



**Better equity: submission to the AER's
Equity beta issues paper**

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Disclaimer

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The views expressed in this document do not necessarily reflect the views of the Consumer Advocacy Panel or the Australian Energy Market Commission.

Introduction

The Public Interest Advocacy Centre

The Public Interest Advocacy Centre (PIAC) is an independent, non-profit law and policy organisation that works for a fair, just and democratic society, empowering citizens, consumers and communities by taking strategic action on public interest issues.

PIAC identifies public interest issues and, where possible and appropriate, works co-operatively with other organisations to advocate for individuals and groups affected. PIAC seeks to:

- expose and redress unjust or unsafe practices, deficient laws or policies;
- promote accountable, transparent and responsive government;
- encourage, influence and inform public debate on issues affecting legal and democratic rights; and
- promote the development of law that reflects the public interest;
- develop and assist community organisations with a public interest focus to pursue the interests of the communities they represent;
- develop models to respond to unmet legal need; and
- maintain an effective and sustainable organisation.

Established in July 1982 as an initiative of the (then) Law Foundation of New South Wales, with support from the NSW Legal Aid Commission, PIAC was the first, and remains the only broadly based public interest legal centre in Australia. Financial support for PIAC comes primarily from the NSW Public Purpose Fund and the Commonwealth and State Community Legal Services Program. PIAC also receives funding from Trade and Investment, Regional Infrastructure and Services NSW for its work on energy and water, and from Allens for its Indigenous Justice Program. PIAC also generates income from project and case grants, seminars, consultancy fees, donations and recovery of costs in legal actions.

Energy + Water Consumers' Advocacy Program

This program was established at PIAC as the Utilities Consumers' Advocacy Program in 1998 with NSW Government funding. The aim of the program is to develop policy and advocate in the interests of low-income and other residential consumers in the NSW energy and water markets. PIAC receives policy input to the program from a community-based reference group whose members include:

- Council of Social Service of NSW (NCOSS);
- St Vincent de Paul NSW;
- Combined Pensioners and Superannuants Association of NSW;
- Park and Village Service;
- Ethnic Communities Council NSW;
- Rural and remote consumers;
- Retirement Villages Residents Association;
- Physical Disability Council NSW; and
- Affiliated Residential Park Residents Association.

1. Overview

1.1 Background to the Equity Beta Issues Paper

PIAC thanks the Australian Energy Regulator (AER) for providing an opportunity to respond to the AER's paper, *Better Regulation: Equity beta issues paper* (Issues Paper).¹ As noted by the AER, the equity beta is a key input parameter to the AER's foundation model for assessing the regulated return on equity, the Sharpe-Lintner capital asset pricing model (S-L CAPM).²

PIAC understands that the AER's Issues Paper is to be read in conjunction with the AER's Draft Rate of Return Guideline³ (Draft RoR Guideline) and the Explanatory Statement, Draft Rate of Return Guideline⁴ (Explanatory Statement Draft RoR Guideline). PIAC has provided a detailed submission to the AER⁵ in response to the Draft RoR Guideline and the current submission should also be read in conjunction with PIAC's previous, more comprehensive submission on the rate of return.

In PIAC's previous submission, PIAC highlighted the importance of the AER's decision on the allowed rate of return to achieving a fair and balanced outcome for all stakeholders in accordance with the National Electricity Objective (NEO), the National Gas Objective (NGO), the Revenue and Pricing Principles (RPP) and the National Electricity Rules (NER) and National Gas Rules (NGR).

In particular, PIAC noted that the AER is required to determine a rate of return that best achieves the specific rate of return objective, that is, the 'allowed rate of return objective' that is set out in the NER and the NGR.⁶ The allowed rate of objective in the NER and in the NGR states:

...that the rate of return for a [regulated network] is to be commensurate with the efficient financing costs of benchmark efficient entity with a similar degree of risk as that which applies to the [service provider] in respect of the provision of [regulated services].

The regulated rate of return takes the form of the weighted average cost of capital (WACC). The AER has decided to continue with the current gearing level of 60 per cent. That is, the allowed return on equity contributes 40 per cent to the total WACC and the allowed return on debt contributes 60 per cent. As noted above, the equity beta is a significant parameter in the estimation of the return on equity component of the WACC.

¹ AER, *Better Regulation: Equity beta issues paper*, 2013.

² See *Ibid*, 6 and 8.

³ AER, *Better Regulation, Draft rate of return guideline*, 2013.

⁴ AER, *Better Regulation, Explanatory statement, Draft rate of return guideline*, September 2013.

⁵ Hughson, B, and Hodge, C, *Reasonably rated: submission to the AER's Draft Rate of Return Guideline*, 2013.

⁶ NER, cl 6.5.2(c) and cl 6A.6.2(c); NGR, r 87 (3).

The allowed return on equity must contribute to the achievement of the allowed rate of return objective. For example, the NER sets out the following requirement for the assessment of the return on equity for an electricity distribution business;

- (f) The return on equity for a *regulatory control period* must be estimated such that it contributes to the achievement of the *allowed rate of return objective*; and
- (g) In estimating the return on equity under paragraph (f), regard must be had to the prevailing conditions in the market for equity funds.

Similar obligations are required for electricity transmission and for gas networks.

The principal question to be addressed in this submission, therefore, is whether the AER's proposal of 0.7 for the estimated equity beta of the benchmark efficient entity contributes to the assessment of the efficient financing costs of a benchmark efficient entity with a similar degree of risk.

PIAC will argue that it does not. PIAC considers that the AER has not appropriately exercised its discretion because, in selecting a point estimate for the equity beta of 0.7 from a range of 0.4 to 0.7, the AER has:

- selected a figure that is at the top of the range of equity beta estimates identified through the empirical analysis of relevant benchmark entities;
- failed to properly consider the advice of its own expert advisors to use an equity beta that is at the lowest possible level reflecting the very low level of risk of the benchmark efficient firm in Australia compared to the market average firm; and
- been overly influenced in its decision to select a point estimate at the top of the range by reference to an econometric model, the Black CAPM, that is recognised as lacking consistent empirical support; and by cross-checking with international comparator data that provide no such direction.

Sections 3 to 7 of this submission provide more detailed explanations for PIAC's concerns with the AER's initial recommendation for a point estimate of the equity beta of 0.7.

At a more general level, however, the AER's decision reinforces PIAC's deep concerns with the practical application of the AER's approach to using other models and data (than the S-L CAPM) to inform or guide their decision on the return on equity.

The NER and the NGR require the AER to 'have regard' to other 'relevant' approaches.⁷ However, it would seem that the AER interprets the requirement to 'have regard' to other relevant approaches to mean that the AER must place some degree of reliance on alternative approaches, even when it is recognised that these alternative approaches produce more inconsistent and volatile outputs than the foundation model itself.

⁷ The relevant sections in the NER and NGR state that in determining the allowed rate of return, regard must be had to 'relevant estimation methods, financial models, market data and other evidence'. See NER cl 6.5.2(e) and 6A.6.2(e), NGR r 87(5).

The potential risk to consumers is, therefore, that the AER's final rate of return determination will be overly influenced by these alternative approaches and will not satisfy either the allowed rate of return objective or the long-term interests of consumers as expressed in the NEO and NGO.

This issue was first highlighted in PIAC's previous submission to the AER's Draft RoR Guideline⁸ and is also of relevance to PIAC's views set out in this submission. PIAC's response to the Draft RoR Guideline, therefore, provides a starting point for the current submission and is summarised below.

1.2 PIAC's response to the Draft Rate of Return Guideline

In its submission to the Draft RoR Guideline, PIAC indicated its support for the overall framework for assessing the return on equity and the return on debt. However, PIAC also expressed its concern with the practical application of the AER's preferred approach. This concern was summarised as follows:

The difficulty PIAC perceives with the AER's proposed approach is the 'role' it gives to these other models [other than the S-L CAPM] and other information sources that are less reliable and satisfy fewer of the AER's criteria, to 'inform' the outcomes of the Sharpe-Lintner CAPM parameters and overall return on equity estimation.

...It is more than likely that these alternative approaches will add noise rather than useful information to the process.⁹

In line with this concern, PIAC made a number of specific recommendations that it considered relevant to the assessment of the equity beta. The relevant recommendations are summarised below:¹⁰

- the AER reconsider how it applies the various alternative models in the overall framework for estimating the return on equity. Consumers should not be exposed to the risks of unstable models (*Recommendation 7*);
- the AER ensure that the final RoR Guideline is explicit about the limitations of alternative models to determine the cost of equity (*Recommendation 8*);
- the final RoR Guideline limit any in-built bias and make clear that the Black CAPM is just one of the various measures of equity beta and that it has no special role in setting the quantum of the equity beta outcomes; it should be strictly limited to a qualitative assessment of the direction of the equity beta [versus 'inform' the equity beta] (*Recommendation 9*).¹¹

⁸ Hughson, B, and Hodge, C, above n 5. For example, see 29-30.

⁹ Ibid, 29.

¹⁰ Ibid, 30–31.

¹¹ PIAC provided an example in its submission to the AER's Draft RoR Guideline which set out the following hypothetical situation: 'suppose statistical analysis and other data lead to the conclusion that the Sharpe-Lintner CAPM equity beta is in the range of 0.3 to 0.7. By including the Black CAPM as 'informative' for the purposes of equity beta assessments, the AER will be much more likely to determine that the point estimate equity beta is closer to 0.7 than to the mean or median of the statistical analysis and other information used in the original Sharpe-Lintner CAPM modeling'; see Ibid, 31.

