Response to the Draft Rate of Return Guideline of the Australian Energy Regulator

11 October 2013

Contents

1. Executive summary

The rate of return guideline development process under the *National Electricity Rules* and *National Gas Rules* is intended to provide guidance on how the Australian Energy Regulator (AER) will seek to apply new rules for estimating the cost of capital for energy network firms.

This guidance is critical for regulated firms and their owners whose obligations to safely and reliably meet demand for network services requires continuous financing of large capital investments in long-lived assets. Energy network firms control network assets valued at over $75 billion and clear, evidenced-based and predictable regulatory decision-making on approaches to setting the expected return on current and future capital is key to facilitating the efficient financing of network infrastructure. A guideline which provides reasonable certainty of application, and which when applied will deliver stability of outcomes on rate of return issues has the potential to materially benefit the long-term interests of consumers.

This objective of providing clear guidance remains unfulfilled in the AER draft rate of return guideline released to date.

Objective of the guideline process has not been met

The draft guideline and associated explanatory statement released by the AER in August are incomplete documents and are lacking in critical information. The draft guideline does not provide the necessary guidance and information to allow a network business nor consumers to make a reasonable estimate of the rate of return resulting from its application. This leaves network firms, investors and consumers with little capacity to make an estimate of the outcomes of the AER's proposed application of the rules. This is fundamentally inconsistent with the intended policy objective in requiring the publication of, and consultation on, a rate of return guideline.

It is also inconsistent with the explicit objective of the AER set in draft guideline:

> *We intend for the final guideline to include sufficient detail to allow a service provider or other stakeholders to make a reasonably good estimate of the rate of return that would be determined by us if the guideline were applied to a determination for a particular business at any given time.*

On behalf of the service providers referred to in this statement, the ENA formally advises the AER that the draft guideline does not allow such an estimate to be made and it is critical for the AER to address the outstanding issues in this submission for it to meet its stated objective for the final guideline.

AER's preferred foundation model risks failing key rule requirements

Energy network businesses consider the AER's proposed approach to estimating the cost of equity to be flawed, convoluted, uncertain and potentially inconsistent with the regulatory rules.

If the AER's proposed foundation model framework is adopted in future regulatory resets as proposed in the guideline, it will be in breach of the rules for setting the return on capital in that relevant evidence has already been wrongly excluded. More generally there is a high risk of further inconsistency with the rules framework because the model introduces a hierarchy in the information to be considered, and introduces a range resulting in a constraint on the use of information that is

not present in the rules. The hierarchy is likely to result in certain information being given a disproportionate weight and the constraints could prevent relevant information being used.

The AER's preferred 'foundation model' for estimating the return on equity is underdeveloped, and uncertain in its practical application. Based on the AER's workshops with stakeholders, this uncertainty about the decision making process in the foundation model appears to be shared by a wide range of parties. The AER is yet to enunciate, in the draft guideline, explanatory statements or discussions to date decision making process by which the foundation model approach would practically resolve conflicting evidence from financial models. This clarity is a fundamental prerequisite for the final guideline to meet the AER's stated objective of allowing service providers to make a reasonably good estimate of the results of its application.

The foundation model approach risks failing to deliver robust estimates that are consistent with the obligations of the AER to consider relevant models, data and evidence in deriving a return on equity estimate. The exclusion of the Fama-French Model is an example of how the approach risks failing to give relevant evidence clear and substantive weight. The use of one subset of evidence to construct bounds to limit the effect of the remainder of the evidence is, however, inherently convoluted and non-transparent.

The key weakness of the foundation model approach is that it compromises the capacity for empirical evidence to be assessed on its merits and accorded appropriate and transparent weight through the cost of equity estimation process. That stakeholders currently lack any indicative AER estimates of key foundation model parameters (equity beta and market risk premium) exacerbates industry concerns that the practical implementation of the model is lacking in predictability and transparency. Even when these ranges and parameters are eventually provided, there would appear to be little clarity or predictability about the final step of the AER's model and specifically how the point estimate is reached from an AER preferred range.

The network sector continues to support the 'multiple model' approach we have detailed in previous submissions. This gives each relevant model and piece of evidence due weight. In principle, this could be implemented in a variety of forms, from a more mechanistic approach of numerically weighting model estimates, to looser approaches that provide the discretion to the AER to set out in reasoning why it attributes significantly greater qualitative weighting to some evidence than others. The ENA supports approaches that clearly and transparently explain the relative weights (or importance) that is assigned to each piece of evidence, and provides an example of a simpler 'transparent CAPM' approach that allows all relevant evidence to be brought to bear in the estimation of parameters of a Sharpe-Lintner CAPM preferred by the AER.

It is ultimately the clarity and quality of reasoning and the logical framework within which evidence is assessed which provides networks, investors and consumers with predictability and improved certainty. ENA members consider these should be a touchstone for developments in the AER's cost of equity approach.

A critical risk for the AER in the implementation of its overall rate of return approach is the potential for the criteria the AER has identified as guiding its approach to lead it to fail to give full weight and effect to the provisions of the Rules. As accepted by the AER, the criteria do not have any legal basis and cannot supplant the Rules. The potential for these criteria to conflict with the binding Rule provisions and lead the AER into making decisions inconsistent with the Rules is in ENA's view high. A ready example of this is the proposal by the AER to, through the application of these draft criteria, give no weight to the Fama-French Model.

Full review of risk and equity beta issues needed prior to finalising the guideline

The network sector provided extensive empirical evidence on Australian equity beta estimation issues in response to the previous AER Consultation Paper. To date the AER has not provided any substantive information on its views with regards to estimates of the equity beta nor any considerations of the information provided by the ENA. Whilst the AER has indicated its intention to separately consult on equity beta issues the ENA considers that as this is a critical determinant under the AER's preferred Sharpe-Lintner model of required equity returns, it is important that the AER allows for a comprehensive consultation approach to be undertaken when its materials and empirical reports on beta are released. The ENA notes that until such consultation has been undertaken and considered, it would be both impractical and prejudicial for the AER to develop a final position on the rate of return guideline.

The ENA considers it is important that the linkages of this work to other qualitative risk assessments the AER has commissioned around networks be made explicit. Network businesses note that there is currently a significant confluence of technological, commercial and regulatory risks which have not been fully recognized to date in AER analysis and materials. For instance:

- The evolution and penetration of embedded generation and storage technologies (such as Solar photovoltaics and improvements in storage technologies), their impacts on quality of supply and changes in demand levels and energy flow patterns across networks make historically based risk assessments poor guides to the future risk environment.

- Commentary by investors and analysts on the recent regulatory rule change, the guideline drafting process and how the AER will exercise its discretion has highlighted that regulatory risk is likely to be looming larger for many providers of capital than previously. A survey recently undertaken by RBC Capital Markets identified that regulatory uncertainty is currently the most significant investor concern in the Australian energy sector. Around half of surveyed investors also had significant doubts about whether the AER's rate of return guideline would deliver on the intent of the rule changes.

- Recent rule changes providing for the potential stranding of capital expenditures made in excess of forecast-based allowances have changed the level of regulatory risk faced by electricity providers. Market commentators have also publicly expressed their views that a lack of clarity about how the AER will set rates of return has further increased risks.

Given these increases in risk facing the networks sector, it is essential that the AER's final guideline explicitly addresses how this changing risk environment has informed the equity beta which is proposed to be adopted, rather than being premised on historic information.

Estimating the cost of corporate income tax – the 'gamma' parameter

Estimating the 'gamma' parameter used for calculating the cost of tax building block is essential to determining whether the total return available to network owners is consistent with the National Electricity and Gas Law and Rule framework.

The draft guideline proposes a substantive shift in the assessment of the 'gamma' parameter from a series of Tribunal and AER decisions over the past three years.

The AER has proposed a new 'equity ownership' approach to establishing the value of imputation credits. This new approach tracks the flow of imputation credits from distribution to redemption, recording the *proportion* of credits that are redeemed. It does not estimate the *value* of imputation

credits, which is the key requirement under the Rules. Evidence of the value of imputation credits is best derived, as with all cost of capital parameters estimates, from empirical data arising from real-world market transactions.

The network sector has provided this real-world empirical evidence in the form of a number of studies that are based on observed market prices that reflect *value*. These studies include an updated SFG study that follows the methodology set out by the Australian Competition Tribunal.

By contrast, the draft guideline proposes that no weight should be applied to any evidence that seeks to determine the value of imputation credits from market prices, but rather all weight should instead be applied to the AER's theoretical analysis that is based on a set of very strong and highly unrealistic assumptions that are inconsistent with the CAPM itself.

Applying the results of the market-based evidence of the value of distributed imputation credits with accepted measures of the distribution rate, confirms the conclusion that gamma should be set to 0.25, unchanged from recent decisions.

The industry average term of debt exceeds 10 years and is based on a BBB credit rating.

Network businesses are supportive of moving to a trailing average cost of debt approach, with annual updating to reduce potential revenue and price volatility between regulatory periods. The AER has, however, proposed a shortening of the assumed term of debt from 10 years to 7 years.

The ENA considers there is no sound empirical basis to conclude that a term of 7 years reflects efficient commercial practice. Survey evidence collated across the private regulated energy infrastructure businesses and provided confidentially to the AER demonstrates that the industry average term of debt at issuance is in excess of 10 years.

In reaching it position, the AER relies on evidence collected in its 2009 review of cost of capital parameters. Specifically, evidence that some businesses used swap contracts to shorten their base interest rate exposure to less than 10 year. This evidence is irrelevant to determining a benchmark term under a trailing average approach. First, use of swaps in this manner was purely a function of the incentives created under the previous 'on the day' approach to setting the cost of debt allowance. There is no reason to believe that businesses will use swaps in a similar manner under a trailing average approach. Second, if the AER did believe that it is efficient for businesses to use swaps it would need to spell out what swap strategy it believes is efficient and explicitly model this in the benchmark used to set the cost of debt allowance. Only then will businesses be able to hedge to the benchmark by actually following that strategy.

The under-compensation arising from a shortening of the term of debt approach is material and volatile over time. This has the potential to inefficiently increase refinancing risks for network firms, and impose arbitrary windfall losses on networks based on the timing of their determination cycles. Addressing these types of outcomes was a primary driver of the AEMC seeking to allow the movement to a trailing average approach, and implementation approaches should recognize this.

The AER appears to suggest that one driver of its shortening of assumed debt tenure is the potential difficulty of reliably and transparently extrapolating available 7 year data to a 10 year term. In recognition of this concern the ENA has provided in this submission alternative robust extrapolation methodologies and is keen to work with other stakeholders and the AER in developing these approaches further.

The ENA supports a credit rating assumption of BBB, based on empirical evidence of the average credit rating of privately owned listed entities in 2013. This position is conditional upon the AER's intended approach on cost of equity issues (including its planned equity beta estimation work).

Transition to new regulatory approaches on cost of debt

The ENA considers that the transition path set out by the AER in its draft guideline is fair and appropriate, where a transition to the new cost of debt approach is to apply. As the AER is aware, some of the ENA's members consider that an immediate transition is required given their particular circumstances. Transition is discussed in more detail in the submissions of individual network businesses.

Next steps

To address the issues discussed above the ENA recommends the AER undertake the following steps in finalising the Rate of Return guideline:

1. Adopt a simpler 'multi-model' approach to the cost of equity estimation, or amend the foundation model to enable it to transparently give appropriate weight to all relevant evidence (see Section 3.1.5);

2. Set out a complete non-binding worked example of the final cost of equity approach, to enable stakeholders to understand its practical operation;

3. Ensure the final guideline contains indicative and non-binding point estimates and ranges for both the market risk premium and equity beta parameters, derived on the basis that these would be the values from applying the AER's preferred methodology given the information currently before the AER;

4. Identify as clearly as possible a 'decision rule' for how the AER will select a point value of the cost of equity from a range;

5. Ensure that consultation processes and timelines on the outstanding beta and risk issues allow for a comprehensive assessment and testing of empirical information put forward as potentially informing future AER decisions;

6. Amend the AER's conceptual framework for the estimation of gamma, ensuring the revised framework allows for empirical work on the *value* of imputation credits to be given appropriate weight; and

7. Retain a 10 year term for the cost of debt, consistent with observed commercial practice of benchmark entities, and adopt a sound extrapolation methodology such as those set out in this submission to provide for this.

The ENA is very keen to work to assist the AER in any way possible up to the release of the final guideline in the provision of information, implementation suggestions or feedback in relation to any of these steps.

2. Background

2.1. Energy Networks Association

The Energy Networks Association is the peak national body representing gas distribution and electricity transmission and distribution businesses throughout Australia.

Energy networks are the lower pressure gas pipes and low, medium and high voltage electricity lines that transmit and distribute gas and electricity from energy transmission systems directly to the doorsteps of energy customers.

Twenty-six electricity and gas network companies are members of ENA, providing governments, policy-makers and the community with a single point of reference for major energy network issues in Australia.

With more than $75 billion in assets and more than 13 million customer connections, Australia's energy networks provide the final step in the safe and reliable delivery of gas and electricity to households, businesses and industries.

In August 2013 the Australian Energy Regulator (AER) released its draft rate of return guideline[1] (the draft guideline) and explanatory statement[2] on the regulated return for energy network businesses. This submission by the Energy Networks Association (ENA) is a response to that draft guideline and explanatory statement.

2.2. Structure of submission

The remainder of the submission is structured as follows:

Section 3 summarises the industry recommended approach for estimating a return on equity for a regulated network firm, and describes the way the relevant models, data and other evidence can be used to derive a robust estimate.

Section 4 discusses the appropriate basis for estimating gamma.

Section 5 sets outs the approach that should be adopted in setting the return on debt.

The submission should be read together with the attached expert reports. A list of these reports is provided in Appendix C.

2.3. Context for network sector response

The response presented in this submission has been developed on a collaborative basis and represents the views of the network sector collectively. This response includes substantial expert material. Last month the ENA provided a summary of the expected expert reports that would accompany this submission, and a further update was provided on 9 October.

[1] Australian Energy Regulator *Draft rate of return guideline*, August 2013

[2] Australian Energy Regulator *Explanatory statement - Draft rate of return guideline*, August 2013

2.3.1. Process of guideline development

The ENA has actively participated in each stage of the AER's consultative processes on the development of the AER Rate of Return Guideline. The development of the first rate of return guideline under revised National Gas and Electricity Rules is a challenging and resource-intensive task. ENA is appreciative of the manner in which the AER staff and Commissioners have sought to engage with industry perspectives on guideline issues, and provided multiple opportunities for all stakeholders to engage on key guideline issues.

Despite this genuine and substantive engagement of AER through the consultation process, there are a number of points of concern ENA would raise with the process to date. These are listed below because in ENA's view they have contributed to the consultation process not functioning as effectively as was possible or desirable. Several of these issues also affected, in our view, the capacity of the AER to reach decisions that were fully informed by relevant evidence and considerations. The process concerns ENA wishes to highlight are:

- the failure to release detailed AER commissioned empirical work on equity beta estimation prior to, or with, the draft guideline;
- the release of a separate AER staff paper on beta issues after the closure date for submissions to the draft guideline;
- the release of ACCC Regulatory Development Branch working papers, of no clear status through the consultation process, and which did not appear to engage with relevant requirements of the National Gas and Electricity Rules;
- a lack of response to direct questions posed to the AER on the operation of its foundation model approach in July; and
- the implementation of a 'new equity ownership' approach in the draft guideline, without this new approach having been foreshadowed in previous consultative steps and papers.

To assist the AER in the next process step of finalizing its guideline the ENA provided the AER with a summary of expected expert work that this submission relies upon. If there are further ways in which ENA can assist the AER in this phase of the project every reasonable effort will be made to do so.

2.3.2. Previous lodged submissions and materials

The draft guideline and explanatory statement have not adequately taken into account the substantive materials provided to the AER in response to its consultation paper.

The AER has indicated that the volume of material submitted by the ENA has been challenging to fully assess in the six weeks between its submission and public release of the draft guideline. In some instances, the AER has stated that it will consider information in reaching conclusions in its final guideline, or in applying the guideline in a determination. In other instances, the AER has reached conclusions to not rely at all upon information submitted by the ENA. The conclusions that do not rely at all upon some information submitted by the ENA are more concerning, because the ENA considers that this material contains relevant information for estimating the regulated rate of return, and its full consideration would have a material impact on the final decisions of the AER.

Consequently, it is important that the AER provides clarity about when and how material which has not been addressed at all so far by the AER will be integrated into the final guideline. It is also important that there is an opportunity for input and consultation should the material lead the AER to pursue substantive shifts in the approach foreshadowed in the draft guideline.

The volume of material is large because the ENA has gone to extensive lengths in response to AER requests to compile empirical evidence on the most reliable estimates of the cost of capital, and the individual parameters that make up the cost of capital. Under the new Rules, this requires a fuller consideration of a wider range of models, data and evidence than in the past.

The reason the ENA has conducted such extensive research into the cost of capital is because the previous approaches adopted by the AER, and the approaches adopted in the draft guideline, do not provide reliable estimates of the cost of capital. The material submitted to the AER represents the results of a genuine effort to improve the reliability of estimates of the regulated rate of return and to improve the transparency of decision-making. There are anomalies associated with the AER's preferred techniques for estimating the cost of capital, and the material submitted to the AER means that there will be fewer anomalous outcomes. This will increase the confidence of investors and consumers in the decision-making process.

The material submitted does not contain irrelevant information. Should the AER determine otherwise, we invite the AER to clearly identify that information which it considers irrelevant to its task and which it has chosen to not consider.

3. Return on equity

3.1. Overview of ENA's concerns and submissions

Key position 1

The foundation model framework the AER has proposed creates a substantial risk that it will misapply the relevant rules.

The ENA has fundamental concerns with the proposed foundation model framework for estimating the return on equity. This section details these concerns.

3.1.1. The foundation model approach

The AER's proposed approach for determining the allowed return on equity is as follows:

1. Determine which methods, models, data and evidence are relevant and exclude from further consideration any that are deemed to be irrelevant;

2. A subset of the relevant evidence is used to select a point estimate for each of the three parameters of the Sharpe-Lintner CAPM foundation model. This produces a point estimate for the required return on equity. That same subset of evidence is used to produce a range for the beta and *MRP* parameters, which produces a consequential range for the required return on equity;

3. The remaining relevant evidence (i.e., the evidence that was not used to parameterise the foundation model) is then used to select a final allowed return on equity from within the range for the required return on equity.

Under this approach, some weight (or "importance")[3] is applied to the Sharpe-Lintner CAPM estimate in Step 2 and some weight is applied to the other evidence in Step 3. The relative weights are determined entirely by the width of the ranges used for the beta and *MRP* parameters. If those ranges are very narrow, the Sharpe-Lintner CAPM estimate receives the primary weight[4] and if those ranges are very wide the other evidence receives the primary weight.[5]

Under the AER's proposed approach, the relative weights applied to each piece of evidence is further complicated by the fact that evidence from other models is to be used to inform estimates of certain Sharpe-Lintner CAPM parameters. For example, the explanatory statement suggests that evidence relating to the Black CAPM may be used to inform the beta estimate and that evidence relating to one form of dividend discount model (DDM) may be used to inform the *MRP* estimate.[6]

[3] In various discussions and forums, the AER has sought to distinguish between the terms "weight" and "importance." This submission uses the two terms interchangeably to simply convey the notion that the final allowed return on equity will not depend equally on every piece of relevant evidence – some pieces of evidence will end up being more influential than others.
[4] For example, if the Sharpe-Lintner CAPM estimated range for the required return on equity was 11.0% to 11.2%, the other (non-CAPM) evidence is only used to select a final allowed return from within this very narrow range.
[5] For example, a Sharpe-Lintner CAPM range of 5% to 20% is essentially uninformative, in which case the final allowed return in equity would have to be based almost entirely on the other (non-CAPM) evidence.
[6] AER *Explanatory Statement*, p.62

The weight assigned to each such piece of evidence would be determined by considering how that piece of evidence resulted in the relevant parameter estimate being different from what it would otherwise have been. For example, if the beta and *MRP* estimates remain unchanged from the current regulatory estimates (which give no weight to the Black CAPM or DDM evidence), the implication would be that those pieces of evidence continue to receive no weight.

3.1.2. Complexity and transparency of foundation model compared to a multi-model approach

The ENA submits that the foundation model approach is more complex and less transparent than the multi-model approach. Both approaches begin by defining the set of relevant evidence.[7] Once that set of evidence has been established, the cost of equity must be estimated. This is the same task under either approach. For example, given that a particular form of DDM is considered to be relevant, the cost of equity from the DDM has to be estimated whether the foundation model or multi-model approach is being used. It is only the final step that differs – the mechanism by which a range of evidence is distilled into a single allowed return on equity. The multi-model approach does this simply and transparently by lining up all of the relevant evidence, discussing the reliability and precision of each piece of evidence, and giving more reliable and precise evidence relatively more weight. By contrast, the foundation model approach assigns some weight to some evidence by allowing that evidence to change the values that would otherwise have been adopted for beta and *MRP* and then assigns weight between the Sharpe-Lintner CAPM and all other evidence via the selection of the widths of the ranges for beta and *MRP*. This mechanism for weighting the various pieces of evidence to distill a final allowed return on equity is highly complex and not at all transparent.

3.1.3. Implementation of the foundation model approach and the AEMC's intention

The ENA is further concerned that the AER's application of the foundation model approach could deliver outcomes that are in substance and process terms essentially the same as those produced under the previous Rules. In particular, the ENA is concerned that the implementation of the foundation model approach will result in:

1. Point estimates of beta and *MRP* remaining as low as they have been in recent determinations, despite the expansion of the evidence that must be considered and the other fundamental changes to the Rules; and

2. Either:

    a. Narrow ranges being adopted for beta and *MRP* such that the Sharpe-Lintner CAPM alone effectively determines the allowed return on equity; or

    b. The set of non-CAPM evidence including inappropriate items that produce such a wide range of outcomes that the AER concludes that little can be gleaned from this set of evidence, in which case again the Sharpe-Lintner CAPM alone effectively determines the allowed return on equity.

[7] The ENA submits that the AER has wrongly excluded some relevant evidence, as set out later in this submission. However, the point being made here is that for a given set of evidence, the foundation model approach is more complex and less transparent than the multi-model approach.

An outcome that effectively uses the Sharpe-Lintner CAPM to arrive at an allowed return on equity that is essentially the same as that produced in recent determinations under the previous Rules would appear to be inconsistent with the AEMC's intention in fundamentally revamping the Rules in relation to the allowed return on equity.

In particular, in its Final Determination Guidance, the AEMC specifically sought to address concerns that, despite its best efforts in making material changes to the Rules, the regulator would seek to continue to estimate the required return on equity via an implementation of the Sharpe-Lintner CAPM that produces the same results. The AEMC sought to assuage these concerns, but indicated that it would not set out a list of what other information and models the regulator must consider (or instructions about how that information should be considered), due to the risk that any such list *itself* would be applied in a mechanistic fashion:

> *A major concern expressed in numerous submissions is that under the proposed changes the regulator would still be able to, in effect, make exclusive use of the CAPM when estimating a rate of return on equity. The Commission understands this concern is potentially of considerable importance given its intention is to ensure that the regulator takes relevant estimation methods, models, market data and other evidence into account when estimating the required rate of return on equity. As discussed above, the Commission takes the view that the balance between flexibility and prescription has been adequately achieved in the final rules. It would be counterproductive to attempt to prescribe a list of models and evidence, which would almost certainly be non-exhaustive and could lead to rigid adherence to them in a mechanistic fashion.*[8]

Rather, the AEMC noted that the new Rules differ from the old Rules in a material way:

> *To determine the rate of return, the regulator is also required to have regard [to] relevant estimation methods, financial models, market data and other evidence. The intention of this clause of the final rule is that the regulator must consider a range of sources of evidence and analysis to estimate the rate of return. In addition, the regulator must make a judgement in the context of the overall objective as to the best method(s) and information sources to use, including what weight to give to the different methods and information in making the estimate. In doing so, the regulator should also have regard to taking an internally consistent approach and, to the greatest extent possible, use consistent estimates of values that are common across the process, as well as properly respecting any inter-relationships between values used.*[9]

3.1.4. Consistency of the foundation model with the Rules

The ENA does not consider that the guideline, and the foundation model approach it contains, is a well-conceived approach for delivering a rate of return estimate consistent with the Rule requirements.

The rule requires all relevant models, data and related information to be taken into account in reaching a cost of equity estimate.

[8] AEMC *Economic Regulation of Network Service Providers* Rule Change Final Determination, November 2012, p.57
[9] AEMC (2012), p.67–68

The foundation model approach in the guideline does not take a 'facts based' approach of 'road testing' each piece of evidence or model to demonstrate, in reality, what might be the strengths, weaknesses, challenges and anomalies when the evidence is applied. Rather, the draft guideline and explanatory statement are the result of an elaborate process of constructing extra-legislative drafting.

The draft guideline and explanatory statement have:

- **Set out principles and criteria not found in the Rules or relevant legislation**

The draft decision has listed out a set of criteria for decision making that are not found in the primary legislation nor the regulatory rules. This process is at high risk of resulting in the AER taking into account irrelevant considerations, acting 'under dictation' by following decision making constraints that prevent it from properly applying the legislation and failing to take into account relevant material. The AER itself has acknowledged this risk where it states that the legislation will take precedence over these criteria.[10] The ENA has already documented its concerns that the application of the criteria devised by the AER will lead to decisions that fail to have regard to relevant evidence and does not believe that the AER has addressed these concerns.[11]

The exclusion of the Fama-French model on the basis that it allegedly lacks a theoretical foundation, that it was developed, and has mostly been applied in another country and is not used by other regulators[12] is already a manifest example of legally impermissible decision making. The way the criteria have been applied has resulted in irrelevant considerations being taken into account, the exclusion of relevant considerations and acting under the dictation of self-imposed extra-legislative decision making constraints.

- **Undertaken classifications into first, second and third class information that are not called for under the Rules**

This process is inherently likely to result in one model (the foundation model) being given a considerably disproportionate weight when compared with non-foundation models that may provide equal or almost as important insights into the cost of equity.

Particularly at risk of wrongful exclusion or under-weighting is the process of relegating some information to a 'third class' status when it is not used to inform the variables used in applying the foundation model.

- **Reached premature conclusions to exclude certain models from consideration before undertaking a consideration of their potential worth in practice**

The concept of eliminating a model without undertaking even providing a worked example of how it could be used in practice, is at high risk of falling into error.

- **Constructed an elaborate approach for synthesizing the available models and data that is not found in the legislation**

[10] In the AER *Explanatory statement - Draft rate of return guideline*, p.25 the AER states "The criteria are not intended to supplant the NEL, NGL or the rules. Rather they are subordinate to the requirements set out in those instruments."
[11] Energy Networks Association *Response to the AER rate of return guideline consultation paper*, June 2013, Sub-section 3.2.
[12] AER *Explanatory statement - Draft rate of return guideline,* p.191-193

Where the rules require all relevant models to be taken into account, the draft decision proposes to select a single model for preeminent or 'foundation' model status. All the other models are relegated to a secondary or tertiary status of informing the value of parameters to be used in the foundation model or potentially influencing the final result by shifting the foundation's point estimate up or down. This approach is at high risk of falling into legal error. All the models, non-foundation models included were designed to deliver 'stand-alone' estimates of the cost of equity and are capable of doing so. It is likely that taking the non-foundation models into account only indirectly through influencing certain values used within the strictures of the foundation model as it is specified, or as an influence within a range provided by the foundation model, will deprive the non-foundation models of an opportunity to provide important insights into the AER's task.

The use of the foundation to set a range establishes a constraint (albeit not an immutable constraint) that is not found in the legislation on the role that the non-foundation models can play when they deliver results outside that range.

- **Failed to provide the guidance for businesses that the rules required the guideline to provide**

The draft guideline states that the strictures of the foundation model approach will be softened by the possibility that, if there is are a significant number of concurrent indications that the range provided by the foundation model is too narrow, a final number outside that range may be adopted.

However, there is no detailed description or worked example of how the ranges will be set, no testing to see how likely it is that the ranges will often be breached nor an explanation of what will happen in practice when they are breached.

3.1.5. Best implementation of a foundation model approach

The ENA submits that the AER's proposed used of a foundation model approach based on the Sharpe-Lintner CAPM is problematic in a number of respects. The ENA further submits that its multi-model approach could be used to distill the same set of relevant evidence down to an allowed return in equity in a less complex, less convoluted and more transparent manner.

If, however, the AER determines that all evidence must be filtered through the Sharpe-Lintner CAPM, the ENA proposes that this should be done in a simpler and more transparent manner. It is important to establish at the outset that the AER's preferred implementation of the Sharpe-Lintner CAPM is not the only manner in which parameter inputs can be estimated, either as point estimates or as ranges. The implication of the explanatory statement is that the AER's preferred estimation techniques will embed not just a foundation model, but what could be called a "foundation approach" to estimating the parameters within that model. For instance, the AER still intends to rely upon one estimation technique and one set of data as its foundation approach for estimating beta (regression analysis of stock returns on market returns for a small sample of Australian-listed firms); and the AER intends to rely on historical excess returns plus the current government bond yield to estimate the expected market return, and give secondary consideration to historical average market returns.[13]

[13] In the Explanatory statement the AER states that historical excess returns will be used to inform a foundation model parameter estimate *(MRP)* but that the Wright approach (which is making an estimate of the expected market return from historical average market returns, rather than adding the current risk-free rate to the historical average excess return) will be used to inform the overall cost of equity (Sub-section 5.3.2, Table 5.2 (p.62 – 63).

These issues are discussed further in Sub-section 3.4. But they are highlighted here because they illustrate the restrictive manner in which the foundation model is likely to be applied.

In particular, the ENA submits that all of the relevant evidence should first be set out. Then all of the evidence that is relevant to beta should be used to produce an estimate of beta, and all of the evidence that is relevant to *MRP* should be used to produce an estimate of *MRP.* In both cases, different pieces of evidence can receive different weights depending on the reliability and precision of the evidence, or whatever other criteria the AER determines to be relevant. The result is a single value for the allowed return on equity.

The ENA submits that this approach is transparent in that it sets out reasons explaining why some pieces of evidence were considered to be more influential than others. There is also a clear link between each piece of evidence and the final allowed return. This simplicity and transparency can be contrasted with the complex and convoluted process of having some evidence determining the point estimate for CAPM parameters, other evidence being used to determine an appropriate range around those point estimates, and yet other evidence being used to select a final allowed return from within a range for the required return on equity. Under the proposed foundation model approach it is almost impossible to trace the relative influence of different pieces of evidence.

The ENA refers to this proposed implementation of the foundation model approach as the 'transparent CAPM' approach and notes that it is different from the approach that the AER has used under the previous Rules in a number of respects. Most importantly, the previous Rules did not require the AER to have regard to all relevant evidence or to the allowed rate of return objective. Moreover, the previous Rules did not require the AER to consider whether the allowed return was commensurate with the prevailing conditions in the market for equity funds.[14] That is, under the new Rules, the AER would need to have regard to a broader range of evidence and would have to consider the reasonableness of its allowed return on equity.

A properly implemented multi-model approach also mitigates the potential anomalies associated with reasonableness checks on an initial value. In its submission to the Consultation Paper the ENA documented that it is unclear how reasonableness checks can be usefully implemented in determining the final estimate of the cost of capital.[15] These concerns have not been addressed by the AER and still apply. The general point is that a reasonableness check can either provide evidence consistent with the initial estimate, or evidence contrary to the initial estimate. If the cross-check supported the initial estimate there would presumably be no change. But if the cross-check provides evidence which is contrary to the initial estimate, the AER has provided no indication of how an estimate would be adjusted. The ENA submits that, if information is relevant to estimation of the cost of equity, this information can be directly incorporated into the estimation process. While there may be uncertainty about the reliability of that information, and the manner in which it is associated with the cost of equity, that uncertainty is exactly the same if the information is used as a reasonableness check. The only difference in that, as a reasonableness check, participants do not really know whether or not the information carried weight in decision-making.

The ENA considers that this 'transparent CAPM' approach would remove a number of the significant legal risks associated with the current foundation model approach. There would, for example, no longer be the danger that differences in classification of non-foundation models and evidence into 'second' and 'third' ranging information would result in inappropriate weightings. The risk of the

[14] The previous *National Electricity Rules* contained no such provision. Whereas the previous *National Gas Rules* did contain such a provision, the Tribunal held that the provision was effectively redundant and had no real role to play. The AEMC has been quite clear about its intention to restore the relevance of the "prevailing conditions" provision.
[15] Energy Networks Association *Response to the AER rate of return guideline consultation paper*, June 2013, p.25–26

range being used to wrongly constrain other models from contributing to the result, and the problems of uncertainty associated with whether the range will be breached and what to do if it is, are also all removed. There remains, however, a fundamental and significant risk that the 'foundation model' would be given pre-eminence over all other information and that fact is inherently likely to result in that model being given significant disproportionate weight.

3.1.6. Summary of ENA submissions on cost of equity framework issues

The ENA's submissions in relation to cost of equity framework issues are as follows:

1. The AER's proposed foundation model approach is complex, convoluted and lacking transparency. It is also inconsistent with the Rules. The AER's foundation model approach should not be used.

2. For a given set of relevant evidence, the ENA's multi-model approach is simpler and more transparent. The multi-model approach should be used to determine the allowed return on equity.

3. If the AER concludes that all evidence must be filtered through the Sharpe-Lintner CAPM in some form:

    a. The AER should explain in detail how the filtering of all evidence through the Sharpe-Lintner CAPM best meets the allowed rate of return objective; and

    b. The "transparent CAPM approach" set out above should be used.

4. If the AER proposes to persist with its proposed foundation model approach:

    a. The AER should explain how each piece of evidence has been used and why it has been used in that manner. In particular, the AER should explain whether a piece of evidence has been used to determine the point estimate of a CAPM parameter, the range of a CAPM parameter, or to select the allowed return of equity from within the range for the required return on equity. It should also explain why that particular use of each piece of information is likely to produce an outcome that is consistent with the allowed rate of return objective.

    b. The AER should also reveal the extent to which each piece of evidence influenced its determination, for example, by stating what the point estimate or range would have been in the absence of that piece of evidence.

3.2. AER's proposed foundation model framework

Key position 2

The foundation model approach requires modification to ensure it can give confidence to investors that it will provide estimates of the required return on equity that is consistent with the allowed rate of return objective and that is commensurate with the prevailing conditions in the market for equity funds.

3.2.1. Anomalous outcomes and lack of transparency

Key position 3

The foundation model approach is likely to lead to anomalous outcomes and a lack of transparency in decision-making unless the initial range is wide enough to account for all reasonably plausible outcomes. If the range is not sufficiently wide, it is unclear how the AER will be able to give appropriate consideration to all available information. The potential for anomalous results and non-transparent decision-making could be alleviated by adopting the multi-model approach of the ENA.

