ERP estimate ;
- the only other report with an imputation-adjusted ERP less than 5% is more than ten years old (the 2003 Deloitte report for United Energy). The return on equity and ERP estimate in this report cannot be said to be indicative of current practitioners' views as to the required return on equity.

Of the 20 independent valuation reports referred to by the AER which have been published in the last decade, none of these actually used an ERP estimate below 5% (adjusted for imputation). Excluding the 2003 Deloitte report and using the correct range of estimates from the Grant Samuel Envestra report, the ERP range from this evidence is approximately 5 – 5.8% (based on the reports in Table 3-20 of the Draft Decision). Therefore, this market evidence clearly does not support the AER's ERP estimate.

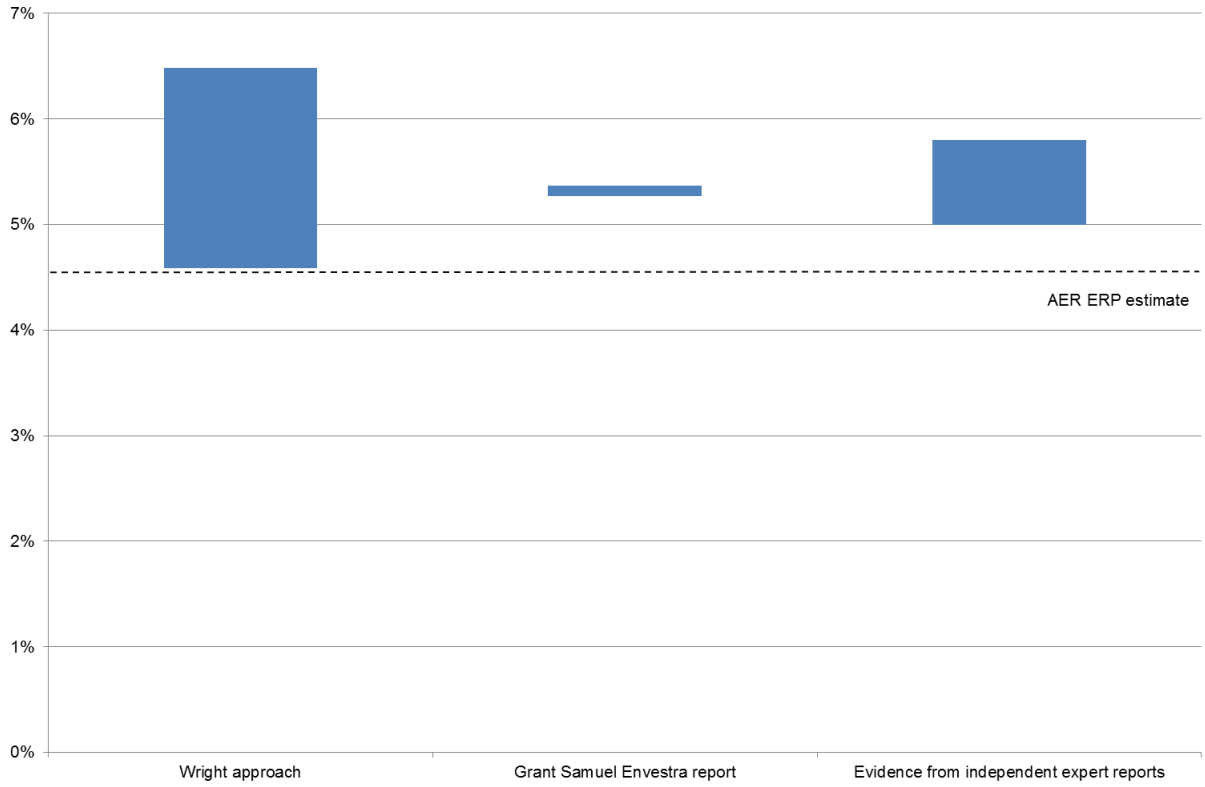
1.7.4 Conclusion in relation to "cross check" evidence

When correctly interpreted, none of the "cross-check" evidence referred to by the AER supports its ERP estimate. In fact, as shown in Figure 3 below, the AER's ERP estimate lies below even the lower bound values indicated by each piece of evidence.

This indicates that the return on equity estimate derived by the AER using the SLCAPM does not reflect prevailing market conditions and is likely to be less than what is required to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers.

[94] Incenta, *Further update on the required return on equity from independent expert reports*, February 2015, p 25.

Figure 3: Corrected ERP cross-checks



1.8 Conclusions

For reasons set out above, Energex does not agree with the AER's approach to determining the return on equity, as set out in the Draft Decision.

As noted previously, Energex endorses the multi-model approach that has been applied by the Network Businesses. For the purpose of its regulatory proposal, Energex has submitted that to the extent the AER continues to apply the SLCAPM as its sole foundation model, it cannot be applied in accordance with the AER's Rate of Return Guideline. The Draft Decision reaffirms that the AER intends to continue to do this. The information in this submission, accompanied by the attached independent expert reports, demonstrates why the AER's approach will not result in an outcome that satisfies the requirements of the NEL and NER.

In order to provide an outcome that satisfies the requirements of the NEL and NER, the AER's application of the SLCAPM must be done in a way that gives proper regard to all relevant models and evidence. The AER argues that it has done so but the practical consequence of its approach is that these other models and evidence are assigned little if any practical weight, resulting in an outcome that is very similar to the approach that would have resulted under the previous rules and the former *Statement of Regulatory Intent.*

Energex's regulatory proposal has demonstrated how these other models and evidence can be applied within the confines of the SLCAPM. This results in the same outcome as the multi-model approach proposed by the Network Businesses and as proposed in the

alternative by Energex in its Response to the AER Issues Paper lodged on 30 January 2015, assuming the same weights are applied. Indeed, the outcomes must align because the different approaches are consistent in terms of the models and evidence that has been used and the influence of each piece of information on the final estimate.

An updated indicative estimate of the required return on equity using both the modified SLCAPM approach and the multi model approach was submitted with Energex's Response to the AER's Issues Paper. This estimate, which was based on a December averaging period, was 10.26%. This estimate was arrived at by applying the following weights to each model: SLCAPM – 12.5%, Black CAPM – 25%, Fama-French – 37.5% and DDD – 25%. It was noted that this was not materially different from the estimate that would result from the application of equal weights, which was 10.16%. Energex notes that the estimate will change with movements in market rates prior to the AER's Final Determination.

2 Value of imputation

Energex proposed a value for gamma of 0.25 in its Regulatory Proposal and considers the AERs' approach as set out in the Draft Decisions to still be subject of error. The submission provided on 30 January set out Energex's reasons for this. As a further supplement to its submission, Energex provides a report by Professor Stephen Gray of SFG Consulting at Attachment 8.