1.3 The AER's Equity beta issues paper

The AER has proposed an estimated equity beta range of 0.4 to 0.7 for the benchmark efficient entity. PIAC considers that the AER has provided a comprehensive coverage of the conceptual and empirical estimates of the equity beta and accepts that it is reasonable for the AER to conclude a range for equity beta of between 0.4 and 0.7.

The AER has also proposed an equity beta point estimate of 0.7. However, PIAC does not concur with the AER's conclusion on the point estimate. This is based on PIAC's view that there is insufficient justification for AER to select an equity beta that is the top of the range that was derived from the empirical estimates. In the absence of this justification, as a matter of policy the AER should adopt an equity beta point estimate closer to the mid-point of the range.

PIAC also notes, however that the AER is still to receive the outcome of an extensive empirical review conducted by Professor Olan Henry (Henry (2013)) who also provided advice to the AER on equity beta for the AER's 2009 WACC review (Henry (2009)).¹² The 2013 review is expected to include empirically based analyses of equity beta using a number of different regression forms, estimation periods, approaches to leverage, units of analysis and portfolio weightings.

It is disappointing that this important empirical study is not available for consideration by stakeholders given the importance of the AER's determination of the equity beta in the rate of return estimation. Nonetheless, PIAC considers that there is sufficient evidence already available to indicate that the AER's choice of the highest point in the range of 0.4 to 0.7 is not justified by the information available to it.

The issues outlined above also highlight the importance of the AER developing a broader suite of measures to assess the overall rate of return on equity. A focus on the component parts can result in a significant bias upwards of the overall rate of return on equity, particularly if the AER adopts a conservative estimate of each of the individual parameters (e.g. the market risk premium and the equity beta). Such an outcome is not in the long-term interests of consumers.

1.4 Recommendations

Recommendation 1

The AER should develop a broader suite of measures to assess the overall rate of return and the return on equity. This would provide a top-down check of the reasonableness of the AER's decisions on the equity beta.

Recommendation 2

The AER should adopt a 'default' equity beta around the middle of the empirically derived range of equity betas. This default should only be varied if there is a compelling case to do so. PIAC therefore recommends an equity beta point estimate between 0.5 and 0.6 as most applicable to the systematic risks facing the benchmark efficient entity in the future regulatory environment.

¹² Henry, O, *Econometric advice and beta estimation*, November 2008, *Estimating Beta*, April 2009. (Henry (2008)). Cited in AER, Equity beta issues paper, above n 1, 30-31.

Recommendation 3

The impact of the changes to the AER's calculation of the rate of return (such as the trailing average and annual update of the cost of debt) on the systematic risk facing the benchmark efficient entity should be further investigated, and the historically based beta averages adjusted to better reflect the significant reduction in the NSPs exposure to financial risk.

Recommendation 4

The impact of gearing levels on the equity beta of the benchmark efficient entity should be further investigated so that there is a clearer empirically based understanding of the impact of the AER's gearing level of 60 per cent on market perceptions of the systematic risk of an NSP, and if the relationship between gearing and systematic risk is linear or non-linear.

Recommendation 5

The AER should place greater reliance on the more recent empirical investigations on the equity beta, and the updated conceptual analyses of its expert advisors.

Recommendation 6

The AER ensure that any empirical studies considered as part of the estimation of the equity beta clearly state all the specifications and permutations of the econometric regressions so that reasonable comparisons can be made between the various regression outputs.

Recommendation 7

When presenting the final results of the 2013 Henry study, the AER should ensure that the multiple permutations in the study are presented in a coherent form with an explanation of the interlinks and the strengths and weaknesses of these multiple regression outputs.

Recommendation 8

The AER conduct a further investigation of the sensitivity of the average and portfolio equity beta estimates for Australian regulated networks to the effects of events affecting a single firm in the sample.

Recommendation 9

The AER should focus its attention on the systematic analysis of Australian firms over time, in preference to international studies, in order to better understand any trends or sensitivities in the equity beta outcomes, and to derive an equity beta consistent with its definition of a benchmark efficient entity.

Recommendation 10

The AER only consider proposed equity beta estimates based on international studies for the benchmark efficient firm, if these proposals are supported by evidence that the inclusion of the international data will enhance both the reliability and the validity of the equity beta estimates. Preferably this evidence would include data from a range of other countries, not just the US.

2. Summary and conclusions

PIAC accepts the AER's proposed range of equity betas for the benchmark efficient firm of 0.4 to 0.7. However, PIAC does not find credible and consistent evidence to support the AER's proposal to select a point estimate of the equity beta at the very top of this range, that is, an equity beta of 0.7. PIAC considers that the AER should select a point estimate around the middle of the range unless there is a compelling reason not to do so.

In PIAC's view, there is no such compelling reason. The selection of the top of the range for the point estimate of equity beta of the benchmark efficient firm is not justified by the conceptual analysis, the empirical studies of Australian firms or by cross-checks of results from international studies of comparator firms. In summary:

- the conceptual analyses of the relative risks facing the benchmark efficient firm by two of the AER's consultants both point to the risks facing the benchmark efficient firm as being very low, or even 'among the lowest possible';¹³
- the most recent empirical analyses of Australian firms indicates an equity beta of between 0.5 and 0.55 over a number of different studies;¹⁴
- the changes to the AER's approach to assessing the WACC components (such as the trailing average and annual updating for the cost of debt), are likely to reduce the systematic risk of the benchmark efficient entity even further in the future;¹⁵
- the international comparators, which the AER proposes to use as a 'cross-check' to the Australian empirical results, provide various results that are difficult to interpret in the Australian context; nor do they provide a consistent basis for selecting the top of the equity beta range; they are equally consistent with accepting an equity beta in the middle of the range; and
- the AER's approach of using the *theoretical* predictions of the Black CAPM to select the *point* estimate, while setting aside the conceptual analyses provided by its own consultants, is contradictory; particularly so, given the AER's own statements that the conceptual analyses *and* (separately) the Black CAPM, do not provide clear indications of the 'magnitude' of the differences in beta from 1.¹⁶

PIAC concludes therefore that the reasons the AER provides for selecting the top of the range for the equity beta point estimate (0.7) for the benchmark efficient firm are weak and inconsistent with the findings of the empirical analyses which the AER states is the '**key determinant of our proposed equity beta point estimate and range**'.¹⁷ [PIAC's emphasis].

In the absence of a sound reason for selecting the top of the range the appropriate equity beta for the benchmark efficient entity should be selected from the mid-point of the empirical range of equity betas. This would suggest an equity beta between 0.5 and 0.6 for the benchmark efficient

¹³ McKenzie M and Partington, G, *Report to the AER, Estimation of the equity beta (conceptual and econometric issues) for a gas regulatory process in 2013*, April 2012, 15.

¹⁴ AER, above n 1, 28-30. The most recent studies cited by the AER include a 2013 study by the ERA which found a re-levered portfolio equity beta estimates range from 0.39 to 0.59, with a mean of 0.5. Similarly, the AER cites a 2013 study by SFG with a re-levered beta estimate range of 0.41 to 0.68 (95% confidence interval) and an average of 0.55. These studies are discussed in more detail in section 4.

¹⁵ Ibid, AER, 17.

¹⁶ Ibid, 11 and 18 (conceptual analysis), 7 (Black CAPM).

¹⁷ Ibid, 11.

entity, an outcome that is consistent with the conceptual analyses and the empirical studies and is not inconsistent with the international studies used as a cross-check.

Recommendation 1

The AER should develop a broader suite of measures to assess the overall rate of return and the return on equity. This would provide a top-down check of the reasonableness of the AER's decisions on the equity beta.

Recommendation 2

The AER should adopt a 'default' equity beta around the middle of the empirically derived range of equity betas. This default should only be varied if there is a compelling case to do so. PIAC therefore recommends an equity beta point estimate between 0.5 and 0.6 as most applicable to the systematic risks facing the benchmark efficient entity in the future regulatory environment.

3. Conceptual analysis

The AER's conceptual analysis includes a 'desk-top' assessment of the differences in risk between the energy sectors and between the benchmark efficient entity and the market average firm. The AER also considers if and how the changes in the regulatory regime may impact on this assessment.

In undertaking this assessment, the AER draws on the recent work of its expert consultants along with a number of studies undertaken during the development of the original 2009 study of the weighted average cost of capital (the 2009 WACC report) and subsequent regulatory determinations.

Based on the conceptual analysis, the AER considers that:

- the different energy network sectors face comparable levels of systematic risk and therefore it is appropriate to adopt the same equity beta across each sector;
- the systematic risk exposure of energy networks going forward is likely to be comparable to their systematic risk exposure in the past; and
- the benchmark efficient energy network entity 'will have lower overall systematic risk exposure than the average firm in the market' although it is 'difficult to determine the magnitude of this difference'.¹⁸

With respect to the first consideration, the assessment of risk across different energy network sectors, PIAC largely supports the AER's conclusions that there is no compelling evidence to support adopting a different equity beta for different sectors.

PIAC also supports the third of the AER's conclusions. That is, the various sources of evidence clearly support the proposition that the benchmark efficient entity has a lower overall systematic risk exposure than the average market firm. PIAC adds that although it may be difficult to determine the magnitude of the difference as suggested by the AER, all the conceptual analysis and empirical evidence points to a *significantly* lower equity beta estimate for the benchmark firm.

¹⁸ AER, above n 1, 11.

However, PIAC has reservations about the second of the AER's conclusions. PIAC considers that there is a strong case that the changes to the regulatory regime (such as an annually updated trailing average cost of debt) will result in a reduction in the systematic risk exposure of the benchmark efficient entity going forward. While this reduction is also hard to quantify, it should be considered as part of the AER's assessment of the point estimate within the range of equity betas.