The AER has stated its intention to use the Sharpe-Lintner CAPM[16] as a foundation model.[17] The AER will develop a range of cost of equity estimates from the Sharpe-Lintner CAPM, and then select a value from within this range based upon other relevant information.[18] However, the AER acknowledges the potential for circumstances to arise in which information suggests that a cost of equity estimate lies outside the range suggested by the foundation model. On this issue the AER states that:

> *Our proposed approach is premised on the expectation that the analysis in step five should not suggest a final return on equity estimate outside the foundation model range. However, if this expectation is not met, we may reconsider the foundation model input parameter estimates, or more fundamentally, we may also reconsider the role of the foundation model itself. This recognises that, ultimately, our rate of return must meet the allowed rate of return objective.*[19]

The alternative proposal put forward by the ENA was that a number of estimates of the cost of equity could be considered, weights assigned to those estimates according to their reliability at the time of each determination, and a final weighted average estimate computed. The potential for conflicting evidence is an important reason the ENA put forward its proposal. Under the foundation model approach, if all relevant information implies a cost of equity estimate within the initial range, the final cost of equity estimate can be determined by giving different consideration to this information on the basis of its reliability. However, if relevant evidence implies a cost of equity estimate from outside the

[16] Sharpe, W., 1964. "Capital asset prices: A theory of market equilibrium under conditions of risk," *Journal of Finance,* 19, 425–442; Lintner, J., 1965. "The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets," *Review of Economics and Statistics,* 47, 13–37.
[17] AER *Explanatory statement - Draft rate of return guideline,* p.11and p.62
[18] AER *Explanatory statement - Draft rate of return guideline,* p.10–11, Sub-section 4.3.3 (p.54–55), Sub-section 5 (p.58), Sub-section 5.2 (p.59), Sub-section 5.3.2 (p.61), Sub-section 5.3.3 (p.64), and, specifically, the AER states that "[w]e propose that our final return on equity estimate will always be chosen within the range set by Sharpe-Lintner CAPM" (p.13).
[19] AER *Explanatory statement - Draft rate of return guideline,* p.65–66

initial range, it is unclear how the AER will account for this information. The AER might widen the initial range, or it might not proceed with the foundation model approach. If the AER decided to widen the range, it would then be in the position of giving consideration to relevant evidence from within this range on the basis of reliability. If the AER decided to reconsider the foundation model approach it would also be in the position of giving consideration to relevant evidence but without lower and upper bounds.

Given the potential for anomalous outcomes under the foundation model approach, the ENA does not see a logical basis upon which the foundation model approach would be retained in preference to an approach which simply gives due consideration to all relevant evidence. Consider for a moment the other information the AER considers relevant for estimating the cost of equity. According to Table 5.2 of the explanatory statement, the AER's decision on the overall cost of equity will be informed by items that include the "Wright" approach (which uses the historical average equity return on the market less the prevailing risk-free rate as the market risk premium when implementing the CAPM, instead of the historical average excess market return), takeover/valuation reports, brokers' cost of equity estimates, other regulators' return on equity estimates, debt spreads and dividend yields.[20] If the AER believes that useful information is conveyed by this suite of data, why not use the information to estimate the cost of equity, and then assign some weight based upon reliability?

To illustrate the potential for anomalous outcomes, suppose the AER estimates the cost of equity from its foundation model at 9.0 per cent , within a range of 7.0 per cent to 11.0 per cent . This could occur if the risk-free rate was 4.0 per cent , the market risk premium was estimated within a range of 5.0 per cent to 7.0 per cent and the equity beta was estimated within a range of 0.6 to 1.0. Now suppose that one of the other pieces of evidence suggests provides an estimate of the cost of equity of 11.8 per cent.

This would put the AER in the position of either widening the range to include the upper bound of 11.8 per cent , discarding the foundation model approach, reaching a final estimate at the top of its range of 11.0 per cent , or treating the other evidence as unreliable. If the first option were undertaken, the AER would be in the position of considering a cost of equity estimate within the range of 7.0 per cent to 11.8 per cent , and could select a final point estimate after giving consideration to the relative reliability of all relevant evidence. This is then, conceptually, equivalent to the approach advocated by the ENA, albeit without the AER transparently specifying the relative weights applied to each piece of evidence and the reasons for applying those relative weights.

If the AER simply shifted its cost of equity estimate to the top of its initial range, then it would be placing high reliance on this range as being reasonable, despite having relevant information that casts doubt on that assumption.

The most anomalous outcome would occur if the AER retained its initial estimate of 9.0 per cent , despite identifying relevant information that suggests that estimate is too low.

All of the possible solutions to the problems of the foundation model approach require is that there be no binding upper or lower bound. An initial range could still be useful in thinking through potential outcomes, but it is the concept of a binding constraint that leads to anomalies. First, the AER could assume that the 11.8 per cent estimate is a reflection of systematic risk, and give this consideration in estimating $\beta \times MRP$. How much reliance to place on this evidence would be a judgment based upon the AER's view on reliability. Second, the AER could decide to give some consideration to its CAPM estimate of 9.0 per cent and some consideration to the estimate of 11.8 per cent from other

[20] AER *Explanatory statement - Draft rate of return guideline,* p.62–63

evidence, again based upon considerations of reliability, and reach a final conclusion between these two estimates.

The point is that the multi-model approach can be applied to all cases for arriving at a final decision on the cost of equity, whereas the foundation model approach will invariably lead to anomalies in which the decision-making is unclear. Regardless of which approach is adopted, the AER will still make an assessment of the relevance and reliability of each piece of information. But the ENA is unaware of any case in which the foundation model approach could lead to a more objective and transparent solution than the multi-model approach. If the AER decides that a cost of equity estimate is not relevant and unreliable, it can assign it zero weight, and the solutions are the same. If the AER decides that a cost of equity estimate is relevant and reliable, what is the harm in assigning that estimate some weight when determining the allowed return on equity? The ENA does not understand the circumstances in which its approach would lead to less reliable or less transparent or less convoluted estimates than the AER's approach, so submits that its multi-model approach will provide more reliable cost of equity estimates and more transparent decision-making.

3.2.2. Potential for arbitrary weighting

Key position 4

The relative consideration given to the foundation model versus other information is likely to vary from case to case on the basis of whether other information suggests a cost of equity a long way from the initial range, or a value close to the initial range. It is not difficult to imagine scenarios in which (counter-intuitively) the more other information suggests that an initial range is inappropriate, the less weight is placed on that other information.

The AER's preference for using a foundation model for estimating the return on equity will necessarily lead to uncertainty about how final estimates will be determined, and the exclusion of relevant information. The basis for the foundation model is that this will provide a range of plausible estimates of the cost of equity, and that a final estimate will be selected from within this range according to other relevant information. The problem with this approach is that the weight in decision-making assigned to the foundation model will vary from case to case. The AER's approach is predicated on the assumption that all relevant information will imply reasonable outcomes from within the range implied by the AER's application of the foundation model. It means that the more other information suggests that the foundation model estimate could be incorrect, the more weight is placed on the foundation model in arriving at the final estimate for the cost of equity.

A purely illustrative example clarifies the point. Suppose the foundation model analysis implied a range for the cost of equity from 10 per cent to 12 per cent , with a mid-point of 11 per cent . An alternative set of relevant information implies that an appropriate value for the cost of equity is 13 per cent . The logical application of this information is for the AER to select a value at the top of the range, or 12 per cent . So, according to point estimates from the two sets of information, there is a 50 per cent weight placed on the foundation model estimate of 11 per cent , and 50 per cent weight placed on the alternative estimate. In another situation, suppose the alternative information suggested a cost of equity of 14 per cent . Again, the logical application of the AER's approach is to estimate the cost of equity at the top of the range. This implies that the AER has placed 67 per cent weight on the foundation model estimate of 11 per cent and 33 per cent weight on the alternative estimate of 14 per cent.

How much weight each piece of evidence should have in reaching a final decision should depend on the reliability of that evidence. The problem with the foundation model approach is that the weight

placed on different pieces of evidence diminishes the further the implied cost of equity estimates are from the boundaries of the range. The AER's approach is predicated on an assumption that all other information will imply a value from within the original range, so it can effectively shift up or down within the range without encountering this type of anomaly.

The ENA submitted a multi-model approach, in which it put forward a set of cost of equity estimates, assigned weights to each of those estimates based upon an assessment of reliability, and then computed a weighted average. The ENA acknowledges that the AER could form a different view as to the appropriate weights to be placed on different cost of equity estimates. For example, it clearly believes that the Sharpe-Lintner CAPM deserves more weight in decision-making than the Fama-French Model.[21] The ENA also acknowledges that the assigned weights could change as the AER reassesses the reliability of each estimate at different determinations. But the benefit of simply writing down (in each network determination)[22] the manner in which the final cost of equity estimate is computed sends a clear signal to investors and consumers that the AER is implementing a transparent approach to decision-making and it provides a crystal clear summary of the AER's view on the relevance of each individual cost of equity estimate.

3.2.3. Lack of transparency under foundation model

Key position 5

The implementation of the AER's foundation model will necessarily be less transparent than the use of the ENA's alternative approach.

The AER has identified transparency as an important aspect of good regulatory practice. But the implementation of the AER's foundation model will necessarily be less transparent than the use of the ENA's alternative approach. Under the foundation model approach, the AER will use its judgment to select a cost of equity estimate within a range. This means that the AER will *implicitly* place weight on different estimates of the cost of equity, but without other participants or even each person within the AER having any knowledge of what those implicit weights are.

For example, suppose the AER estimates that the cost of equity from the Sharpe-Lintner CAPM is 11.00 per cent , within a range of 10.00 per cent to 12.00 per cent . It considers two pieces of other evidence, one of which suggests that a value of 12.00 per cent is appropriate, another of which suggests that a value of 10.00 per cent is appropriate. The AER ultimately determines that the final estimate is to be 10.75 per cent . The implication is that the evidence consistent with the lower bound of 10.00 per cent was more relevant and reliable than the evidence consistent with the upper bound of 12.00 per cent . However, investors, consumers and even the individual members of the AER will have no idea how much influence each piece of evidence actually had on the final decision. Does the outcome mean that the evidence consistent with the upper bound carried a small 10 per cent weight in the decision, the foundation model point estimate carried 55 per cent weight, and the evidence consistent with the lower bound carried 35 per cent weight? Alternatively, does it mean that the evidence consistent with the upper bound carried 20 per cent weight on the decision, the

[21] Fama, E.F., and K.R. French, 1993. "Common risk factors in the returns on stocks and bonds," *Journal of Financial Economics,* 33, 3–56.

[22] Given that the draft guideline does not contain parameter estimates, other than an estimate for the value of imputation credits, the ENA does not anticipate that the Final Guideline will contain parameter estimates. In the absence of parameter estimates the issue of assigning specific weights is a moot point. The ENA considers that providing parameter estimates and an overall conclusion on the cost of equity, cost of debt and a benchmark regulated return would benefit investors and consumers by increasing the transparency in decision-making. The Final Guideline is non-binding which allows the parameter estimates and conclusions to be re-visited in a determination.

foundation model point estimate carried 35 per cent weight, and the evidence consistent with the lower bound carried 45 per cent weight?

A fundamental difference between the foundation model approach of the AER and the multi-model approach put forward by the ENA is transparency in reaching the final decision. Under the multi-model approach, stakeholders can observe just how relevant and reliable the decision-maker considers each piece of evidence to be. Under the foundation model approach of the AER, the relative merits of different estimates are made implicitly with no transparency for stakeholders.

3.2.4. Impacts of proposed 'rounding' approach

Key position 6

In the event that the foundation model cost of equity estimate is adjusted on the basis of other information, the AER proposes to adjust only in increments of 0.25 per cent . This creates an unnecessary level of inertia that places extra weight on the Sharpe-Lintner CAPM estimate over other evidence that could otherwise lead to a change in the estimate. This does not appear to be consistent with the Rules.

The AER has proposed that, in the event that it decides to deviate from its Sharpe-Lintner CAPM estimate of the cost of equity, it will adjust the cost of equity in increments of 0.25 per cent . According to the AER this decision reflects a trade-off between the imprecision with which cost of equity estimates can be made and materiality.[23] The materiality concept is that, assuming 60 per cent gearing, a shift of 0.25 per cent in the cost of equity estimate results in a shift of 0.10 per cent in the regulated rate of return.

The ENA is concerned that this particular approach embeds an unnecessary layer of friction into the cost of equity estimate. The ENA understands that no-one can precisely claim that the cost of equity is 12.02 per cent rather than 12.01 per cent or 12.03 per cent . The final cost of equity estimate, however, is not an exercise in spurious precision. It is a mathematical outcome of making a series of decisions throughout the estimation process. At the last step, in assigning a final estimate for the cost of equity, the necessity and benefit of shifting to the nearest 0.25 per cent is unclear. The practical effect of this is that, when there is a change to the cost of equity estimate, the change will be at least 0.25 per cent . There is no reason to believe that investors or consumers will benefit from a series of 'sticky' estimates of the cost of equity, and then a step change under different market conditions.

To make this example clear, suppose the point estimate of the required return on equity from the Sharpe-Lintner CAPM is 12.16 per cent , within a range of 11.16 per cent to 13.16 per cent. Other information suggests that the required return on equity is 13.86 per cent . The AER decides to move to the top end of its range, but the final estimate is 13.00 per cent because this is a multiple of 0.25 per cent . There is no logical reason under this scenario why the estimate of 13.00 per cent is better than 13.16 per cent . It is true that the required return on equity is estimated with imprecision, and the ENA recognises this imprecision by proposing a multi-model approach. Imprecision is not reduced, however, by merely rounding the final number to the nearest 0.25 per cent . Rounding will always lead to an estimate which is something worse than the best estimate. So the only reason to round is for 'stability'. This does not really improve stability, however, it just embeds a different form of instability, replacing small, more frequent changes with large, less frequent changes.

[23] AER *Explanatory statement - Draft rate of return guideline,* p.68

Furthermore, rounding to the nearest 0.25 per cent creates an additional layer of inertia that places extra weight on the Sharpe-Lintner CAPM estimate over other evidence that could otherwise lead to a change in the estimate. In the event that the data and analysis suggests a small change of less than 0.25 per cent to an initial estimate, there seems no reason to retain the foundation model estimate and it seems to serve no purpose under the Rules.

3.2.5. Model selection

Key position 7

The selection of the Sharpe-Lintner CAPM is, in reality, based upon the AER's assessment of its relative empirical performance, rather than on its theoretical soundness as claimed by the AER. Reaching a conclusion on the basis of empirical outcomes is best performed by assigning weights according to the relative merits of each model, rather than using a single foundation model as an anchor point.

Sub-sections 3.4 to 3.7 are devoted to separate analyses of different models used to estimate the cost of equity, and the AER's consideration of the relative usefulness of those models. In the current sub-section we evaluate the merits of selecting the Sharpe-Lintner CAPM on the basis of its theoretical soundness. A reasoned consideration of the theoretical basis for each model, and the empirical support for each model, leads to the conclusion that the AER's preference for the Sharpe-Lintner CAPM is, in reality, based upon an implicit assessment of its empirical performance. This casts doubt on whether the Sharpe-Lintner CAPM can really be used as a foundation model. This issue does not arise under an approach in which no model is classified as the foundation, and in which all relevant models are given relative consideration on the basis of their reliability.

The AER has elected to use the Sharpe-Lintner CAPM as its foundation model on the basis of its theoretical underpinnings. According to the Sharpe-Lintner CAPM, the expected return on any risky asset is the sum of the risk-free rate of interest and a premium for bearing systematic risk. To place this choice in context, alternative models that could have been selected are the Black CAPM[24], the Fama-French Model[25] and the dividend discount model.

The difference between the Sharpe-Lintner CAPM and the Black CAPM is that the Black CAPM is a more general version of the model, in which the expected return is the sum of the return on an asset with zero systematic risk (which is called the zero beta asset) plus a premium for bearing systematic risk.[26] The Black CAPM was derived under less restrictive assumptions than the Sharpe-Lintner CAPM so is relatively more likely to capture the way assets are priced in reality. The reliance on less restrictive assumptions makes the Black CAPM more theoretically robust. The only reason for the predominant use of the Sharpe-Lintner CAPM in practice is that we can more easily observe something close to the risk-free rate of interest, the yield on government securities. It is more challenging to estimate the expected return on an asset with zero beta.

So, despite the AER's stated preference for using the Sharpe-Lintner CAPM on the basis of its theoretical underpinnings, this is not really the case. The reason the AER has a preference for the Sharpe-Lintner CAPM over the Black CAPM is entirely empirical. It is easier to estimate the expected return on asset that bears almost no risk, compared to the zero beta asset, so the AER

[24] Black, F., 1972. "Capital market equilibrium with restricted borrowing," *Journal of Business,* 45, 444–455.
[25] Fama, E.F., and K.R. French, 1993. "Common risk factors in the returns on stocks and bonds," *Journal of Financial Economics,* 33, 3–56.
[26] The equation for the Black CAPM is as follows: Expected return = Expected return on a zero beta asset + Beta x (Expected return on the market portfolio – Expected return on a zero beta asset).

has a preference for the less theoretically robust Sharpe-Lintner CAPM. Put another way, the AER has a preference for implementing the CAPM in a particular manner. Beta estimates are derived primarily from regressing stock returns on market returns for a small sample of Australian-listed firms;[27] and the market risk premium is estimated primarily using historical average excess returns.[28] The risk-free rate is estimated as the yield to maturity on ten year government bonds.[29] According to the AER, "no generally accepted empirical measurement of the zero beta portfolio exists"[30] and "[t]he Black CAPM has theoretical strengths, however, there are also significant limitations to implementing the model."[31]

The second alternative model that could be used as the foundation model is the Fama-French Model. In this model, two other risk factors are incorporated into expected returns. These factors are commonly known as the size factor and the book-to-market factor.[32] The AER has selected the Sharpe-Lintner CAPM over the Fama-French model as its foundation model on the basis that the Fama-French factors do not have a theoretical basis.

It is not correct to say that the Fama-French Model has no theoretical basis. For the last 20 years, researchers have devoted an incredible amount of resources to developing and empirically testing theories that explain why the size and book-to-market factors are able to explain stock returns. These theories have been developed after observing the empirical regularity that small stocks, on average, earn higher returns than large stocks, and high book-to-market stocks earn higher returns than low book-to-market stocks. It is correct that the academic community has not yet reached a consensus about exactly what risks are proxied by the Fama-French factors. These factors could be proxies for risks of financial distress,[33] asymmetric exposure to market conditions,[34] or arbitrage risk,[35] amongst other theories.

So the AER's preference for the Sharpe-Lintner CAPM over the Fama-French Model appears to be based on two reasons. First, theories to explain the Fama-French Model were developed after observing empirical evidence that differed from the predictions of the CAPM. Second, there is more than one possible theory to explain this evidence. That is entirely different to the conclusion that the factors have no theoretical basis. According to the AER's rationale, there will never be a theory that will surpass the Sharpe-Lintner CAPM, because researchers develop theories to explain what they observe. Researchers do not merely sit in isolation to the market and derive theories entirely independent of what they observe in the market. In this particular case, researchers observed that the predictions of the Sharpe-Lintner CAPM did not hold, because small stocks and high book-to-

[27] AER *Explanatory statement - Draft rate of return guideline,* p.215. The AER has stated that it will consider beta estimates from firms listed overseas (p.216). However, the AER has requested an updated set of beta estimates for Australian-listed firms but not made the same request for overseas-listed firms.
[28] AER *Explanatory statement - Draft rate of return guideline,* p.212. While the AER has stated that it will consider other information in estimating the market risk premium, the AER has never adopted an estimate for MRP which differs from 6.0% or 6.5%, a range which is consistent with the AER's estimate of historical excess returns (p.214).
[29] AER *Explanatory statement - Draft rate of return guideline,* p.209
[30] AER *Explanatory statement - Draft rate of return guideline,* p.189
[31] AER *Explanatory statement - Draft rate of return guideline,* p.191
[32] The equation for the Fama-French Model is as follows: Expected return = Risk-free rate of interest + Beta x (Expected return on the market portfolio – Risk-free rate of interest) + Size exposure (or the "s" coefficient) x *SMB* + Book-to-market exposure (or the "h" coefficient) x *HML*. *SMB*, for "small minus big" is the expected return on a portfolio of small market capitalisation stocks minus the expected return on a portfolio of large market capitalisation stocks. *HML*, for "high minus low" is the expected return on a portfolio of stocks with a high ratio of book value to market value of equity minus the expected return on a portfolio of stocks with a low ratio of book value to market value of equity.
[33] Vassalou, M., and Y. Xing, 2004. "Default risk in equity returns," *Journal of Finance,* 59, 831–868.
[34] Petkova, R., and L. Zhang, 2005. "Is value riskier than growth," *Journal of Financial Economics,* 78, 187–202.
[35] Ali, A., L. Hwang, and M.A. Trombley, 2003. "Arbitrage risk and the book-to-market anomaly," *Journal of Financial Economics,* 69, 355–373.

market stocks earned returns that were too high compared to what would be expected, given their beta estimates.[36]

The final alternative model put forward by the ENA was the dividend discount model. The term "model" in this case means something different to the Sharpe-Lintner CAPM, Black CAPM or Fama-French Model. In this instance it simply means deriving an estimate of the cost of equity by directly estimating the discount rate that sets the present value of expected dividends equal to the share price. It is the same principle by which the AER estimates the cost of debt, as the yield to maturity on corporate debt with a similar level of risk to the benchmark firm. There is no specification as to what risks are incorporated into asset prices, merely an understanding that asset prices represent the present value of expected cash flows discounted at a rate which reflects the risk of those cash flows.

Preference for any other model – Sharpe-Lintner CAPM, Black CAPM or Fama-French Model – over the dividend discount model also has nothing to do with theory. It is entirely based upon the AER's view that its empirical estimates from the Sharpe-Lintner CAPM are superior to the estimates that can be derived from the dividend discount model.

The contrast amongst the four models discussed above highlights the fundamental flaw in the AER's rationale for using a foundation model approach. The AER's preference for one particular model, the Sharpe-Lintner CAPM, is entirely grounded in the ease of empirical estimation – the Black CAPM is more theoretically sound, the Fama-French Model is supported by 20 years of theoretical development, and the dividend discount model is based on the theory that assets can be valued as the present value of expected cash flows, which is the most important principle underpinning the regulation of network assets and the AER's post-tax revenue model.[37]

The reason the AER's approach is flawed is that the assessment of the empirical performance of models is a matter of degree. It is not a task which can be usefully performed by selecting the "best" model to determine an anchor point, and then shifting from this anchor point (within a limited range) on the basis of information from the other models. It is a task that can be usefully performed by assigning weights to those models at each determination according to their relative merits, thereby revealing that assessment in a transparent manner.

[36] Tests of the CAPM using realised stock returns began in the 1970's, and the consistent result was that returns on stocks with low beta estimates were higher than predicted by the CAPM (Black, F., M.C. Jensen, and M. Scholes, 1972. "The Capital Asset Pricing Model: Some empirical tests," *Studies in the Theory of Capital Markets,* ed. by M.C. Jensen, Praeger Publishers Inc., New York; Fama, E.F., and J.D. MacBeth, 1973. "Risk, return and equilibrium: Empirical tests," *Journal of Political Economy,* 81, 607–636). It was in the 1990's that the book-to-market characteristic was identified as being associated with returns (Fama, E.F., and K.R. French, 1992. "The cross-section of expected stock returns," *Journal of Finance,* 47, 427–465). This led to the devlopment of the Fama-French Model (Fama, E.F., and K.R. French, 1993. "Common risk factors in the returns on stocks and bonds," *Journal of Financial Economics*, 33, 3–56).

[37] http://www.aer.gov.au/node/9926

3.3. Response to critique of 'multi-model' approach

Key position 8

The multi-model approach continues to provide a more robust alternative to the foundation model. It gives more transparent effect to the revised Rules, involves no additional complexity in decision-making and does not involve the double-counting of information.

3.3.1. Double-counting of information

Key position 9

The proposal put forward by the ENA does not involve the double-counting of information as suggested by the AER. Rather, the transparency of the ENA approach means that the relevant consideration given to outcomes from different information is made clear.

One reason the AER considers the foundation model approach to be superior to the alternative put forward by the ENA is that the AER considered the ENA approach involves double-counting of information.[38] This conclusion is incorrect and leads to the erroneous conclusion that assigning weights to four different cost of equity estimates incorrectly over-weights some information.

The ENA submitted four estimates of the cost of equity which were compiled in a manner specifically designed to avoid double-counting of information. Across these four estimates there are two parameter inputs which are the same across the estimates – the risk-free rate of interest and the expected return on the market portfolio. All this means is that there is one view on the risk-free rate, and one view on the market return, which will be independent of what risks to the benchmark firm are incorporated into different models and how these are measured. Specifically, with reference to the estimates compiled based upon prevailing market conditions, the ENA submitted an estimate for the risk-free rate of 3.2 per cent , estimated as the yield to maturity on government bonds. It also submitted an estimate for the market return of 12.2 per cent . This was an estimate compiled as the market capitalisation weighted average of dividend discount model estimates for all Australian-listed firms with available data.[39] The ENA also considered estimates of 11.8 per cent from AMP, an estimate of 12.0 per cent derived from analysis conducted by Lally after corrections made by the ENA, and an estimate of 12.6 per cent from Bloomberg.

The use of the same inputs for the risk-free rate and the market return in different models does not mean that information is double-counted in decision-making. The inputs could have been specified in regulation, or measured using historical averages, or measured with reference to a past regulatory determination, or something else. The point is that the different models proposed by the ENA are means of computing estimates of the risk of the benchmark relative to the risk of the market and the risk-free rate, and there is no reason why the expected market return and risk-free rate estimate would change depending upon which concept of risk was considered.

Indeed, the ENA has been consistent with the new Rules in ensuring that it has been internally consistent throughout its estimation process. The new Rules require that "the regulator should also have regard to taking an internally consistent approach and, to the greatest extent possible, use

[38] AER *Explanatory statement - Draft rate of return guideline,* p.70
[39] SFG Consulting, "Dividend discount model estimates of the cost of equity," June 2013.

consistent estimates of values that are common across the process."[40] The ENA's proposed approach does no more than ensure that estimates of values that are common across the process are used consistently.

The ENA has not double-counted information in adopting a multi-model approach to estimating the cost of equity. It has deliberately compiled estimates from different models so there is not overlap of information across those models, and then applied weights to the different outcomes in order to reach a final conclusion in a quantitative manner. The specification of weights informs participants of how a conclusion was reached. In doing so, the ENA has provided a degree of transparency in its approach which is far greater than that proposed by the AER.

In contrast, the AER's own foundation model approach proposes to use other regulators' return on equity estimates to inform its decisions. Uniformly, those regulators currently rely on the Sharpe-Lintner CAPM to set return on equity estimates,[41] and consequently this will have the effect of the use of the Sharpe-Lintner CAPM multiple times through the AER's own foundation model approach.

The question of how much weight to be placed on different pieces of information should be contingent upon its probative value, which should be based on considerations such as its robustness, consistency with rule requirements, independence and reliability. The way in which the AER classifies the use of information, in combination with its foundation model approach, makes it impossible to establish just how much consideration was given to different pieces of information in reaching a final decision.

3.3.2. Complexity and the multi-model approach

Key position 10

The AER considers the ENA's multi-model approach to be unreasonably complex. The ENA disagrees with this characterisation and submits that the use of more than one model is entirely consistent with the requirement of the new Rules to consider a broader range of models. The ENA proposal is to use four models that are considered by experts to be the most widely-accepted models in research and practice, and which require the estimation of a small number of additional parameters.

The explanatory statement claims that the multi-model approach is complex, requiring the full parametisation of four alternative models.[42] There are two levels of consideration. First, the set of relevant evidence must be established. The ENA has submitted that the Fama-French model is relevant evidence whereas the AER has concluded that it is not. This is not a question of complexity. This is a question of whether or not the Fama-French model is relevant evidence that must be considered under the Rules. Ultimately, the Fama-French Model evidence will either be ruled in or ruled out.

[40] AEMC (2012) p. 67–68

[41] Economic Regulation Authority, 2013. "Explanatory statement for the draft rate of return guidelines: Meeting the requirements of the National Gas Rules," August, Sub-section 10.3 (p.133); Queensland Competition Authority, 2009. "QR Network Draft Access Undertaking," December, Sub-section 1.3 (pp.11–20); Independent Pricing and Regulatory Authority, 2013. "WACC methodology: Research – interim report," June, Sub-section 2.1 (p.4) for a summary of the current methodology and the remainder of the report for dicussion of potential changes to the current methodology.

[42] AER *Explanatory statement - Draft rate of return guideline,* p.70

Having determined the set of relevant evidence, the next stage is to distill that evidence into a single allowed return on equity. Under the multi-model approach, each piece of evidence is assigned weight according to the reliability of that evidence (or any other criteria that are deemed to be relevant). Under the foundation model approach, however, *the same set of relevant evidence* is disaggregated into three groups with some informing the point estimates of CAPM parameters, other evidence determining ranges around those point estimates, and another group being used to select a final allowed return from the foundation model range for the required return on equity. This multi-stage approach is far more complex and convoluted than simply assigning different evidence different weight according to its reliability. It is also much less transparent.

The ENA submission included supporting reports on specific issues, which the AER notes totaled over 900 pages.[43] The reason for this number of reports is that the ENA is in a position of justifying models and evidence not previously relied upon by the AER, either because of a rules constraint (in the case of the Fama-French Model) or because of the AER's own past decisions (in the case of information that could have been used to make informed decisions under the old Rules). There is an important reason for each piece of evidence submitted to the AER, and an important reason why particular estimation techniques and datasets were used in the analysis – because this allowed for the most reliable estimates of the cost of equity.

Volume of information is not the same as complexity. The ENA does not expect the AER to replicate the work of the ENA in each determination. It submits that the AER consider the evidence put forward by the ENA, and if that information appears complex, to ask the ENA for clarification of its information.

The AER argues that complexity is a barrier to consumers becoming engaged in the process for setting the regulated rate of return.[44] This argument is predicated on an assumption that consumers can only be engaged in the process if they can replicate each computation performed by the AER in reaching its decisions. But this assumption is wrong. Suppose that regulation of banks was performed with the same approach. Would the capital adequacy rules for banks be set in a manner that consumers could measure the risk impact of different capital adequacy standards? Does the takeovers panel make decisions on market impact on the basis of whether consumers can measure industry concentration in an area?

Consumers can become engaged in the process for setting the regulated rate of return without necessarily performing an empirical analysis to determine parameter inputs for different models, provided the AER provides those consumers with relevant information. Consumers are concerned with outcomes. In the specific case of energy consumers, they have a preference for secure energy supply, energy supply at a fair price, and stable prices over time.45 Submissions to the AER from consumer groups expressed a different view to the ENA on the way this can be achieved, with a

[43] AER *Explanatory statement - Draft rate of return guideline,* p..71
[44] AER *Explanatory statement - Draft rate of return guideline,* p.71
[45] Public Interest Advocacy Centre, 2013. "Balancing risk and reward: Submission to the AER's consultation paper," June, (emphasis added), "From PIAC's perspective, the long-term interests of consumers are, in turn, best served by a regulatory regime that finds a balance between the legitimate interests of investors in receiving a **fair return for risk** and the provision of network services of the appropriate **quality, safety and reliability at a fair price** to consumers (p.3)" and "a primary principle of balanced outcomes…[is that]…consumers…are not exposed to unexpected increases in their electricity bills or, more generally, network prices that reflect inefficient investment in the network (p.4)." Major Energy Users, 2013, "Rate of return guidelines: Comments on the consultation paper," June, Sub-section 1.4 (p.8) – The MEU makes that point that stability and certainty of pricing are secondary considerations to the primary concerns for consumers that they do not pay more than the efficient price for the service they receive, network service providers cannot pick and choose options to maximise revenue and guidelines should rely upon empirical evidence and not be overly reliant on theory.

preference for a primary model with cross-checks.[46] Consumers can become engaged in decision-making if the AER provides them with information showing the likely impact of the AER's decision on the reliability of supply, the average cost of supply and the potential variation in the cost of supply.

3.4. Sharpe-Lintner Capital Asset Pricing Model

3.4.1. Theory and application

In assessing the Sharpe-Lintner CAPM as a potential candidate for its foundation model, the AER comments on stakeholder concerns, noting that:

> *these concerns, however, are not limitations of the model, but instead, represent stakeholder concerns about how we previously implemented the model.*[47]

It is appropriate to acknowledge the distinction between the Sharpe-Lintner CAPM as a theoretical concept, and the application of this concept in practice. However, it is not the case that stakeholders only disagree with the AER's implementation of the model. Under the previous Rules, when the AER was required to use the CAPM, debate about whether the Sharpe-Lintner CAPM was the best or only model to use was moot. Under the new Rules, in which alternative models are available for analysis, the ENA submits that there are material limitations associated with the CAPM as a theoretical concept, and that there is considerable theory and evidence to support the use of alternative models. These models are discussed in subsequent sections.

With respect to the AER's implementation of the CAPM, the AER has acknowledged that stakeholders have raised concerns over the AER's implementation of the model. However, it is unclear from the explanatory statement whether the AER agrees with these concerns, so intends to modify its implementation, or disagrees with those concerns, so intends to make no changes. The estimation of specific parameters in the implementation of the Sharpe-Lintner CAPM is considered directly below.

[46] Public Interest Advocacy Centre, 2013. "Balancing risk and reward: Submission to the AER's consultation paper," June, (p.9); Major Energy Users, 2013, "Rate of return guidelines: Comments on the consultation paper," Section 5 (pp.33–34).
[47] AER *Explanatory statement - Draft rate of return guideline,* p.186

3.4.2. Equity beta

Key position 11

Beta estimates based on regressions of historical stock returns on historical market returns, especially in small samples, are unreliable estimates of forward-looking systematic risk. Beta estimates will be more reliable if the AER considers a broader sample of firms listed overseas, performs any regression analysis using the techniques recommended by the ENA, and considers data and estimation techniques outside of regression-based estimates of stock returns on market returns. The CAPM does not require beta estimates to be made purely on the basis of regressions of stock returns on market returns. The ENA submitted beta estimates based upon analyst forecasts and the dividend discount model, but other data and estimation techniques can also be adopted by the AER.

In making an estimate of the cost of equity from the Sharpe-Lintner CAPM, the AER previously compiled a set of beta estimates from a simple regression analysis of stock returns on market returns. In performing this analysis it relied primarily on evidence from a small sample of Australian-listed firms.[48] The sample comprises nine firms, of which just five remain listed.[49] The draft guideline indicates that the AER will continue to place primary reliance on the regression-based beta estimates for this small sample of Australian listed firms:

> *The equity beta range will be estimated with regard to theoretical and empirical evidence—based on the observed equity beta for a comparator set of Australian energy networks, cross checked against overseas energy networks and other Australian utilities.*[50]

In preparation for the issue of its final guideline the AER commissioned an update of beta estimates for those same firms using more recent data.[51] But it has excluded the computation of beta estimates for any firms outside Australia, or the use of any estimation technique other than the regression analyses of historical stock returns that were specifically detailed in the terms of reference to its consultant. This is what we refer to as the "AER's implementation of the CAPM."

These regression-based estimates of beta are merely one type of *estimate* of systematic risk. They are not empirical betas as opposed to something that is not empirical. They are merely estimates of systematic risk based upon the historical relationship between stock returns and market returns. There is a difference between the CAPM equation and the AER's particular implementation of the CAPM, but this distinction is not apparent in the AER's reference to "the observed equity beta for a comparator set."[52] The regression-based estimate of beta is not "the *observed* equity beta" but is merely one possible estimate of systematic risk.

[48] AER *Electricity transmission and distribution network service providers: Review of the weighted average cost of capital (WACC) parameters*, May 2009, Sub-section 8.5.2.1 (p.264), "[T]he AER continues to place a limited amount of weight upon the United States equity beta estimates (i.e treating the estimates as a check on the adopted beta estimate)."

[49] The firms currently listed are Envestra, APA, Spark Infrastructure, SP Ausnet and Duet. The firms no longer listed are Gasnet, Alinta, AGL and Hastings Diversified Utilities Fund.

[50] AER *Explanatory statement - Draft rate of return guideline,* p.64

[51] The report on updated beta estimates was not available to the ENA at the submission date, so the ENA may need to make a further submission to the AER once this report becomes available.