3.1 Have the regulatory changes lead to changes in systematic risk for the benchmark efficient entity?

The AER highlights a number of important regulatory changes that may reduce systematic risk. However, the AER also concludes that historically based equity beta estimates remain a 'reasonable basis'¹⁹ for determining the equity beta estimates for the benchmark efficient firm in the future.

Based on the same information, however, PIAC draws a different conclusion. That is, the evidence suggests that the benchmark efficient service entity is likely to be less exposed to systematic risk than it was under the previous regime.

In assessing this further, PIAC notes the important distinction highlighted by the AER between changes to the systematic risk facing the benchmark efficient network service provider (NSP) and changes to the NSP's exposure to non-systematic risk. As stated by the AER, 'it is only systematic risk that is of relevance to the determination of equity beta'.²⁰ In effect, the key question is: how sensitive are the returns and cash flows of the benchmark efficient entity to changes in the broader economy relative to the sensitivity of the market average firm to these changes?

There are three areas identified by the AER that are expected to decrease the volatility of the cash flows of the benchmark efficient entity. They are:

- the adoption of a trailing average approach rather than the current 'on-the-day' approach to the return on debt. The AER notes that the trailing average approach will 'more closely align with the efficient debt financing practices' and will 'lead to less volatile cash flows' over time;²¹
- the AER's proposal to change its approach to the return on equity 'which is expected to lead to a more stable return on equity over time';²² and
- transition to the new approaches will be 'gradual due to various transitional arrangements and different regulatory periods'.²³

The AER also notes, however, that 'changes to the non-WACC aspects of the Better Regulation program' (e.g. the introduction of new benchmarking techniques and incentive schemes) might increase risk. However, the AER also states that it is 'unclear to what extent these changes [to

¹⁹ Ibid, 14.

²⁰ Ibid,13. This is based on the assumption that investors hold fully diversified equity portfolio. See Ibid, 14 (footnote 27).

²¹ Ibid.

²² Ibid.

²³ Ibid,14.

the non-WACC aspects] will reflect changes in the systematic risk of a benchmark efficient entity'.²⁴

Having identified all these factors, the AER then draws the conclusion that 'Australian empirical estimates (which are historical) remain a reasonable basis for determining our equity beta estimates'.²⁵

In contrast, PIAC would conclude that the same evidence points to a change in the systematic risk facing the benchmark efficient entity relative to the risk facing the same entity under the current regulatory settings. Most particularly, the adoption of a trailing average approach, particularly if it includes annual updates for the cost of debt, should markedly reduce the risks of a network to re-financing of debt and interest rate volatility. It should also therefore increase the stability of a NSP's returns and cash flow.

If the new approach does *not reduce risk* (relative to the current 'on-the-day' and with no annual update approach), it is unclear to PIAC why the AER is proposing this new approach to the assessment of the allowed cost of debt when this new approach is significantly more complicated and burdensome to administer than the current approach.

Recommendation 3

The impact of the changes to the AER's calculation of the rate of return (such as the trailing average and annual update of the cost of debt) on the systematic risk facing the benchmark efficient entity should be further investigated, and the historically based beta averages adjusted to better reflect the significant reduction in the NSPs exposure to financial risk.

3.2 The level of systematic risk relative to the average market firm²⁶

The AER summarises the critical question to be answered here, namely, 'where should the equity beta of the benchmark efficient entity sit relative to the average equity beta across all firms in the market, which is 1.0 by definition'.²⁷

Two types of systematic risk are identified as relevant to answering this question:

- business risk, which relates to the systematic risk exposure of the underlying business assets;²⁸ and
- financial risk, which relates to the additional systematic risk exposure that arises from the debt holdings of the firm as the systematic risk exposure for equity holders increases as more debt is issued.²⁹

The AER draws on two comprehensive expert reports to conclude that the overall *business risk* for the benchmark efficient entity will be 'very low'.³⁰ PIAC agrees with this proposition.

²⁴

Ibid.

²⁵

Ibid.

²⁶

The AER draws largely on the reports by Frontier Economics, *Assessing risk for regulated energy networks*, July 2013, McKenzie, M, and Partington, G, *Estimation of equity beta*, April 2012 and McKenzie, M, and Partington G, *Report to the AER: Risk, asset pricing models and WACC*, June 2013.

²⁷

Ibid. The AER also refers to this as the 'market average firm'.

²⁸

Ibid.

²⁹

Ibid, 16.

³⁰

Ibid. See also footnote 23.

In principle, as network businesses are typically more highly leveraged than the market average firm (i.e. there is 60 per cent debt), the *financing risk* for the efficient entity might be expected to be higher than the market average firm.

However, as indicated in the AER's Issues Paper, there is no simple relationship between leverage and financing risk; there may for instance be a non-linear relationship where debt up to a certain percentage makes little change in financing risk, however, debt above that critical level significantly increases financing risk.³¹ While PIAC has not undertaken a detailed examination of this, the qualitative information from the market indicates that investors consider efficiently managed network businesses are 'low risk' and have 'steady cash flows' when gearing sits around the 70 per cent mark.³² However, when the gearing level of the firm increases above a certain level and/or the market disapproves of the firm's approach to capital management, then the capital markets may respond through higher interest rates for debt and credit downgrades.³³

Recommendation 4

The impact of gearing levels on the equity beta of the benchmark efficient entity should be further investigated so that there is a clearer empirically based understanding of the impact of the AER's gearing level of 60 per cent on market perceptions of the systematic risk of an NSP, and if the relationship between gearing and systematic risk is linear or non-linear.

The Frontier report proposes five categories of financing risk, of which four categories are considered medium to low risk and only one category, interest rate reset risk, is assessed by Frontier as medium to high risk.³⁴

However, Frontier also acknowledges that the NSPs have a number of ways that they can mitigate financing risks (and business risks), such as hedging interest rates and currency exchange rates. More particularly, Frontier's assessment of risk is conducted on the basis that the current approach to assessing the cost of debt, the 'on-the-day' approach continues. This is unlikely to be the case given the AER's proposed changes under the Better Regulation program.

As a result of the changes to the AER's approach, such as the introduction of a trailing average (to replace 'on-the-day') assessment of expected debt costs and the proposed annual update of the cost of debt, the interest rate reset risk is significantly reduced in the next round of determinations. This point is acknowledged by both the AER³⁵ and by Frontier³⁶ and noted above in section 3.1, although the impact is not quantified.

Overall, therefore, there is very strong support in the conceptual analysis for an equity beta that is significantly below the market average. As McKenzie and Partington said in their 2012 report, after considering the relative degree of systematic risk:

³¹ This was proposed in the first instance by McKenzie and Partington, 2012, above n 13, as cited in the AER, *Equity beta issues paper*, above n 1, 16.

³² See for example, Hughson, B, and Hodge, C, above n 5, Table 1, 23 – 24.

³³ For example, in August 2008, Standard and Poor's (S&P) changed the rating outlook for the Envestra group from stable to negative (at BBB-). S&P indicated its concern with (inter alia) the 'group's unchanged aggressive approach to using debt to fund its growth while maintaining shareholder returns...'. See Standard & Poor's Press Release, *Envestra Outlook Revised to Negative On Aggressive Financing: Group Ratings Affirmed*, 13 August 2008.

³⁴ See also AER, above n 1, 16-17. Note that illiquidity risk is assessed as low for large networks and medium to high for small networks.

³⁵ Ibid, 17.

³⁶ Frontier Economics, *Assessing risk for regulated energy networks*, 74.

...The previous conceptual discussion clearly provides evidence to suggest that the **theoretical beta of the benchmark firm is very low**. While it is difficult to provide a point estimate of beta, based on these considerations, it is hard to think of an industry that is more insulated from the business cycle due to inelastic demand and a fixed component to their pricing structure. In this case, one would expect the beta [for a benchmark energy network firm] to be **among the lowest possible** and this conclusion would apply equally irrespective as to whether the benchmark firm is a regulated energy network or a regulated gas transmission pipeline.³⁷

PIAC agrees with this conclusion while also noting that the 2012 report was prepared before the Better Regulation program commenced. With the implementation of the AER's new regulatory approach, the relative systematic risks facing the benchmark network firm is most likely to further decrease, suggesting a further reduction in the equity beta.

3.3 Overview of the conceptual analysis and the supporting empirical analysis

PIAC also considers that the AER's conclusion from the conceptual analysis does not adequately reflect the strong and consistent nature of the conceptual analysis provided by their expert consultants. For example, the AER states:

Based on the available evidence, including the expert reports from Frontier and McKenzie and Partington, we consider there are reasonable conceptual grounds to expect that the equity beta of a benchmark efficient regulated energy network will be below 1.0.

...

Further conceptual analysis does not indicate the magnitude of the difference between the benchmark efficient entity and the market average (1.0) and we propose to rely on empirical estimates for this assessment.³⁸

This appears to PIAC to be a very weak conclusion for the AER to make from the detailed theoretical and observational analyses in the expert reports by Frontier and McKenzie and Partington. While the reports do not quantify the equity beta their analysis of relative risk strongly suggests to PIAC that the beta should be *significantly less* than 1.0.³⁹ The 2012 McKenzie and Partington report, which includes both a conceptual and econometric analysis, provides further strong support for PIAC's view. As noted previously, in the 2012 report, McKenzie and Partington conclude that the equity beta for a network firm should be 'among the lowest possible'.⁴⁰ The 2012 report also comments on a number of other theoretical and empirical studies including the research and reports on equity beta of US and other international firms by Aswath Damodaran of the Stern University in New York.

Damodaran's equity beta tables are based on a wide range of US industry sectors and updated annually.⁴¹ The most recent assessment (January 2013) indicates an average raw beta of between 0.43 and 0.58 for US electricity utilities and 0.46 for US natural gas utilities, with market

³⁷ McKenzie and Partington, 2012, above n 13, 15.