[52] AER *Explanatory statement - Draft rate of return guideline,* p.64

Even if it was certain that assets are priced according to the CAPM, it does not hold that beta estimates compiled from simple regression of stock returns on market returns are reliable estimates of risk. In addition, even if the AER was certain that regression analysis of stock returns on market returns was the only possible way in which it can compile a beta estimate, it does not hold that a sample of five (or even nine) listed firms is sufficiently large to reach reliable conclusions.

In the terms of reference that underpin the updated analysis requested by the AER, it asks the consultant "to provide a conclusion on the appropriate range for the equity beta of a benchmark regulated energy network from an empirical perspective."[53] The consultant was advised:

1. not to perform computations using the Vasicek adjustment, despite the AER receiving empirical analysis from the ENA that estimates compiled using this adjustment are more reliable than estimates which exclude the adjustment;[54]

2. to compile estimates using least absolute deviation (LAD) regression, despite the AER receiving empirical analysis from the ENA that LAD regression estimates have a material downward bias;[55]

3. to compile estimates using weekly returns but without repeating the analysis five times with start points on Monday, Tuesday and so on, despite receiving evidence from the ENA that there can be materially different outcomes depending upon the randomly chosen start point;[56] and

4. to only use a sample of nine Australian-listed firms in the analysis, despite the ENA providing the AER with a set of U.S.-listed firms compiled in a transparent manner on the basis of industry and the proportion of regulated assets,[57] and despite the ENA providing empirical evidence on the variation in small sample estimates.[58]

Any conclusion the consultant makes on the "range for an equity beta of a benchmark regulated energy network from an empirical perspective" needs to be prefaced with these limitations in mind. The consultant was retained to compile a set of regression-based estimates of beta for Australian-listed firms and was specifically instructed not to compile beta estimates using techniques that the ENA has documented would improve the reliability of the estimates. The ENA believes that the consultant cannot reach a conclusion on the appropriate equity beta range for a benchmark regulated energy network, because the information set available to the consultant is too restrictive to reach such a conclusion.

Even if the Sharpe-Lintner CAPM is adopted as a foundation model, there is no reason why the AER should also introduce what the ENA refers to as a "foundation technique" for estimating a parameter within that model. The AER's almost exclusive reliance in regression-based estimates of beta in past decisions, and the fact that it has put forward no alternative approach to estimating beta, implies that it will continue to place sole reliance on these regression-based estimates in reaching a decision on beta.

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[53] Terms of reference for the estimation of equity beta using regression analysis on a set of Australian-listed firms.
[54] Gray, S., J. Hall, N. Diamond and R. Brooks, 2013. "The Vasicek adjustment to beta estimates in the Capital Asset Pricing Model," SFG Consulting and Monash University, June.
[55] Gray, S., J. Hall, N. Diamond and R. Brooks, 2013. "Comparison of OLS and LAD regression techniques for estimating beta," SFG Consulting and Monash University, June.
[56] SFG Consulting, 2013. "Regression-based estimates of benchmark parameters for the benchmark firm," June.
[57] Competition Economists Group, 2013. "Information of equity beta from U.S. companies," June.
[58] Gray, S., J. Hall, N. Diamond and R. Brooks, 2013. "Assessing the reliability of regression-based estimates of risk," SFG Consulting and Monash University, June.

Further, even if beta estimates are to be made using historical returns, there is little chance that a sample of five (or even nine) firms will provide a reliable estimate of beta. The ENA documented that there is substantial variation in average beta estimates across small samples of firms. The ENA also submitted beta estimates from a large sample of firms listed in the United States, which the ENA believes is relevant evidence for the AER. The AER has stated that is will consider evidence from firms listed outside Australia.[59] Given that it has commissioned the computation of beta estimates for Australian-listed firms only, we submit that the estimates put forward by the ENA for U.S.-listed firms represent the most reliable beta estimates for firms listed outside Australia. The ENA also submits that, unless the evidence from this larger sample is given material weight in the AER's estimation, its regression-based beta estimates will be almost entirely unreliable.

The position of the ENA is that estimates of systematic risk can be made using information other than this historical relationship between stock returns and market returns. As one example of other information that can be used to compile beta estimates, the ENA submitted that the risk premium of Australian-listed network businesses was 96 per cent of the risk premium of the market portfolio, which implies a beta estimate of 0.96 under the assumption that assets are priced according to the Sharpe-Lintner CAPM. This estimate was made directly from dividend discount model analysis from a dataset of analyst forecasts. The AER has already concluded that the Sharpe-Lintner CAPM is the model that is most reliable in estimating the cost of equity, so the necessary implication of the AER's conclusion is that the beta estimate from this analysis is 0.96.

The ENA submits that its June submissions on equity beta have not yet been addressed in the guideline process. It looks forward to the AER's forthcoming paper on equity beta that will presumably address the ENA's submissions that were made three months ago. The ENA also looks forward to assisting the AER with a further submission on this issue in response to the AER's forthcoming paper.

3.4.3. Risk-free rate

The ENA agrees that the risk-free rate should be estimating as the yield to maturity on 10-year Commonwealth Government Securities.[60] This is consistent with the long-lived nature of network assets and investors' expectations.[61]

3.4.4. Expected return on the market and the market risk premium

Key position 12

The ENA supports a wider range of evidence informing an *MRP* estimate, such as estimates from the dividend discount model compiled in a robust manner. Consistent with the objective of the Rules, the explanatory statement to the final guideline should set out the value for *MRP* that would result from the AER applying its outlined approach in current market circumstances.

Overall response to the AER's approach to estimating the market risk premium

The AER has stated that it will choose a value for the *MRP* based on evidence that includes:[62]

[59] AER *Explanatory statement - Draft rate of return guideline,* p.64 and p.216
[60] AER *Explanatory statement - Draft rate of return guideline,* p.209
[61] Incenta Economic Consulting *Term of the risk free rate for the cost of equity,* June 2013.

- Historical excess returns;
- The dividend growth model (DGM);[63]
- Survey evidence;
- Implied volatility; and
- Recent decisions among Australian regulators.

The following sub-section is devoted to the AER's consideration of historical excess returns as an estimate of the *MRP.* The remainder of the current sub-section relates to the AER's consideration of the other four sources of information listed above.

The AER intends to use the dividend discount model, but there are potential problems with the way in which the AER intends to apply this model to estimate the expected market return. As discussed in Sub-section 3.7 of this submission, in implementing the dividend discount model the AER has adopted a set of estimation techniques and assumptions that will lead to less reliable estimates of market returns than are possible under alternative estimation techniques and assumptions. Essentially, the AER is making an assumption about long-run growth rather than extracting an estimate from prices, earnings and dividends. SFG provides an attractive method that uses current market prices to infer what the market believes long-run growth to be. Since the method adopted by SFG has growth as an outcome of the process rather than an assumption, it removes the flexibility for parties to choose a value for long-run growth that they deem to be beneficial. The ENA believes that documenting this view would assist in the process of setting up a guideline that will ensure that the cost of equity is set in a way that is consistent with prevailing conditions in the market.

In its response to the consultation paper the ENA emphasised the problems with a reliance on surveys.[64] The AER states that it is mindful of the limitations of survey evidence.[65] However, the AER has provided no indication of how these limitations will impact upon the consideration given to survey evidence. In the Consultation Paper the AER lists a table of key findings from *MRP* surveys[66] but the AER has provided no analysis on whether these surveys (or subsequent versions of those same surveys) would meet the Tribunal's criteria of timeliness, clarity and representativeness.[67] So there is ambiguity on two issues. First, participants have no real idea whether the current list of surveys referred to by the AER are considered to be sufficiently reliable to carry weight in decision-making. Second, if the current list of surveys is considered to contain reliable evidence on the *MRP*, participants do not have a reasonable understanding of the relative consideration given to that survey evidence.

With respect to the use of implied volatility in setting the *MRP,* there is also a high degree of uncertainty over how relevant the AER considers this information. With respect to the most recent determination in which implied volatility was considered, the AER's position on this metric was ambiguous. The AER stated that:

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[62] AER *Explanatory statement - Draft rate of return guideline,* p.212
[63] The term "dividend discount model" is used in this submission because the term "dividend growth model" is often used to refer to the specific case in which expected growth in dividends is constant in all forecast years.
[64] Energy Networks Association *Response to the AER rate of return guideline consultation paper*, June 2013, Sub-section 4.3.3.1.7, p.42
[65] AER *Explanatory statement - Draft rate of return guideline,* p.213
[66] AER Consultation Paper *Rate of Return Guideline*, Sub-section D.4, p.81.
[67] Energy Networks Association *Response to the AER rate of return guideline consultation paper*, June 2013, Sub-section 4.3.3.1.7, p.42

> *The AER does not consider that VAA's implied volatility glide path approach produces a robust basis on which to place substantive weight in estimating a 10 year forward looking MRP. However, even if weight were to be given to this approach, it would currently support an MRP estimate below 6 per cent. The AER notes that this is a forward looking measure that until recently was strongly advocated by regulated businesses. It is appropriate to consider this measure, among other measures of the MRP, having regard to the strengths and weaknesses of this approach.*[68]

In the context of this most recent determination, the AER states that it is appropriate to consider implied volatility in the context of estimating the *MRP,* despite being concerned over the reliability of this metric as an indicator of the *MRP.* In the draft and final decision the AER has confirmed that implied volatility is relevant to estimating the *MRP.* However, participants have no indication of the relative consideration to be given to this information. From February 2007 to February 2013 the implied volatility index fell within a range of around 10 per cent to 60 per cent .[69] The average value of the volatility index over this period was 18.6 per cent . Yet the range for the *MRP* adopted during this period by the AER was just 6.0 per cent to 6.5 per cent . Participants have no real indication of how relevant the AER considers implied volatility estimates to be in setting the *MRP.* The implication is that participants are aware that, all else being equal, higher implied volatility could imply a higher estimate for the *MRP.* Yet participants have no real understanding of how much weight is assigned to this information in reaching a final decision.

With respect to other regulators' *MRP* estimates, the ENA submits that it is the rationale behind these estimates that could form relevant information for the AER's consideration, rather than the figures themselves that are relevant. For instance, suppose another regulator placed equal weight on an estimate of the *MRP* derived from historical average returns and an estimate of the *MRP* derived from dividend discount model analysis. A sound approach would be to consider why the other regulator elected to give equal weight to these two alternative estimates, and to use that consideration when determining the relative weight to be assigned to each of the two estimates. In contrast, it does not make sense to consider each other regulator's final estimate of *MRP* as a separate piece of evidence.

Review of historical data in estimating the expected market return and the market risk premium

With respect to the analysis of historical data, the AER makes a distinction between incorporating the market risk premium *(MRP)* as a parameter in the Sharpe-Lintner CAPM, versus incorporating the expected market return *(r_m)* as a parameter. This distinction is made in the AER's consideration of what it refers to as the "Wright approach."[70]

The Sharpe-Lintner CAPM states that the expected return on an asset is the sum of the risk-free rate and a premium for bearing systematic risk. In turn, the premium for bearing systematic risk is the product of the equity beta (β) and the difference between the market return (r_m) and the risk-free rate of interest (r_f). This difference ($r_m - r_f$) is the market risk premium.

One way to estimate the expected return on the market at a particular point in time is to compute the historical average market return. This would be an appropriate input into the Sharpe-Lintner CAPM if

[68] AER *Access arrangement final decision: SPI Networks (Gas) Pty Ltd 2013–17*, Part 2: Attachments, March 2013, Sub-section 5.3.3, p.105
[69] AER *Access arrangement final decision: SPI Networks (Gas) Pty Ltd 2013–17*, Part 2: Attachments, March 2013, Sub-section 5.3.3, Figure 5.3 (p.105).
[70] AER *Explanatory statement - Draft rate of return guideline,* p.196–197

expected returns on the market were independent of the risk-free rate of interest, and if we had no other information to suggest whether the current required returns are above or below the historical average. (For example, if there was no dividend discount model estimate of the market return or any other indicator or current required returns). By implication, if the risk-free rate was low at a particular point in time, the resulting market risk premium would be relatively high.

Another way to estimate the expected return on the market at a particular point in time is to compute the historical average *excess* market return, the difference between the return on the market proxy and the proxy for the risk-free rate, and then add this historical average excess return to the contemporaneous risk-free rate estimate. This would be an appropriate input into the Sharpe-Lintner CAPM if expected returns on the market moved in a direct relationship with the risk-free rate of interest (again setting aside the availability of other information to make estimates of current required returns).

In short, in the absence of any other information, if there is zero correlation between the risk-free rate and the expected market return, an appropriate estimate of the expected market return would be the historical average market return; and if there is perfect positive correlation between the risk-free rate and the expected market return an appropriate estimate of the expected market return would be the historical average excess return added to the contemporaneous risk-free rate proxy. This is acknowledged by the AER when it states:

> *The Wright approach assumes that the relationship between the risk free rate and the MRP is perfectly negatively correlated. Alternatively, our current implementation of the Sharpe-Lintner CAPM assumes there is no relationship between the risk free rate and the MRP. There is no consensus in the literature, however, on the direction, magnitude or stability of the relationship between the risk free rate and the MRP. Instead, there is evidence to support both a positive and negative relationship. Given these uncertainties – in particular, that the direction of any relationship may be variable and unstable – we consider it more reasonable to assume that no relationship exists between the MRP and the risk free rate.*[71]

The ENA has five important concerns with the AER's reasoning and conclusions on the relationship between expected market returns and the risk free rate.

The first concern relates to the logic underpinning the AER's decision-making process. The AER received advice from its own consultants that there was no consensus in the literature about the relationship between the risk free rate and the *MRP.* So, according to this advice, it could be the case that there is zero correlation between the risk free rate and the *MRP* and it could be the case that there is zero correlation between the risk free rate and the expected market return. Faced with this information the AER reached one conclusion – that the expected market return moves by exactly the same magnitude and direction as the risk-free rate – but without any rationale as to why this is an appropriate conclusion. Even if the AER is faced with a situation in which the literature has not reached a consensus, it is still in a position of having to critically examine that literature, and decide which evidence is most convincing – rather than giving primary weight to evidence from one end of a spectrum about which "there is no consensus."

The ENA submits that the AER re-consider the evidence available to it on the relationship between the risk free rate and market returns and support its conclusion with reference to that evidence. Implicit in the AER's logic is that it considers there to be more reliable evidence in favour of there

[71] AER *Explanatory statement - Draft rate of return guideline,* p.199–200

being a one-for-one relationship between the risk-free rate and expected market return, and less reliable evidence in favour of there being no relationship between the risk-free rate and expected market return. Yet participants have no indication of which evidence the AER considers to be most reliable or how it has reached its conclusion.

The second concern is that, having made the assumption noted above, under the foundation model approach, the AER treats these two potential sources of information quite differently in evaluating evidence. According to Table 5.2 of the explanatory statement, historical excess returns will be used to inform the AER's estimate of the *MRP* as an *input into the foundation model*, and historical returns on the market (listed as the Wright approach) will be used to inform the AER's estimate of the *overall return on equity*.[72] This means that historical average excess returns will be used to estimate the initial range for the *MRP* (and consequently the range for the Sharpe-Lintner cost of equity) and historical average market returns will be used, as a second-order consideration, to assist (along with a whole range of other information not even related to MRP) in selecting a final value from within the range.

The ENA submits that assigning these two very different roles to historical returns is inappropriate and that both sources of information are relevant for estimating the expected market return.

As a specific example, suppose the historical average market return was 12.0 per cent , the historical average risk-free rate was 5.5 per cent , the historical average excess return was 6.5 per cent , and government bond yields at present are 4.0 per cent . According to the AER's approach, the baseline estimate of the market return (absent any other information) would be 10.5 per cent , the sum of the risk-free rate and the historical average excess return. Embedded in this estimate is the assumption that the expected market return moves on a one-for-one basis with government bond yields. An alternative approach would be to assume that expected market returns are equal to 12.0 per cent , and so the implied market risk premium is 8.0 per cent . If, according to the AER's advice, there is no consensus in the literature about the relationship between the risk-free rate and the market risk premium, there is no consensus that an estimate of 6.5 per cent for the market risk premium is any better than an estimate of 8.0 per cent for the market risk premium. Yet the first figure of 6.5 per cent is established as a default position, and the second figure of 8.0 per cent is only used to deviate from this default position (after potentially being diluted by a whole range of other evidence).

It would make more sense to consider both estimates of the market return as relevant information, and then to give relative consideration to each estimate of the market return according to the reliability of that estimate.

The third concern is that the AER characterises the use of historical excess returns as being a *simplification* of the manner in which the CAPM parameters are estimated. Specifically, the AER states that (emphasis added):

> *Our current implementation of the Sharpe–Lintner CAPM estimates the return on equity with reference to the prevailing risk free rate, plus the product of the equity beta and the MRP. In effect, this* ***simplifies*** *the Sharpe–Lintner CAPM to the following formula:*
>
> $k_e = r_f + \beta_e \times MRP$

[72] AER Explanatory Statement, Sub-section 5.3.2, Table 5.2 (pp.62–63).

The AER's implementation of the Sharpe-Lintner CAPM is not at all a simplification. It is no more simple to estimate *MRP* (and to consequently add r_f to get r_m) than it is to estimate r_m (and to consequently subtract r_f to get *MRP*). In either case, there is an estimate of r_f, r_m and *MRP.*

Fourth, in assessing these two alternative means of analysing historical returns, the AER co-mingles discussion of its estimate of the *MRP* based upon historical excess returns, and its estimate of the *MRP* based upon other information in addition to historical excess returns. The AER contrasts its implementation of the CAPM with the Wright approach in the following manner (emphasis added):

> *[W]e consider that implementing the Wright approach is more transparent and replicable than our standard implementation of the Sharpe–Lintner CAPM. As noted, our standard implementation requires the use of some **judgment** in determining a market risk premium. The Wright approach, however, requires less judgment. The Wright approach assumes that the return on the market is constant and as such, uses only historical data to estimate the return on the market.*[73]

In this paragraph, the AER contrasts the estimate of the market return and the market risk premium from *all* sources of evidence (including historical excess returns) with the estimate of the market return and the market risk premium from one source of evidence (historical market returns). The ENA sees no logical rationale for making a contrast in this manner, which leads to the conclusion that the Wright approach is "more transparent and replicable," but in the view of the AER "not as flexible to changing market conditions."[74]

The ENA submits that the two different approaches to analysing historical data have exactly the same level of transparency and replicability. With respect to the AER's view on their responsiveness to changing market conditions, this is discussed below.

The fifth concern of the ENA is that the AER has not made a distinction between the likely scenarios in which the risk-free rate might move in the same direction as the expected market return, or in the opposite direction to the expected market return. The AER's advice from its consultants is that there is no consensus in the literature on the relationship between the risk-free rate and the market risk premium. This is a statement about what we would expect to observe on average.

The basic reason for the different possible relationships between the risk-free rate and the market risk premium is that the risk-free rate can change for different reasons. As one example, the risk-free rate could fall because inflation expectations fall. In the absence of any other information about the expected market return, we could reasonably expect the expected market return to fall as well, and so there is the same real risk-free return, the same real market return and a constant market risk premium. So that is one scenario in which there is a one-for-one relationship between the risk free rate and the expected market return.

A counter-example is the case of a financial crisis in which investors are prepared to pay a high price (and therefore receive low returns) for investing in the safest asset available, which is government bonds. Investors sell riskier assets and buy less risky assets. Government bond yields would also likely fall in this situation because of the activities of central banks to lower interest rates. So this is an alternative scenario in which the proxy for the risk-free rate falls, but the expected market return rises.

[73] AER *Explanatory statement - Draft rate of return guideline,* p.186
[74] AER *Explanatory statement - Draft rate of return guideline,* p.186

These are two examples of changing market conditions which need to be considered in forming an estimate of the market return. The AER characterises its approach as more responsive to changing market conditions than the Wright approach. But this characterisation only applies to the use of information *other* than historical market returns or historical excess returns. Neither time series of historical returns is "responsive to changing market conditions." It is more appropriate to refer to the time series that is appropriate for the market conditions faced at each point in time. The use of historical excess returns as a proxy for the market risk premium is appropriate for the first scenario (low government bond yields due to low inflation expectations); and the use of historical market returns as a proxy for the expected market return would be appropriate for the second scenario (low government bond yields due to a flight to quality).[75] These scenarios are not exhaustive, of course, but illustrative of reasons for different relationships between the risk-free rate and expected market returns.

The differing reasons for fluctuations in government bond yields underscores the benefits of performing a direct estimate of the market cost of equity using the dividend discount model, which was used in the ENA's estimate of the market cost of equity. Information from historical returns is one source of relevant information for estimating the expected market return, and the consideration given to each source of evidence should be based upon an assessment of reliability in the particular market circumstances. Other information might suggest that historical excess returns, or historical market returns, are more or less relevant in particular conditions. The ENA considered all of this information in arriving at its conclusions regarding the expected market return.[76]

Specific consideration of the historical excess returns series

The AER has only ever adopted estimates for the *MRP* of 6.0 per cent and 6.5 per cent , relying primarily on historical average returns on the Australian equity market. In particular, the AER relies upon estimates compiled by Brailsford, Handley and Maheswaran (2008, 2012) in supporting its most common assumption that *MRP* is equal to 6.0 per cent .[77] Other published sources, including the annual compilations by Dimson, Marsh and Staunton report higher results for the historical MRP.[78] The ENA submitted evidence compiled by NERA Economic Consulting that the historical *MRP* estimate reported in the papers by Brailsford, Handley and Maheswaran was understated due to particular assumptions made by the authors in compiling historical data.[79]

The AER has not responded to this analysis and the ENA submits that the material differences in average *MRP* estimates resulting from the two datasets constitute relevant evidence. The difference in average estimates is close to 0.5 per cent which spans the entire range of point estimates for the *MRP* adopted by the AER in all determinations.

The report by NERA refers to downward adjustments to the Lamberton dividend yield series that were made by Brailsford, Handley and Maheswaran (2008, 2012) in data compilation. The adjustments by these researchers had been made because of perceived deficiencies with the

[75] The expected market return would actually be greater than or equal to the historical average market return in the scenario described here, absent other information, but this is secondary to the main point.
[76] Competition Economists Group *Estimating the return on the market*, June 2013.
[77] Brailsford, T., J. Handley and K. Maheswaran, 2008. "Re-examination of the historical equity risk premium in Australia," *Accounting and Finance,* 48, 73–79; Brailsford, T., J. Handley and K. Maheswaran, 2012, "The historical equity risk premium in Australia: Post-GFC and 128 years of data," *Accounting and Finance,* 237–247. For example, see Australian Energy Regulator *Access arrangement final decision: SPI Networks (Gas) Pty Ltd 2013–17*, Part 2: Attachments, March 2013, Sub-section 5.3.3, p.95–98
[78] See, for instance, Dimson, E., P. Marsh, and M. Staunton "Credit Suisse global investment returns sourcebook," Credit Suisse, February 2012, p.57
[79] NERA Economic Consulting *The market, size and value premiums: A report for the Energy Networks Association,* June 2013

original Lamberton series.[80] The analysis by NERA was performed by reconstructing historical records from source material, and then re-calculating value-weighted dividend yields for selected years between 1891 and 1957. The results of the investigation demonstrated that the broad assumptions made by Brailsford, Handley and Maheswaran had caused a downward bias to the estimated dividend yield series, with the result that the *MRP* which they calculated was under-stated. NERA has estimated that a corrected value for the historical average excess return is approximately 6.5 per cent over the period from 1883 to 2011[81]. The evidence obtained by NERA about the errors in the calculation of the historical excess returns is strong because the evidence is derived from a detailed audit of disaggregated historical data. There are no models or forecast assumptions that are intrinsic to the analysis.

3.5. Black Capital Asset Pricing Model

Key position 13

The empirical evidence the ENA submitted on the Black CAPM, namely the lack of any reliable relationship between regression-based beta estimates and stock returns, should be used to estimate beta in parameterising the Sharpe-Lintner CAPM. The final guideline should disclose the relative importance assigned to each piece of information in estimating beta, which the ENA submits can be done in a transparent manner by assigning weights to different estimates.

The AER has stated that theory underpinning the Black CAPM, and empirical evidence in relation to that model, will be used in reaching its final decision on the estimate of beta as an input into the Sharpe-Lintner CAPM. The AER acknowledges that the Black CAPM implies that, for an asset with a beta estimate below one, the returns are higher than implied by the Sharpe-Lintner CAPM. Specifically, the AER notes that:

> *Criticisms of the Sharpe–Lintner CAPM, therefore, may be a result of common implementations of the model as distinct from theoretical failings. The results of these empirical tests indicate the model may under estimate returns for low beta firms ('low beta bias'). These implementation problems are important, but we consider that they can be overcome or mitigated. For example, using a 10 year term for the risk free rate and using the Black CAPM theory to inform the beta estimate would provide corrections for any possible low beta bias.*[82]

The reason the AER proposes to take the Black CAPM implications into account by informing the beta estimate for the Sharpe-Lintner CAPM, rather than as a direct implementation of the Black CAPM, is because of the empirical challenge of making a reliable estimate of the expected return on a zero beta asset.[83] NERA (2013),[84] could find no reliable relationship between regression-based

[80] NERA Economic Consulting *The market, size and value premiums: A report for the Energy Networks Association,* June 2013, p.ii
[81] NERA Economic Consulting *The market, size and value premiums: A report for the Energy Networks Association,* June 2013, p.17
[82] AER *Explanatory statement - Draft rate of return guideline,* p.187
[83] For the AER's discussion and conclusions on the Black CAPM, refer to the AER *Explanatory statement - Draft rate of return guideline*, Sub-sections E.3, F.2.2, and G.3.
[84] http://www.aer.gov.au/sites/default/files/Report%202%20-%20Black%20CAPM%20Zero%20Beta%20Estimate%20%28Final%29%20-%2027%20June.pdf.

estimates of beta and stock returns at all, which demonstrates the ENA's concern with the AER's implementation of the Sharpe-Lintner CAPM.[85]

The ENA proposed use of both the Sharpe-Lintner CAPM and the Black CAPM in determining the cost of equity capital. The proposed estimate from the Black CAPM was set equal to the expected market return on the basis that there was no reliable evidence to suggest that regression-based estimates of beta had any relationship with stock returns. So the Black CAPM estimate is equivalent to populating the Sharpe-Lintner CAPM with a beta of one.

The ENA then considered the relative merits of these two estimates, along with estimates from the dividend discount model and the Fama-French Model, and assigned weights to those estimates based upon all the information available at the current time.

In assigning weights the ENA has performed an analysis which is consistent with the AER's stated intention to arrive at an estimate from the CAPM which gives consideration to the evidence and implications of the Black CAPM, which is that assets with low beta estimates have higher expected returns than implied by the Sharpe-Lintner CAPM. The only difference is that the ENA approach is transparent about how it reached its conclusions and what weight was applied to each piece of evidence.

The ENA submits that, if the AER determines that the Sharpe-Lintner CAPM must be used as the central model, the Black CAPM evidence (and all evidence relevant to beta) should be used to determine the beta estimate that results in the allowed return on equity that best meets the allowed rate of return objective. The final guideline should explain what information was used to estimate beta, how it was used, and set out reasons explaining the relative weight (or "importance") assigned to each piece of information.

3.6. Fama-French Model

Key position 14

In concluding that the Fama-French Model has no role to play in determining the allowed returns on equity, the AER has elected not to use relevant evidence. This is inconsistent with the Rules. The concerns of the AER over the Fama-French Model (theoretical limitations, complexity and imprecision) could equally be levelled at the Sharpe-Lintner CAPM, which is the cornerstone of the AER's foundation model approach. The AER has also not addressed the relevant evidence put forward by the ENA that the application of the Sharpe-Lintner CAPM leads to an under-estimate of returns for low beta stocks with high book-to-market ratios. Under the Rules, regard should be had to this empirical evidence.

In its draft guideline the AER decided that the Fama-French Model had no role to play in determining the allowed return on equity. The model will not be used as the foundation model and will not be used to inform the final decision on the allowed return on equity in any way. The reasons the AER considers the Fama-French Model to be irrelevant are that:

1. the *SMB* and *HML* factors "are not motivated by predictions about what factors should be relevant to investors (p.191)," and

[85] In particular, refer to Figure 5.1, NERA Economic Consulting *Estimates of the zero-beta premium*, June 2013

2. those same factors might not "follow a pattern of systematic observance in Australia (p.191)." The AER also commented on implementation challenges, namely instability in estimates of exposure to these factors (that is, instability in estimates of *s* and *h*) and instability in the factor return premiums (that is, instability in estimates of *SMB* and *HML*).[86]

The ENA submits that giving the Fama-French model zero consideration is inconsistent with the Rules. The explanatory statement did not give thorough consideration to the relative merits of the Sharpe-Lintner CAPM and the Fama-French Model. Instead, the AER decided that one model is useful and the other is not. The ENA submits that the relevance and reliability of both models is a matter of degree. So the best way to give appropriate consideration of the models is to assign weights according to their relevance and reliability.

The AER's reasons for giving no weight to the Fama-French model are wrong, inconsistent or overstated, for the following reasons.

First, the *purpose* of the Fama-French Model is the same as the Sharpe-Lintner CAPM, to estimate the required return on equity. The AER's contention that the Fama-French Model is not appropriate to estimate the cost of equity is a misrepresentation of its use. The Fama-French Model is extensively used as a benchmark in studies of portfolio performance to determine whether a portfolio earned returns above what would be expected, given the risks of the portfolio. The benchmark is the opportunity cost of funds.

Second, the Fama-French Model is *no more complex to implement* than the Sharpe-Lintner CAPM, given that the risk exposure to the three factors can be estimated in exactly the same way as used by the AER to estimate beta (regressions of stock returns on market returns), and the factor premiums themselves can be estimated using historical returns, the same technique used by the AER to estimate the market risk premium in average market conditions.

Third, the AER's characterisation of the Sharpe-Lintner CAPM as having "sound theoretical foundations"[87] and the Fama-French Model as having "no clear theoretical foundation"[88] is inappropriate. The first question in this regard is whether we would expect risks other than systematic risk to be priced. As highlighted in an expert report by NERA, the extensive set of assumptions that are required for the Sharpe-Linter CAPM to hold, and which do not hold because of market imperfections, have two important implications. First, in a world with real market imperfections, in general, risks other than market risk will be priced. Second, the simple relation between mean return and market beta will no longer hold.[89] In short, in real-world markets, multiple risks could be reflected in asset prices, and the empirical evidence suggests that the *SMB* and *HML* factors are the best available proxies for those risks.

Given that, with market imperfections we would expect risks other than market beta to be priced, the second question is whether there is a body of theory to support the use of the Fama-French Model in measuring risk. For 20 years researchers have developed *theories* that explain the Fama-French factors, and these theories should not be discounted merely because they were developed to explain what we observe, and that there is debate over whether the factors capture one risk or

[86] For the AER's consideration of the Fama-French Model, refer to Sub-section E.4 of the *Explanatory statement*.
[87] AER *Explanatory statement - Draft rate of return guideline*, p.26
[88] AER *Explanatory statement - Draft rate of return guideline*, p.191, quoting McKenzie and Partington "Risk, asset pricing and WACC," June 2013.
[89] See NERA Economic Consulting *"The Fama-French Three Factor Model: A report for the Energy Networks Association,* October 2013, Sub-Section 2.1 for discussion of the Sharpe-Lintner CAPM and Sub-section 2.2 for discussion of the Black CAPM.

multiple risks. These factors could be proxies for risks of financial distress,[90] asymmetric exposure to market conditions,[91] or arbitrage risk,[92] amongst other theories. If the perspective of the AER was adopted (risk factors are only valid if theories are developed in advance of observing relationships in data) it would be almost impossible to implement a multi-factor model to estimate the cost of equity. This represents a particularly high hurdle to adopting anything other than the one-factor Sharpe-Lintner CAPM, despite the evidence that asset prices cannot be explained by the Sharpe-Lintner CAPM.

Fourth, the AER has a preference for the Sharpe-Lintner CAPM over the Fama-French Model because of its use in practice.[93] But this view is predicated on an assumption that practitioners implement the Sharpe-Lintner CAPM in the same manner adopted by the AER. However, the evidence demonstrates that independent expert valuation professionals do *not* implement the CAPM in the way the AER does.[94] Practitioners are aware of the imprecision associated with regression-based estimates of beta derived from small samples. They are also aware that the Fama-French factors are likely to be a proxy for risk, and that there could be one or more risks associated with these factors. So practitioners do not mechanically incorporate regression-based estimates of beta into the Sharpe-Lintner CAPM.[95] Some practitioners adopt beta estimates which are adjusted towards one on the basis of estimation error.[96] Other practitioners make adjustments to their CAPM estimates of the cost of equity on the basis of considerations other than regression-based estimates of beta, which include risks proxied by *SMB* and *HML*. While there is survey evidence that practitioners adopt the CAPM in estimating the cost of equity,[97] the ENA submits that practitioners account for the risks proxied by the size and book-to-market factors in reaching their estimates of the cost of equity. All the ENA has proposed with the Fama-French Model is a transparent, objective way of directly accounting for these risks.

Fifth, in dismissing the Fama-French model, the AER commented that the size factor was not statistically significant in Australian data and the AER expressed concern over instability of the factor returns themselves and exposure to the factor returns.[98] On implementation issues, the *SMB* and *HML* factor returns are no more unstable than historical market excess returns, which carry substantial weight in the AER estimate of the market risk premium.[99] Furthermore, beta estimates

[90] Vassalou, M., and Y. Xing, 2004. "Default risk in equity returns," *Journal of Finance,* 59, 831–868.
[91] Petkova, R., and L. Zhang, 2005. "Is value riskier than growth," *Journal of Financial Economics,* 78, 187–202.
[92] Ali, A., L. Hwang, and M.A. Trombley, 2003. "Arbitrage risk and the book-to-market anomaly," *Journal of Financial Economics,* 69, 355–373.
[93] AER *Explanatory statement - Draft rate of return guideline*, p.26 where the AER refers to the use of the Sharpe-Lintner CAPM "by capital market participants more generally" and Sub-section 5.4 (p.66) where the AER refers to the Sharpe-Lintner CAPM's "widespread use amongst market practitioners."
[94] http://www.aer.gov.au/sites/default/files/Report%204%20-%20Use%20of%20Independent%20Expert%20Reports%20%28Final%29%20-%2026%20June.pdf.
[95] In particular, SFG Consulting (2013) noted, in their report entitled *Evidence on the required return on equity from independent expert reports*, that in 2012/13 that in half of independent experts reports reviewed there was an additional uplift to the cost of equity above the estimate implied by the CAPM (Section 3, p.12).
[96] For the theoretical and empirical genesis of this adjustment, see Vasicek, O., 1973. "A note on using cross-sectional information in Bayesian estimation of security betas," *Journal of Finance,* 28, 1233–1239; Blume, M.E., 1971. "On the assessment of risk," *Journal of Finance,* 26, 1–10; and Blume, M.E., 1975. "Betas and their regression tendencies," *Journal of Finance,* 30, 785–795.
[97] Graham, J.R., and C.R. Harvey, 2001. "The theory and practice of corporate finance: Evidence from the field," *Journal of Financial Economics,* 60, 187–243. Truong, G., G. Partington, and M. Peat, 2008. "Cost-of-capital estimation and capital-budgeting practice in Australia," *Australian Journal of Management,* 33, 95–121.
[98] AER *Explanatory statement - Draft rate of return guideline* p.191–192, including the statement that "these factors vary considerably and do not follow a pattern of systematic observance in Australia (pp.191–192)" and "the factor exposures…are unstable when estimated for individual stocks and it is difficult to understand why the factor exposures bounce around when business risks appear stable (p.192)."
[99] See NERA Economic Consulting *The Fama-French Three Factor Model: A report for the Energy Networks Association,* October 2013, Sub-section 5.2 for discussion of the stability of the time series of SMB and HML values

from regression analysis are also highly unstable over time and across samples of firms in the same industry.[100]

A notable omission from this comment was any reference to the book-to-market factor, which on average is significantly greater than zero in historical data, and has persisted over time and across markets. The AER's comment on statistical significance is also misleading because, as mentioned above, the variation over time in the size and book-to-market factors is no different from the variation over time in historical equity market returns relative to government bond yields. In other words, there is as much statistical uncertainty associated with the measurement of the market risk premium using historical data, as there is over the measurement of the size and book-to-market factors using historical data. Further, the contribution of the size factor to the cost of equity estimate by the ENA was small, in comparison to the material contribution of the book-to-market factor. Yet the AER elected to make no comment whatsoever on the magnitude or statistical significance of the book-to-market factor.