³⁸ AER, above n 1, 18.

³⁹ See McKenzie, M, and Partington G, *Report to the AER: Risk, asset pricing models and WACC*, 2013, 11-16, and Frontier Economics, above n 36, 64.

⁴⁰ McKenzie and Partington, 2012, above n 13, 15.

⁴¹ *Ibid*, 29-32.

debt to equity ratios above the 60 per cent of the benchmark efficient entity.⁴² These 2013 betas are somewhat lower again than the betas from the Damodaran's tables cited by McKenzie and Partington in their 2012 report—perhaps reflecting the gradual strengthening of the US economy since the GFC (Damodaran uses five years of historical data for each annual update).⁴³

Given this, PIAC considers that the AER should have placed more reliance on the findings of the empirical studies cited by McKenzie and Partington. PIAC also notes that the average 2013 beta figures from Damodaran might be conservative (i.e. overestimate the equity beta) if used in the context of estimating the benchmark efficient firm operating in Australia.

This is because there is a consistent pattern observed across a number of studies that US equity betas for energy utilities are higher than betas derived from Australian data. As noted by the AER in the Issues Paper, there are important differences in the regulatory regimes, tax laws and general economic environment between Australia and the US.⁴⁴ This issue, along with the general difficulties of using international comparator data are discussed further in section 6 of this submission.

Recommendation 5

The AER should place greater reliance on the more recent empirical investigations on the equity beta, and the updated conceptual analyses of its expert advisors.

4. Comparator set collection

The AER states that it proposes to 'use firms that share all or most of the key characteristics of the benchmark efficient entity when conducting our regression analysis to estimate the equity beta'.⁴⁵ The AER also states that this includes 'entities that provide regulated electricity and/or gas network services operating within Australia'⁴⁶ and that the AER will cross-check the estimated equity betas against equity betas found for comparable entities. These include water networks and international energy networks.

Further important issues that are discussed by the AER and which may have a significant influence on the observed equity beta for the benchmark efficient firm are:

- the time periods used in the regression analysis to generate reliable estimates of the equity beta; and
- the limited set of comparable firms to include in the regression analysis; the AER identified only nine 'reasonable Australian comparators'.⁴⁷

In considering these issues, the AER concludes:

⁴² Damodaran, A. The raw beta estimates are before de-levering and re-levering. The 2013 equity beta tables can be found through the following links: <https://www.google.com.au/#q=aswath+damodaran> and www.stern.nyu.edu/~adamodar/. The tables are listed in the 'Data Page/levered and unlevered betas by industry'.

⁴³ McKenzie and Partington, 2012, above n 13, Appendix 2, 29-32. The average betas of the US firms range from 0.66 to 75. Unfortunately, McKenzie and Partington do not provide dates for the Damodaran table although it could be assumed that the beta tables are either for 2011 or 2012.

⁴⁴ AER, above n 1, 21.

⁴⁵ Ibid, 19.

⁴⁶ Ibid.

⁴⁷ Ibid.

- it is not good practice to ‘relax’ the threshold of comparability; while this would make the equity beta estimate more statistically reliable, it would do so at the expense of relevance of the results;⁴⁸
- in particular, it is not appropriate to use international data as a primary determinant of equity beta for the benchmark entity;⁴⁹
- the set of nine Australian comparators ‘generates a consistent pattern of empirical estimates that is robust across different sample periods and econometric techniques’;⁵⁰
- the comparator set will only include data over an applicable time period for firms that are no longer publically traded on the Australian Stock Exchange (ASX);⁵¹
- the comparator set will be continuously reviewed and adjustments made to reflect changes in the organisational structure and commercial activities of the nine firms.⁵²
- the proposed estimation period is five years, representing a trade-off between collecting more data and the relevance of that data;
- however, in order to address the question of ‘unrepresentative’ events (such as the ‘technology bubble’ and the GFC), the AER’s equity beta regression analysis will include a number of estimation periods, namely; the longest period available; the period after the technology bubble and before the GFC, then the period after the GFC; and the last five years of available data.

PIAC accepts, on a preliminary basis, that the AER’s conclusions on the process to establish the set of comparator firms and data to be included in the empirical regression analysis are reasonable, particularly given the known limitations of the available Australian data. However, PIAC cannot yet take a final position on the appropriateness of the AER’s comparator set until the AER is able to complete and publish the results of the 2013 empirical analysis of the equity betas conducted by Professor Henry for the AER.

In the meantime, the AER and other stakeholders, including PIAC, are reliant on empirical estimates provided from a range of other studies that exhibit various degrees of relevance and statistical robustness. As discussed in the next section (section 5), this raises important questions about what studies should be considered relevant and what conclusions the AER should draw from these studies.

Importantly, PIAC notes that as the equity beta estimate is for the benchmark efficient firm⁵³ the equity beta does not represent the equity beta of any individual NSP. Nor should it reflect the equity beta of NSPs that are not operating efficiently and are perceived to have higher levels of systematic risk exposure, than an efficiently financed efficient benchmark firm.

⁴⁸

Ibid.

⁴⁹

Ibid. The AER cites the report, SFG, *Regression-based estimates of risk parameters*, June 2013. In this report, SFG propose an equity beta point estimate of 0.82, using data on US firms as well as Australian firms. See section 5.2.3 for details.

⁵⁰

Ibid, 19-20.

⁵¹

Ibid, 20.

⁵²

Ibid, 21.

⁵³

The AER has provided a conceptual definition of a ‘benchmark efficient entity’ as ‘a pure-play’ regulated energy network business operating within Australia. See *AER, Explanatory Statement: Draft rate of return guideline*, August 2013, 10.

5. Empirical estimates

In the absence of its own empirical research study, the AER identifies four other relevant studies that it regards as being most directly relevant to estimating the equity beta of the benchmark efficient firm. The AER concludes that the equity beta estimate for the benchmark efficient firm falls in the range of 0.4 to 0.7. In doing so, AER has not included the highest or lowest observations in the estimated range of equity betas.

The AER has selected 0.7, at the top of the equity beta range, for the point estimate of equity beta for the benchmark efficient firm based on exogenous data or theory.

PIAC believes that the AER's *equity beta range* of 0.4 to 0.7 is reasonable, although it is worth noting that there are many more empirical observations below 0.4 than there are above 0.7. Similarly, over 80 per cent of the observed equity beta average estimates were between 0.4 and 0.59,⁵⁴ that is, at the *lower end* of the AER's range.

Based on this evidence and the conceptual studies, PIAC does not accept that the AER's point estimate of the equity beta of 0.7 is reasonable. On the basis of the various empirical studies presented in the AER's Issues Paper, PIAC concludes that the best estimate of the equity beta point estimate for a benchmark efficient firm lies between 0.5 and 0.6. This is consistent with the conceptual studies of Frontier and McKenzie and Partington. The reasons for PIAC's conclusions of a lower equity beta point estimate are set out below.

5.1 Regression specifications and permutations

Having stated that it will rely on empirical analysis rather than conceptual analysis for deriving a range and point, the AER is faced with the difficulty of defining the specifications for the regression analysis.

As noted in section 4 above, one of the important elements of the specification problem is deciding on the time periods over which the data is analysed and whether any time periods should be excluded from the analysis. However, there are a number of other elements of the regression specification that must also be determined, all of which may have an impact on the overall results. These specifications and permutations include the following options (which can be used in multiple combinations):

- the relevant comparator set; i.e., which firms should be included (see section 4 above);
- the time period for the regression, i.e., which time periods should be used (see section 4);
- use weekly or monthly estimate intervals;
- use discrete or continuous returns;
- apply adjustment factors to the results and, if so, which approach to use;
- use raw betas or de-lever and re-lever, and if so, which approach to leverage to use;

⁵⁴ This is based on the contents of Tables 4.1 to 4.7 in AER, *Equity beta issues paper*, above n 1, 25-29. These tables show a number of results that sit below and above the range of 0.4 to 0.7, for instance, there are 32 separate observations below 0.4 compared to 13 above 0.7. Similarly examination of the averages in Tables 4.1 – 4.3 and 4.7 shows that out of 27 averages: 8 were between 0.4 and 0.5, 13 between 0.5 and 0.6, 5 between 0.6 and 0.7 and 1 above 0.7. (excludes the individual company averages, and only one column of averages taken from each table, for example, in Table 4.2, only the averages in the final column ('avg (P1'-5)') were included.

- which type of regression model (e.g. ordinary least squares (OLS), least absolute deviation (LAD) etc.);
- use individual firms (and the mean of these) or a portfolio approach;
- use a constant weight portfolio approach or time varying rates; and
- if a constant weight portfolio, whether to use equal weights or weight by value.⁵⁵

It is not PIAC's intention in this submission to assess the merits of all these different permutations, although PIAC accepts the AER's view that all the permutations listed above represent 'plausible approaches to the econometric analysis'.⁵⁶

The list above, however, is intended to demonstrate that it is not sufficient just to conduct an empirical analysis and base the point estimate from these. It is essential that any empirical analysis of equity beta estimates undertaken by the AER, or any other stakeholder, is absolutely transparent about the approach that is being used and the assumptions made.

Recommendation 6

The AER should ensure that any empirical studies considered as part of the estimation of the equity beta clearly state all the specifications and permutations of the econometric regressions so that reasonable comparisons can be made between the various regression outputs.