Finally, and most importantly, the book-to-market factor has been, on average, over time and across markets persistently positive. It is an empirical fact that stocks with positive exposure to this factor have earned higher returns than stocks with negative exposure to this factor, even after controlling for systematic risk exposure.[101] This empirical fact could result from the *HML* factor being a proxy for a priced risk factor or a statistical anomaly. The AER position on whether the book-to-market factor represents a priced risk factor can only be sustained if it believes that the book-to-market effect is a statistical anomaly, and therefore unlikely to be repeated in the future, which would run contrary to the empirical evidence on its persistence over time and across markets.

The ENA submits that, if the AER determines that the Sharpe-Lintner CAPM must be used as the central model, the Fama-French evidence (and all evidence relevant to beta) should be used to determine the beta estimate that results in the allowed return on equity that best meets the allowed rate of return objective. The final guideline should explain what information was used to estimate beta, how it was used, and set out reasons explaining the relative weight (or "importance") assigned to each piece of information.

3.7. Dividend discount model

Key position 15

The AER should widen the use made of the dividend discount model and implement a DDM methodology which promotes stable estimates.

In the draft guideline the AER stated it intended to place reliance on dividend discount model estimates in forming a view on the market risk premium.[102] However, it ruled out using dividend discount model estimates to inform its view on the required return on equity for a benchmark energy

for Australia and the United States; and NERA Economic Consulting *The market, size and value premiums: A report for the Energy Networks Association*, June 2013, Sub-section 5.1 for discussion of the stability of the time series of market risk premium estimates from historical data.

[100] See Gray, S., J. Hall, N. Diamond, R. Brooks, 2013. "Assessing the reliability of regression-based estimates of risk," June, Sub-section 5.1 for discussion on the stability of beta estimates.

[101] NERA Economic Consulting *Review of cost of equity models: A report for the Energy Networks Association*, June 2013, Section 4, p.20–26

[102] AER *Explanatory statement - Draft rate of return guideline*, p.212–214

network.[103] The ENA submits that it is possible to use the dividend discount model to inform estimates of the required return on equity for the market and for the benchmark energy network.

In addition, the ENA submits that the estimation processes adopted by the AER for implementing the dividend discount model will lead to estimates of the required return on equity that will be more unstable over time and exhibit more dispersion across firms, than those compiled using more appropriate techniques. This instability can be addressed by the AER re-considering the evidence before it in the manner set out below.

The ENA provided the AER with a detailed report which summarised dividend discount model estimates for all Australian-listed firms, over all time periods, which were available for analysis.[104] This report was dismissed by the AER as being "excessively complex (p.220)." Instead, the AER chose to implement a version of the dividend discount model that it considered to represent an appropriate balance between its desire for transparency and simplicity versus a constant-growth version that is "excessively simplistic." To put this analysis in context, the *only* difference between a constant growth version of the dividend discount model and the version of the dividend discount model put forward by the AER is that the AER imposes an assumption that constant growth is achieved in forecast year three, rather than forecast year one. So according to the AER's rationale, the inclusion of one additional year of dividend forecasts overcomes the limitations of something that is "excessively simple" to something that strikes just the right balance.

The fundamental difference between the approach of the AER and the approach recommended by the ENA is in relation to the estimation of long-term growth. In performing its analysis the AER imposes an assumption about long-term growth, with that assumption being made entirely independent of share prices, dividend expectations and earnings expectations. In short, the AER inputs an assumption about growth, and the output is an estimate of the cost of equity. In contrast, the approach put forward by the ENA allows the estimate of long-term growth and the cost of equity to be estimated simultaneously, with both being impacted by share prices, earnings forecasts and dividend forecasts.

The reason the AER may characterise this approach as complex is because of a series of techniques that were implemented to mitigate estimation error. A straightforward analysis of the AER's results in comparison to those submitted by the ENA suggests that these techniques achieved this objective. The market cost of equity estimates compiled by the AER are more volatile over time than those compiled by the ENA. And in relation to the sub-sample of energy network businesses, the AER characterises its own estimates as so high as to be implausible.[105]

The reason the AER's estimates for the market are more volatile than the estimates compiled by SFG Consulting, and the reason the AER generates much higher estimates for network businesses, is because the AER estimation technique embeds a set of choices which directly contributes to this outcome. In the estimation techniques that underpin the estimates submitted by the ENA, there was an important reason for each choice made in compiling the estimates. The report submitted to the AER detailed each of the methodological choices made in compiling the final estimates.[106] This gives the appearance that the submitted approach was, according to the AER, too complex.

This is not the case. The technique used to compile the dividend discount model estimates is not unreasonably complex, and actually leads to cost of equity estimates that are useful in decision-

[103] AER *Explanatory statement - Draft rate of return guideline*, p.222–225
[104] SFG Consulting *Dividend discount model estimates of the cost of equity*, June 2013, Sub-section 4.1, p.17
[105] AER *Explanatory statement - Draft rate of return guideline*, p.224–225
[106] SFG Consulting *Dividend discount model estimates of the cost of equity,* June 2013, Sections 2 – 3, p.2–26 and Appendices 1 and 2 (p.33–40).

making. In contrast, the approach of the AER means that, in relation to the market cost of equity, this will be almost perfectly correlated with the dividend yield in forecast year two, which the AER has stated should only provide a directional indication of the cost of equity. Using the AER's technique, on average, the market cost of equity will be understated during periods of low dividend yields (when growth expectations will, on average, be high) and the market cost of equity will be overstated during periods of high dividend yields (when growth expectations will, on average, be low).

If the AER has a genuine interest in using the dividend discount model to estimate the cost of equity it cannot simply use a constant estimate of growth in its equation, estimated independently of market conditions, and expect it to be achieved by forecast year three.[107] Further, if the AER has a genuine interest in using the dividend discount model to estimate the cost of equity for a listed energy network, it should acknowledge that its estimates for listed energy networks may have been counter-intuitive *because* of a weakness in its estimation technique, and that this technique could be refined with the objective of improving the reliability of the estimates.

To address the AER's concerns over the complexity of the ENA approach, the ENA has provided additional supporting material.[108] In this report there is a breakdown of each methodological choice adopted in the ENA analysis and a comparison of the corresponding methodological choice adopted by the AER. The report explains how the AER could also decide to make each of these choices, and implement them in a relatively straightforward manner.

The four key estimation techniques and assumptions which differ between the AER and ENA approaches are identified separately, to demonstrate that each choice of estimation technique and assumption can be made independently of all the others. These estimation techniques and assumptions relate to:

1. the length of the explicit forecast period and transition to long-term growth– two years (AER) versus ten years (SFG);

2. the share price – market price (AER) versus price target (SFG);

3. growth – constant estimate derived from historical GDP growth less 1 per cent (AER) less an estimate determined with reference to share price, earnings and dividends (SFG); and

4. timing of recording of share price and earnings and dividend forecasts – consensus forecasts matched with price each day (AER) versus matching of share price and forecasts according to the day on which the forecasts are made (SFG).

So it is not a matter of the AER using its current dividend discount model technique versus the approach of the ENA. The AER can make any number of changes to its estimation approach which the ENA submits will materially improve the reliability of its cost of equity estimates from the dividend discount model. If the AER makes these choices, the cost of equity estimates will exhibit less dispersion across firms at each point in time, and less dispersion over time for the same firms.

[107] As discussed in Section 3 of the SFG Consulting report *Dividend discount model estimates of the cost of equity* any implementation of the dividend discount model necessarily involves an assumption about dividends over all forecast years. The current assumption made by the AER is that the best approximation of dividend forecasts is achieved by assuming constant growth from year three onwards, and this assumption is made entirely independent of share price, earnings forecasts and dividend forecasts.

[108] SFG Consulting *Reconciliation of dividend discount model estimates with those compiled by the AER,* October 2013.

The AER has identified stability of the cost of equity estimate as important for investors and consumers. It is worth reiterating that the cost of equity estimates submitted by the ENA were more stable than those compiled by the AER, and more stable than the AER's implementation of the CAPM.[109] If stability of cost of equity estimates is important to the AER, then it should implement techniques that achieve this objective.

Further, the ENA submits that if the AER continues with its approach on the basis of its simplicity and transparency, it simply provides the AER with a mechanism to adopt estimates for the market cost of equity which it believes are correct according to its subjective opinion. The AER's position is that the best estimate of growth for listed firms is 1 per cent below an estimate of overall economic growth.[110] The specific figure that is used by the AER in analysis is 4.6 per cent . Yet this ultimately leads to an assumption that long-term price-earnings ratios will be lower than what we observe even for the firms with the longest trading history on the Australian Securities Exchange. So the AER process will be predicated on an assumption that the long-term price-earnings ratios will be lower than what we have previously observed. Put another way, the AER's approach for estimating long-term growth is based upon what it believes the market *should* assume for long-term growth, without any reference to market prices that reflect what the market *actually* assumes for long-term growth.

The ENA has already made the point that the market's expectations for growth in dividends cannot be estimated by such an approach, which assumes that share price changes are almost entirely due to changes in the cost of capital, rather than expectations for growth. For the AER to place zero weight on the ENA estimates, which directly address this challenge and which contribute to the allowed rate of return objective, would be inconsistent with the Rules.

3.8. Example of implementation under the foundation model approach

In the current response to the draft guideline the ENA maintains its position that the best and most transparent way to reach a final estimate of the cost of equity is to apply weights to estimates compiled from different models, data and estimation techniques according to the reliability of the various pieces of evidence.

If, however, the AER determines that all evidence must be filtered through the Sharpe-Lintner CAPM, the ENA proposes that this should be done in a simpler and more transparent manner, as set out in Section 3.1.5 above. In particular, the ENA submits that all of the relevant evidence should first be set out. Then all of the evidence that is relevant to beta should be used to produce an estimate of beta, and all of the evidence that is relevant to MRP should be used to produce an estimate of MRP. In both cases, different pieces of evidence can receive different weights depending on the reliability and precision of the evidence, or whatever other criteria the AER determines to be relevant. The result is a single value for the allowed return on equity.

In this section, the ENA demonstrates how this approach could be implemented in relation to the beta parameter. That is, the goal of this section is to illustrate how all of the relevant evidence that has been submitted so far could be used to inform the estimate of beta that is most likely to lead to an allowed return on equity that meets the allowed rate of return objective. This is to be compared with the AER's proposed approach in which a subset of the evidence will be used to determine a

[109] SFG Consulting *Reconciliation of dividend discount model estimates with those compiled by the AER*, October 2013, Sections 7 and 8; SFG Consulting *Dividend discount model estimates of the cost of equity*, June 2013, Sub-section 4.2.1.
[110] AER *Explanatory statement - Draft rate of return guideline*, p.221

range for beta and the remainder of the evidence will either be rejected (to the extent that it suggests an estimate outside that range) or used to select a final allowed return on equity point estimate.

In particular, if all evidence is to be filtered through the lens of the Sharpe-Lintner CAPM, the relevant goal is to determine the estimate of beta that, when inserted into the CAPM, is most likely to produce an estimate of the required return on equity that is consistent with the allowed rate or return objective. The relevant goal is *not* to estimate the historical covariance between stock and market returns for a particular small sample of companies. With this framework and objective in mind, four approaches for determining appropriate beta estimates are set out below.

First, the ENA has previously shown that regression analysis of stock returns on market returns for comparable listed firms in Australia and the United States supports a point estimate of 0.82.[111] A reasonable range around this point estimate would be quite wide because the standard error of the regression estimate is relatively high and the ENA has also submitted evidence of the instability of beta estimates across time, across firms within the sample, and even across which days of the month are used to compute the return series.

Second, the AER has acknowledged that there are concerns with the application of the Sharpe-Lintner CAPM on the basis of its empirical performance and has concluded that:

> *Theoretical and empirical evidence, however, supports using the Black CAPM, to some extent, in the process for estimating the return on equity. As such, we propose to use the Black CAPM to inform the selection of the equity beta.*[112]

The AER's concern over the empirical performance of the CAPM, populated with regression-based estimates of beta, was borne out by evidence presented by the ENA that there was no relationship between regression-based beta estimates and average stock returns.[113] So there is the very real possibility that beta estimates from regressions of stock returns on market returns convey no information at all which allows us to distinguish the cost of equity for the benchmark from the cost of equity for the market. In other words a beta estimate of one is likely to produce an estimate of the required return on equity at least as reliable as that produced by a regression-based estimate of beta.

Third, the ENA put forward an estimate from dividend discount model analysis, formed on the basis that listed energy networks had 96 per cent of the risk premium of the market.[114] The dividend discount model analysis does not make any assumptions about exactly which risks are priced and how they are priced by the market and is therefore less restrictive than other models. However, if all evidence is to be filtered through the lens of the Sharpe-Lintner CAPM, the implication from the dividend discount model analysis is that a beta estimate of 0.96 should be used.

Fourth, the ENA compiled cost of equity estimates under the Fama-French Model. These estimates showed that the risk premium for the benchmark firm was 91 per cent of that for the average firm (with a market beta of 1 and other factor sensitivities of 0). Again, if all evidence is to be filtered through the lens of the Sharpe-Lintner CAPM, this implies that an equity beta of 0.91 is likely to produce a reasonable estimate of the required return on equity for the benchmark firm. This estimate of beta reflects the evidence that the Sharpe-Lintner CAPM, with simple regression-based estimates

[111] SFG Consulting *Regression-based estimates of risk parameters for the benchmark firm*, June 2013, Section 6, p.16
[112] AER *Explanatory statement - Draft rate of return guideline*, p.62
[113] NERA Economic Consulting *Estimates of the zero-beta premium*, June 2013, Section 5, Table 5.1 (p.14) and Figure 5.1 (p.15).
[114] SFG Consulting *Dividend discount model estimates of the cost of equity*, June 2013, Sub-section 4.4, p.27–28

of beta, tends to under-estimate the returns required on stocks with low beta estimates, high book-to-market ratio and small market capitalisation.[115] Computing the beta estimate on the basis of total risk premium is simply correcting for mis-measurement in the beta estimate from regression analysis.

This leaves us with four point estimates for equity beta:

1. 0.82 from regression analysis of stock returns on market returns;

2. 1.00 from analysis which suggests that regression-based estimates of beta could well provide no relevant information at all about systematic risk;

3. 0.96 from dividend discount model analysis; and

4. 0.91 from measurement of equity beta which accounts for exposure to the Fama-French factors.[116]

The ENA does not propose to enter into a debate at this stage about the precise weightings to be applied to estimates of beta from different data and estimation techniques,[117] and has consistently stated that weights can be altered over time according to new information about relevance and reliability of different data and estimation techniques. The important point is that the ENA fails to see how a conclusion can be reached in a transparent manner without specifying the weights that have been applied to each piece of evidence and the reasons why those weights have been applied.

3.9. Other evidence

Key position 16

The AER's position in the use of other evidence to inform the cost of equity is ambiguous because understanding how this information will be used, and the consideration given to the information, can only be fully understood in the context of specific applications. The ENA disagrees with the omission of financeability and credit metrics as relevant information (although the AER has stated this information might be useful) and seeks clarification regarding the AER's view on how implied volatility will impact its estimate of the market risk premium.

3.9.1. AER's view on relevance can only be determined in the context of specific applications

In the explanatory statement, the AER concludes the following alternative sources of information will be used in reaching a final decision on estimating the cost of equity.[118] There are four sources of

[116] 0.91 is the estimate under prevailing market conditions and 0.95 is the estimate under long-term average market conditions.
[117] Particularly given the fact that the AER has not as of the time of finalising this submission provided its beta report.
[118] AER *Explanatory statement - Draft rate of return guideline*, p.196–206

information classified as providing a range for the cost of equity (Wright approach[119], broker return on equity estimates, other regulators' return on equity estimates and takeover and valuation reports), two sources of information classified as providing directional indication of the return on equity (credit spreads and dividend yields) and one source of information classified as providing a relative comparison (comparison with return on debt).

There are also four sources of information that the AER has determined will not be used to estimate the cost on equity.[120] The Fama-French Model will not be used in any form and is discussed earlier. The other three sources of information that will not be used to estimate the cost of equity are brokers' and other regulators' estimates of the overall rate of return (as opposed to the cost of equity, which will be taken into account), regulated asset base multiples of trading and acquisition prices and financeability and credit metrics.

The ENA has a general observation on the use of other evidence in setting the cost of equity, followed by some specific observations. The general comment is that there is vague justification for the selection of individual types of evidence to be included or excluded in considering the cost of equity, and how that information will be taken into account. The reason for this ambiguity is that, without reaching conclusions on parameter estimates or the final cost of equity, it is challenging to illustrate how evidence from different sources has an impact on decision-making.

All of the above sources of information are relevant to estimating the cost of equity, but just how it is taken into account, and the consideration given to the information, should depend upon its relevance and reliability. For this reason, the ENA has the following specific observation.

3.9.2. Implied volatility clarification

The AER has stated that implied volatility of market returns will be used to inform its estimate of the market risk premium.[121] The AER also notes that it has previously identified limitations to this evidence but that implied volatility analysis will reflect changing market conditions.[122]

The AER's discussion of implied volatility is one example of the ambiguity that results from discussing the relevance of particular sources of information in the absence of reaching any specific conclusions. All that can be concluded from the AER's statement on implied volatility is that, all else equal, if implied volatility increases, the estimate of the market risk premium could be higher.

If the AER were to complete the process of estimating the weighted average cost of capital, participants would be in a better position to understand how much relevance implied volatility (and every other piece of information) has in the decision-making process. Participants would be informed about whether the AER's concerns over the limitations of this metric outweighed its potential use as an indicator of the market risk premium.

[119] What the AER terms "the Wright approach" is merely forming an estimate of the market return as an historical average of market returns, rather than adding an historical average of excess market returns relative to the current risk-free rate.
[120] AER *Explanatory statement - Draft rate of return guideline*, p.207–208
[121] AER *Explanatory statement - Draft rate of return guideline*, Sub-section 5.3.2 (p.62), Sub-section G.2.1 (p.212), Sub-section G.2.2 (p.213)
[122] AER *Explanatory statement - Draft rate of return guideline*, p.214

4. Value of imputation tax credits (gamma)

Key position 17

The AER's 'equity ownership' conceptual framework does not provide any relevant empirical evidence to the key question under the rules of the value of imputation credits, which is a market-based concept. The best updated relevant evidence continues to support a value of 0.25.

The ENA is conscious that the AER has requested that every effort is made to limit the volume of material submitted to that which is necessary, and the manner in which the material is submitted is easily digested by the AER itself and other interested parties. In relation to gamma, this poses a significant challenge because the draft guideline and explanatory statement proposes to adopt a "new" conceptual framework for establishing gamma as follows:

> *We propose that the value of imputation credits within the building block revenue framework is an estimate of the expected proportion of company tax which is returned to the representative investor through utilisation of imputation credits.*[123]

This is also referred to in the decision as the "cash flow interpretation of the value of imputation credits"[124] and the "equity ownership approach".[125]

There was no explicit forewarning in the Issues Paper that the AER might propose what it asserts is a new 'conceptual framework' for gamma nor in consultation with stakeholders prior to the release of the explanatory statement. The explanatory statement also raises a substantial number of new considerations and concerns with valuation studies that have not previously been the subject of consultation and scrutiny.

In fairly responding to the explanatory statement, it has been necessary to provide detailed, and at times new, material in relation to gamma. Nevertheless, every effort has been made to facilitate the reader's task by setting the key points out in this chapter and substantiating all the key points in a detailed appendix. The two parts of the submission must be read in conjunction with each other and with the expert statements attached because the detailed work substantiating the points is intentionally annexed rather than restated in the body of the submission.

Section 4.1 sets out the key flaws with the way that the explanatory statement reaches a figure for gamma. These flaws range from the misconception of gamma as a measure of the redemption of franking credits to the use of flawed taxation statistics and continued reliance on dated analysis that has since been found to be flawed.

Section 4.2 sets out the conceptual framework that should apply when establishing a figure for gamma.

Section 4.3 addresses the question of the valuation of imputation credits. The explanatory statement raises a number of criticisms concerning the ENA's approach to establishing the value for gamma using dividend drop-off studies. These criticisms are thoroughly investigated and addressed in the appendix to this submission and the results are summarised. The explanatory statement also

[123] AER *Explanatory statement - Draft rate of return guideline*, p.118
[124] AER *Explanatory statement - Draft rate of return guideline*, p.123
[125] AER *Explanatory statement - Draft rate of return guideline*, p.126

suggests that there are other valuation methods that could (and perhaps should) be used in addition to or instead of dividend drop-off studies. Again the appendix explores each of these alternative methodologies in detail and reports the results.

Section 4.4 sets out the ENA's submissions as to how the final guideline should be framed.

4.1. Flaws in the way the explanatory statement establishes a figure for gamma

There are significant flaws with the explanatory statement's approach to establishing a figure for gamma.

First, the suggestion in the explanatory statement that the proposed conceptual framework is new is not correct. In fact the cash flow concept has been explicitly referred to in relation to gamma since the beginning of modern energy network regulation in Australia but in every significant legislative and adjudicative decision, the decision maker has acknowledged that cash flows cannot themselves be adopted as the gamma parameter but instead the *value* to investors of the cash flows must be estimated. Indeed the currently proposed cash flow concept is in substance the same concept that the AER proposed in the 2009 WACC review and which was explicitly rejected by the Tribunal three years later. [126]

Second, the concept proposed is counter to the explicit wording of the current rules and does not take account of the extrinsic materials and historical material that demonstrates conclusively that a market valuation rather than a cash flow concept must be adopted. The appropriate mechanism to advance a new conceptual framework for gamma would be a rule change process and the time to have done so would have been the AEMC's recent process that adopted the current Rules.

Third, even if the Rules did not bind the AER in this respect (or if the rules themselves were reconsidered) the AER's 'new' conceptual framework would be inappropriate because the proposed conceptual framework is inconsistent with the economic role played by gamma in establishing the over-all fair and efficient return which can only be achieved through a market valuation and not by tracing of cash flows. The fundamental economic framework in relation to dividend imputation was set out by Officer (1994)[127] who states (emphasis added) that:

> *γ is the **value** of personal tax credits.*[128]

Further, adopting a cash flow concept would be inconsistent with the method for establishing all the other WACC parameters which are each established as a market based valuation.

Indeed the explanatory statement itself struggles to reconcile the economic theory and the statutory language with the cash flow concept in that it both identifies the concept of "valuation" as being what is required and as the reason why the Tribunal has erred in establishing a figure for gamma.

[126] *Australian Competition Tribunal, Application by Energex Limited (Gamma)(No 5) [2011] ACompT 9, May 2011*
[127] Officer, R. R., 1994. "The cost of capital of a company under an imputation system," Accounting and Finance, 34, 1–17.
[128] Officer (1994), p.1

Key position 18

The ENA submits that the conceptual framework within which gamma must be set remains as it has since the beginning of the NEM. It is one that seeks a *valuation* for imputation credits (rather than a cash flow tracking analysis of the utilisation of the credits) and this valuation must be established on a basis that is consistent with the other WACC parameters and with the allowed rate of return objective.

The AER should not substitute an *average cash flow tracking* interpretation for the accepted *valuation* interpretation of gamma.

The above discussion explains why the concept of a cash flow model is flawed. The following flaws apply equally under the new conceptual framework proposed and also if an attempt is made to use taxation statistics to reach a valuation for gamma.

Fourth, the explanatory statement purports to apply a 'representative investor' framework in applying its cash flow concept. Properly applying a representative investor framework requires that all asset holders must invest all their wealth within the market under examination. This is inherently inconsistent with the market definition and framework adopted by the AER. In the framework that the AER purports to use, there is no market clearing condition in which case no representative investor can be determined and the CAPM pricing relation cannot be obtained. Alternatively, under any version of the CAPM, investors maximize utility over their portfolios, but this is not the case under the AER's framework. That is, the AER framework is inconsistent with a representative investor equilibrium and inconsistent with the basis for the CAPM.

Fifth, the explanatory statement relies on selected taxation statistics and on two studies, one co-authored by Hathaway in 2004 and the other by Handley and Maheswaran in 2008. On the strength of a new report attached from Hathaway, the AER's recurring approach of relying on taxation statistics to establish the gamma, whether as a measure of cash flow or value, must now cease. It would be dangerous and irresponsible to continue to rely on these statistics and reports in light of the evidence now presented by Hathaway.

The report annexed from Hathaway:

- Demonstrates that there is an $87.5 billion 'hole' or internal inconsistency in taxation statistics. This is not a criticism of the taxation statistics themselves which are collected, collated or published for taxation revenue purposes and not for the purposes of measuring actual returns nor setting regulatory rates of return. The point is that they are simply unreliable and un-usable for estimating the net amounts shareholders ultimately receive for imputation credits.

- Now states, referring to his 2004 report:

  "I would caution anyone, including the AER, against relying on those parts of my earlier reports which focused on ATO statistics. The data was then not as clear as it is today. I had to rely on separate analyses of ATO tax data and the ATO financial data. As I am now aware with the new data, there is an extremely large discrepancy between these two subsets of data. The missing link was the data on the flows of credits between companies which is now visible after the changes of 1 July 2002 [statistics for which are published two years in arrears]. I would recommend that the AER do not rely on that earlier report."

- Articulates a fundamental flaw in Handley and Maheswaran's work that was neither addressed in Handley's detailed response to criticisms of that work nor acknowledged by the AER when it

was first raised. Handley and Maheswaran's work relies on dividend withholding tax data to estimate franked dividend income of foreign investors. That approach is simply wrong and the Handley and Maheswaran paper must now be disregarded because franked dividends are free of withholding tax because the corporate tax paid on a franked dividend already exceeds the amount that would otherwise be payable in withholding tax.

Previously, the Tribunal has accepted that taxation statistics could form an upper bound on the value of theta. If taxation statistics were reliable, this would be a reasonable approach to take because it is logical that the value of an imputation credit is most unlikely ever to exceed its face value (while on the other hand there are many reasons why the market valuation could be less than the full face value).

If taxation statistics are used as an upper bound (or even for valuation purposes which for the reasons set out above would be the wrong approach), there are a number of adjustments that would need to be made to the published taxation statistics as follows:

- an adjustment for the 45 day holding rule;
- recognition of the costs of the time value of money in waiting for the credit to be redeemed;
- a correction for Hathaway's findings that the Handley and Maheswaran (2008) significantly under-estimates the proportion of foreign investors; and
- a re-balancing to reflect that the aggregate statistics include many small and medium non-listed companies that tend to have much higher utilisation rates than large, usually listed entities that are the comparable firms used by the AER as representative of the benchmark firm.

However, the above analysis indicates that taxation statistics are inherently very unreliable and this suggests they may not even be suitable as an upper bound any more.

4.2. Why valuation studies using market data are the only way to establish the gamma figure

It is no accident that gamma is included in the part of the Rules that concerns establishing a weighted average cost of capital and that the rate of return guideline addresses gamma together with the return on equity and the return on debt. To the extent that imputation credits provide equity holders with value, it reduces the returns that equity holders require in the form of dividends and capital appreciation of their shares.

The mechanism by which imputation credits have potential value to some investors is that the credits reduce the amount of personal tax that those investors would otherwise have to pay. The relevant consideration when establishing a figure for gamma is a comparison of:

a. The return on equity that the market would require from the benchmark firm *without* imputation; against

b. The return on equity that the market would require from the benchmark firm *with* imputation.

Cash flows are an indirect input into a market valuation but they are too remote from the final clearing price to provide any real indication of value. By analogy, while cash is paid out for the bricks, wood and labour that goes into constructing a house, undertaking an aggregate cash flow analysis (even with an adjustment for the time value of money) is unlikely to deliver a valuation that is even approximate to the actual valuation. On the other hand, it is possible to directly observe market trading and to discern a valuation from that trading.

4.3. Market values for gamma

In its 2009 WACC Review Final Decision, the AER concluded that:

> *The AER agrees that the clear evidence is that the majority of market practitioners do not make any adjustment for the value of imputation credits.*[129]

The AER went on to dismiss that evidence from further consideration on the basis that practitioners may be using a "classical" approach that differs from the regulatory approach and which enables practitioners to estimate the ex-imputation required return on equity in a way that does not require an estimate of gamma.

The ENA submits that if there is a classical approach that can be used to estimate the ex-imputation required return on equity without requiring an estimate of gamma, the estimate from that approach should at least be compared with the corresponding estimate from the regulatory approach. The AER could not properly conclude that its estimate of the ex-imputation required return on equity was commensurate with the prevailing conditions in the market for equity funds without even comparing its estimate with the corresponding estimate from the market approach.

The explanatory statement makes some further observations concerning "market practice". It notes that there are investment funds that specifically target shares with franked dividends and it observes that some investors have previously engaged in a practice known as "dividend washing".

From these observations the explanatory statement concludes that some investors attach a significant value to imputation credits. However, the explanatory statement does not explain how this qualitative evidence would (or could) be used to assist in the estimation of gamma. The attached Appendix B addresses the reasons why this information can have no substantive bearing on the estimate of gamma, but in general the ENA submits that anecdotal material and qualitative observations are not substitutes for an analysis of market data when estimating any WACC parameter.

In its submissions on to the AER prior to the draft guideline and the explanatory statement, the ENA proposed to use a state of the art dividend drop off study for the purpose of valuing gamma. The explanatory statement criticises the notion of using a single drop off study but it should be noted that the dividend drop off study uses techniques and data that have culminated from an extensive lineage of studies over a number of years by different authors, a number of which are cited in the explanatory statement.

However, a number of the studies listed in the explanatory statement must be disregarded because they predate important taxation system changes. In its final decision on the 2009 WACC Review the AER stated in relation to these studies:

[129] AER (2009), p. 407.

> *The AER maintains its view that there is compelling evidence to reject pre-2000 data from consideration in estimating a forward-looking theta. Accordingly, for the purposes of this final decision the AER has estimated theta based on post-2000 data only.*[130]

The majority of the dividend drop-off studies that are set out in Table K.12 of the explanatory statement use pre-2000 data and are therefore must be excluded from consideration. The only studies that use post-2000 data are the following:

a) Beggs and Skeels (2006) (but only the results for the post-2000 sub-period). This study should be disregarded. The Australian Competition Tribunal considered the reliability of the Beggs and Skeels estimate and concluded that the AER was wrong to have relied on it.

b) SFG (2011) which was accepted by the Tribunal.

c) SFG (2013) which follows the methodology accepted by the Tribunal but updates it for the current guideline setting process.

d) ERA (2013). Consistent with almost all other dividend drop off studies, the ERA study presents results using the standard approach of assuming that, but for the dividend, the stock price of each stock on the day that it first trades ex-dividend would have followed the movement in the broad market. That is, if the broad market index increases by 2 per cent over the ex-dividend day, it is assumed that, but for the dividend, the particular stock would also have increased by 2 per cent . When applying the standard assumption, the ERA study reports that the average estimate of theta is 0.34. The estimate using robust regression and Model Specification 4 (which the ERA considers to be the most reliable estimate) is 0.33.[131] The ERA study also reports results without applying the standard assumption and these additional results should be disregarded.

In summary, only relevant dividend drop off studies (the two SFG studies and the ERA study when applying the standard assumption) deliver results for theta slightly under 0.35.

The explanatory statement raises a number of potential issues with dividend drop off studies:

a) The explanatory statement notes that there is abnormally high trading volumes that tend to be observed around ex-dividend events and it speculates that this may render the dividend drop off studies unreliable.[132] Appendix B to this submission examines this issue thoroughly and concludes that to the extent that such trade could affect the value of theta, it can only have the effect of giving the value a small uplift. In other words, if there is an effect on price from abnormally high trading, the value for theta derived from dividend drop off studies should be adjusted downwards.

b) The explanatory statement considers that there is a problem with allocating the value between dividends and imputation credits but a close examination of all the dividend drop off studies reveals a remarkably uniform combined value very close to $1 for $1.

[130] AER (2009), p. xix and p. 430.
[131] Vo, Gellard and Mero (2013), Table 5
[132] AER *Explanatory statement - Draft rate of return guideline*, p.242-243

c) The explanatory statement raises a number of statistical issues with the models used for dividend drop off studies. All these technical issues are explored in Appendix B and none of them are found to be present.

The explanatory statement points out that there are other methods of obtaining a market valuation for gamma:

a) the comparison of simultaneous trades in ordinary shares (which entitle the holder to dividends and imputation credits) and other securities such as futures contracts (which involve no such entitlement);

b) the comparison of the ex-imputation returns (and equity values) of companies with different imputation credit yields; and

c) dividend drop-off analyses using hybrid securities.

The ENA has procured more up to date and more thorough studies of each of the first two of these types of valuation techniques. SFG has prepared an analysis using futures trading and NERA has undertaken a comparison of ex-imputation stock returns for companies with different imputation credit yields.

The new SFG and NERA studies both indicate that the value of theta is below the dividend drop-off estimate of 0.35. The former indicates that the value of theta should is approximately 0.12 and the latter that theta is of close to zero value. These findings are consistent with the analysis referred to above that shows that the effect of abnormal trading volumes on the value of theta derived from dividend drop off studies may be to inflate its value.

Although either of the studies could provide a basis for a lower valuation for theta than 0.35, the ENA is conscious that these studies have only emerged after the draft guideline has been released and studies using these methodologies have not previously been the subject of regulatory scrutiny. Therefore, while reserving the position that these studies could be presented as the primary basis for establishing a value for theta from the commencement of future regulatory decision making processes, for the purposes of the 2013 guideline process, the ENA would accept a value of theta of 0.35 derived from the dividend drop off studies.

4.4. Summary of position on value of imputation credits

The new Rules confirm that theta must be estimated as the value of imputation credits, rather than via a cash flow tracking analysis of the average utilization of the credits. This is the proper economic basis for theta and the basis on which theta has always been estimated, so no new framework is required or appropriate. The AER should not substitute an *average cash flow tracking* interpretation for the accepted *valuation* interpretation of gamma.

In relation to the representative investor equilibrium and the “equity ownership” approach:

a. the entire suite of published evidence that uses traded market prices to estimate the value of theta should *not* be rejected, and theta should *not* be set equal to an estimate of the redemption rate – as the draft guideline proposes;

b. the redemption rate (whether estimated directly using tax statistics or indirectly via an estimate of equity ownership and assumptions about investor redemptions) does not

provide an estimate of the value of distributed imputation credits. At best, the redemption rate provides an upper bound for the value of theta; and

c. the framework developed in the explanatory statement is *not* a representative investor equilibrium framework – there is no market clearing condition which means that no equilibrium can be derived and no representative investor can be derived.