The AER's proposed econometric study, which is not completed at the time the AER published the current Issues Paper, is designed to *explicitly* consider multiple permutations and ensure that assumptions are transparent. The AER states:

The key aspect of the new terms of reference [to Professor Henry] is that, where there are alternative econometric approaches underlying the generation of the empirical estimates, and these alternatives each have merit, we have asked Professor Henry to undertake each of them. This generates a large number of permutations across the different combinations of plausible econometric approaches, which reveals any interaction effects. It also allows us to ascertain which decisions on econometric technique are material to the empirical outcomes.⁵⁷

PIAC believes that the AER's approach described above is potentially a constructive approach to dealing with the multiple options for the econometric analysis. It is hoped that the study may, therefore, provide useful insights into how best to conduct an empirical assessment of the equity beta in the future as well as for the current equity beta assessment process. However, PIAC's final judgement on whether the AER's study provides such insights or simply adds more noise to the final assessment of the equity beta point estimate will await the publication of Professor Henry's report.

In the interim, the AER (and stakeholders such as PIAC) are reliant on the limited number of Australian econometric studies of the equity beta for a benchmark efficient entity. These studies, and the AER's interpretation of the outputs of these studies, are discussed in section 5.2 below.

⁵⁵ The list is largely derived from the core set of regression permutations set out by the AER in the terms of reference issued to Professor Henry as part of the current equity beta review (the 2013 Henry review). Professor Henry also conducted the econometric analysis of equity beta for the AER's 2009 WACC review. See AER, *Equity beta issues paper*, above n 1, 30-31.

⁵⁶ See AER, above n 1, 30.

⁵⁷ Ibid.

Recommendation 7

When presenting the final results of the 2013 Henry study, the AER should ensure that the multiple permutations in the study are presented in a coherent form with an explanation of the interlinks and the strengths and weaknesses of these multiple regression outputs.

5.2 Econometric studies on benchmark efficient entity

The AER has summarised a number of studies in the Issues Paper that have attempted to measure empirically, the equity beta for the benchmark efficient entity.⁵⁸ They are (using the AER's nomenclature) as follows:

- 2009 Henry estimates (see Tables 4.1 to 4.3);
- 2011 ERA estimates (the ERA is the Economic Regulation Authority of Western Australia) (see Tables 4.4 to 4.5);
- 2013 ERA estimates (see Tables 4.6 to 4.7); and
- 2013 SFG estimates.

Based on these studies, PIAC supports the AER's proposed range of equity beta of 0.4 to 0.7. PIAC, however, also identifies a number of other aspects from the econometric studies that are important for the consideration of the final point estimate for the equity beta. They are described in more detail below

5.2.1 2009 Henry estimates

The 2009 Henry equity beta estimates are summarised in Tables 4.1 to 4.3 of the Issues Paper.⁵⁹ The estimates are derived from re-levered portfolio equity beta estimates using different time periods, portfolio combinations, regression methodologies and weightings. Some important observations include:

- monthly observations demonstrate greater variations in equity beta results to different methodologies than weekly observations; the monthly portfolio equity beta estimates range from 0.44 to 0.94 with averages across portfolio mixes of **0.55 to 0.66** (i.e. the dispersion of the averages is 0.11 from a total of 8 averages);
- the sensitivity of monthly observations to the regression methodology is particularly evident in the period March 2007 to September 2008 (comparing Column 'P5' in Tables 4.2 and 4.3);
- weekly observations are more stable across different permutations of the regression methodologies and demonstrate less dispersion of the results; the weekly portfolio equity beta estimates range from 0.35 to 0.64 and the averages across portfolio mixes of **0.49 to 0.55** (i.e. the dispersion of the averages is only 0.06 points from a total of 8 averages); and
- the variations in the range of the different permutations of monthly observations appears to be mainly due to two factors:
 - the specific time period of March 2007 to September 2008;⁶⁰ and
 - the inclusion of Hastings Diversified Fund (HDF) in the portfolio mix.⁶¹

⁵⁸ *ibid*, 24-31

⁵⁹ *Ibid*, 25-27.

⁶⁰ For example, in Table 4.2, compare column 'P5' with column 'Avg (P1-5)'; in column P5 (Mar 2007 – Sep 2008) the equity betas range from 0.6 to 0.94, in column Avg (P1-5) (Jan 2002- Sep 2008), the equity beta estimates range from 0.57 to 0.66.

⁶¹ For example, in Table 4.3, HDF is added to the portfolio in column 'P3'. When comparing column P2 (which does not include HDF) with column P3, the equity beta increases by around 0.1 point on most of the

These latter two observations on the impacts of the time period of the regression and the introduction of one particular network company, HDF, to the portfolio mix, are worthy of further investigation. For instance, it may signal the sensitivity of the equity beta estimate to specific exogenous events (such as the GFC), and to specific company events as in the case of HDF. PIAC has briefly reviewed the publically available history of HDF over recent years. It indicates that HDF may have been experiencing financial difficulties just prior to its take-over by the APA Group in December 2012.⁶² If this were the case, it would not be surprising to see HDF's financial position more sensitive to systematic risk factors.

Given the relatively small sample of firms used in the econometric analyses of the Australian firms, significant variations in the estimated equity beta for one company may strongly influence the overall industry averages. In addition, this same outcome suggests that the econometric analysis is assessing equity beta for the benchmark efficient entity in a way that also includes company specific, non-systematic diversifiable risk.

The impact of HDF on the estimated portfolio equity beta for a benchmark efficient company can also be seen in the recent econometric studies conducted by the ERA as discussed below in section 5.2.2.

Recommendation 8

The AER conduct a further investigation of the sensitivity of the average and portfolio equity beta estimates for Australian regulated networks to the effects of events affecting a single firm in the sample.

5.2.2 2011 and 2013 ERA estimates

The AER states that the 2011 ERA study replicates 2009 Henry study but uses an updated dataset (to October 2011). The 2013 ERA study updates the dataset again and includes two additional econometric techniques.⁶³

Across the two empirical studies conducted by the ERA, the empirically derived equity beta estimates were generally below 0.6 with average of the individual firms ranging from **0.45 to 0.60**. Removal of HDF from the sample further reduced the average equity betas. The average betas after removal of HDF from the sample ranged from **0.36 to 0.51**. This is illustrated in Table 1 below, which summarises the ERA's findings across different samples, methodologies and time periods.

permutations; e.g. for equal weighted OLS regression form, the equity beta increases from 0.46 to 0.58 with the inclusion of HDF.

⁶² For example, HDF's last half yearly report to June 2012 reports a net after tax loss of some \$135M, largely due to various financing charges and management fees, a net negative cash flow of \$172M, and a net debt of \$1,326M on a market capitalisation of \$1,272. See HDF, *2012 Half Yearly Results Presentation*, 31 August 2012. <http://www.asx.com.au/asxpdf/20120831/pdf/428djn589gz5p9.pdf>

⁶³ ERA, *Draft decision on proposed revisions to the access arrangement for the Western Power network, Submitted by Western Power*, March 2012, 195-205 (ERA, *Draft decision: Western Power access arrangement*). ERA *Explanatory statement for the draft rate of return guidelines: Meeting the requirements of the National Gas Rules*, August 2013, 168-181. Given the short time-frame for submissions, PIAC relies largely on the AER's summary of the two ERA studies.

PIAC finds the AER's reporting of the ERA's study interesting in the light of the AER's own proposal to set the equity beta point estimate at the top of the range of equity beta estimates. For example, the AER summarises the ERA's position as follows:

Overall, the ERA considered the results supported an equity beta in the range of between **0.5 and 0.8**. It determined an equity beta point estimate of **0.65** being reasonable for Western Power's Access Arrangement.⁶⁴ [PIAC's emphasis]

PIAC's initial observation is that the ERA's conclusions on both the range and the point estimate appear conservative given the individual company data and, in particular, when considered in the context of the average of the individual estimated equity betas. Table 1 below illustrates the average regression results, with average betas of the total sample ranging from 0.4 to 0.6 for the 2011 ERA study.

In addition, while the ERA's *equity beta range* of 0.5 to 0.8 seems conservative given the results of the regression analyses, and is higher than the AER's proposed equity beta range of 0.4 to 0.7, the ERA's *point estimate* of 0.65 is lower than the AER's *point estimate* of 0.7.

Table 1: Summary of ERA's analysis of equity betas for individual firms

ERA Sample	Regression form	Average beta of total sample	HDF beta	Average beta excluding HDF
2011 monthly sampled (Sample size = 9)	OLS	0.45	0.07	0.50
	LAD	0.47	0.47	0.47
2011 weekly sampled Sample size = 9	OLS	0.60	1.34	0.51
	LAD	0.44	0.84	0.39
2013 sample Sample size = 6	OLS	0.50	1.20	0.36
	LAD	0.49	1.11	0.37
	Robust MM	0.52	1.00	0.42
	Thiel-Sen	0.48	1.00	0.38
	Average	0.50	1.08	0.39

Summarised from Tables 4.4 to 4.6. of the AER's Issues Paper. The average of the total sample has been calculated by the AER. The average excluding HDF has been calculated by PIAC for the purposes of this submission.

⁶⁴ AER, *Equity beta issues paper*, above n 1, 28. The AER cites ERA, *Draft decision: Western Power access arrangement*, March 2012, above n 63, 205.

5.2.2.1 2011 ERA study

It is instructive to examine the outcomes of the 2011 ERA study because of its relevance to the AER's estimation of equity beta, particularly in the absence of the updated 2013 Henry study.

In the 2011 ERA study, the ERA applied both the OLS and LAD regression methods to the data (see Table 1) using both monthly and weekly sampling, and then de-levered/re-levered the results. One of the more important observations from the study, and one that provides somewhat more confidence in the validity of the overall results, was the degree of consistency in the *averages of the beta estimates* across different regression types, sampling periods and time period of the study. The range of the average betas was **0.45 and 0.55**. PIAC notes also that removing the anomalous data from HDF (see section 5.2.1 above) reduces the range of the average betas to **0.40 and 0.50**.

However, the 2011 ERA study only estimated the equity beta estimates for each of the nine *individual* businesses.⁶⁵ Therefore, the outputs of the study are not directly comparable with the 2009 Henry results that used a portfolio approach. Nevertheless, based on the average betas calculated by the AER in Table 1, it is notable that both the 2009 Henry and the 2001 ERA studies arrive at broadly similar conclusions on the estimated equity beta with observations lying mainly in the range of **0.4** to a maximum of **0.6**.

5.2.2.2 2013 ERA study

The 2013 ERA study was able to update the 2011 study. It also included two additional regression techniques and estimated a *portfolio equity beta* as well as the individual company beta estimates. The nine companies included in the original study were reduced to six to ensure all members of the sample had data up to 2013.

Again, the 2013 ERA study revealed a pattern of consistent results when considering the *averages of the beta estimates for the individual firms*. The averages across four different regression methodologies sat between **0.48 and 0.52** (see Table 4.6 in the AER's Issues Paper and Table 1 above). Such consistency across different methodologies should provide some comfort that although the sample sizes of Australian firms are small, when the different analyses are taken together, they provide a strong indication of the best estimate of the equity beta.

In both the 2011 and 2013 studies, however, there were quite large differences between the equity betas for the individual firms. For example, in the 2013 ERA study, the estimated equity beta for two of the six firms was less than 0.30 across the different methodologies. However, HDF had equity beta's ranging from 1 to 1.20. Hence, while the average betas demonstrated consistency across the various studies and methodologies, the individual firms showed a much wider dispersion reflecting their individual corporate histories, capital structures, risk profiles and the like.

As noted, the 2013 ERA study also examined the *portfolio equity beta estimates*. The results are summarised in Table 4.7 of the AER's Issues Paper. Notwithstanding the different approach and weightings in the portfolio, the results demonstrate equity betas in the range of **0.46 to 0.53**. These results are very consistent with the average of the equity betas of the individual firms in the 2011 and 2013 ERA study of averages for individual firms (above).

⁶⁵ AER, above n 1, 27-29. See notes to the Tables 4.4 to 4.7.

Generally, the results of the portfolio analysis were reasonably consistent across different mixes of firms in the portfolio, and time periods. However, HDF had a noticeable impact in moving the portfolio equity beta higher. For example, the portfolio of three firms for the period August 2004 to April 2013, demonstrated a range of equity betas from 0.39 to 0.44. When HDF was added to the portfolio, the equity beta range across the different methodologies jumped to 0.47 to 0.58.⁶⁶

Although there were larger individual firm differences this is less important because the objective is to forecast the rate of return for the benchmark efficient firm rather than forecast the returns for an individual company (as an investor might want to do).

What is important in forecasting the equity returns for a benchmark efficient firm, is the *overall* average equity betas and portfolio estimates and the consistency of these findings across different methodologies and time periods. Such consistency can give confidence in the results even when the relevant samples are relatively small.⁶⁷

The two ERA studies and the 2009 Henry study provide a demonstration of this consistency across a range of approaches and time periods for both average and portfolio equity betas. Taken together, they suggest an empirically derived equity beta of **between 0.5 and 0.6** for the benchmark efficient firm.

5.2.3 2013 SFG Study

The Energy Networks Association of Australia (ENA) submitted a number of reports from its expert consultant, SFG, providing an additional empirical analysis to derive the estimated equity beta for both Australian and UK firms.

The SFG study provided estimates of systematic risk for the Sharpe-Lintner and Black capital asset pricing models (CAPMs) and for the Fama-French three-factor model using historical returns on nine Australian-listed stocks and 56 US-listed stocks over an 11-year period from 2002 to 2012.⁶⁸ The sample of Australian firms included the same firms that were in the original 2009 Henry study. .

For the CAPM part of the study, SFG used a somewhat different methodology than the 2009 Henry study and the 2011 and 2013 ERA studies. In particular, the AER states that the SFG study:

- used data up to 19 February 2013 based on four-weekly returns;
- only examined OLS estimates as it considered LAD estimates exhibit a downward bias;⁶⁹
- made a Vasicek adjustment to the OLS estimates which increased OLS beta estimates by an average of 0.03.⁷⁰

⁶⁶ Ibid, Table 4.7, 29. The three firm scenario is taken from the column labeled 'P2', while the inclusion of HDF in the mix is taken from the column labeled 'P3'. P2 and P3 cover almost the same time period (2nd half of 2004 to April 2013), so the differences are due to the inclusion of HDF in the portfolio.

⁶⁷ This may for instance, address some of the issues raised in a supplementary report by SFG Consulting and others with the reliability of results from a small sample. See also section 5.2.3 in this submission.

⁶⁸ SFG Consulting, *Regression-based estimates of risk parameters for the benchmark firm*, June, 2013, 2.

⁶⁹ Ibid, 5. SFG claims that the bias is 'approximately 0.15 for the average firm', and 'if implemented into regression-based estimates of risk this is likely to result in cost of capital estimates with a material downwards bias.

⁷⁰ See AER, above n 1, 29-30.

Notwithstanding the exclusion of the LAD regression estimates (which SFG claims are biased downwards) and the inclusion of an upward adjustment to the equity beta estimate, the SFG study found a mean re-levered value-weighted CAPM beta estimate of **0.60** for the individual Australian firms, with a 95 per cent confidence interval of 0.37 to 0.83.⁷¹ When applying an equal-weighted index, the mean was **0.55** with a 95 per cent confidence interval of 0.39 to 0.70.⁷² The average of the means of the individual and equal-weighted regressions was a beta estimate of **0.58** for the Australian sample of nine firms.⁷³

PIAC suggests that SFG's empirical analysis of Australian firms is not inconsistent with the equity beta point estimate of around 0.5 to 0.6 for the benchmark efficient entity that PIAC identified as a reasonable point estimate from the 2009 Henry study and the 2011 and 2013 ERA studies (see Table 1 and section 5.2.2).⁷⁴

The SFG study also considered a much larger sample of 56 US integrated energy stocks.⁷⁵ The study found an average equity beta estimate of 0.88 for the value-weighted stocks. The equal-weighted index produced a beta estimate of 0.91 for the US sample.⁷⁶ Both these estimates are significantly higher than the equity beta estimates that SFG found for the Australian sample (0.60 and 0.55 for the value-weighted and equal-weighted regressions respectively).

SFG also calculated average equity betas for a combined sample of Australian and US firms of 0.84 (value-weighted) and 0.86 (equal-weighted).⁷⁷ The combined sample betas of 0.84 and 0.86 reflect the fact that the US sample is so much larger than the Australian sample. It says little, per se, about the equity beta in Australia for the benchmark efficient firm. SFG has also 'adjusted' the combined sample results by adding greater weight to the Australian sample (24 per cent rather than 14 per cent in the raw sample data). On this basis, SFG recommends an equity beta for the CAPM of **0.82**.⁷⁸ However, it is not clear from the SFG report why 24 per cent was chosen for the weighting of the Australian firms.⁷⁹

The difficulties with using international data to assess the equity beta of the benchmark efficient firm will be further considered in the next section. However, PIAC's strong view is that it would be inappropriate to include the US equity beta data to estimate either the range or point estimate of the equity beta of the benchmark efficient firm. This is despite the superficial appeal of increasing the reliability of the regression results (or, in statistical terms, reducing the standard deviation of the observations) by using a combined sample of US and Australian firms to estimate the benchmark efficient entity.

⁷¹ SFG, *Estimates of risk parameters*, above n 68, Table 2, 13.

⁷² Ibid, Table 3, 15.

⁷³ Ibid, Table 4, 16.

⁷⁴ PIAC is not implying here that SFG supports such a conclusion. SFG has suggested an equity beta of 0.82 based on a combined sample of Australian and US firms, with the Australian results contributing 24% to the final figure of 0.82.

⁷⁵ AER, above n 1, 32. The AER states that the US integrated energy companies involve energy generation, transmission, distribution, retail and other regulated activities. See also SFG, *Estimate of risk parameters*, above n 68, 10. SFG provides a more detailed assessment of how the 56 firms were selected, including a requirement to include only firms that had at least 50% regulated assets.

⁷⁶ SFG, above n 68, Table 2, 13, and Table 3, 15.

⁷⁷ Ibid, Table 2, 13 and Table 3, 15.

⁷⁸ SFG, *Estimate of risk parameters*, above n 68, 16.

⁷⁹ Ibid. SFG explains their approach in terms of the need to increase reliability in the sample, but it is not clear why 24 per cent was chosen versus some other percentage.

Reliability should not be achieved at the expense of validity, and the US integrated energy companies vary in structure, risk exposures, regulatory, business and operational environments to such an extent that their inclusion would risk undermining the validity of the equity beta estimate for the benchmark efficient Australian firm.

SFG notes that the US sample has been scrutinised to assess the proportion of assets under regulation, industry classification and prior use in comparable firm analysis for regulatory decision-making.⁸⁰ Nevertheless, these US firms are generally integrated businesses incorporating activities that have a range of systematic risk exposure. As the AER suggests, there are many factors other than the regulatory status of the firms to consider when assessing the role that international measures should have in determining the equity beta for the benchmark efficient firm.⁸¹ Further, the AER considers that it is 'desirable to examine evidence on all available international comparators, rather than only those based in the US'.⁸²

In PIAC's view, it is better to develop the equity beta for the benchmark efficient entity by focussing on a systematic analysis over time of the Australian firms. For instance, the updated 2013 Henry report will provide a wide range of analyses of Australian data over different periods and using different methodologies. If a consistent pattern emerges from this, then the AER can have increased confidence in both the validity and reliability of the beta estimates, without resort to using selected international data to build up the sample size.