ATO tax statistic data does not provide a reliable estimate of redemption rates.

A suite of approaches are available to estimate the value of distributed tax credits or theta. These approaches have been published in peer-reviewed academic journals, have a sound conceptual and empirical basis, and have formed the basis of every regulatory estimate of gamma to date. These approaches, being based on traded market prices, are also consistent with the way every other WACC parameter is estimated. By contrast, not even the authors of redemption rate studies propose that redemption rates can be used to estimate the value of distributed tax credits.

The weight of evidence suggests that market professionals make no adjustment to their cost of capital estimates in relation to imputation credits. If there is a "conventional" or "classical" approach that can be used to estimate the ex-imputation required return on equity without requiring an estimate of gamma, the estimate from that approach should at least be compared with the corresponding estimate from the regulatory approach.

In relation to dividend drop-off analysis:

a. The best available dividend drop-off estimate of theta is 0.35;

b. To the extent that trading around ex-dividend events has an impact, it is likely to *increase* the estimate of theta;

c. There is consistent evidence that the combined value of a one dollar dividend and the associated imputation credit is approximately one dollar. The regulatory values should be consistent with this evidence, however the estimates proposed in the explanatory statement imply a combined value of $1.30; and

d. Dividend drop-off analysis produces estimates that are stable across model specifications and empirical methods and which have standard errors that are low relative to other WACC parameters.

In relation to other methods to estimate the value of theta:

a. The AER should clarify whether it intends to place any weight on results that are based on pre-2000 data;

b. The best available estimate of theta implied by the simultaneous prices of ordinary shares and futures contracts is 0.12; and

c. A growing body of franking credit yield studies shows that returns are independent of the imputation credit yield. If imputation credits were materially valued, firms with high imputation credit yields would require lower returns (from dividends and capital gains) – but this is not the case.

5. Return on debt and gearing

5.1. Trailing average approach

The ENA agrees that the trailing average approach to estimating the cost of debt should be set out in the guideline. The majority of businesses support the trailing average approach where the term reflects actual business practices (i.e. 10 year term to maturity) and annual updating is included. The trailing average approach performs well in terms of minimizing the potential difference between the return on debt allowance and the expected required return on debt, as required under the *National Electricity Rules*[133]. It also better reflects the actual and efficient financing practices of the majority of businesses and will result in lower volatility in both revenue and prices, compared with the current approach.

The ENA also recognizes the AER's preference that the guideline should specify a single approach to estimating the return on debt. However, as the ENA has previously submitted[134], some businesses consider that the hybrid or current approaches better reflect efficient debt management practices in some cases. While the AER has chosen to include only the trailing average approach in the draft guideline, as the guideline is not binding, businesses have the opportunity to present alternative approaches as part of their revenue determinations.

The ENA strongly supports that annual updating of the cost of debt will be carried out as part of the trailing average approach set out in the draft guideline. Annual updating avoids storing up the effects of year on year adjustments for a single end-of-period look-back which may result in greater price shocks for customers. Similarly, if annual updating did not occur the businesses would incur a funding cost associated with the timing difference between updates to the actual cost of debt and the cost of debt allowance.

The ENA would welcome further details on how annual updating would be carried out to be provided by the AER. An opportunity to comment on the implementation of this process, for example, changes to be made to the PTRM, would also be welcome.

Key position 19

The sector supports the adoption of the 10 year trailing average approach provided it is applied with a process of annual updating.

5.2. Bloomberg curve fitting

The ENA supports the AER's decision to continue to rely on a curve fitting process to determine the benchmark cost of debt. The ENA also supports the AER's adoption of the Bloomberg BBB fair value curve as the mechanism for giving effect to the curve fitting process. However, the ENA continues to believe that the curve fitting process outlined by CEG[135] remains a useful cross-check on the proprietary methods employed by Bloomberg.

[133] NER 6.5.2(k)(1) and 6A.6.2(k)(1)
[134] ENA *Response to the AER Consultation Paper – Rate of Return Guideline*, June 2013
[135] CEG *Estimating the debt risk premium*, June 2013

5.3. Benchmark term of debt

Key position 20

The 7 year term of debt assumption would lead to a material underestimate of the cost of debt of a benchmark efficient firm, and the current 10 year term reflects the actual debt management practices of regulated infrastructure businesses.

The AER's draft guideline reduces the benchmark term of debt from 10 years to 7 years. The rationale provided for this change in the draft explanatory statement is three fold.[136]

(i) First, the AER argues that the available evidence suggests that the average term of debt is less than 10 years. In this context the draft explanatory statement introduces the concept of "the average effective term of debt" which the AER argues takes into account the 'swapping of the risk free rate'. It is argued that "the average effective term of debt" can be shorter than the average term at issuance; [137]

(ii) Second, the AER argues that adopting a 7 year benchmark term will make it easier to conform with the requirement that automatic updating of the trailing average portfolio return on debt is mechanistic. This is because the AER is proposing the use of the Bloomberg BBB fair value curve to estimate the cost of debt and this curve is currently only published up to a 7 year maturity. Consequently, adopting a benchmark term of greater than 7 years would require specification of a mechanistic way of extrapolating the Bloomberg BBB fair value curve beyond 7 years. Moreover, the AER considers that describing such a mechanistic extrapolation is not feasible; [138] and

(iii) Third, the difference in term premium between 7 and 10 years is not, on average, material.[139]

The second and third rationales sit somewhat uneasily next to the first rationale - such that it is not entirely clear how to interpret the AER's position.

One interpretation of the AER's position is that it believes that 7 years is the best estimate of the term of debt that will give rise to a cost of capital allowance that is consistent with achieving the Allowed Rate of Return Objective, namely, a cost of capital that is:

> *"commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in the provision of reference services"*

Under this interpretation it is not obvious what purpose the second and third rationales serve in generating the AER's final position – other than perhaps to placate potential critics on the grounds that nothing much turns on the adoption of a 7 year term because retaining a 10 year debt term will not lead to a materially different answer and is possibly not feasible to do in a mechanistic manner.

[136] This summary of the AER rationale follows the dot point summary on page 152 of the *Draft Explanatory statement*.
[137] AER *Explanatory statement - Draft rate of return guideline*, p.153-155
[138] See AER *Explanatory statement - Draft rate of return guideline*, p.156-157
[139] See AER *Explanatory statement - Draft rate of return guideline*, p.158

Alternatively, the AER may be expressing the view that it is less than clear what term of debt will be most consistent with achieving the Allowed Rate of Return Objective (10 years, 7 years or something in between). Under this interpretation, the AER is not arguing that a 7 years term reflects efficient financing practice. Rather, the AER is arguing that something between 7 and 10 years is the best estimate. Moreover, whatever that term is, it will not result in materially different costs/allowances than a 7 year term and, therefore, 7 years is to be preferred for practical purposes of implementation.

The ENA strongly disagrees with both of these potential interpretations of the AER's position. This submission critiques each of the rationales listed at paragraphs (i)-(iii) above.

5.3.1. Materiality of difference between 7 and 10 year term

The AER's conclusion that the difference between a 7 and 10 year term is not material is based on the following analysis:

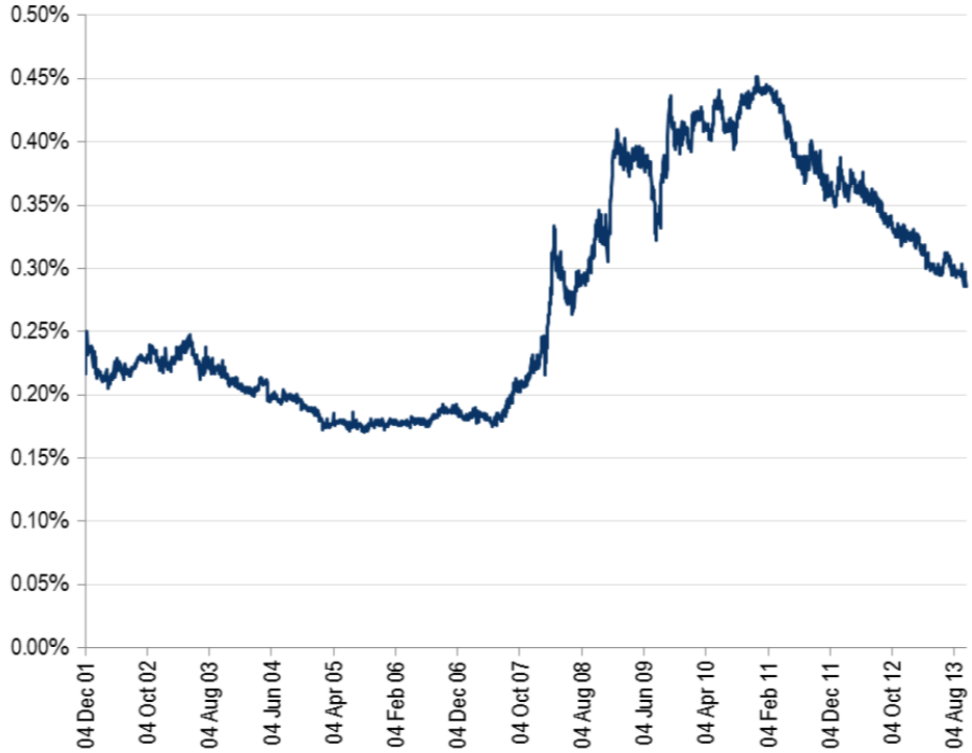
> *The AER has calculated the average difference in the yield between the 10 year and the seven year Bloomberg BBB fair value curve for all currently available data. From December 2001 to October 2007 the average difference in yield is 21 basis points.*[140] *PwC estimated a 7.6 basis points annual increment using the paired bond approach over the 20 day period ending on 16 December 2011.*[141]

The ENA does not accept that this analysis demonstrates a lack of materiality associated with adopting a 7 year term rather than a 10 year term. First, 21 basis points is not immaterial. For each $1bn of RAB ($600m of debt at 60 per cent gearing) 21 basis points represents $1.26m *per annum* (or $6m over a five year regulatory period). A 7.6bp pa premium is a 22.8bp extrapolation from 7 to 10 years (or $7m over five years on a $1bn RAB). Moreover, the 7.6bp pa estimate by PwC is for the debt risk premium (DRP) only. The increase in the cost of debt from 7 to 10 years also includes the increase in the risk free rate. As noted by CEG this has averaged 21bp since June 2010.[142] This approximately doubles the amount of underestimation associated with the PwC method.

The ENA also notes that, the AER's sample period (December 2001 to October 2007) is prior to the global financial crisis (GFC) when corporate yield curves tended to be low and flat. Since the GFC the AER's own average estimated increase in BBB cost of debt from 7 to 10 years has been substantially higher. This is well illustrated by Figure 6 of Attachment A of the QTC submission (reproduced below) which shows a steep increase in the extrapolation from late 2007 (almost precisely the end of the AER sample period "December 2001 to October 2007").

[140] Bloomberg ceased publishing its 10 year BBB fair value curve in October 2007. Hence this is the most contemporaneous actual data available.
[141] PwC, *SP AusNet, Multinet Gas, Envestra, and APA Group: Estimating the benchmark debt risk premium*, March 2012, p. v.
[142] CEG, *Mechanistic cost of debt extrapolation from 7 to 10 years*. See Table 1 (difference between 53.7bp and 32.9bp)

FIGURE 6: ESTIMATED 10-YEAR SRP MINUS BLOOMBERG 7-YEAR BBB SRP



It is also worth noting that the pattern in the above chart is entirely consistent with the pattern in AER decisions since the GFC as demonstrated in Tables 3, 4 and 5 of the Attachment A to the QTC submission.

Equally important, the AER's estimate of 21 basis points is a long run average estimate, the actual difference in any given period could be much greater – as is amply illustrated in the above figure. A firm actually issuing 10 year debt but being compensated on the basis of the cost of 7 year debt, would clearly have faced persistent and material under-compensation since October 2007. It is possible that this could exceed the materiality threshold defined in the NER of 1 per cent of an NSP's annual revenue requirement, or maximum allowed revenue for the purposes of a cost-pass through event.

It is unreasonable to argue that this risk exposure is immaterial for a firm issuing 10 year debt and being compensated on the basis of 7 year debt. Embedding unnecessary exposure to this risk into the regulatory regime going forward is clearly inconsistent with the Allowed Rate of Return Objective.

It is also inconsistent with the rationale for the adoption of a trailing average cost of debt under the draft guideline. The adoption of a trailing average where the term is set consistent with a business's actual term of debt has the significant advantage, relative to the 'on the day' approach, of being hedgeable/implementable by a business. This means that the business can follow a strategy where the cost of debt allowance can reasonably be expected to equal the cost of debt in real time. However, adopting a trailing average with a term that is different from a business's actual term of debt on the basis that 'on average overtime the difference will not be large' would, even if true,

expose the business to unnecessary risks in the short to medium term (of course, it is not correct that the historical average extrapolation is immaterial as already discussed).

Given the above, a conclusion that there is an immaterial difference between 7 and 10 year term assumptions cannot be used to justify the adoption of a 7 year term of debt benchmark.

5.3.2. Extrapolating Bloomberg from 7 to 10 years

Section 7.3.3 the draft explanatory statement considers and rejects three mechanistic approaches to extrapolating the Bloomberg BBB fair value curve from 7 to 10 years. These are rejected as being either too inaccurate or too hard to specify in full to ensure mechanistic application in all possible future circumstances.

Once again, it is unclear what role in the AER's final conclusion this analysis plays. If the AER's view is that, even if extrapolation from 7 to 10 years could be accurately and mechanically estimated, a 7 year term would still be the best estimate of the term that satisfies the Allowed Rate of Return Objective then a 7 year term assumption would stand on its own. There would be no need to examine the ability to mechanistically extrapolate from 7 to 10 years as 7 years would be the right answer. If this is the case then the AER's analysis in Section 7.3.3 is irrelevant to the AER's final conclusion.

In the above context, the analysis in the draft explanatory statement, at least implicitly, accepts that a term greater than 7 years is appropriate but argues that it is, as a practical matter, too difficult to mechanically update a ten year term during a business's averaging period. The ENA has asked CEG to address this conclusion and their advice is that[143]:

- The AER's approach is essentially an assumption of zero extrapolation in all circumstances. While this is simple and capable of being mechanistically updated it is not accurate;
- There are clearly superior methodologies for estimating the appropriate extrapolation between 7 and 10 years that, applied to current and historical data, give rise to more accurate estimates of the 10 year cost of debt than applying a zero extrapolation. Moreover, these methods of extrapolation are capable of mechanistic updating during a business's regulatory period.
- The AER is wrong to argue that difficulties in extrapolation make the adoption of a 7 year term necessary.

CEG note that, in order to derive a 10 year BBB+ cost of debt from a 7 year BBB+ cost of debt it is necessary to extrapolate both the risk free rate and the debt risk premium (DRP) from 7 years to 10 years. As is described in the below quote:

> *This is described mathematically in the formula below (where the symbol "Δ" signifies a change in the variable).*
>
> $$\Delta yield\ 7\ to\ 10\ years = \Delta riskfree\ rate\ 7\ to\ 10\ years + \Delta DRP\ 7\ to\ 10\ years$$
>
> *Equivalently, one can express the 10 year cost of debt in term of the 7 year cost of debt (7 yr Rd) as follows:*

[143] CEG, *Mechanistic cost of debt extrapolation from 7 to 10 years*.

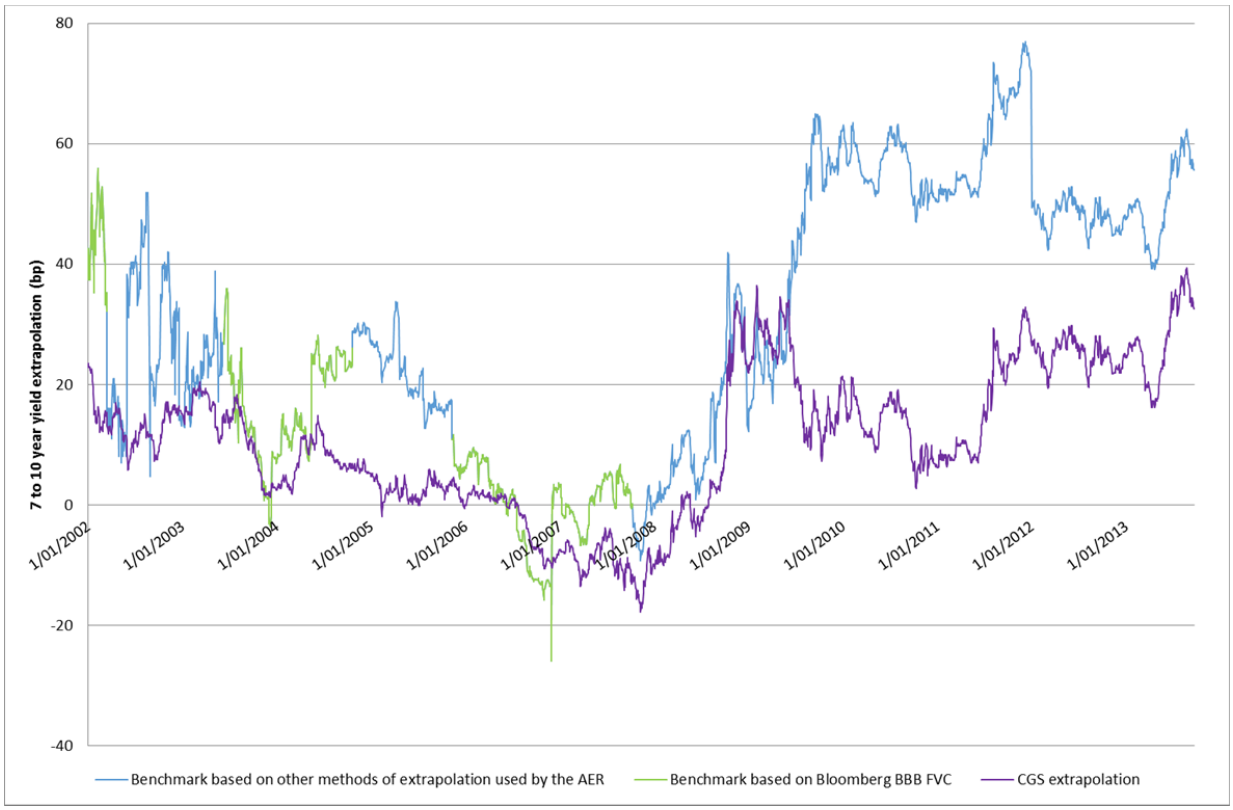
$$10\ yr\ Rd = 7\ yr\ Rd + (10\ yr\ RFR - 7\ yr\ RFR) + (10\ yr\ DRP - 7\ yr\ DRP) \quad (1)$$

As this formula makes clear, the extrapolation of the 7 year cost of debt to the ten year cost of debt is comprised of the sum of:

- *Extrapolation of the risk free rate (10 yr RFR-7 yr RFR); and*
- *Extrapolation of the DRP (10 yr DRP- 7 yr DRP).*

Clearly the CGS yield curve can be used to mechanically implement the risk free component of the extrapolation. CEG show that doing so would clearly be more accurate than applying zero extrapolation and would be a trivial exercise to implement mechanistically. Figure 1 from the CEG report compares historical CGS extrapolation (difference between 7 and 10 year CGS yields) with benchmark extrapolation (based on the actual shape of the Bloomberg BBB curve and/or actual results of AER extrapolation methods applied historically).

Figure 1 : 7 to 10 year extrapolation approaches



Source: Bloomberg, RBA, CEG analysis

In almost all periods, CGS extrapolation is between the benchmark and 'zero' extrapolation. In other words, CGS extrapolation is more accurate than assuming zero extrapolation but is also an underestimate of the benchmark extrapolation. This reflects the fact that the DRP term premium

between 7 and 10 years is positive. because the DRP term premium between 7 and 10 years is positive.

The existence of a strongly positive historic DRP term premium underlines the importance of accounting for this in any extrapolation. CEG set out more accurate and equally mechanistic extrapolations of the DRP exist than simply assuming zero extrapolation. This DRP extrapolation need not be performed using purely contemporaneous information during each business's annual averaging period (as was the case for the approaches considered and rejected by the AER in the draft explanatory statement). For example, CEG note that mechanical extrapolation of the DRP can be achieved by:

- estimating the DRP extrapolation at the beginning of the regulatory period and holding this constant over the regulatory period (i.e., adding a constant DRP premium to the CGS extrapolation estimated in each annual update); or

- making use of the historical relationship between the 7 and 10 year DRP to define a formula for the 10 year DRP in terms of the 7 year DRP (observable from Bloomberg fair value curve).

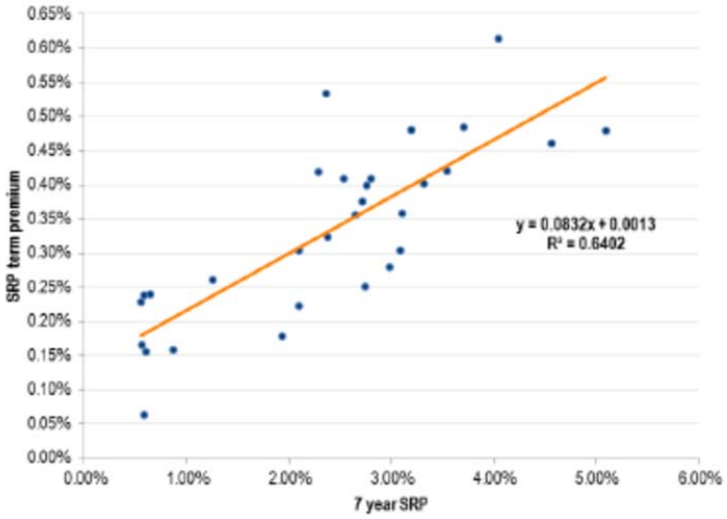
The first approach would be a continuation of current AER practice. Annual updates would take into account variability in the 7 year cost of debt (referencing the Bloomberg fair value curve) and the 7-10 year risk free term premium (referencing the CGS yield curve) but would simply add a fixed premium to this determined at the beginning of the regulatory period to reflect the DRP term premium. This is, in effect, a continuation of the current approach to DRP extrapolation from 7 to 10 years – where the AER uses the paired bond analysis to arrive at a premium for the DRP between 7 and 10 years and holds this constant over 5 years.

Alternatively, variations in the DRP extrapolation from year to year during a regulatory could be mechanistically estimated in a number of ways. CEG notes that the QTC has provided an historical analysis that suggests the 10 year DRP measured relative to the swap curve (QTC calls this the swap risk premium or "SRP") is reliably defined as:

SRP extrapolation = 13bp + 8.3 per cent of the 7 year SRP

Figure 4 from the QTC submission (reproduced below) shows the fit of this regression.

FIGURE 4: 7-YEAR SRP VS. SRP TERM PREMIUM BETWEEN 7 AND 10 YEARS



Each of the parameters in this formula (the fixed term of 13bp and the variable coefficient of 0.083) is known in advance because they have been estimated from regressions of historical time series data. The 7 year SRP can be mechanistically observed based on the Bloomberg BBB FVC less the AFMA 7 year swap value (both published daily). Consequently, this method can provide a mechanistic update of the 10 year cost of debt (10 yr Rd) inclusive of a term premium in the DRP between 7 and 10 years. Ultimately the 10 year cost of debt would be set equal to the sum of each of the following mechanistically observable parameters.

10 yr Rd = 10 year swap – 7 year SRP + SRP extrapolation

Moreover, the QTC has tested the accuracy of this estimate relative to the AER's current practice of applying a paired bonds analysis and has found an average difference of just 1bp over five different averaging periods. Similarly, this approach is currently estimating a very similar DRP extrapolation to CEG's estimate of 30.4bp using the paired bond analysis in August 2013. [144] When compared with the DRP set in the 21 regulatory decisions since SP AusNet in December 2007:

- the QTC method marginally underestimated all 14 regulatory decisions since April 2010 (an average underestimate of under 6bp in total in a range of 0bp to 12bp);
- the QTC method marginally overestimated 3 out of the 4 earlier regulatory decisions since April 2010 (an average overestimate of 12bp in total in a range of 9bp to 16bp); and
- materially overestimated (by 38bp) the extrapolation in a single regulatory decision – being that for ActewAGL where the averaging period was directly in the midst of the worst of the GFC (February 2009) – in a period where Bloomberg and CBASpectrum fair value curves departed wildly.

The only regulatory decision where the QTC regression formula did not reasonably accurately estimate the actual AER extrapolation decision was in the single regulatory period where we can

[144] See p.16 of Victorian Electricity Distribution Businesses *Submission on the rate of return to apply to the charges revision applications of Advanced Metering Infrastructure*, August 2013.

have the least faith in the accuracy of that AER decision due to the data difficulties associated with the GFC. It is important to point out here that global debt markets were severely dislocated in 2008/09 and the reliability of estimates of the cost of debt, including the Bloomberg fair value curve used by the AER at that time, were put under stress. Consequently, the QTC method may have produced an inaccurate estimate of the AER extrapolation for ActewAGL but an accurate estimate of the actual cost of debt.

The ENA submits that the above analysis clearly demonstrates that a mechanistic extrapolation of both the DRP and the risk free rate is possible and is more accurate than simply applying an assumption of zero extrapolation. In view of this, the guidelines should state that extrapolation of the 7 year cost of debt to the 10 year benchmark must include:

- extrapolation reflecting the contemporaneous CGS extrapolation from 7 to 10 years; and
- extrapolation of the DRP component of the cost of debt from 7 to 10 years. However, this extrapolation need not be based on purely contemporaneous data during each annual averaging period. Rather, it could be based on a fixed amount, or a fixed formula (QTC proposal), agreed at the beginning of the regulatory period.

The guidelines could specify a specific form(s) of mechanistic extrapolation of the DRP component – such as the QTC proposal, a paired bond analysis or Nelson Siegel estimate performed in an averaging period immediately prior to the beginning of the regulatory period. However, the actual mechanistic DRP extrapolation approach proposed by businesses/adopted by the AER must, consistent with the Allowed Rate of Return Objective, be expected to give rise to an accurate extrapolation of the Bloomberg DRP from 7 to 10 years.

5.3.3. Businesses actual debt financing practices

5.3.3.1. AER position

The evidence of businesses' actual debt financing practices is addressed on pages 153 to 155 of the draft explanatory statement. The AER states that it has previously estimated the effective term of debt for regulated businesses at 7.37 years.

> *"The debt term at issuance, after accounting for floating rate notes and hedging, was estimated to be 7.37 years."*[145]

The AER dismisses the relevance of analysis presented by PwC and CEG that the average term of debt for similar businesses is at least 10 years on two grounds:

- It is argued that both PwC and CEG might overestimate the term of debt at the time of issue due to methodological problems; and
- Neither PwC nor CEG account for any shortening in the effective term of debt due to the use of swap contracts.

The AER's final conclusion is as follows:

[145] AER *Explanatory statement - Draft rate of return guideline*, p.154

> *As discussed, we consider that the average effective term of debt to be relevant in determining the average term of debt for a benchmark efficient entity. This is likely to be less than 10 years based on a consideration of the available evidence. Further, there is no evidence to suggest that service providers align the average term of debt with the asset life.*[146]

The AER does not present any updated evidence to support a 7 year average term at issuance for Australian firms.

5.3.3.2. AER criticism of CEG and PwC analysis

The AER criticised CEG's analysis on the basis that it used only Bloomberg data which does not include comprehensive data on bank debt. CEG argues that it is inappropriate to include all bank debt in the calculation of average debt term. CEG notes that the debt that is relevant to the AER's consideration is the debt used to fund the RAB (i.e. drawn bank debt). Undrawn bank debt is not used to fund the EAB and at least some part of a business's drawn bank debt is used for funding cash and cash equivalents which should be treated as negative bank debt for the current purpose. For example, CEG notes that a business that takes out $5m in short term debt from a bank and holds that $5m in cash has not actually incurred any net debt and is not using the loan in question to fund the RAB.

Undrawn bank debt is clearly not used fund the RAB either but is necessary for operating a business with an investment grade credit rating (inadequate liquidity results in a binary decision from S&P that the entity is non-investment grade (below BBB-) – refer to S&P Liquidity Criteria).[147] .

PwC has responded to the criticisms of its work. The AER criticised the use of different data sources but PwC has explained that each data source provides information that the others do not. Where there were inconsistencies, a careful process was undertaken to adjust the numbers drawn from Bloomberg and Loanconnector to reconcile them with the figures in annual reports. In any event, the adjustments required to reconcile the figures were not material.

The AER suggested also that it used an inconsistent method of adjustment when Bloomberg reported data differed from the data in annual reports. PwC has explained that there were indeed two methods used for adjusting the Bloomberg figures when they differed from the data in annual reports and that each of these methods has a compelling logic in the circumstances in which they were employed.

Where PwC found that the Bloomberg and Loan Connector databases suggested a lower level of debt on issue than was actually the case, then it concluded that the Bloomberg and Loan Connector databases did not provide a comprehensive coverage and omitted debt issues. In this case, PwC identified the value of omitted debt and assumed that the term of the omitted debt was the same as the sample average.

Where PwC found that the Bloomberg and Loan Connector databases suggested a higher level of debt on issue than was actually the case, then PwC concluded that the Bloomberg and Loan Connector data bases most likely provided a comprehensive coverage of debt issues, but that some of the facilities were not fully drawn down in the case of bank debt, or that bonds had been repurchased early in the case of corporate bonds. In this case, there is complete information about

[146] AER *Explanatory statement - Draft rate of return guideline*, p.155
[147] Standard & Poor's Methodology and Assumptions: Liquidity Descriptors for Global Corporate Issuers, 28 September 2011

the term of the debt, and PwC assumed that each facility was draw down to the same extent (so that the undrawn or repurchased amounts were pro-rated across each facility, again performed separately for bank debt and bonds).

Moreover, once regard is had to the debt management practices of foreign regulated businesses it is clear that an average term of debt at issuance is at least 10 years.

5.3.3.3. Confidential information provided by businesses

Following the release of the draft explanatory statement the ENA has asked each business to provide details of their term at issuance of their actual debt portfolio. This information is confidential to each business but has been provided to Jones Day and CEG in order for aggregate measures of average term to be produced. For the same sample of businesses originally examined by CEG and PwC (listed businesses with assets regulated by the AER)[148] the simple/weighted average of term to maturity at issue of all drawn debt is 11.3/10.8 years. However, the ENA has also collected debt portfolio information for ElectraNet which is another privately owned energy network business regulated by the AER (albeit not listed). Including ElectraNet in the sample reduces the simple/weighted average of term to maturity at issue of all drawn debt to 10.9/10.7 years.

However, these estimates treat all bank debt 'as if' it is used to fund the RAB when, in reality, liquid short term debt is used to fund liquid financial assets in addition to, or instead of, the long term fixed assets in the RAB. That is, short term cash assets and short term bank debt are essentially the same thing with the opposite sign (if a business borrows a dollar from a liquid bank facility and holds it as a dollar in liquid cash net debt has not increased nor has the term of your net debt altered). CEG have treated such liquid financial assets as 'negative bank' debt with the same term as the shortest term bank debt on each company's books (the effect of which is to 'cancel out' that bank debt – consistent with the fact that rather than funding the RAB the bank debt is funding liquid assets). When this is done the simple/weighted average of term to maturity at issue of all drawn debt is:

- 11.5/11.0 years for the original CEG sample of privately owned listed regulated energy companies; and

- 11.1/10.9 years for the original CEG sample plus ElectraNet.

CEG also analyses a further sensitivities to this analysis – some of which raise the estimated average term of debt and others which lower it. However, the sensitivity with the lowest estimate (which involves the exclusion of the longest dated bond in the sample) still only results in a simple/weighted average term of 10.1/9.7.

This data strongly supports the original conclusion by CEG and PwC that the benchmark term of debt at issuance should be at least 10 years. The AER conclusion that the term at issuance for the total debt portfolio is likely to be shorter than the estimates presented by CEG and PwC is incorrect.

[148] These are SPN, SKI, DUET, Envestra and APA. For DUET the ENA has only collected data for the Multinet Gas and United Energy holding companies (not for DBNGP which is not an ENA member and is not regulated by the AER).

5.3.3.4. AER is wrong to rely on its 2009 estimate of 'average effective term of debt'

The draft explanatory statement justifies adopting a trailing average of 7 year debt despite the fact that there is uncontested evidence that businesses issue debt with a term that is closer to 10 years than 7 years. The justification for doing so is the assumption that businesses shorten their 'average effective term of debt' by entering into swap contracts. The AER estimated in 2009 that the 'average effective term of debt'[149] was 7.37 years.

The logic underpinning this position is internally inconsistent with the adoption of a trailing average cost of debt and the implementation of this in the draft guideline.

(i) If a trailing average approach is adopted as the benchmark efficient debt management strategy, then not only will there be no need for businesses to enter into swap contracts, it will be impossible to do so and hedge their costs to the regulatory allowance.

(ii) If the funding practices underpinning the AER's 2009 estimate, in particular the use of swap contracts, are considered benchmark efficient practice then the hybrid approach, not the trailing average approach, is the benchmark efficient debt management strategy;

If the cost of debt allowance is set using the trailing average approach businesses will have no incentive to use swap contracts to match their (risk free) interest rate exposure to the 5 year regulatory period. This practice is purely a creature of the incentives created under the 'on the day' approach to estimating the cost of debt allowance. This practice was common at the time of the AER's 2009 study and is why the AER arrives at a 7.37 year estimate for the 'average effective term of debt'. The 7.37 per cent estimate is itself some sort of weighted average of swap contracts that are shorter than 7 years (predominantly 5 years to match the length of the regulatory period) and a 10 year term for the DRP (which cannot be altered using swaps). Once a trailing average approach is adopted businesses will no longer use swaps in this way because to do so would be to increase not reduce the mismatch between costs and allowances. This was recognised by the Regulatory Development Branch (RDB) in its recent paper 'Estimating the Cost of Debt':

> *the use of swap contracts to lock in the cost of debt for the access arrangement is a consequence of the regulatory framework, and their use by regulated businesses would change if the regulatory framework were to change.*[150]

The RDB also commented that:

> *'…it is questionable whether a business needs to use any swaps if the regulator compensates the businesses using a portfolio approach that applies to the total cost of debt.*[151]*'*

[149] The *Draft Explanatory Statement* does not clearly state what is meant by the concept of 'average effective term of debt'. There is no clear description provided, either in the current document or in the 2009 document, of how one should go about estimating the concept of 'average effective term of debt'. Nor does the AER provide a 'best estimate' of the average effective term of debt in the *Draft Explanatory Statement*. The only clear statement from the AER is that it believes that this 'is likely to be less than 10 years' and that, in May 2009 was estimated by the AER to be 7.37 years.

[150] ACCC Regulatory Development Branch *Estimating the Cost of Debt – A Possible Way Forward*, April 2013, p.11

[151] *Ibid,* p.25

In addition, Lally's advice to the AER itself makes clear that the swap strategy employed under the 'on the day' approach to regulation is irrelevant to an assessment of efficient use of swaps in a different circumstance.

> *Furthermore, the relevant firms to observe for these purposes are the firms that it regulates sans regulation, which is impossible. Observation of the swap contract behaviour of the firms in the presence of regulation will not be a satisfactory substitute because this swap contract behaviour will be influenced by the nature of the regulation. For example, if the regulatory cycle is five years, regulated firms can be expected to convert the risk free rate component of their cost of debt into five year debt and the evidence presented (AER, 2009, pp. 152-153) indicates that they do this.* ***This tells us nothing about how they would behave if they were not regulated. [Emphasis added]***[152]

In the above quote Lally makes the point that the use of swaps under the 'on the day' regime is irrelevant to an assessment about the efficient use of swaps under a scenario of 'no regulation'. However, the same logic also implies that it is irrelevant to an assessment about the efficient use of swaps under a radically different way of compensating for the cost of debt such as the trailing average.