The next section will further consider the issues with international comparisons.

Recommendation 9

The AER should focus its attention on the systematic analysis of Australian firms over time, in preference to international studies, in order to better understand any trends or sensitivities in the equity beta outcomes, and to derive an equity beta consistent with its definition of a benchmark efficient entity.

6. International comparators

6.1 The role of international comparators

The AER has defined the benchmark efficient entity as 'a pure play, regulated energy network business operating in Australia.'⁸³ The critical test, therefore, when considering international studies is the degree to which any such international comparator is consistent with this definition of a benchmark efficient entity. If it varies significantly, for instance, if it is not a 'pure play' network business (and many of the US sample referred to in Section 5 above are not), then the AER should be very circumspect in how it uses the data.

PIAC recognises the difficulties in estimating equity betas based on empirical analysis, given the small number of utilities in Australia. As highlighted in the discussion about HDF, in a small sample, events that impact on the perception of non-systematic risk for an individual company can significantly alter the estimated equity beta that is designed to measure the relative systematic risk of the industry benchmark efficient firm. It is this type of problem that leads to the

⁸⁰ Ibid. This assessment was conducted by Competition Economists Group (CEG).

⁸¹ AER, above n 1, 34.

⁸² Ibid.

⁸³ AER, above n 53, 10.

search for other relevant samples, such as international comparators or like industry comparators (such as the regulated water companies).

There are two general ways the international comparators can be included in the equity beta estimation process. The international comparators can be used:

- as part of the sample set for the regression analysis – SFG adopts a similar approach in their regression study of betas, although it appears that the betas for Australian and US firms are derived separately, then combined into one overall sample average;⁸⁴
- as a guide or cross-check to the range of equity betas, or the point estimate of equity beta, that are initially derived from the cohort of Australian firms – the AER, for instance, is proposing to use international data as a ‘cross-check of domestic beta estimates’.⁸⁵

PIAC agrees with the AER regarding the necessity of interpreting the results of international studies with ‘caution’.⁸⁶ PIAC also recommends that a critical analysis is undertaken, particularly when using international studies to estimate either the range or the point estimate of the equity beta for the benchmark efficient firm. Indeed, the AER indicates that its practical assessment of international comparators will be guided not only by a sense of ‘caution’, but also by the requirement that ‘the choice of overseas comparators is based on **solid reasoning**’.⁸⁷ [PIAC’s emphasis]

This ‘solid reasoning’ should include a critical examination of the regulatory differences between Australia and the comparator nations. However, it should also consider the broader economic, operating, tax and legal environments. Given the complexity of making comparisons, there must be a strong onus of proof on any stakeholder who proposes using international comparator data in a ‘determinative’ or ‘informative’ role (versus using the results as a ‘cross-check’). That is, the onus should sit with the proposer to clearly establish the benefits that the international data adds to the estimation of the equity beta for the benchmark efficient entity in terms of enhancing both the reliability and validity of the results.

PIAC also agrees with the AER’s conclusion that:

Further, while we recognise the trade-of between the sample size of the comparator set and the relevance of potential comparator businesses to our conceptual benchmark, we consider it desirable to examine evidence on all available international comparators, rather than only those based in the US.⁸⁸

PIAC believes that it is not only ‘desirable’, but it *is essential* that the AER casts a broader international net than just US businesses. A broader based study will not only give the AER greater confidence in the role that international comparators can play in the equity beta estimation, it will also enable a better understanding of the important factors that influence the validity of the comparators.

⁸⁴ For example, see SFG, *Estimates of risk parameters*, above n 68, Table 2, 13. SFG’s final recommendation of a beta of 0.82 is based on a weighting the Australian sample, such that the Australian sample contributes 24% of the combined result and the US sample contributes 76% (in the raw data, the Australian sample represents 9% of the total). See also page 16.

⁸⁵ AER, above n 1, 32.

⁸⁶ Ibid, 34.

⁸⁷ Ibid.

⁸⁸ Ibid, 34.

PIAC's conclusion, therefore, is that there is some value in principle in considering international comparators. However, these comparators should not be used purely in the pursuit of greater statistical reliability. The more important questions concern the *role* that the international comparator data should play and whether this data supports or undermines the *validity* of the AER's estimation of the equity beta of a benchmark efficient pure-play firm operating in Australia.

More generally, PIAC's considers that where these two questions cannot be readily answered, (i.e. the role of the international comparator data and the validity to the benchmark efficient entity), then the AER should re-consider the level of reliance it is currently placing on the international comparator data as a cross-check to estimates derived directly from Australian network companies.

The next section summarises PIAC's response to the international comparator data provided by the AER in section 5.2 of the Issues Paper.

Recommendation 10

The AER only consider proposed equity beta estimates based on international studies for the benchmark efficient firm, if these proposals are supported by evidence that the inclusion of the international data will enhance both the reliability and the validity of the equity beta estimates. Preferably this evidence would include data from a range of other countries, not just the US.

6.2 International empirical estimates

The AER has summarised international empirical estimates broadly in two time periods. The first period uses pre-GFC industry data for the regression analyses while the second period includes data after the onset of the GFC.

There are clearly considerable difficulties in comparing the international empirical estimates of equity beta not only because of the differences in the economic, operational and financial risk characteristics, but also because of the variety of methodologies, assumptions, adjustments and so on (some more explicit than others). For example, are the estimates unlevered, or de-levered and re-levered (for gearing), and if so, by what methods. Is the data weekly sampled or monthly, is it weighted or non-weighted and so on.

Given this, PIAC finds that the AER's conclusion with respect to the equity beta range is not unreasonable. The AER concludes that:

After taking into account the difficulty of adjusting for different operating environments we consider that the [international] data nonetheless provides support for our estimate of an equity beta range for the benchmark efficient entity of 0.4 to 0.7.⁸⁹

However, PIAC is less convinced of the second arm of the AER's conclusions:

We also consider that this evidence is more supportive of a point estimate of equity beta that is located closer to the upper end of this range.⁹⁰

⁸⁹ Ibid, 37.
⁹⁰ Ibid.

There are a number of reasons why PIAC does not support the AER's position that the international data supports their decision to adopt a point estimate of 0.7, at the top of the range. PIAC's reasons are built on a number of findings in the various international studies cited previously as well as the Australian data. In particular, PIAC notes that studies, such as the 2013 SFG study, generally find that US utilities have higher observed equity betas than the Australian firms.

A 2011 report by NERA Economic Consulting (NERA) to the Queensland Competition Authority (QCA)⁹¹ provides a further example of higher US betas. It also illustrates the more general difficulties of using the international comparators to guide or cross-check decisions on the equity beta point estimate for an Australian benchmark efficient firm.

In the AER's Issues Paper, the AER reports that NERA implemented two leverage adjustments, and used both equal-weighted and value-weighted portfolios to produce point estimates of:

- 0.52 to 1.09 for UK firms; and
- 0.70 to 0.96 for US firms.⁹²

However, closer examination of the NERA study indicates that this 'range' of results appears to include both energy and water utilities in the UK and US. The ranges also include results from both of the two leverage adjustment methodologies reported by NERA, although one of these, using the Conine formula for leverage, was not preferred by NERA.⁹³

NERA does provide separate details for the energy utility sector, using weekly data and NERA's preferred 'AER' leverage methodology for a benchmark leverage of 60 per cent:⁹⁴ The results are summarised in Table 2 below and provide a somewhat different perspective, particularly results for the post-GFC period of 2009-2011.

Table 2, 2011 NERA study of equity betas for energy utilities in Australia

Regression Period	Utility Country	Equity beta	
		equal weighting	value weighting
2000-2011	Australia Energy	0.518	0.449
	UK Energy	1.090	1.071
	US Energy	0.880	0.787
2009-2011	Australia Energy	0.646	0.458
	UK Energy	0.634	0.648
	US Energy	0.962	0.857

NERA, Cost of capital report for water infrastructure, 2011, 36-37. Numbers in bold 'differ significantly from one at the 5 per cent level.

⁹¹ NERA Economic Consulting, *Cost of Capital for Water Infrastructure, Report for the Queensland Competition Authority*, March 2011. (NERA, *Cost of Capital Report*).

⁹² AER, above n 1, 36.

⁹³ See NERA, *Cost of Capital Report*, above n 91, 33-34 for a further discussion on why NERA prefers to use the 'AER' formula for de-levering and re-levering the equity betas, rather than the Conine formula. The results using the Conine formula are provided in the Appendix to the report, for historical continuity).

⁹⁴ Ibid, Table 5.1, 36-37. See notes to Table 5.1 for more details.

Consistent with the other reported studies, the equity beta estimates are higher for the US than for Australia. The more striking observation is the difference between the UK energy equity betas in the period 2000-2011 compared to the period 2009-2011, with equity betas of around 1 (the market average) in the study that includes earlier years and less than 0.65 in the post-GFC study.

It is not possible using the available data to explain why there has been such a significant change between the two periods in the UK, particularly given that the changes in the Australian data and the US data between the same two sample periods are considerably smaller. However, as there are only three utilities in the UK energy sample, it may be that specific events for an individual firm are overly influencing the reported results.⁹⁵

Given the 2009-2011 data from NERA and the 2013 average beta results of raw beta estimates of 0.43 to 0.58 reported by Damodaran and discussed in section 3.1.2,⁹⁶ PIAC considers that the international evidence does not provide any consistent support for the AER's proposal to set the equity beta estimate at the *highest end of the range* (i.e. 0.7) for a benchmark efficient entity. More so, given that such a result (an equity beta of 0.7 for the benchmark efficient entity) would be inconsistent with the various empirical studies of Australian firms that together indicate a point estimate equity beta between 0.5 to 0.6.