It is a serious error for the AER to infer that the efficient term of debt issued by businesses will, *under a trailing average approach*, be to issue 7 year debt on the basis that, *under the 'on the day' approach*, businesses:

- issued 10 year debt; and
- swapped the risk free component of that debt portfolio to 5 year terms coinciding with the firm's regulatory period (i.e., coinciding with the term at which the regulator reset cost of debt allowances).

The hedging strategy observed in 2009 was to hedge the risk free rate in the regulatory cost of debt and *minimise* exposure to base rate fluctuations throughout the regulatory period. If a trailing average approach is implemented then any NSPs that utilised swaps/floating rate debt to shorten their 'effective term' in this way will be exposing themselves to interest rate risk, rather than hedging it.

Consider a business that issues 10 year debt and then enters into, say, 3 year swap agreements such that its 'average effective term of debt' is somewhere between 3 and 10 years (say 7 years). That business is now exposed to material interest rate risk when the 3 year swaps expire. This is true even if the term of the trailing average is set equal to 7 years. An increase in interest rates in three years' time (when the swaps expire) will gradually be reflected in a 7 year trailing average. However, it will lead to a full and automatic increase in the cost of debt for a business that is using such a hedging strategy.

Put simply, a business that issues 10 year debt will need to use swaps with a much shorter term than 7 years in order to achieve a 'weighted average effective term' of 7 years. Such a strategy will expose the business to serious interest rate risk and they simply would not follow that strategy – especially given the aggressive assumed 60 per cent gearing.

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[152] Lally *Estimating the Cost of Debt of the Benchmark Efficient Regulated Energy Network Business*, August 2013, p.11.

Indeed, as explained by CEG it is impossible to issue 10 year debt and then convert that exposure, using derivatives, to hedge to a 7 year trailing average.[153] A 7 year trailing average benchmark is simply unhedgeable for a firm that issues 10 year debt. Given that the evidence is overwhelming that businesses issue 10 year debt on average adopting a 7 year trailing average will create an unhedgeable benchmark – inconsistent with efficient financing practices in the sector.

The trailing average cost of debt allowance is explicitly calculated on the basis that there is no swap overlay to a business's debt portfolio. It is illogical to base the term of debt under the trailing average approach on an assumption that businesses will enter into swap contracts. For the reasons set out above, the use of swap contracts will not be an efficient practice under the 7 year trailing average benchmark. Moreover, if the AER believes that it would be efficient to use swap contracts then then the correct approach to estimating the cost of debt allowance is a hybrid approach that explicitly defines and costs a particular swap overlay to a 10 year debt issuance program.

Trying to *implicitly* include a vague notion of an (unspecified and uncosted) swap overlay by adjusting the term of issuance in a trailing average approach to something below the actual term of issuance is unacceptable. To do so would simply replace one unhedgeable approach (the 'on the day approach') with another unhedgeable approach.

The ENA notes that the ability to hedge to the regulatory allowance was regarded by the AEMC as serving the long-term interests of consumers:

> *…the long-term interests of consumers would be best served by ensuring that the methodology used to estimate the return on debt reflects, to the extent possible, the efficient financing and risk management practices that might be expected in the absence of regulation*.[154]

5.3.3.5. Interrelationship between term of issuance, credit risk and cost of debt

The draft explanatory statement assumes that a shorter term of debt issuance reduces interest rate costs. The ENA agrees that this is true where:

1. the yield curve for an issuer is upward sloping; and

2. the position of the yield curve *for that issuer* is independent of the average term of debt issuance *for that issuer*.

The AER's analysis explicitly focuses on the first assumption and implicitly assumes the second assumption holds true. That is, in the AER's conceptual framework the optimal term of debt for a

[153] CEG *Review of Lally and Chairmont Reports*, October 2013.

[154] AEMC *Final rule change determination*, 29 November 2012, p.76. The Draft Explanatory Statement (p. 115) interprets this to mean that the regulatory benchmark should be formulated in a way that allows businesses to align their debt management practices to it. On page 115 if the *Draft Explanatory Statement* the AER quotes approvingly the following passage from the NSW DNSP, Submission to the consultation paper, June 2013, p. 5.

> *The ability to emulate the benchmark debt management approach is essential to minimise the risk of significant mismatch between the regulatory cost of debt allowance and the regulated businesses' actual cost of debt. If the regulated businesses can engage in debt management practices that match the benchmark efficient approach, this provides a natural hedge to the regulatory benchmark. This is highly attractive for regulated network businesses, especially when debt markets are volatile. In turn, the desire to achieve a natural hedge ensures that regulated network businesses actually engage in the efficient benchmark debt management practice.*

business is a trade-off between higher refinancing risk (associated with issuing short term debt) and higher interest costs (associated with issuing longer term debt). The AER concludes:

> *"As discussed in section 6.3.3 a benchmark efficient entity will balance refinancing risk (or renegotiation risk) against the rate of return on a debt portfolio and interest rate risk. In particular, when a service provider seeks to refinance its debt, it faces the risk that the return on debt will be either higher or lower than that currently incurred or that it cannot obtain all of its debt requirements.* ***This refinancing risk leads businesses to secure longer term debt and to diversify their debt portfolios by staggering the maturities on their debt. On the other hand, assuming an upward sloping yield curve, longer term debt is more expensive. Accordingly, a benchmark efficient entity would choose its debt tenor to balance this trade-off****. Lally supports the view that an efficient (unregulated firm) would optimally trade off the reduction in renegotiation risk from longer term debt and the increased interest rate risk arising from a shorter effective term of debt."*

The ENA has asked CEG[155] to consider this conceptual framework and their advice is that it is overly simplistic. CEG notes that the net effect on the cost of debt associate with shortening the average term of debt on issue is a combination of two effects:

- moving down an upward sloping issuer yield curve; and
- the issuer yield curve shifting up as lending to the issuer at any given maturity becomes more risky.

Whether the net effect is an increase or reduction in the cost of debt is an empirical question – it is not theoretically obvious that the effect would be a lower cost of debt as has been assumed by the AER. By failing to take account of the second effect the AER has incorrectly assumed a 'free lunch' exists for businesses lowering debt costs by shortening the term of their debt.

Classic examples of the problems of borrowing at short term are Lehman Brothers and Centro.[156] This is the main reason Standard & Poor's[157] assess availability of liquidity when determining credit ratings. Higher exposure to these risks increase the probability of default, reduces the credit rating, and other things being equal, results in higher borrowing costs.

Put simply, firms with shorter term debt maturity profiles will, other things equal, have higher perceived credit risk and lower credit ratings. To the extent that the AER estimates a given credit rating based on the actual debt practices of businesses (which are to issue 10 year debt on average) and then assumes a shorter benchmark term for debt issuance of 7 years then the AER would need to revise downward its estimated credit rating accordingly.

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[155] CEG *Review of Lally and Chairmont Reports*, October 2013.

[156] The Centro collapse and subsequent legal cases and convictions center around the extensive use of bank debt and the failure to disclose the amount of bank debt falling due in the near term. For example, see http://www.smh.com.au/business/former-chief-tells-of-centro-debt-shock-20120412-1wwja.html. Similarly, Lehman Brothers, whose collapse precipitated the escalation of the GFC in late 2008 was unable to refinance itself when short term debt markets on which it was reliant refused to roll over its debt. for example, see http://online.wsj.com/article/SB10001424052748703713504575475532391301148.html

[157] Standard & Poor's Methodology and Assumptions: Liquidity Descriptors for Global Corporate Issuers, 28 September 2011

The draft explanatory statement also suggests that businesses can reduce refinancing risk by issuing long-term debt and then reduce interest costs by entering into derivative contracts (swaps) to shorten the length of the effective debt term.

However, the ENA notes that 'refinancing risk' is not purely determined by the term of the debt issued independent of the use of swap contracts. A business that issues 20 year debt but uses interest rate swaps to shorten the risk free interest rate exposure on their portfolio to 3 months would still face considerable 'refinancing risk' in the sense that they must find the funds to pay any variations in short term interest rates.

Furthermore, a business using interest rate swaps to shorten the term of its risk free interest rate exposure to less than the tenor used to set the cost of debt is exposing itself to interest rate risk. There are no guarantees that the 3 month floating rate plus the Debt Risk Premium will always be lower than the 20 year fixed rate at the time of issuance. Hence, the business could end up with a higher average cost of debt over the term of the loan.

5.3.3.6. Shorter term debt does not lower the WACC

Even if issuing a shorter average term of debt (say 7 years instead of 10 years) did lower the cost of debt it does not follow that it lowers the cost of capital. This is implicitly acknowledged in the above quote from the draft explanatory statement which states that there is a trade-off between lower interest rates and higher refinancing risks. Implicitly, this statement suggests that higher refinancing risks raise the cost of equity (if this is not the case then there is no trade off against which to optimise).

As noted by CEG[158], the Modigliani-Miller theorem states that, in a world with zero transaction costs, the cost of capital is invariant to the type of debt funding used. Issuing shorter term debt, even if it has lower interest costs, will not lower the WACC because there will be an offsetting increase in the cost of equity. Consequently, even if it was correct that a 7 year term assumption (properly implemented with a lower credit rating than a 10 year term assumption) lowered the cost of debt there would need to be a consequential and fully offsetting increase in the cost of equity.

CEG also note that the Modigliani-Miller theorem does, in the presence of transaction costs, allow for the cost of capital to depend on the debt management strategy employed by a business. However, because businesses can be assumed to have already adopted the strategy that lowers transaction costs, any assumption that departs from what businesses actually do (such as assuming a 7 year term) would raise (not lower) the cost of capital.

5.3.3.7. Accounting for interrelationships between parameters

In the context of the above analysis the ENA considers that the reasoning behind the adoption of 7 year term in the draft explanatory statement is inconsistent with the Rules which require that:

> *In determining the allowed rate of return, regard must be had to:*
>
> *(i) relevant estimation methods, financial models, market data and other evidence;*

[158] Reference required

(ii) the desirability of using an approach that leads to the consistent application of any estimates of financial parameters that are relevant to the estimates of, and that are common to, the return on equity and the return on debt; and

(iii) any interrelationships between estimates of financial parameters that are relevant to the estimates of the return on equity and the return on debt.

Specifically, the draft explanatory statement fails to take into account the interrelationship between the assumed term of debt issuance and the level of the credit rating and the cost of equity.

5.4. Benchmark credit rating assumption

Key position 21

Based on current empirical evidence and cost of equity approaches the AER should adopt a BBB credit rating assumption.

The facts upon which the AER concludes that a credit rating of BBB+ is appropriate are largely the same as the facts upon which the ENA concludes that a credit rating of BBB- to BBB is appropriate. The difference in conclusions is due to the fact that:

- the AER focuses on the average credit rating over the period 2002 to 2012 (BBB+)[159] and 2002 to 2013 (BBB+, negative watch); [160] while
- the ENA focuses on the most recent year 2013 (BBB) [161]

The draft explanatory statement does not provide a salient explanation for why it focusses on historical average credit ratings. In the ENA's view the benchmark credit rating adopted in the guidelines should reflect the benchmark credit rating most likely to exist over the period the guidelines will be applied. This is the most recent observations of credit rating – not the average credit rating over the last decade.

The ENA's June 2013 submission set out the reasons why the ENA believed that the benchmark credit rating should be set to BBB. The primary reason was that this is the 'average' credit rating for NSPs that make up the sample for defining the benchmark term. In addition, AER's approach to setting the cost of equity had resulted in substantially reduced equity margins for regulated businesses – very substantially reduced compared to those allowed before the global financial crisis (GFC) of 2008/09.

Prior to that period businesses were afforded a higher equity beta (1.0 versus the current 0.8 allowance) and the AER's mechanistic application of the Sharpe-Lintner CAPM gave substantially higher equity allowances due to higher beta and substantially higher Commonwealth Government bond yields. Moreover, the debt risk premium paid by businesses on their debt has increased materially relative to prior to the GFC.

All of these factors weaken the credit standing of regulated businesses relative to the period pre 2008/09. Unless the AER is predicting a reversion to the pre 2008/09 market conditions (including

[159] As per Table 7.2 of the AER *Explanatory statement - Draft rate of return guideline*
[160] As per Table 7.2 of the AER *Explanatory statement - Draft rate of return guideline*
[161] As per Table 7.2 of the AER *Explanatory statement - Draft rate of return guideline*

the AER's own cost of equity allowances) then there is no basis to have regard to credit ratings prior to 2008/09 in setting the forward-looking credit rating in the guidelines.

The AER needs to assess the benchmark credit rating from a forward looking and more fundamental perspective that (at a high level) reflects the processes used by credit rating agencies. Standard and Poor's derive an entity's credit rating by assessing two types of risk profiles – Business Risk and Financial Risk. The Business Risk profile is ranked as either 'Excellent' (being the lowest risk) through 'Strong', 'Satisfactory', 'Fair', 'Weak' to 'Vulnerable' (the highest business risk). The Business Risk profiles of Australian Energy Network Service Providers are rated "Excellent" due to the high cash flow certainty and stability from its regulated natural-monopoly operations.

The Financial Risk profile encompasses a number of sub-factors including cash flow adequacy, financial policies, governance, risk tolerance, capital structure and liquidity. The Financial Risk profile is ranked from 'Minimal' (the lowest financial risk), through 'Modest', 'Intermediate', 'Significant' and 'Aggressive' to 'Highly Leveraged' (the most financial risk). The primary measures of financial risk are the Funds From Operations[162] ('FFO') to Interest and FFO to Debt. Australian Energy Network Service Providers generally have a Financial Risk profile rated as "Significant" or "Aggressive" due to the relatively low cash flow coverage of interest payments (FFO-to-Interest of 1.6 to 3 times) and relatively high gearing level. FFO-to-Debt is the metric used to assess the effect of gearing on the ability of an issuer to make debt repayments in a timely manner.

The table below sets out the ratings for each Australian Energy Network Service Provider, with the associated target FFO-to-Interest and FFO-to-Debt to maintain their current ratings. The Standard and Poor's ratings range from BBB- to A-, with gas businesses rated on average at BBB, which is one notch lower than the average electricity business rating of BBB+.

[162] FFO is cash flow after interest less CIB indexation. FFO-to-Interest is (FFO + Interest Expense + CIB Indexation) ÷ (Interest Expense + CIB Indexation).

Table 1

Australian Regulated Energy Businesses	S&P Rating	FFO/Interest Coverage	FFO/Debt
Gas Network Service Providers			
Envestra	BBB, Stable	2.2x- 2.4x	9%-10%
APT Pipelines (APA)	BBB, Stable	2.1x- 2.3x	>8.5%
Energy Partnership (Gas) (Multinet)	BBB-, Negative	1.7x - 1.9x	5% - 8%
ATCO Gas Australia	BBB, Positive	2.4x- 2.5x	11%-12%
SPI Assets	BBB, Stable	>2.5x	>11%
DBNGP Trust	BBB-, Stable	1.5x - 1.7x	5% - 7%
Electricity Network Service Providers			
SA Power Networks	A-, Stable	3.0-3.5x	15%
Citipower	A-, Stable (1)	≥2.5x	≥9%
Powercor	A-, Stable (1)	≥2.5x	≥9%
ElectraNet	BBB, Stable	1.7x -2.5x	8%-10%
United Energy Distribution	BBB, Stable	2.3x-2.5x	9%-11%
Gas & Electricity Network Service Provider			
SP Ausnet Group	BBB+, Stable	>2.5x	>10%

Note: (1): Without the benefit of majority CKI ownership the stand-alone rating for these entities is one notch lower at BBB+.

The threshold financial metrics for each rating level from Table 1 have been summarised in Table 2 below.

Table 2

Credit Rating	FFO-to-Interest Coverage Threshold	FFO-to-Debt Threshold
A-	3.0-3.5x	12%-16%
BBB+	2.5-3.0x	9% - 12%
BBB	1.9 – 2.5x	8%-11%
BBB-	1.7 – 1.9x	5% - 8%

In arriving at the allowed rate of return, the rules require that the AER has regard to:[163]

- relevant estimation methods, financial models, market data and other evidence;

[163] NER, cls. 6.5.2(e) and 6A.6.2(e); NGR, r.87(5).

- the desirability of using an approach that leads to the consistent application of any estimates of financial parameters that are relevant to the estimates of, and that are common to, the return on equity and the return on debt; and

- any interrelationships between estimates of financial parameters that are relevant to the estimates of the return on equity and the return on debt.

In determining the benchmark credit rating the AER must therefore take into consideration the interrelationships between the Financial Risk Profile and the credit rating and ensure (through some relatively simple checks) that the combination of the allowed rate of return on equity, allowed rate of return on debt, operating and capital expenditure, return of capital (i.e. regulatory depreciation), tax depreciation and tax payable in the PTRM result in FFO-to-Interest and FFO-to-Debt that are commensurate with the benchmark credit rating. As submitted in the Kanangra report[164] recent AER regulatory decisions have resulted in rating on the lower limit of BBB and this is below the BBB+ benchmark proposed in the draft guideline. The inconsistency of this relationship needs to be resolved in the final guideline.

5.5. Other cost of debt estimation issues

5.5.1. Liquidity allowance

The draft explanatory statement does not examine the issue of debt raising costs and, in particular, the need to invest in maintaining liquidity reserves (above and beyond the RAB) to obtain an investment grade credit rating.[165] The draft explanatory statement does make the following statement at page 67:

> *The yield to maturity (YTM) may include compensation for both systematic and non-systematic risk. To the extent we are operating under a pricing model that assumes investors only price systematic risk, the YTM will include compensation for the risk free rate, plus compensation for systematic risk, plus compensation for the expected loss due to default. While default risk is likely to be driven by both systematic and non-systematic risk, given we use the observed YTM, it does not matter what risk is priced in the market, or what pricing model investors use, as all priced risks and cash flow expectations should be fully reflected in the YTM.* ***Therefore, if liquidity risk or other factors are priced in the debt markets they should be adequately compensated under the current approach to setting the return on debt.*** *[Emphasis added]*

It is not obvious that this is responding to the PwC analysis. However, to the extent that it is it is misguided. The above quote is referring to liquidity of secondary bond sales. The PwC analysis refers to the holding of liquid assets by a business in order to reduce the risk of inability to refinance debt as it falls due.

In any event, as noted earlier, CEG has examined the actual debt portfolios of private Australian energy network businesses regulated by the AER[166] and this data confirms the use of undrawn

[164] Kanagra Ratings Advisory Services *Credit Ratings for Regulated Energy Network Service Businesses*, June 2013, Table 14
[165] As noted in the PwC *Debt financing costs*, June 2013.
[166] Cheung Kong group (SA Power Networks, CitiPower and Powercor), Envestra, Electranet, SP AusNet, DUET group (Multinet Gas and United Energy), and APA group.

facilities to provide the liquidity reserves[167] for credit rating and operational purposes and working capital necessary to run a business (smooth cash flows and receipts and ensure funding is available to repay debt as it falls due). Undrawn bank debt comprises 20 per cent on average, of the comparable businesses total available (drawn plus undrawn) debt portfolio. Undrawn bank debt accounts for a weighted average of 14 per cent of total drawn debt – which is higher than the 8 per cent estimate figure used by PwC to estimate the costs of liquidity management.[168]

5.5.2. New issue premium

The ENA notes that there has been an observed and empirically verifiable phenomenon that the yields on debt in primary issue markets are higher than the yields on debt in the secondary markets from which the AER derives its estimates of the cost of debt. Market participants refer to this phenomenon as the "New Issue Premium (NIP)". The NIP arises because secondary market transactions are typically for smaller volumes than primary market transactions, which means that investors demand a premium relative to secondary trading levels in order to absorb the additional volume requirement. The NIP is related to market determined factors such as the size and tenor of the specific primary transaction, the bond spread relative to a risk-free rate benchmark, the trend in the bond spread, the tenor of the bond, and swap market volatility. The draft guideline does not address the impact of the NIP on the yields on debt recorded in secondary markets, however ENA member businesses will provide submissions on this matter. The ENA also anticipates that ENA member organisations will provide evidentiary material in their individual reviews.

5.5.3. Gearing

The ENA supports the AER's decision to rely on leverage assumption of 60 per cent, subject to the credit rating being set at an appropriate level as described above.

5.5.4. Chairmont and Lally debt reports

Along with the draft guideline, the AER has released two expert papers that deal with cost of debt issues - these are papers by Lally and Chairmont. These papers are not heavily relied on by the AER and in important ways the AER has departed from the advice of these experts – most particularly in relation to the continued use of the Bloomberg BBB fair value curve which both of the experts recommend not using but which the AER proposes to continue to use. Where the ENA considers the AER has inappropriately relied on these consultants this has already been noted above (e.g., in relation to the simplistic view that lower term of debt issues lowers the cost of debt and WACC).

The AER has not consulted on the opinions set out in those reports in this guideline development process. The ENA notes the advice from Jones Day[169] that the Tribunal, in the *Envestra* matter, expressed the view that the AER should only adopt a different methodology from the past after conducting a broad based consultation. Jones Day advises that:

> *The suitable process for a broad based consultation with interested parties across the full spectrum of entities in the industries it regulates, consumers of their services and other*

[167] Standard & Poor's, Methodology and Assumptions: Liquidity Descriptors for Global Corporate Issuers, 28 September 2011
[168] PwC *Debt Financing Costs*, June 2013.
[169] Jones Day, External Memo, *Application of the decision in the Envestra case to the proposals in the Australian Energy Regulator's draft Rate of Return Guidelines*, September 2013

interested parties is the triennial rate of return guideline setting process. These triennial processes enable all parties nationally to participate on an equal footing. It is now too late to do this effectively in the 2013 guideline process.

Nonetheless, there are views expressed in these papers that the ENA considers are either wrong or are not supported by the available evidence. In relation to selecting a sample of bonds for the purpose of informing an estimate of the benchmark cost of debt these views include that the sample:

- should be restricted to Australian regulated energy utilities or similar 'natural monopoly' Australian firms;[170]
- should exclude subordinated bonds;[171]
- should exclude callable debt;[172]
- should exclude foreign issued bonds (even by Australian utilities). [173]

Similarly, the ENA considers that the following views are at best not well supported:

- that the benchmark term for the risk free component of the cost of debt under a trailing average is 'indeterminable';[174]
- reliance on simple sample averages rather than curve fitting is appropriate. [175]

The ENA has asked CEG to advise on each of these positions. CEG's finds that the above positions are not well supported by facts or theory.[176]

5.6. Transition to new cost of debt benchmarks

Key position 22

In some circumstances, it may be that no transition is required if the business already uses a debt financing approach consistent with an efficient benchmark or this is the best way of facilitating a business to hedge its efficient interest costs to the regulatory allowance.

The ENA considers that the transition path set out by the AER in its draft guideline is appropriate, where a business is in transition from a debt raising practice that is consistent with the AER's current approach to establishing the cost of debt. On the other hand, some businesses already adopt the trailing average method and those businesses will discuss in their own submissions to this guideline development process their views as to whether a transition should be adopted.

[170] Lally *Estimating the Cost of Debt of the Benchmark Efficient Regulated Energy Network Business*, August 2013, page 3. Chairmont Consulting *Debt Risk Premium Expert Report*, 2011, pages 8 to 17.
[171] Ibid Lally, section 6.5, Ibid Chairmont, section 3.4.
[172] Ibid Lally, section 6.4, Ibid Chairmont, section 3.3.
[173] Ibid Lally, section 6.2.
[174] Lally, Estimating The Cost of Debt of The Benchmark Efficient Regulated Energy Network Business, August 2013, page 3.
[175] Ibid Chairmont, p/46
[176] CEG *Review of Lally and Chairmont Reports*, October 2013.

6. Related issues outside of the guideline scope

6.1. Debt and equity raising costs

The ENA understands that there have been some discussions on whether debt and equity raising costs would be addressed under this guideline or the expenditure forecast assessment guideline. It is now understood that these matters are out of scope for this guideline, and will be addressed in individual network determinations. The ENA seeks the opportunity to continue to engage with the AER on this matter after this submission has been lodged in the lead up to the finalisation of the guideline should this position change.

6.2. Method for forecast inflation

Similarly, the ENA understands at this time that the issue of appropriate methodologies for forecasting expected inflation as part of the application of the overall cost of capital framework is currently intended to be addressed on a decision-by-decision basis. The ENA seeks the opportunity to continue to engage with the AER on this matter after this submission has been lodged in the lead up to the finalisation of the guideline should this position change.

Appendix A: Memorandum on foundation model application

Memorandum

Understanding how the foundation model for cost of equity estimation works

1. Introduction

This memorandum seeks to provide the basis for discussions exploring the operation of the AER's proposed foundation model approach to estimating the required return of equity set out in its draft *Rate of Return Guidelines* and associated *Explanatory Statement*.

To allow for this exploration and a clearer understanding of the foundation model the memorandum:

- outlines our understanding of the differences between proposed approaches put forward by industry and the AER;
- identifies three critical questions necessary for industry to understand how the model would be applied; and
- sets out for discussion four potential scenarios and questions that arise in applying the foundation model to these scenarios.

2. AER proposed approach

The ENA understands the proposed approach for estimating the required return on equity for the benchmark firm to involve the following steps:

1. Estimate a range and a point estimate for the beta and market risk (MRP) parameters and a point estimate for the risk-free rate parameter. The estimate of MRP would be informed by evidence from dividend growth model (DGM) analysis and the estimate of beta would be informed by empirical evidence about the extent to which empirical beta estimates below 1 tend to under-estimate stock returns (such as the Black CAPM);
2. Insert the three point estimates into the Sharpe-Lintner CAPM formula, producing a default point estimate for the required return on equity;

3. Insert the two ranges and risk-free rate point estimate into the Sharpe-Lintner CAPM formula, producing a range for the required return on equity; and

4. Use other relevant evidence to select a final point estimate for the required return on equity from within the range.

3. Clarifying the differences in industry and AER proposed approaches

The various different methods that have been proposed for implementing the requirements of the new Rules differ in terms of the weights they assign to the various pieces of relevant evidence. For example, the ENA's proposed approach assigned some weight to the Sharpe-Lintner CAPM estimate, some weight to the Fama-French estimate, some weight to the DGM estimate for the benchmark firm, and so on. The AER has proposed to assign zero weight to the Fama-French estimate and zero weight to the DGM estimate for the benchmark firm, but the weights assigned to the Sharpe-Lintner CAPM compared to other relevant evidence is not specified.

Under the AER's proposed approach, the relative weights applied to the Sharpe-Lintner CAPM compared to all other relevant evidence appear to be determined by the width of the ranges of the beta and MRP parameters.

At one extreme, the width could be zero (i.e. point estimates are used). In this case, there would be no opportunity for any other evidence to have any effect and the required return on equity would be determined solely by the Sharpe-Lintner CAPM, as was the case prior to the rule change.

At the other extreme, the parameter ranges could be very wide, in which case the range for the required return on equity would also be very wide. At the extreme, the final range could be so wide as to be completely uninformative (e.g. an estimated range of 5% to 20%). In this case, the Sharpe-Lintner CAPM would receive zero weight, with the other relevant evidence solely determining the final allowed return on equity.

4. Role and function of parameter and foundation model ranges

Clearly, the AER proposes outcomes somewhere between the two extreme cases above. This brings into focus that a key issue is the role and functions of parameter and model ranges.[177] On this point, the ENA seeks to better understand:

1. **How the AER proposes to determine the ranges for the beta and MRP parameters** - only when this information is known will stakeholders have any clear sense of the relative weights to be applied to the Sharpe-Lintner CAPM (as under the old Rules) and the other relevant evidence (that must be considered under the new Rules).

[177] Some of these issues were outlined in ENA's informal note *Workability of Proposed Foundation Model Rate of Return Approach,* July 2013

2. **How the AER proposes to select a point estimate from within the range that is produced by the Sharpe-Lintner CAPM** - only when this information is known will stakeholders have any sense of how the broader range of relevant evidence that is required to be taken into account by the new Rules will be given effect.

3. **What the AER sees as the advantages of filtering all relevant evidence through the prism of the Sharpe-Lintner CAPM** - the disadvantage of use this type of filter is apparent when all of the other evidence points to a point outside the range produced by the Sharpe-Lintner CAPM. If simplicity or familiarity are reasons proposed for using the Sharpe-Lintner CAPM as a filter, the ENA seeks to better understand these reasons – given that a particular piece of evidence is considered to be relevant and is to be estimated anyway, how does filtering it through the CAPM make it simpler or more familiar?

Scenario #1

'Foundation model potential underestimate' or 'GFC Mark II'

Summary

This scenario examines issues around where even a wide foundation model range does not encompass a cost of equity estimate consistent with the preponderance of evidence.

Assumptions

- Final guideline incorporates current foundation model approach
- Capital markets undergo a period of significant acknowledged stress and uncertainty
- AER analysis arrives at the ranges, point estimates and preliminary assessments set out in Tables 1 and 2

Table 1 - Step three: Foundation model implementation

Parameter	Range	Point estimate
Risk free rate	N/A	3.94
Equity beta	0.4-1.0	0.8
Market risk premium	5.5-7.5	6.5
Foundation model R^e	**6.14-11.44**	**9.1**

Table 2 - Step four: taking into account other information

Information source	Form of information	Indication (R^e % or status)	Implication for foundation model estimate
Professor Wright approach	Range	12-13	✗
Takeover/valuation reports	Range	12-14	✗
Broker return on equity estimates	Range	11.5-14	✗
Other regulators' return on equity estimates	Range	11.5-13.5	✗
Debt spreads	Directional	Rising	!

Dividend yield	Directional	Above average	!
Comparison with return on debt	Relative	Rd approaches foundation model Re	!

Possible implementation of AER Steps 5-6

- The upper bound of the foundation model range does not intersect with any other range of point value estimates
- The foundation model point estimate appears inconsistent with all evidence
- Therefore, the foundation model parameters should be reexamined and re-estimated, with a new point value estimated, or the foundation model itself should be reviewed

Questions that arise from scenario

- How would the AER go about analyzing and thinking about these circumstances?
- How would the AER decide whether to re-estimate the parameters or whether to discard the foundation model?
- If the choice is taken to respond to these circumstances by re-estimating foundation model parameters, are all values re-estimated? Or just some? On what basis? Are the parameter ranges widened?
- Would a possible response to this scenario be to adopt a point value at the top end of the range (11.4%) in recognition that it was 'close' to two other pieces of evidence?
- What does it mean for this example that adding 25 basis points onto the top of the foundation model range would bring about an estimate consistent with two additional pieces of evidence?
- What can one say about a foundation model lower bound of 6.14% in this example, given the universe of other evidence? Is there any reason to believe it could represent a feasible estimate?
- Would a review of the foundation model automatically bring about a review of the guideline? Could a review of the foundation model in these circumstances lead to its retention?

Scenario #2

'Mixed evidence'

Summary

This scenario examines issues around a more typical regulatory circumstance of a range of conflicting evidence set against a wide foundation model range.

Assumptions

- Final guideline incorporates current foundation model approach
- Capital markets face uncertainty but no acknowledged abnormal market conditions
- AER analysis arrives at the ranges, point estimates and preliminary assessments set out in Tables 1 and 2

Table 1 - Step three: Foundation model implementation

Parameter	Range	Point estimate
Risk free rate	N/A	3.94
Equity beta	0.4-1.0	0.8
Market risk premium	5.5-7.5	6.5
Foundation model R^e	**6.14-11.44**	**9.1**

Table 2 - Step four: taking into account other information

Information source	Form of information	Indication (R^e % or status)	Implication for foundation model estimate
Professor Wright approach	Range	11.5-12.5	✗
Takeover/valuation reports	Range	8-10	✓
Broker return on equity estimates	Range	13-14	✗
Other regulators' return on equity estimates	Range	8-10	✓
Debt spreads	Directional	Stable	?
Dividend yield	Directional	Average	?

Comparison with return on debt	Relative	Rd below foundation model Re	?

Possible implementation of AER Steps 5-6

- A variety of arguably less robust evidence supports the foundation model point estimate
- Other evidence contradicts the point estimate or is ambiguous
- There appears no clear basis for either adopting or not adopting the foundation point estimate

Questions that arise from scenario

- How would the AER go about analyzing and thinking about these circumstances?
- Is a mixed set of evidence against a foundation point model estimate a threshold for changing the foundation model, just re-estimating parameters, or effectively an 'all clear' to proceed with the foundation model point estimate?
- Should the AER respond to these circumstances by re-estimating parameter ranges and point values?
- Is there any implicit 'rank ordering' or 'hierarchy' of other information that would mean that the outcome would be different if the ticks and crosses in Table 2 were in different places?

Scenario #3

'Narrow ranges – mixed evidence'

Summary

This scenario illustrates the impact of narrowing the parameter ranges where other evidence sets out a wider range of potential estimates.

Assumptions

- Final guideline incorporates current foundation model approach
- Capital markets face uncertainty but no acknowledged abnormal market conditions
- AER analysis arrives at the ranges, point estimates and preliminary assessments set out in Tables 1 and 2

Table 1 - Step three: Foundation model implementation

Parameter	Range	Point estimate
Risk free rate	N/A	3.94
Equity beta	0.6-0.7	0.65
Market risk premium	6.0-6.5	6.5
Foundation model R^e	**7.54-8.49**	**8.2**

Table 2 - Step four: taking into account other information

Information source	Form of information	Indication (R^e % or status)	Implication for foundation model estimate
Professor Wright approach	Range	8.5-11	✗
Takeover/valuation reports	Range	9-10	✗
Broker return on equity estimates	Range	9-12	✗
Other regulators' return on equity estimates	Range	8-9	✓
Debt spreads	Directional	Stable	?

Dividend yield	Directional	Average	?
Comparison with return on debt	Relative	Rd well below foundation model Re	✓

Possible implementation of AER Steps 5-6

- The regulator faces mixed evidence , some possibly supporting the foundation model estimate and some disconfirming it
- There appears no clear basis for either adopting or not adopting the foundation point estimate

Questions that arise from scenario

- How would the AER go about analyzing and thinking about these circumstances?
- In circumstances comparable to Scenario #2, would the result of following the AER's proposed outcome in that scenario be different in this scenario because of the narrower foundation range?
- What do the parameter ranges actually represent? Does the AER propose to set wide or narrow boundaries?
- Does an upper or lower return on equity boundary made up of applying all lower and upper bound input parameters have any inherent plausibility?
- If so, is this different in any way from assuming a uniform distribution of parameters?
- How is can these circumstances be distinguished from instances under the previous Gas Code where regulators systematically rejected return on equity estimates that they perceived were based on input parameters that were selected from the 'upper end' of a feasible range?

Scenario #4

'High risk-free rate'

Summary

This scenario examines circumstances in which the risk free rate rises above levels typically experienced over the past decade, in some senses, the 'flip side' to current market conditions.

Assumptions

- Final guideline incorporates current foundation model approach
- Developments in the Australian economy and global capital markets mean the risk-free rate rises to levels not experienced over the past decade
- AER analysis arrives at the ranges, point estimates and preliminary assessments set out in Tables 1 and 2

Table 1 - Step three: Foundation model implementation

Parameter	Range	Point estimate
Risk free rate	N/A	11.0
Equity beta	0.4-1.0	0.8
Market risk premium	5.5-7.5	6.5
Foundation model R^e	**13.2-18.5**	**16.2**

Table 2 - Step four: taking into account other information

Information source	Form of information	Indication (R^e % or status)	Implication for foundation model estimate
Professor Wright approach	Range	10-12	✗
Takeover/valuation reports	Range	9-12	✗
Broker return on equity estimates	Range	9-12	✗
Other regulators' return on equity estimates	Range	10-17	✓
Debt spreads	Directional	Stable	?

Dividend yield	Directional	Average	?
Comparison with return on debt	Relative	Rd well below foundation model Re	✓

Possible implementation of AER Steps 5-6

- The regulator faces mixed evidence , some possibly supporting the foundation model estimate and some disconfirming it
- The foundation model estimate produces what is an abnormally high required return on equity, compared to historical decisions, and evidence of the more stable long term nature of required equity returns
- There appears no clear basis for either adopting or not adopting the foundation point estimate

Questions that arise from scenario

- How would the AER go about analyzing and thinking about these circumstances?
- Given that the foundation model has been assessed as the most appropriate model, and its parameter estimates were informed by DGM and Black CAPM evidence, should it be assumed a return on equity of 16.2% would be applied, or could the final estimate be adjusted to a lower point in the foundation model range?
- Would circumstances such as this trigger a reassessment of the use of the Sharpe-Lintner CAPM as the foundation model?
- How can the AER best give confidence to long-term investors that they do not face asymmetrical outcomes whereby under historically low risk-free rates point estimates from the foundation model are given substantial weight despite evidence it may underestimate required returns, but where risk free rates substantially increase the same investors face a 'truncation' of what the foundation model would predict for these circumstances?

7. Appendix B: Value of imputation credits (gamma)

7.1. Conceptual framework

The explanatory statement suggests that a new conceptual framework for gamma should be adopted:

> *We propose that the value of imputation credits within the building block revenue framework is an estimate of the expected proportion of company tax which is returned to the representative investor through utilisation of imputation credits.*[178]

This is also referred to in the decision as the "cash flow interpretation of the value of imputation credits"[179] and the "equity ownership approach".[180]

As explained in this appendix, the ENA considers the draft guideline's approach to be a misconception of the role of gamma in the regulatory structure set out in the Rules. Rather, for the reasons explained, gamma is properly conceptualised as an estimate of the market valuation placed upon the credits. Imputation credits will have a cash flow benefit to the investors who redeem them. It is the market value of the credits, not the number of them that are redeemed, that is the relevant concept. This is because it is the market value of the credits that is incorporated into the share price and the cost of capital, both of which are also market value concepts. Indeed, every other WACC parameter is estimated with reference to market values.

To gain a full understanding of whether the AER's equity ownership or cash flow conceptual framework is in fact new, and whether such a concept is appropriate, it is important to review the origins and previous considerations in relation to gamma. As demonstrated below, the AER's proposed concept is neither new (it has previously been considered and rejected) nor is it now permissible under the rules.

Since the inception of the National Electricity Market and equivalent reforms to the gas market, it has been recognised that it is necessary to take into account the dividend imputation tax system in establishing an efficient weighted average cost of capital. At the time of inception, theoretical papers by finance academics had recognised that the imputation system provided a mechanism that could affect investment decisions but only initial work had been undertaken on quantifying this consideration[181] and applying the concept in regulatory practice.[182]

At the time it was developed in 1997, the *National Electricity Code* contained a schedule to guide the then national and state regulators in setting the weighted average cost of capital. At that time, the discussion explained this issue in the context of electricity network businesses that were government-owned and subject to competitive neutrality principles. The schedule included the following statement:

> *Clause 3(4)(b)(i) of the Competition Principles Agreement states:*

[178] AER *Explanatory statement - Draft rate of return guideline* p.118
[179] AER *Explanatory statement - Draft rate of return guideline* p.123
[180] AER *Explanatory statement - Draft rate of return guideline* p.126
[181] See, for example, the reference quoted below from the *National Electricity Code* to work done by Melbourne University.
[182] For example, in granting authorisation for the National Electricity Code's Victorian derogations, the ACCC noted that NERA had questioned the Victorian regulator's approach to gamma as follows: "Does imputation credit utilisation raise consistency issues with respect to foreign owners compared to local owners?"

"The Parties will impose on the Government business enterprise full Commonwealth, State and Territory taxes or tax equivalent systems.

Weighted average cost of capital can be defined and expressed in pre-company tax terms or after company tax terms. Both definitions of weighted average cost of capital will yield exactly the same results, provided that:

- *the definition of cash flows (ie costs and revenue requirements) is consistent with the definition of weighted average cost of capital applied; and*

- *the tax rate used to "gross-up" after tax required return to pre-tax required return is the effective tax rate paid by the company.*

Under an imputation tax system, a proportion of the tax paid at the company level is, in effect, personal tax withheld at the company level. Australia has a full imputation tax system, however the proportion of company tax paid which can be claimed as a tax credit against personal tax varies, depending on:

- *the marginal tax rate of the recipient of the franked dividend; and*

- *whether the recipient is an Australian tax-payer.*

The value of franking credits, will impact on:

- *the value of an investment as perceived by various investors; and*

- *the weighted average cost of capital of a tax-paying corporate entity.*

In October 1993, researchers at the Melbourne University Graduate School of Management completed initial empirical research into the value of franking credits in Australia. The results of this research indicated that franking credits were, on average, valued by equity investors at approximately 50 cents in the dollar.

As the ultimate owners of government business enterprises, tax-payers would **value their equity (and post corporate tax cash flows)** on exactly the same basis as they would **value** an investment in any other corporate tax-paying entity. On this basis, it would be reasonable to assume the average franking credit **value** (of 50 per cent) in the calculation of the Network Owner's pre-*tax weighted average cost of capital."*[183] *(underlying and bold added for emphasis)*

There has always been a recognition that there are a range of factors which result in the redemption of imputation credits being lower than the face value of the imputation credits that are distributed, including the prevalence of international investors, for whom imputation credits are effectively worthless. However, the ultimate task in relation to gamma has always been to determine the *value* to investors of those cash flows (insofar as those credits affect the value of an investment and (correspondingly) the corporate cost of capital). As the AER's explanatory statement correctly notes:

[183] The Melbourne University Study was based on the first version of the Hathaway and Officer study. That study includes an analysis of redemption rates as well as a dividend drop-off analysis. All of this analysis was conducted using data that pre-dated the major tax law changes to the imputation system (45-day Rule and Rebate Provision) which has since been identified as the date from which any forward regulatory decisions concerning gamma should be based.

*The Officer framework[184] and the tax provisions in the rules include the value of imputation credits as an adjustment to the estimated cost of company income tax. Specifically, the framework implies that company tax is reduced for the **value of** the cash flows from the government which are then distributed back to investors through imputation credits.[185]*

From the outset, the role of gamma within the regulatory framework has been to distinguish between:

- The proportion of the total return to equity that must be provided for from allowed revenues; and
- The proportion of the total return to equity that is assumed to come from dividend imputation tax credits.

The national electricity and gas instruments did not contain any further explicit guidance concerning gamma until the AEMC's November 2006 decision introducing new electricity transmission rules.[186] New rule 6A.6.4(a) included the following provisions concerning gamma (bolding and underlying added for emphasis):

*γ is the **assumed** utilisation of imputation credits, which is deemed to be 0.5.*

and:

*"Where the value of the **assumed** utilisation of imputation credits referred to in paragraph (d) cannot be determined with certainty, the AER must have regard to:*

(1) the need to achieve an outcome that is consistent with the market objective (6A.6.4(e)).

It is important to note the use of the word "assumed". The rules did not refer to the utilisation of imputation credits itself nor to an estimation of them but rather a concept that was to be "assumed". The AEMC's Determination elucidates what was to be "assumed" in relation to the utilisation of imputation credits (emphasis added):

Tax

Tax should be estimated based on parameters for a benchmark business and not a TNSP's actual financial and tax arrangements. The value of imputation credits has been deemed to be 0.5.

The value of gamma

Citipower and Powercor submitted that the 0.5 value for gamma is based on outdated market evidence, and that it therefore requires updating with new information. Specifically they indicated that:

[184] Discussed further below.
[185] AER *Explanatory statement - Draft rate of return guideline* p.121
[186] In March 2008 the MCE process for establishing new distribution rules adopted the language of "assumed utilisation" without deeming the initial value to be 0.5 and therefore it is clear that the same concept (although not necessarily initial value) for gamma was to be adopted.

Previous regulatory decisions have relied on the research of Hathaway and Officer published in 1996 in setting the value of gamma to 0.5. … [and]

The value of gamma is too important to set based on dated research. The AEMC should set the value of gamma on the basis of a robust assessment of the available market evidence and practice.

During this Review, AGL and CitiPower and Powercor submitted reports indicating that the value of gamma should be in a region between 0 to 0.5. These reports were also presented to the Essential Services Commission (ESC) in the course of the recent Victorian 2006-2010 Electricity Distribution Price Review. At that time the ESC undertook extensive analysis of these reports in making its Rule Determination and in particular on the assumptions of the effective tax rate and the samples used. From this analysis and the evidence of the reports, the ESC determined that there was inadequate evidence to support changing the value of gamma from 0.5.

On this basis the Commission maintains the view that it is not appropriate to change the value of gamma at this stage. However, the Commission notes that the value of gamma is also subject to review by the AER every five years, allowing additional analysis and developments in financial theory to be taken into account at that time.

The above passage makes it clear that the task was to seek a market valuation but the state of the science at the time was not sufficient to persuade the AEMC of a change to the valuation to be assumed.

As part of the AER's process for estimating the regulated rate of return, further work on the valuation of gamma was undertaken but the valuation remained contentious as between the AER and the businesses. The Australian Competition Tribunal was required to adjudicate this issue in the Energex case in 2010[187]. In that case, the Tribunal used market based dividend drop-off studies to set the point estimate, subject to an upper bound using tax statistics. In doing so, however, it also stated the following:

The Tribunal has found some deficiencies in its understanding of the foundations of the task facing it, and the AER, in determining the appropriate value for gamma. These issues have not been explored so far because they have not arisen between the parties, who appear to be in agreement about how the Rules should be interpreted regarding the treatment of corporate income tax. They may be matters that the Tribunal will take up in its further decision in the matters; or they may best be left until the next WACC review. Indeed, they may go to the basis for the Rules themselves.

The Tribunal would be assisted in its consideration of the issues before it if the AER were to provide relevant extrinsic material explaining:

(a) the rationale for including the gamma component in the formula for calculating the estimated cost of corporate income tax; and

[187] *Application by Energex Limited (Gamma) (No 5) [2011] ACompT 9 (12 May 2011)*

(b) how it relates to the rest of the building blocks, especially the rate of return (clause 6.4.3(a) and cl 6.5.2(b) of the Rules)."

This passage of the decision merely sought an explanation of why the Rules required the corporate tax payment to be adjusted using the value of gamma and how that is related to allowed returns and WACC, and the next section of this submission sets out that explanation. The key point to note is that even though the effect of gamma is formally made via the tax allowance, the effect is to reduce the allowed return on equity relative to what it would otherwise have been. That is, as explained in the following section, the answer to the Tribunal's question in (b) above is that the role of gamma is to allocate the total required return on equity into (i) that component that must be provided out of allowed revenues, and (ii) that component that is assumed to be paid in the form of imputation credits. The answer to the ACT's question in (a) above is that the adjustment to the tax allowance is simply the mechanism via which the partitioning in (b) is implemented. That is, the tax allowance is adjusted to ensure that the allowed revenue is reduced to provide for only the ex-imputation return on equity.

In December 2012, the AEMC adopted the current text of the electricity and gas rules that effectively mirrored its 2006 Decision while clarifying in the Rules themselves that the concept is for a valuation to be made (emphasis added):

γ is the value of imputation credits.

On this occasion the reasons for the Decision adopting the rules stated (emphasis added):

The final rule requires the allowed rate of return to be determined on a nominal vanilla WACC basis with proper regard to dividend imputation (gamma). This is also consistent with the existing WACC approach in the NER rate of return frameworks in that it requires a consistent treatment of cash flows and the discount rate to properly incorporate the gamma factor. The current prescription of the gamma value of 0.5 in clause 6A.6.4 has also been removed to allow the regulator the ability to estimate an appropriate value that reflects the best available evidence at the time of a decision and would therefore result in a rate of return that meets the overall objective.

In the AEMC's decision and its reasoning, there was no suggestion that the Rules or their application had been flawed nor that there needed to be a new conceptual framework adopted for gamma. The AEMC has clarified (to the extent that any clarification was required) that gamma is the value of imputation credits. Moreover, the AEMC has specifically referred to the direct link between gamma and the allowed return on equity by linking the estimation of gamma to the allowed rate of return objective. This linking requires that the ex-imputation return on equity (that proportion of the total return on equity that is to be funded out of allowed revenues) must be consistent with the allowed rate of return objective.

The regulatory task remains one of *valuing* the cash flows that arise from imputation credits rather than simply tracking those cash flows through the system.

Any change to that conceptual approach would require a rule change and the time for the AER to propose a conceptual change would have been as part of the AEMC's recent rule consideration process. Any such change would be inconsistent with the overall economic regulatory framework and requirements of the revenue and pricing principles and the NEO.

Moreover, there would be a significant inconsistency with the NEO/NGO, Revenue and Pricing Principles and the allowed rate of return objective to adopt anything other than a market based valuation for gamma. As is frequently observed, to achieve the market objective, electricity network investors should be recompensed sufficiently to attract the necessary level of investment and not over-rewarded in a way that could lead to over-investment and/or unnecessarily high customer charges. The way to achieve this balance is through providing a return that mirrors the returns that would be gained in efficiently operating equity markets and those same equity markets are therefore a vastly superior source of data for establishing all aspects of the WACC than any other source of data.

> The ENA submits that the conceptual framework within which gamma must be set remains as it has since the beginning of the NEM. It is one that seeks a *valuation* for imputation credits (rather than a cash flow tracking analysis of the utilisation of the credits) and this valuation must be established on a basis that is consistent with the other WACC parameters and with the allowed rate of return objective.
>
> The AER should not substitute an *average cash flow tracking* interpretation for the accepted *valuation* interpretation of gamma.

The explanatory statement struggles to reconcile the language used to discuss the theory behind gamma and the valuation concept required by the rules with the new conceptual basis that the AER proposes to adopt when determining theta and in the process manifests that there is confusion over important aspects of the AER's proposals. In several places, the explanatory statement refers to gamma as representing the *value* of imputation credits which is natural given the theoretical framework and the explicit requirements of the rules. However, when explaining why the AER considers that the Tribunal erred in its decision in the *Gamma* Case, the first point set out in the explanatory statement is the AER's view that the Tribunal should not have considered theta to be a "market value" concept.[188]

That is, it is not clear whether the AER considers that:

a. Gamma represents the value of imputation credits and the best and only way to estimate the value of distributed credits (theta) is via average redemption rates; or

b. Gamma does not represent the value of imputation credits at all, but rather some cash flow tracking metric.

> The ENA submits that the final guideline should clarify whether or not the AER considers that gamma represents the *value* of imputation credits. If it does, it should clarify in what way the AER considers the Tribunal to have erred when it applied the valuation concept. If the AER does not consider that gamma should represent the value of imputation credits, the AER should explain why gamma should not be considered to represent the value of imputation credits and whether it considers this alternative concept to be permissible under the current rules or whether a rule change would be required before its new conceptualisation can be implemented.

The mechanism by which imputation credits have potential value to some investors is that the credits reduce the amount of personal tax that those investors would otherwise have to pay. The ENA submits that the relevant consideration is a comparison of:

[188] AER *Explanatory statement - Draft rate of return guideline*, p.132.

c. The return on equity that the market would require from the benchmark firm *without* imputation; against

d. The return on equity that the market would require from the benchmark firm *with* imputation.

This is a complex conceptual comparison that cannot be achieved (for a range of reasons set out below) via the simplistic assumption that the average redemption rate perfectly reflects the differential.

However, one possibility is that the AER is not using the average redemption rate as an estimate of the value of imputation credits and the extent to which they affect required returns. Rather, the AER may be proposing that theta should simply be directly defined as the average redemption rate – that theta is not a value or return concept at all, but that theta properly represents the *amount* of credits that are redeemed.

For the reasons set out in this submission, the ENA considers that average redemption rates do not have any role to play in relation to gamma. Neither are redemption rates themselves used in the definition or formula for establishing gamma nor are redemption rates useful in establishing the value of imputation credits.

Even so, if the AER were to persist in the final guideline to directly define theta as the average redemption rate, it would be more appropriate to consider the average redemption rate of the benchmark firm rather than using aggregate market data. The logic of a market-wide valuation is that there is arbitrage between the trade in different equities and an implicit in stock prices is an equilibrium valuation for the incremental value to shareholders for the component of their returns that they receive from imputation credits. However, in a cash flow model that focuses on the imputation credit as a flow of cash returned to shareholders as an off-set for actual taxes paid, the relevant cash flow concept would be benchmark network business's redemption figures.

If the same conceptualisation of theta is adopted, in the final guideline as in the draft, the quantification should use the benchmark firms' redemption rate which will require an energy network 'cash flow' / 'equity ownership' analysis to be undertaken (and the ENA would wish to be consulted on such a valuation). If, however, the AER does in fact accept that theta is defined to be the market value of distributed credits, the final guideline should explain why it considers that the Tribunal determination (that proceeded on the market value basis) is no longer relevant.

7.2. Economic foundations of gamma

The fundamental economic framework in relation to dividend imputation was set out by Officer (1994).[189] Officer states (emphasis added) that:

> *γ is the **value** of personal tax credits.* [190]

and

[189] Officer, R. R., 1994. "The cost of capital of a company under an imputation system," Accounting and Finance, 34, 1–17.
[190] Officer (1994), p.1.

*a measure of the **value** of a dollar of imputation tax credit (γ)*[191]

and

*γ can be interpreted as the **value** of a dollar of tax credit to the shareholder*[192]

and

*Where there is a market for tax credits one could use the market price to estimate the **value** of γ for the marginal shareholder i.e. the shareholder who implicitly sets the price of the shares and the **price** of γ and the company's cost of capital at the margin, but where there is only a covert market, estimates can only be made through **dividend drop-off rates**.*[193]

Within the economic framework originally set out by Officer (1994), gamma represents (and has always represented) the market *value* of imputation credits (rather than a cash flow tracking analysis of the average utilisation of the credits).

The AER should not substitute an *average cash flow tracking* interpretation for the accepted *valuation* interpretation of gamma.

7.3. Gamma as a component of investor returns

7.3.1. Gamma reduces the return that the firm can provide to its shareholders

As explained above, in the regulatory setting, gamma plays the role of determining:

- What proportion of the total return to equity must come from allowed revenues; and
- What proportion of the total return to equity is assumed to come from dividend imputation tax credits.

In particular, the proportion of the total return that is assumed to come from allowed revenues is:

$\frac{1-T}{1-T(1-\gamma)}$, where T is the corporate tax rate, the balance being assumed to come from the value of imputation credits.

The draft guideline proposes that T = 30 per cent and γ = 0.50, which implies that 82 per cent [194] of the total return to equity comes from allowed revenues and 18 per cent is assumed to come from imputation credits. For example, suppose that the regulator determines that the total required return

[191] Officer (1994), p.10.
[192] Officer (1994), p.4.
[193] Officer (1994), p.4.
[194] $\frac{1-T}{1-T(1-\gamma)} = \frac{1-0.3}{1-0.3(1-0.5)} = 0.82.$

on equity is 10 per cent . The parameter estimates set out in the draft guideline imply that the allowed revenue should be set so that the firm is able to provide a return of 8.2 per cent to its shareholders, the other 1.8 per cent being assumed to come from the value of imputation credits.

> The role of gamma is to determine the return that comes from the value of imputation credits and consequently the reduction in the return to be paid out of allowed revenues.
>
> Gamma should not be interpreted in any other way, including as the expected proportion of corporate tax to be redeemed by the representative investor.

7.3.2. Rationale for the adjustment formula

Officer (1994) sets out the full derivation of the adjustment formula set out above, but the basic intuition for it can be obtained from the simplified example set out below. Consider a company that earns $100 profit, pays $30 corporate tax, and then pays a $70 fully-franked dividend. The shareholder receives the $70 dividend and $30 of imputation credits. Suppose that the imputation credits are assumed to be valued at half their face value. Thus, the shareholder receives dividends worth $70 and imputation credits worth $15. 82 per cent (70/85) of the shareholder's return comes via payments from the firm and 18 per cent (15/85) comes from the value of imputation credits.

In terms of the generic formula, for every $1 of profit, the company pays T of tax and distributes a dividend of $(1 – T) together with T of imputation credits that are valued at γT. The total value is $(1 – T)+ γT which can be written as $[1 – T(1 – γ)]. The proportion of the total return provided by the firm is $\frac{1-T}{1-T(1-\gamma)}$, with the balance coming in the form of imputation credits.

Again, this is a simplified example to help provide some intuition. A more formal definition of the same formula is available in Officer (1994).

	Example	Formula
Company profit	100	1
Less Corporate tax	30	T
Post-tax profit and dividend paid	70	1-T
Value of imputation credit at γ=0.5	0.5x30=15	γT
Total value	85	(1-T)+ γT=1-T(1-γ)
Proportion from firm	70/85 = 82%	(1-T)/(1-T(1-γ))
Proportion from imputation credits	15/85 = 18%	γT/(1-T(1-γ))

Gray and Hall (2006)[195] show that this relationship is also implicit in the derivations of Lally (1992)[196] and Lally and van Zijl (2003).[197]

[195] Gray, S. and J. Hall, 2006. "The Relationship Between Franking Credits and the Market Risk Premium," *Accounting and Finance*, 46, 405–428.
[196] M. Lally, 1992. "The CAPM under dividend imputation," *Pacific Accounting Review*, 4, 31–44.
[197] M. Lally and T. van Zijl, 2003. "Capital gains tax and the capital asset pricing model," *Accounting and Finance*, 43, 187–210.

7.3.3. Regulatory implementation via the tax allowance

As explained above, under the Rules, the effect of imputation credits is implemented via the tax allowance. This is merely the means of calculating the reduction in the allowed revenues that would be commensurate with the reduction in the allowed return to equity due to the assumed value of imputation credits. As a number of regulatory determinations have demonstrated, the implementation under the Rules is *exactly equivalent* to the reduction in the return to equity holders (i.e., the computation of the ex-imputation allowed return on equity), as set out above. For example, the Technical Note at the end of this appendix sets out the numerical illustration that was submitted by ETSA Utilities in the last SA electricity determination.

7.3.4. Summary

Gamma is a *return* concept. Gamma represents the reduction in stock returns that shareholders will accept in return for the value of imputation credits that they receive.

> Gamma is a measure of the trade-off between stock returns and the value of imputation credits. Gamma does not involve an offsetting of the *value* of stock returns with the *flow* of imputation credits. Rather, gamma involves an offsetting of the *value* of stock returns with the *value* of imputation credits.

In particular, under the parameters in the draft guideline, shareholders in the benchmark firm would have their allowed returns reduced by 18 per cent due to the assumed value of imputation credits.

7.4. Conceptual problems in using tax statistics/redemption rates to establish a value for imputation credits

7.4.1. Overview

As explained in the previous section, the relevant regulatory task is to establish a single value for gamma which is consistent with the establishment of the other aspects of the WACC. This cannot be achieved from the analysis of tax statistics because:

- Even if taxation statistics could accurately identify an actual utilisation rate, the task is to identify a valuation for imputation credits and a utilisation rate is not a means of calculating or observing the value for imputation credits; and
- In any event, it is not possible to identify a reliable utilisation rate from the data because none of the taxation statistics directly provide a utilisation rate and the figures that are available from which to calculate such a rate exhibit very sizable inconsistencies.

This section discusses the first of these considerations and the following section discusses the second. In particular, this section establishes that tracking the flow of imputation credits through the system to redemption (even if it was possible to do that with any precision) is not a means of determining the equilibrium value of those credits. The explanatory statement appears to revive

(from the previous WACC Review) the notion that the flow of imputation credits can be used to determine the equilibrium value via a representative agent model and a particular market definition. This notion appeared to be settled after being raised at the last WACC Review and ruled upon by the Tribunal.

7.4.2. The proposed use of redemption rates

The explanatory statement defines theta to be "the value investors receive through imputation credits as a proportion of the credits that the benchmark company distributes."[198] The explanatory statement goes on to propose that theta should be estimated as the aggregate proportion of distributed imputation credits that are redeemed,[199] commonly known as the "aggregate redemption rate." The explanatory statement further suggests that the aggregate redemption rate can be estimated in two ways:

1) By estimating the proportion of shares of Australian companies that are owned by resident investors and assuming that those investors will redeem all credits that are distributed to them; and

2) By using aggregate tax statistics provided by the ATO to estimate the ratio of redeemed credits to distributed credits.

The Explanatory statement concludes that both means of estimating the redemption rate support an estimate of 70 per cent .[200]

7.4.3. Tribunal finding in relation to tax statistics and redemption rates

In its previous WACC Review, the AER also sought to rely on tax statistics to estimate the value of distributed imputation credits (theta). In that case, the AER relied on aggregate redemption rates estimated by Handley and Maheswaran (2008)[201] to inform its estimate of theta.

The Australian Competition Tribunal considered the use of redemption rates, concluding that information about redemption rates:

> *could only be related to the fact that it was an upper bound. No estimate that exceeded a genuine upper bound could be correct. Thus the appropriate way to use the tax statistics figure was as a check.*[202]

That is, the Tribunal held that redemption rates cannot be used to estimate the value of theta, but can only be used as an upper bound, against which other estimates can be tested.

The explanatory statement sets out the AER's reasons for considering that the Tribunal erred in its conclusion on this point.[203] In particular, the AER considers that the Tribunal was wrong to consider

[198] AER *Explanatory statement - Draft rate of return guideline*, p.122
[199] AER *Explanatory statement - Draft rate of return guideline,* p.122-124
[200] AER *Explanatory statement - Draft rate of return guideline* p.119
[201] Handley, J. and K. Maheswaran, 2008. "The efficacy of the Australian imputation tax system," *Economic Record,* 84, 82–94.
[202] *Application by ENERGEX Limited (No 2) [2010] ACompT 7,* Paragraph 91
[203] AER *Explanatory statement - Draft rate of return guideline* p.132

(a) that theta represented the *value* of imputation credits, and (b) that empirical studies based on traded prices are capable of producing reliable estimates of the *value* of theta. The ENA submits that the explanatory statement is wrong on both of these points. As set out in the previous section, theta clearly *does* represent the value of imputation credits. The reliability of empirical studies based on traded market prices, vis-à-vis the alternative of conceptual assumption is addressed in detail below.

The explanatory statement goes on to note that McKenzie and Partington (2011)[204] (which is not new evidence – it was commissioned by the AER for the Tribunal process referred to above) concludes that redemption rates from aggregate tax statistics may not even be suitable to provide a upper bound for the value of imputation credits.[205]

> The ENA submits that redemption rates (whether estimated directly from ATO aggregate tax statistics or indirectly by estimating the aggregate proportion of domestic ownership and assuming that domestic shareholders will redeem) can, at most, be used as an upper bound for the value of theta.

7.4.4. Equilibrium considerations: Market definition

The key elements of the framework that is set out in the explanatory statement are:

1) "The value of imputation credits is the representative investor's expected reduction through imputation credits of effective company tax paid"[206];

2) "The representative investor is a weighted average of investors in the defined market. Specifically, investors are weighted by their value weight (equity ownership) and their risk aversion" [207]; and

3) "Consistent with the 2009 WACC review, we propose to define the market as an Australian domestic market that recognises the presence of foreign investors to the extent they invest in the Australian market. This definition reflects the realities of capital markets, and sits in between the purely theoretical definitions of a 'full segregated' market and a 'fully integrated' market. This definition has critical implications for the value of imputation credits."[208]

The ENA agrees that the critical issue within this conceptual framework is the definition of "the market" and the implications this has for the computation of the representative investor and consequently for the equilibrium value of imputation credits.

It appears to be common ground that, if the market is defined to be the global integrated capital market, the representative investor would be some form of weighted-average over all global investors. In this case, Australian investors would make up an immaterial component of the "representative investor" and the resulting equilibrium value of theta would be immaterially different from zero.

It also seems to be accepted that if the market is defined to be a completely segregated Australian market, all investors would be Australian and the representative investor would be Australian and

[204] McKenzie, M., and G. Partington, 2011. "Report to the AER: Response to questions related to the estimation and theory of theta," March.
[205] AER *Explanatory statement - Draft rate of return guideline*, p.132
[206] AER *Explanatory statement - Draft rate of return guideline*, p.119
[207] AER *Explanatory statement - Draft rate of return guideline*, p.119–120
[208] Explanatory Statement, Sub-section 8.3.1 (p.120).

theta would be close to one.[209] Of course, in this scenario 30 per cent of Australian firms would not exist (because 30 per cent of the equity funding would not be available) and more than half of the regulated gas and electricity network assets would not exist (because more than 50 per cent of their equity capital is provided by foreign investors).

The AER proposes a definition between these two cases, where foreign investors are recognised "to the extent that they invest in the Australian market."[210]

This issue of the definition of the market has already been discussed at great length during the 2009 WACC Review and was the subject of detailed reports and submissions to the Tribunal's *Gamma* case.[211] The "new" equity ownership framework that is proposed in the explanatory statement is nothing more than a rebadging of the same arguments that have been dealt with previously. For example, in its 2009 WACC Review Final Decision, the AER adopted exactly the same representative investor framework with exactly the same market definition that is proposed in the draft guideline:

> *…foreign investors in the Australian market will be recognised in defining the representative investor, but only to the extent that they invest in the domestic capital market.*[212]

The "equity ownership" conceptual framework is a rebadging of the same market definition representative investor arguments that were used in the 2009 WACC review and subsequent Tribunal hearing.

7.4.5. Parameter estimation in the defined market

Traded equilibrium market prices are used to estimate all other WACC parameters. For example, the risk free rate is estimated by taking the observed yield of government bonds. This yield automatically reflects the proportion of bonds that are held by foreign investors and the fact that from time to time foreign investors may require higher or lower yields than are required by domestic investors. A "cash flow" model is not used to estimate a simple average of the theoretical yield that would be required by foreign investors and the theoretical yield that would be required by domestic investors. Rather, market valuations are estimated from the equilibrium traded market price that reflects the outcome of trading among all market participants. The equilibrium traded market price automatically reflects the relative wealth of all investors, differences in risk aversion, and every factor that might be relevant to the formation of equilibrium value.

For example, in 1993 approximately 25 per cent of CGS were owned by foreign investors. By 2012 that figure had risen to over 80 per cent .[213] Over the same period, CGS yields dropped to their lowest level since WWII. One of the key reasons for the dramatic increase in the demand for Australian government bonds was that yields on government bonds in other countries were even lower than they were in Australia. Hence, Australian government bonds were attractive relative to other options available to foreign investors. The estimate of the risk-free rate using observed

[209] Even in the case of perfect segmentation, it is unlikely that theta could ever be equal to one – because investors have to wait until their end-of-year tax returns are processed before they receive any benefit from imputation credits. This time delay would cause at least some loss of value.
[210] AER *Explanatory statement - Draft rate of return guideline*, p..49
[211] *Application by ENERGEX Limited (No 2) [2010] ACompT 7*
[212] AER (2009), p.426
[213] http://www.rba.gov.au/statistics/tables/xls/e03hist.xls?accessed=2013-09-26-13-43-50.

equilibrium market prices automatically incorporates everything that might affect the equilibrium outcome.

A critical question to consider here is the following – if government bond yields in the United States, Europe and Japan had been 10 per cent instead of 1 per cent over this period, would investors have accepted historically low yields on Australian government bonds? That is, is it reasonable to think that the yields available on other government bonds (US, Europe, Japan) is one of the things that investors will consider when determining the yield they require from Australian government bonds? Or would investors require the same yield from Australian government bonds regardless of whether other government bonds were yielding 1 per cent or 10 per cent ?

Obviously it is the case that the returns on comparable investments in the United States, Europe and Japan will have some influence over the returns that investors require from their Australian investments. It is inconceivable that investors (whether domestic or foreign) would require the same returns on their Australian investments independent of the returns that were available on comparable investments elsewhere.

The complex interaction between the returns that are available in other markets and the returns that investors require on Australian assets is easily accommodated if parameters are estimated with reference to observed market data. Market prices automatically reflect every consideration that investors will have when determining the price at which they are willing to buy or sell an asset. This is the approach that the draft guideline proposes to adopt for every WACC parameter other than theta.

However, the explanatory statement proposes that theta should be estimated by making assumptions about how different investors will value imputation credits, and then making further assumptions about how trading amongst different investors with different valuations will result in an equilibrium value of theta.

By analogy, there are two ways to estimate the value of a house. One way is to observe the recent traded prices of a number of comparable houses. The other is to estimate (or assume) a value for each input (the land, the wood, the bricks, the labour, etc.) and to model, via some conceptual framework, how all of those inputs come together to produce a final value. The draft guideline proposes to use the former approach for every other WACC parameter but the latter approach for theta.

Moreover, the conceptual framework that the AER proposes to use to derive a value for theta assumes that the returns that are available on investments outside Australia have no impact whatsoever on the returns that investors require from their Australian investments. For example, investors (domestic and foreign) require the same yield on Australian government bonds whether the yields on U.S., European and Japanese bonds are 1 per cent or 10 per cent . Such an assumption is:

1) Unfounded and unlikely to be true;

2) Unnecessary – if theta were to be estimated using market price data like every other WACC parameter; and

3) Inconsistent with the way in which all other WACC parameters are estimated.

The ENA submits that theta should be estimated using established empirical techniques applied to observed market data – the same approach that is used to estimate every other WACC parameter. Market prices embed every factor that leads every investor to trade the way they have – their wealth level, their risk aversion, the full range of investment opportunities available to them, and so on. Market prices also embed the complex outcome of trading among investors with different characteristics. Market prices provide a much more reliable estimate of value than the simplistic framework that the draft guideline proposes to use for theta only.

Finally, it should be noted that in the 2009 WACC Review and subsequent Tribunal hearing, the AER used the same definition of the market as it proposes to use in the draft guideline. At that time, the AER proposed to estimate theta from observed market prices – as it did for every other WACC parameter – but it initially proposed to estimate the distribution rate (F) on the basis of a theoretical assumption that was inconsistent with the empirical data. That approach was rejected by the Tribunal. The AER now proposes to estimate the distribution rate with reference to observed empirical data, but to estimate theta on the basis of a theoretical framework that is inconsistent with the observed empirical data.

7.4.6. The representative investor framework

The explanatory statement cites a number of studies that derive representative investor models in the context of a dividend imputation tax system. Those studies include papers by Lally (1992), Lally and van Zijl (2003), and Monkhouse (1993). Those papers are all based on the basic CAPM framework and/or the after-tax CAPM framework that was originally developed by Brennan (1970).[214]

In the 2009 WACC Review, the discussion of representative investor models converged on a setting in which there is a single market consisting of *n* risky assets held collectively by *m* investors. The AER stated that:

> *…the starting point for the Sharpe CAPM (and all subsequent versions of the CAPM) is to assume a given set of assets (n risky assets and a risk-free asset) and a given set of investors (m) who collectively determine the prices of those assets.*[215]

In his advice to the AER on this issue, Handley (2009) also set out part of the derivation of the CAPM where there is a single market consisting of *n* risky assets held collectively by *m* investors.[216]

A crucial aspect of these models is that:

1) The *m* investors must, between them, hold 100 per cent of the *n* assets; and

2) The *m* investors own nothing other than the *n* assets.