However, the international data does provide a useful 'cross-check' to the *counterfactual* claim, namely the claim that the equity beta for the benchmark efficient entity should be greater than 0.7. Given the consistency of the Australian empirical results and the lack of consistent evidence from the international studies for a higher equity beta, there is very little justification for a higher equity beta and/or the retention of the current equity beta of 0.8.⁹⁷ This conclusion is discussed further in section 7 below.

7. Selection of a range and point estimate.

As stated previously in this submission, PIAC has no particular difficulty with the selection of the range of 0.4 to 0.7 for the estimated range of equity beta for the benchmark efficient firm operating in Australia.

However, PIAC considers that the AER has *not* provided adequate reasoning for selecting an equity beta point estimate at the very top of the range of empirical estimates (although the AER prefers to refer to this as 'the upper end of the range of empirical estimates'). PIAC's concerns have been discussed in the previous sections of this submission.

⁹⁵ Unfortunately, the NERA report does not provide equity betas for individual firms, so it is difficult to determine reasons for such a significant change. Importantly, while the 2000-2011 estimated equity beta for the UK is not significantly different than 1 at the 5 per cent level, the 2009-2011 results are significantly different from 1. All Australian results are significantly different from 1, but only one of the US results is statistically significant.

⁹⁶ As discussed in section 3.3, the Damodaran beta tables for 2013 show average betas (not re-levered) for electricity and gas utilities in the range of 0.43 to 0.58, with debt/equity ratios greater than the 60% used by the AER for the benchmark efficient entity.

⁹⁷ The allowed equity beta of 0.8 in the 2009 WACC review was above the range of 0.4 to 0.7 that the AER had identified from the empirical data in the 2009 Henry report. The AER's decision reflected the difficult economic circumstances at the time, and the uncertainties around the analysis. The AER now states that they have 'greater confidence in the reliability of the empirical estimates'. AER, above n 1, 40.

The summary below addresses the three reasons provided by the AER for their selection of an equity beta at the top end of the range, i.e. an equity beta of 0.7.⁹⁸ In responding to the AER's position, PIAC's contention is that the *default point estimate* should be selected around the central tendency in the empirical results, and any deviation from this should be clearly justified. It is not sufficient for the AER to state the results are 'not inconsistent' with the AER's chosen point estimate.

1. The AER has stated that the results of overseas studies support the choice of a point estimate in the 'upper end' of the AER's range.⁹⁹

PIAC disputes this conclusion. The international comparators are not consistent in either their methodology or outcomes. They are heavily dominated by US studies, and the data has consistently demonstrated that US results are higher than those found in the Australian empirical studies which points to some underlying difference in relative systematic risk (to the market as a whole). Even so, at least some more recent US results (such as the 2013 Damodaran beta tables) point to an equity beta for US energy utilities of less than 0.7 despite higher gearing. Similarly, the most recent UK data referred to by NERA and cited in the AER's Issues Paper indicates an equity beta for the UK of less than 0.65 (see Table 2 above, 2009-2011 regression estimates).

2. Selection of a point [estimate] at the 'higher end of the range' appears compatible with the theoretical predictions of the Black CAPM.¹⁰⁰

PIAC's response is to question the relevance of the Black CAPM as a basis for modifying a consistent pattern of empirical results. PIAC highlights that the AER has explicitly rejected the use of the conceptual studies for estimating the equity beta point estimate, stating that instead it intends to *rely on the empirical data*. It is not clear, therefore, why the AER should seek to justify selecting the top end of the range by reference to the *theoretical* predictions from the Black CAPM, particularly as the AER itself states with respect to the Black CAPM:

...there are major problems deriving a reasonable empirical estimate using this model [the Black CAPM], and theoretical analysis does not lead to a clear indication of the **magnitude of the difference** between the Black CAPM and the standard CAPM.¹⁰¹ [PIAC's emphasis]

The AER's inconsistency here is further illustrated by comparing its proposed use of the Black CAPM with its much weaker use of the conceptual studies to guide the selection of a point estimate for the equity beta. That is, the AER claims that the theory underpinning the Black CAPM can be used as evidence to support the AER's proposed point estimate of 0.7, at the top of the equity beta range. However, the AER rejects the conceptual analyses by Frontier and by McKenzie and Partington, which suggest an equity beta point estimate at the lowest end of the range as a guide to the point estimate. With respect to these latter studies, the AER states:

⁹⁸ This summary of the AER's position is based on the AER's reasoning in the Issues Paper. See, AER, above n 1, 42.

⁹⁹ Ibid.

¹⁰⁰ Ibid.

¹⁰¹ Ibid, 40.

Further, conceptual analysis **does not indicate the magnitude of the difference** between the benchmark efficient entity and the market average (1.0) and we propose to **rely on empirical estimates for this assessment.**¹⁰²[PIAC's emphasis]

It seems to PIAC that the same logic that the AER applied to the conceptual studies should apply to the application of the theoretical premise of the Black CAPM. As the Black CAPM also does not indicate the 'magnitude of the difference', the AER should rely more on the evidence from the empirical studies to guide its decision. On the other hand, if the AER is to be guided by the Black CAPM, it should equally be guided by the conceptual analysis of Frontier and McKenzie and Partington, which in PIAC's view would point to a different outcome.

PIAC would also draw the AER's attention to one of the conclusions of the McKenzie and Partington 2012 report. When considering the question of whether equity betas below one are downwardly biased in the standard CAPM, McKenzie and Partington conclude:

The answer to this question is that the point estimate of beta in a correctly specified CAPM type regression is **unbiased** irrespective as to whether the estimate is above or below one.¹⁰³

If the empirical evidence strongly and consistently points to a particular equity beta point estimate then this empirical data should be the main guide to the AER's decision rather than a theoretical proposition that provides very little quantitative guidance and has limited empirical support.

3. Cross checks from the water sector are consistent with the AER's choice of a point estimate at the upper end of the AER's range.¹⁰⁴

The AER provides a number of references to various studies of the water sector. However, PIAC suggests that the AER's conclusion that the results from the water sector are consistent with the selection of the 'upper end' of the AER's range is not adequately supported by the data.

For example, the AER states that 'Recent decisions by regulators of Australian water networks have adopted equity beta point estimates that tend to be around 0.7, and have been between 0.55 and 0.8.'¹⁰⁵ The AER also states that SFG 'recently produced empirical estimates for an Australian water utility where the mean equity beta estimate was 0.55.'¹⁰⁶

These reported results do not unambiguously support the AER's conclusions. Firstly, there is considerable circularity in the regulatory determinations between the regulated water and energy industries. That is, there is a tendency for the regulators of both water and energy utilities to cross-check with each others' decisions. This circularity means that the decisions of water regulators provide little new information to guide the AER's estimation of the equity beta point estimate.

Secondly, where the water utilities have been subject to other empirical testing in the same study as the energy firms, the findings on the differences in the equity betas between the energy and

¹⁰² Ibid, 18.

¹⁰³ McKenzie and Partington, *Equity beta report*, above n 26, 23.

¹⁰⁴ AER, *Equity beta issues paper*, above n 1, 42.

¹⁰⁵ Ibid.

¹⁰⁶ Ibid.

water utilities are inconsistent. In its 2011 study for the QCA, NERA highlights the difficulty as follows:

Our estimates of the equity beta of a UK water utility are always below the corresponding estimates for a UK energy utility. On the other hand, our estimates of the equity beta of a US water utility are always above the corresponding estimates for a US energy utility.¹⁰⁷

Thirdly, PIAC notes that the findings reported by the AER in support of its proposed 0.7 equity beta, are also quite consistent with PIAC's conclusions from the empirical analysis of the Australian energy NSPs. That is, the observations reported by the AER of a range of regulator outcomes of 0.55 to 0.8 (noting the circularity issue), and the separate empirically derived SFG estimates of 0.55 are also consistent with an equity beta point estimate of between 0.5 and 0.6. Given the consistency, it is unclear to PIAC why the AER has chosen 0.7 as the equity beta, when a range between 0.5 and 0.6 would be consistent with the same underlying data.

Overall, therefore, PIAC considers that the AER's reasoning for selecting a point estimate for the equity beta at the top of the range, i.e. 0.7, is quite weak. Given the AER's initial emphasis on using empirical results, the default assumption for the point estimate of beta should be somewhere in the mid-region of the range of empirically derived equity betas.

PIAC agrees with the AER that the role of the international comparators is as a cross-check to the Australian empirical analysis, but it should be a cross-check on the reasonableness of the *default assumption* of a mid-point of the range, not a cross-check of a decision to adopt the top of the range as the AER appears to be doing. PIAC considers that both the international comparators and the water industry results, when used as a cross-check to the Australian empirical analysis, are equally consistent with an estimate in the mid-region of the observed range of equity betas, that is, an estimate of equity beta between 0.5 and 0.6.

In summary, PIAC strongly recommends that the AER re-examine its proposed point estimate. The preferable position is for the AER to take the central estimate in the range as the starting assumption and not vary this unless there is some compelling evidence to do so. PIAC believes there is no such compelling evidence and, therefore, the point estimate for the benchmark efficient entity should be set at between 0.5 and 0.6.

Recommendation 10

The AER should adopt a 'default' equity beta around the middle of the empirically derived range of equity betas. This default should only be varied if there is a compelling case to do so. PIAC therefore recommends an equity beta point estimate between 0.5 and 0.6 as most applicable to the systematic risks facing the benchmark efficient entity in the future regulatory environment.

¹⁰⁷ NERA, *Cost of Capital Report*, above n 91, 38.