That is:

1) None of the *m* investors can hold any assets outside the model; and

[214] Brennan, M.J., 1970. "Taxes, Market Valuation and Corporate Financial Policy," *National Tax Journal,* 23, 417–427.
[215] AER (2009), p.424
[216] Handley, J., 2009. "Further comments on the valuation of imputation credits," April (pp.13-14).

2) There can be no investors outside of the model who can possibly buy any of the *n* assets inside the model.

In other words, the derivation of the CAPM and subsequent models that are based on it, require a closed system. A model in which investors who are inside the system are able to invest in assets outside the system, or where investors outside the system are able to invest in assets inside the system is very different from the CAPM or any subsequent model based on it. None of the CAPM derivations hold in such a case and the CAPM pricing equation (which is used to estimate the required return on equity) does not hold.

To see this, consider the derivation presented by Brennan (2008)[217] as cited by Handley (2009).[218] Here every investor maximises their end-of-period utility:

$$\underset{z_{ij}}{Max} V_i\left(\overline{W}_i, S_i^2\right)$$

subject to:

$$\overline{W}_i = \sum_{j=1}^{n} z_{ij}\overline{P}_{j1} - R\sum_{j=1}^{n}\left(z_{ij} - \overline{z}_{ij}\right)\overline{P}_{j0}$$

$$S_i^2 = \sum_{j=1}^{n}\sum_{k=1}^{n} z_{ij} z_{ik}\omega_{jk}$$

The first of these equations says that all investors maximise their end-of-period expected utility over their total portfolio. Utility is increasing in wealth (and hence expected returns), $\overline{W}_i$, and decreasing in variance, S_i^2. z_{ij} represents the weight that investor *i* invests in each of the *n* assets. The second equation says that investor *i* must invest all of his wealth among the assets within the market. Expected end-of-period wealth is the expected payoff on each of the *n* risky assets inside the system plus the return on the amount invested in the risk-free asset. The last equation is the expression for the variance of the returns of the investor's portfolio, all of which has been invested among the *n* assets inside the market.

Brennan (2008) goes on to note that market clearing requires that $\sum_{i=1}^{m}\mathbf{z_i} = \mathbf{1}$. This market clearing condition requires that, for each asset *j*, the sum of the demands of all investors must equal the supply of the asset.

The budget constraint above requires that every investor has invested 100% of their initial wealth allocation among the *n* risky assets (and the risk-free asset) in the market.

In summary, the derivation of the equilibrium requires that:

1) The *m* investors must, between them, hold 100% of the *n* assets in the market; and

[217] Brennan, M.J., 2008. "Capital asset pricing model", "The New Palgrave Dictionary of Economics", Eds. Steven N. Durlauf and Lawrence E. Blume, Palgrave Macmillan, The New Palgrave Dictionary of Economics Online, Palgrave Macmillan. 23 September 2013, DOI:10.1057/9780230226203.0190.

[218] Handley, J., 2009. "Further comments on the value of imputation credits," April. We adopt the full notation, as set out in Brennan (1992).

2) The *m* investors own nothing other than the *n* assets (and a residual position in the risk-free asset).

That is:

1) None of the *m* investors can hold any assets outside the market; and

2) There can be no investors outside of the market who can possibly buy any of the *n* assets inside the market.

If these requirements for market clearing are not met, no equilibrium can be derived, no representative investor can be determined, and the CAPM pricing relation cannot be obtained.

Now consider the case where each of the *m* investors inside the system is able to invest in n_1 assets inside the system and n_2 assets outside the system, this optimisation becomes:

$$\underset{z_{ij}}{Max} V_i\left(\overline{W_i}, S_i^2\right)$$

subject to:

$$\overline{W_i} = \sum_{j=1}^{n_1+n_2} z_{ij}\overline{P}_{j1} - R\sum_{j=1}^{n_1+n_2}\left(z_{ij} - \overline{z}_{ij}\right)\overline{P}_{j0}$$

$$S_i^2 = \sum_{j=1}^{n_1+n_2}\sum_{k=1}^{n_1+n_2} z_{ij} z_{ik}\omega_{jk}.$$

That is, the end-of-period utility of each investor depends on the value of his investments inside the system plus the value of his investments outside the system and the relationship (covariance) between those two holdings. This optimisation has the obvious implication that investors in CAPM-type models maximise the utility of their *total* portfolios. When considering the return that they require from a particular investment, investors consider the returns that are available from alternative investments and the relationship between the particular investment and the rest of the investor's portfolio.

The ENA submits that (a) if the standard requirements for market clearing are not met, no equilibrium can be derived, no representative investor can be determined, and the CAPM pricing relation cannot be obtained, and (b) the standard market clearing conditions are not met in the "representative investor" framework set out in the explanatory statement.

Consequently, using the aggregate redemption rate as an estimate of theta cannot be justified on the basis of a representative investor equilibrium.

7.4.7. Implications of the proposed "representative investor" framework

As set out above, every representative investor equilibrium framework requires a closed system whereby all of the assets within the system are owned by investors within the system and no investor within the system owns any assets outside the system. Violation of this basic principle, and

the market clearing condition that goes with it, means that an equilibrium cannot be achieved and a representative investor cannot exist.

This is not to say that there is any problem with the derivation of the CAPM or any of the representative investor models that are cited in the explanatory statement. Rather, the problem is with the AER's misconstruction of the concept of a representative investor equilibrium – the AER's notion that some sort of representative investor can be defined without a market clearing condition, which is impossible.

Another way of looking at the proposed framework is that the AER assumes, for the purposes of estimating theta only, that the returns that are available on investments outside Australia have no impact whatsoever on the returns that investors require from their Australian investments. For example, investors (domestic and foreign) require the same yield on Australian government bonds whether the yields on US, European and Japanese bonds are 1% or 10%. As set out above, such an assumption is:

1) Unfounded and unlikely to be true;

2) Certain to produce nonsensical outcomes;

3) Completely unnecessary – if theta were to be estimated using market data like every other WACC parameter;

4) Inconsistent with the way in which all other WACC parameters are estimated; and

5) Inconsistent with the most basic notion of the CAPM, which is that investors maximise utility over their portfolio, not discrete segments of it.

Moreover, in defining their notion of the representative investor, the AER also assumes away the relevance of risk aversion and all elements of the tax position of investors other than the tax position with respect to imputation credits. All after-tax representative investor models from Brennan (1970) onwards show that the representative investor depends on risk aversion and total tax position.

> The ENA submits that using the aggregate redemption rate as an estimate of theta cannot be justified on the basis of a representative investor equilibrium. Theta should not be estimated on the basis of a series of highly unrealistic theoretical assumptions and within the context of an "equilibrium" model with no market clearing condition. Rather, it should be estimated using accepted empirical methods applied to observed market prices – the same way every other WACC parameter is estimated.

7.4.8. Another perspective on the proposed "representative investor" framework

The attached expert report from NERA (2013)[219] provides another perspective on the representative investor framework that is set out in the explanatory statement. That report notes that since imputation credits are of value to domestic investors, domestic investors will rationally harvest credits up to the point where the costs of harvesting credits match the benefits of doing so. The ATO places limits on the extent to which domestic investors can harvest imputation credits without

[219] NERA *Imputation credits and equity prices and returns*, 2013.

being exposed to the risks associated with holding domestic equities. So harvesting credits necessarily requires domestic investors place a larger fraction of their wealth in domestic equities than they would in the absence of an imputation system. The additional risk that domestic investors must bear by placing a larger fraction of their wealth in domestic equities is one of the costs that they face in harvesting imputation credits.

In other words, the marginal value of successive imputation credits falls as domestic investors seek to harvest more and more credits. This is because their investment portfolios become more concentrated in franked-dividend-paying stocks.

The question that a regulator must answer is what impact the distribution of credits by a company will have on the cost of equity. This requires a comparison of the cost of equity that would prevail when credits are distributed to the cost of equity that would prevail were no credits to be distributed. Determining the difference between these two costs of equity is not a straightforward task because the shareholdings of domestic and foreign investors will depend on whether credits are distributed. One cannot, for example, determine the difference between the cost of equity that will prevail when credits are distributed and the cost of equity that would prevail were no credits to be distributed simply by measuring the fraction of credits that are redeemed from tax statistics. This is because domestic investors who redeem credits would be likely to place a smaller fraction of their wealth in domestic equities were no credits to be distributed and because foreign investors would be likely to place a larger fraction of their wealth in domestic equities.

This analysis suggests that even if all credits were currently redeemed by domestic investors, one could still not determine the difference between the cost of equity that will prevail when credits are distributed to the cost of equity that would prevail were no credits to be distributed by measuring the fraction of credits that are redeemed from tax statistics. This is because foreign investors who may not hold domestic equities when credits are distributed might well hold domestic equities were no credits to be distributed. The tax statistics compiled by the ATO cannot, by construction, provide information about the characteristics of potential holders of domestic equities. These potential holders of domestic equities, however, can play an important role in determining what impact the distribution of credits will have on the cost of equity.

Lajbcygier and Wheatley (2012) provide a simple general-equilibrium example that illustrates this point.[220] In their example, aside from an inability of foreign investors to redeem imputation credits, there are no barriers to international investment. There is a single domestic risky asset, a single foreign risky asset and a risk-free asset in zero net supply. Imputation credits are financed by a tax on dividends and interest and there are more foreign investors than there are domestic investors. When credits are distributed, only domestic investors hold the domestic risky asset and so all credits are redeemed. On the other hand, when no credits are distributed, foreign investors hold the domestic risky asset. As a result, foreign investors play an important role in determining the impact that credits will have on the domestic cost of equity. If the ratio of domestic to foreign wealth is around two per cent, then in Lajbcygier and Wheatley's model, introducing a credit yield of three per cent lowers the domestic without-credit equity premium by just 6 basis points. Thus even if all credits are redeemed and the credit yield is an economically significant quantity, the impact of credits on the cost of equity can be small.

Moreover, one cannot determine the impact of imputation credits distributed on the cost of equity from an analysis of domestic equity ownership prevalent under an imputation system. This is because equity ownership in the absence of an imputation system is likely to differ and

[220] Lajbcygier, P. ,and S.M. Wheatley, 2012. "Imputation credits and equity returns," *Economic Record,* 88, 476-494.

ownership in the absence of an imputation system will play a role in determining the impact of credits on the cost of equity.

7.5. Taxation statistics are unreliable for regulatory estimation purposes

Even if there was not a conceptual problem with using taxation statistics to estimate a value (or if the regulatory task was to estimate utilization instead of value), there is also a much more immediate practical problem with using taxation statistics. As the AER acknowledges, there are very substantial revisions by the ATO of its imputation statistics. These revisions occur for a wide range of reasons, not least of which is that taxpayers lodge late tax returns and corrections to tax returns often years after the financial year concerned.

Additionally, the taxation statistics are not collected for regulatory purposes and it is difficult to make accurate adjustments to enable them to be useful. A simple example is that there is extensive double counting when dividends are passed through multiple corporate entities and multiple levels of franking occur and adjustments need to be made to use the statistics to account for this phenomenon of companies owning companies. The way this adjustment should be made, and many like it, is not clear from the data.

Similarly, there are also significant unexplained anomalies amounting to many tens of billions of dollars when comparing different figures collected as part of the full suite of taxation statistics available.

The attached report, Hathaway (2013),[221] details these difficulties and in particular identifies an $87 billion internal inconsistency in the statistics when one seeks to glean the data necessary for regulatory decision making. This discrepancy amounts to 32 per cent of the total distribution of imputation credits. For this reason, Hathaway concludes that "the ATO statistics cannot be relied upon for making conclusions about the utilization of franking credits."[222]

The ENA submits that ATO tax statistic data does not provide a reliable estimate of redemption rates.

7.6. Introduction to the use of market based data to establish a value for gamma

As explained above, redemption rates are incapable of providing an investor valuation for imputation credits because they do not measure the value attached to the credits by investors and, in any event, the statistics are not collected for regulatory purposes and the various published numbers contain significant unexplained anomalies.

On the other hand, there is a well-developed suite of approaches that can establish what value investors place on imputation credits using the same data sources as are used to set the other WACC parameters. This suite of valuation approaches has been published in peer-reviewed academic journals, has a sound conceptual and empirical basis, and has formed the basis of every regulatory estimate of gamma to date.

[221] Hathaway, N. J., (2013), "Imputation credit redemption ATO data 1988-200: Where have all the credits gone?"
[222] Hathaway (2013), p. 5.

The ENA submits that a suite of approaches are available to estimate the value of distributed tax credits, theta. These approaches have been published in peer-reviewed academic journals, have a sound conceptual and empirical basis, and have formed the basis of every regulatory estimate of gamma to date. These approaches, being based on traded market prices, are also consistent with the way every other WACC parameter is estimated. By contrast, not even the authors of redemption rate studies propose that redemption rates can be used to estimate the value of distributed tax credits, theta.

7.7. Evidence of market practice

7.7.1. Introduction

As part of its consideration of the gamma parameter during its 2009 WACC Review, the AER considered a range of evidence about the practice of market professionals. That evidence showed that:

1) The great majority of independent expert valuation reports make no adjustment at all to either cash flows or discount rates to reflect any assumed value of franking credits (Lonergan, 2001[223]; KPMG, 2005[224]);

2) The great majority of CFOs of major Australian companies (who between them account for more than 85 per cent of the equity capital of listed Australian firms) make no adjustment at all to either cash flows or discount rates to reflect any assumed value of franking credits (Truong, Partington and Peat, 2008[225]);

3) Published Queensland Government Treasury valuation principles require government entities to make no adjustment at all to either cash flows or discount rates to reflect any assumed value of franking credits (OGOC, 2006[226]); and

4) Credit rating agencies make no adjustments in relation to franking credits to any quantitative metric that they compute when developing credit ratings for Australian firms.

In its 2009 WACC Review Final Decision, the AER concluded that:

> *The AER agrees that the clear evidence is that the majority of market practitioners do not make any adjustment for the value of imputation credits.* [227]

However, the AER concluded that there are at least two reasons why market professionals might not make any adjustment in relation to imputation credits:

1) No adjustment would be observed if market professionals considered that imputation credits had no material effect on the equilibrium stock price or on the equilibrium cost of equity; or

[223] Lonergan, W., 2001. "The Disappearing Returns: Why Imputation Has Not Reduced the Cost of Capital," *JASSA*, Autumn 1, 1–17.
[224] KPMG *The Victorian Electricity Distribution Businesses Cost of Capital - Market practice in relation to imputation credits Victorian Electricity Distribution Price Review 2006 – 10*, 2005
[225] Truong, G., G. Partington, and M. Peat, 2008. "Cost of Capital Estimation and Capital Budgeting Practice in Australia," *Australian Journal of Management,* 33, 95 – 121.
[226] Queensland Government Treasury, 2006, "Government owned corporations – Cost of capital guidelines," www.ogoc.qld.gov.au.
[227] AER (2009), p.407

2) No adjustment would be observed if market professionals were using an approach that enabled them to bypass the need to estimate gamma.

The second alternative was raised in Handley (2008), a report commissioned by the AER.[228] Handley notes that the ultimate task of the regulator is to estimate the ex-imputation required return on equity, defined as:

$$r_e^* = r_e\left[\frac{1-T}{1-T(1-\gamma)}\right]$$

As in the example above, if the total required return on equity is estimated to be $r_e = 10\%$ and if $T = 30\%$ and $\gamma = 0.5$, the ex-imputation required return is $r_e^* = 8.2\%$. In this case, shareholders require a total return of 10 per cent , but the regulator sets prices or revenues so that the firm can provide a return of 8.2 per cent , with the remaining 1.8 per cent assumed to come from the value of imputation credits.

The regulatory approach for estimating r_e^*, the ex-imputation required return on equity (which determines the regulated firm's revenue allowance), involves two steps. First, the regulator estimates r_e, the total return on equity, including imputation credits. In the 2009 WACC Review this was done using the SL CAPM with an estimate of MRP that was grossed-up to incorporate the assumed value of imputation credits. Then, the regulator removes the assumed effect of imputation credits via the adjustment formula set out above.

Handley (2008) advised the AER that market professionals may be using what he called the "conventional" or "classical" approach to estimate r_e^* directly, without the need for an estimate of gamma at all. Under the SL CAPM, for example, r_e^* could be estimated directly in a single step by simply using an estimate of MRP that had not been grossed-up to reflect the assumed value of imputation credits.

In summary, the regulated firm's revenue requirement must be set so that the firm is able to pay a return of r_e^* to its shareholders. According to Handley (2008), there are two ways to estimate r_e^*:

1) Use the two-step regulatory approach to estimate r_e^*; or

2) Use the direct conventional (or classical) approach to estimate r_e^* that is used by market professionals.

In its 2009 WACC Review, the AER accepted the advice of Handley (2008), concluding that:

> *On this basis the AER considers it is clear that there is a valid valuation framework (i.e. the classical approach) that would avoid the need to directly estimate gamma. It is quite possible and plausible that market practitioners are consciously choosing to adopt this simpler approach to estimating the cost of*

[228] Handley, J., 2008." A note on the value of imputation credits," December, www.aer.gov.au/content/index.phtml/itemId/722190.

> *equity. To reiterate, as the NER require the AER to estimate gamma in calculating the tax building block (i.e. the 'assumed utilisation of imputation credits'), the classical valuation approach is not available.*[229]

Under the previous Rules, the AER approach was to estimate r_e^* using only the two-step regulatory approach. Information about the conventional or classical approach for estimating r_e^* was used only for the purpose of explaining away the evidence about the dominant market practice being to make no adjustment for imputation credits.

Under the new Rules, which require consistency between the parameters and that gamma must be set in a way that is consistent with the allowed rate of return objective, the ENA submits that the AER should at least compare its estimate of r_e^* with the estimate of r_e^* that would be obtained using the conventional or classical approach. It would not be appropriate for a regulator to raise the existence of the conventional or classical approach for the purpose of explaining away evidence of market practice, but then to not compare its own estimate of r_e^* with the corresponding estimate obtained under the conventional or classical approach.

The ENA submits that if there is a "conventional" or "classical" approach that can be used to estimate the ex-imputation required return on equity without requiring an estimate of gamma, the estimate from that approach should at least be compared with the corresponding estimate from the regulatory approach.

7.7.2. SFG (2013) Review of Independent Expert Reports[230]

SFG (2013) reviewed independent expert reports from 2008 to 2013 and concluded that:

> *None of the reports in our sample make any adjustment in relation to dividend imputation. No adjustments of any kind were made to any cash flows and no adjustments of any kind were made to any discount rates.*[231]

This confirms that the long-established practice of independent expert valuation professionals making no adjustment in relation to imputation credits remains the current practice.

7.7.3. KPMG survey[232]

The explanatory statement refers to a survey of six banks, six professional services firms, and six infrastructure funds.[233] No information is provided about which organisations responded to the survey, what the response rate was, which individuals within each organisation completed the survey or their qualifications or roles within the organisation. Moreover, the largest group in the

[229] AER (2009), p.409
[230] http://www.aer.gov.au/sites/default/files/Report%204%20-%20Use%20of%20Independent%20Expert%20Reports%20%28Final%29%20-%2026%20June.pdf.
[231] SFG (2013), p.2
[232] AER *Explanatory statement - Draft rate of return guideline*, p.134-135
[233] http://www.kpmg.com/AU/en/IssuesAndInsights/ArticlesPublications/valuation-practices-survey/Documents/valuation-practices-survey-2013-v3.pdf.

survey was infrastructure funds, which are able to report higher asset values to the extent that a positive value of gamma is assumed. It is difficult to imagine that any survey could fare worse when compared against the criteria set out by the Tribunal for the use of survey information.[234]

> The ENA submits that if the KPMG survey information is to be used to inform the AER's estimate of theta, the final guideline should set out precisely how it is to be used and an explanation of why the AER considers this information to be reliable. The final guideline should also indicate whether the AER considers responses from this survey in relation to other WACC parameters (e.g., MRP) to be similarly reliable.

7.7.4. Equity imputation funds[235]

The explanatory statement refers to an "informal survey"[236] that identifies the existence of a number of managed funds with a focus on investing in firms with a high imputation credit payout ratio. Survey evidence is notoriously controversial because the results can be highly sensitive to the way the sample is identified from the population, the questions asked, the ordering of the questions and what the respondents might have understood to be likely to result from the survey data being used. Where the results of a survey are likely to be controversial, the AER should employ the Court guidelines[237] on the collection of survey evidence to ameliorate the unique problems associated with information collected through surveys.

The explanatory statement does not indicate how many of these funds the AER has identified, the dollar volume of assets under management, the proportion of all funds that have an imputation yield focus, or any quantitative information whatsoever. The questions were not disclosed before the survey was conducted to enable comments from interested parties to be considered. Moreover, the explanatory statement does not indicate whether this evidence about the existence of imputation funds would cause its estimate of theta (or gamma) to be higher or lower than it would otherwise be, and by how much. The ENA submits that these details should be set out in the final guideline.

The existence of such funds suggests nothing more than that there exists a group of investors who are attracted to investing in franked-dividend-paying stocks. . An equilibrium theta of 1 would imply that the full face value of imputation credits is impounded into share prices, in which case shareholders would have to pay for the full face value of imputation credits when buying the shares. In this scenario, there would be no demand for an imputation-focused fund. By contrast, an equilibrium theta of 0 would imply that imputation credits have no impact on stock prices at all, in which case it is investors (rather than firms) who benefit from imputation. In this scenario, an individual investor who valued imputation credits may benefit from investing in a fund that focused on firms with high imputation yields. That is, the demand for imputation-focused funds will be inversely related to the equilibrium value of theta.

The explanatory statement concludes that "the managed funds expect that they can earn arbitrage returns because the actual value of imputation credits exceeds the implied market price."[238] This statement raises a number of questions and issues that should be addressed in the final guideline:

1) By what means does the AER claim to know what the managed funds expect, and the reason for expecting it?

[234] *Application by Envestra Ltd (No 2), ACompT 3, Paragraphs 162-163*
[235] AER *Explanatory statement - Draft rate of return guideline*, p.135-136
[236] AER *Explanatory statement - Draft rate of return guideline*, p.136

[238] AER *Explanatory statement - Draft rate of return guideline*, p.136

2) The term "arbitrage" would appear to be mis-used in this context – there is no zero-investment riskless profit, which is what "arbitrage" means.

3) The statement above suggests that the "implied market price" differs from the "actual value" of imputation credits. It is possible that the equilibrium value of imputation credits differs from the "actual" value to a subset of investors (those who would be attracted to such a fund). However, this does not imply that the equilibrium value that is impounded in market prices is somehow incorrect, or that an assumption about the "actual value" for some subset of investors should be used in place of the equilibrium market value that develops from trading among all investors.

7.7.5. Dividend washing[239]

The explanatory statement refers to a change in tax policy to prevent certain investors from being able to effectively double the amount of imputation credits they receive via a process known as "dividend washing." The AER notes that some investors did engage in the practice of dividend washing, which "suggests that imputation credits are significantly valuable to these particular investors."[240] Of course, this tells us nothing at all about the equilibrium value of imputation credits, just that a very small subset of investors[241] have some positive valuation.

> The explanatory statement does not indicate whether this evidence about the existence of dividend washing would cause the AER's estimate of theta (or gamma) to be higher or lower than it would otherwise be, and by how much. These details should be set out in the final guideline.

Moreover, the explanatory statement only seeks to interpret the evidence about the previous existence of dividend washing. It does not seek to interpret the effect of the abolition of this practice. The abolition of a means for a subset of investors to extract some value from imputation credits would, if anything, reduce the equilibrium value. However, the quantum in this case is so small that dividend washing is likely to be immaterial.

7.7.6. Conclusions in relation to market practice

The weight of evidence suggests that the dominant practice of market professionals is to make no adjustment to the cash flows, parameter estimates, or WACC in relation to imputation credits. In the 2009 WACC Review, the AER agreed that the dominant market practice was to make no adjustment, but interpreted this evidence as suggesting that market professionals may be using an approach to directly estimate the ex-imputation required return on equity (r_e^*) – where that direct approach circumvents the need to estimate gamma. If that is the case, the AER should at least compare its estimate of r_e^* with the estimate that would be obtained using the approach for estimating r_e^* that it says is being used by market professionals.

The existence of imputation-focused managed funds suggests nothing more than that the full value of imputation credits is not incorporated into market prices.

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[239] AER *Explanatory statement - Draft rate of return guideline*, p.136
[240] AER *Explanatory statement - Draft rate of return guideline*, p.136
[241] AER *Explanatory statement - Draft rate of return guideline*, p.136notes that the total effect is anticipated to be only $20 million per year.

The cessation of dividend washing suggests that the equilibrium value of theta may be expected to fall, however the dollar amounts involved are so small that any effect is likely to be negligible.

In relation to the anecdotal evidence of imputation funds and dividend washing, the explanatory statement states that "[w]e have not relied on this information to determine a specific value, but this information is consistent with the significant and positive estimate for gamma we have applied."[242] However, that evidence is only consistent with some investors having a positive valuation of imputation credits. It provides no evidence at all about the equilibrium value of theta. If the AER remains of the view that this evidence is consistent with its proposed value of theta:

1) The final guideline should explain in detail the process by which that evidence can be used to infer an appropriate range for the equilibrium value of theta; and

2) An explanation of whether (and if so, why) the AER considers this evidence to be inconsistent with the currently used value of theta of 0.35.

7.8. Dividend drop-off studies

7.8.1. Use of pre-2000 data

The explanatory statement summarises the results of a number of dividend drop-off analyses.[243] Many of those studies provide estimates that are based solely, or in part, on data that pre-dates the Rebate Provision that took effect on July 1 2000. In its last WACC Review, the AER considered the reliability of estimates that use any pre-2000 data. In its 2009 Final Decision the AER noted that:

> *In its explanatory statement the AER considered there to be persuasive evidence to reject pre-2000 data from consideration in estimating theta. In this respect there is a clear conceptual case to focus on data from the post-2000 period only, given the tax changes in July 2000 which allowed a full cash rebate to resident investors for unused imputation credits.*[244]

The 2009 Final Decision considered this issue further and went on to conclude that:

> *the AER maintains its view from the explanatory statement that there are strong conceptual grounds for a structural break in theta estimates after the July 2000 tax changes. The AER reiterates that the case for a structural break as a result of the July 2000 tax changes has a sound conceptual basis, and is supported by the most reliable and verifiable empirical evidence.*[245]

The AER's final conclusion on this point at its 2009 WACC Review was:

> *The AER maintains its view that there is compelling evidence to reject pre-2000 data from consideration in estimating a forward-looking theta. Accordingly, for the*

[242] AER *Explanatory statement - Draft rate of return guideline*, p.134
[243] AER *Explanatory statement - Draft rate of return guideline*, Table K.12, p.240-241
[244] AER (2009), p.426
[245] AER (2009), p.428

purposes of this final decision the AER has estimated theta based on post-2000 data only.[246]

The explanatory statement provides no indication of any change in the AER's view on the July 2000 tax change. Consequently, the ENA assumes that only those dividend drop-off estimates that are based on data subsequent to the July 2000 tax change will be considered to be relevant evidence for the guideline. For this reason, the ENA does not comment on studies that are based on pre-2000 data. However, the ENA reserves its right to make detailed submissions in relation to the strengths and weaknesses of individual studies if the AER determines that pre-2000 data has once again become relevant.

7.8.2. Summary of empirical estimates

7.8.3. Relevant drop-off studies

The majority of the dividend drop-off studies that are set out in Table K.12 of the explanatory statement use pre-2000 data and are therefore excluded from consideration. The only studies that use post-2000 data are:

1) Beggs and Skeels (2006) – but only the results for the post-2000 sub-period;

2) SFG (2011);

3) SFG (2013); and

4) ERA (2013).

7.8.4. The Beggs and Skeels and SFG studies

In its 2009 WACC review, the AER sought to rely on the Beggs and Skeels estimate to the exclusion of all other dividend drop-off estimates. The Australian Competition Tribunal recently had cause to consider the reliability of the Beggs and Skeels estimate and concluded that the AER was wrong to have relied on that study. The Tribunal then directed that SFG should conduct a "state-of-the-art" dividend drop-off study to assist the Tribunal.[247] The Tribunal also directed that the dividend drop-off study to be performed by SFG "should employ the approach that is agreed upon by SFG and the AER as best in the circumstances."[248]

After a number of meetings and telephone conferences and circulation of several draft versions of proposed Terms of Reference, agreement on several matters could not be reached. This required a further hearing before the Tribunal on those matters that were in dispute. At the completion of this hearing, the Tribunal made an immediate ruling, finding against the AER on all issues.

SFG then conducted the state-of-the-art dividend drop-off study and circulated a draft report to all parties. The AER and the regulated businesses provided comments on the draft report and these were taken into account in a revised report that was provided to all parties and to the Tribunal.

[246] AER (2009), p. xix and p.430
[247] *Australian Competition Tribunal [2010] ACompT 7,* Paragraph 146.
[248] *Australian Competition Tribunal [2010] ACompT 7,* Paragraph 147

At the final hearing, the AER submitted that the SFG study had departed from the Terms of Reference, could be criticised on numerous other grounds, and should therefore be afforded little weight. The Tribunal rejected these submissions entirely concluding that:

> *It is not necessary to set out the details of the eight issues, since they raise no important or significant questions of principle…Calling them "major compliance issues" is unnecessarily pejorative.*
>
> *Whether or not the terms of reference have been departed from, what is important is whether the concerns raised by the AER with the construction of the database cast doubt on the value of SFG's analysis, requiring the Tribunal to give it less weight than it otherwise would. In the Tribunal's view, they do not.*
>
> *The Tribunal is satisfied that the procedures used to select and filter the data were appropriate and do not give rise to any significant bias in the results obtained from the analysis. Nor was that suggested by the AER.*[249]

The Tribunal then accepted the estimates of the SFG (2011) study in full.

> *The Tribunal is satisfied that the procedures used to select and filter the data were appropriate and do not give rise to any significant bias in the results obtained from the analysis. Nor was that suggested by the AER. In respect of the model specification and estimation procedure, the Tribunal is persuaded by SFG's reasoning in reaching its conclusions. Indeed, the careful scrutiny to which SFG's report has been subjected, and SFG's comprehensive response, gives the Tribunal confidence in those conclusions.*[250]

The Tribunal went on to conclude that:

> *The Tribunal is satisfied that SFG's March 2011 report is the best dividend drop-off study currently available for the purpose of estimating gamma in terms of the Rules.*[251]

and

> *The Tribunal finds itself in a position where it has one estimate of theta before it (the SFG's March 2011 report value of 0.35) in which it has confidence, given the dividend drop-off methodology. No other dividend drop-off study estimate has any claims to be given weight vis-à-vis the SFG report value.*[252]

The SFG (2011) study concluded that:

> *For the reasons set out in detail in this report, we conclude that the appropriate estimate of theta from the dividend drop-off analysis that we have performed is 0.35 and that this estimate is paired with an estimate of the value of cash dividends in the range of 0.85 to 0.90.*[253]

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[249] *Australian Competition Tribunal [2011] ACompT 9*, Paragraphs 18-19.
[250] *Application by Energex Limited (Gamma) (No 5) [2011] ACompT 9 (12 May 2011)*, Paragraph 22.
[251] *Application by Energex Limited (Gamma) (No 5) [2011] ACompT 9 (12 May 2011)*, Paragraph 29.
[252] *Application by Energex Limited (Gamma) (No 5) [2011] ACompT 9 (12 May 2011)*, Paragraph 38.
[253] SFG (2011), Paragraph 3

The SFG (2013) study employs the same methodology as the SFG (2011) study, but extends the data set through to the end of 2012. The conclusion from that study is that:

> *the conclusions from that earlier study remain valid when tested against the updated data set.*[254]

7.8.5. The ERA study

Vo, Gellard and Mero (2013) from the ERA have recently produced a drop-off study that essentially follows the methodology of the SFG studies. One important deviation from the SFG methodology is that the ERA study also presents results that are based on analysis that omits the standard market adjustment. The standard approach in dividend drop-off studies is to assume that, but for the dividend, the stock price would have followed the movement in the broad market over the ex-dividend day. That is, if the broad market index increases by 2 per cent over the ex-dividend day, it is assumed that, but for the dividend, the particular stock would also have increased by 2 per cent .

The market adjustment is performed in every study set out in Table K.12 of the explanatory statement, including the ERA study. However, the ERA study also reports results in the absence of this standard market adjustment on the basis that, but for the dividend, a particular stock price might have moved (over the ex-dividend day) by somewhat more or less than the market. For example, it is possible that when the broad market increases by 2 per cent , a particular stock might have moved (but for the dividend) by 1.8 per cent or by 2.2 per cent .

Omitting the market adjustment entirely is certain to be an inferior estimate on average. Whereas individual stocks might have moved by somewhat more or less than the broad market, on average stocks will move exactly in accordance with the market index, by definition.[255] That is, the standard market adjustment produces estimates of "but for the dividend" stock price movements that are unbiased on average – in the sense that it is equally likely that (but for the dividend) the stock might have moved somewhat more or somewhat less than the broad market index. Omitting the market adjustment entirely is to assume that (but for the dividend) the stock price would not have moved at all. Such an omission creates a bias. If the broad market increased by 2 per cent over the ex-dividend day, the assumption that the stock price would have been 0 per cent is clearly likely to be a material under-estimate, on average.

The reason the ERA authors provide for reporting results that omit the standard market correction is that "applying the market correction is an unnecessary complication to an already complex econometric task."[256] However, the correction is necessary to produce unbiased estimates and it is not difficult to implement. Furthermore, having actually computed the results that incorporate the market adjustment, there appears to be no reason to ignore them on the basis that their computation is too complex. For these reasons, the ENA submits that the subset of the results in the ERA paper that are based on analysis that omits the standard market adjustment should receive no weight.

When the standard market adjustment is performed, the ERA study confirms the results from the SFG studies. In particular, the SFG studies conclude that an appropriate value for theta is 0.35. The ERA study reports that, when the standard market correction is applied, the average estimate of theta is 0.34. The estimate using robust regression and Model Specification 4 (which the ERA considers to be the most reliable estimate) is 0.33.[257] When no market correction is applied, the

[254] SFG (2013), Paragraph 6
[255] This is because the market portfolio is an average taken over all stocks.
[256] Vo, Gellard and Mero (2013), p.32
[257] Vo, Gellard and Mero (2013), Table 5

ERA reports an average theta estimate of 0.40 and a robust regression estimate from Model Specification 4 of 0.32.

7.8.6. Summary of drop-off results

The ENA submits that the best available dividend drop-off estimate of theta is 0.35. This is the estimate reported by SFG (2011) and SFG (2013). It is also closely consistent with the results of the ERA study when the standard market adjustment is applied.

7.9. Effect of additional trading around the ex-dividend event

7.9.1. Overview

In its explanatory statement, the AER sets out its concerns regarding the abnormally high trading volumes that tend to be observed around ex-dividend events.[258] The AER notes that drop-off studies are based on stock price changes between the cum-dividend and ex-dividend prices, and that there is evidence that trading volumes are higher than normal over those two days. The AER further notes that a particular mix of investors might be motivated to trade around the ex-dividend day, and that this mix might differ from the mix of investors who trade at different times of the year. The AER refers to this as a potential "clientele effect," concluding that:

> *By largely reflecting the abnormal trading conditions on the two relevant trading days, dividend drop off studies may not identify the market value for the representative investor in other circumstances.*[259]

In summary, the AER's concern is that the theta estimated using dividend drop-off analysis will reflect the equilibrium value of the mix of investors who trade around the ex-dividend date, which may differ from the mix of investors who provide long-term equity capital to the firm.

7.9.2. The impact of additional trading

The first step in addressing the potential clientele effect is to consider whether there is any evidence that the mix of investors who trade around ex-dividend events is unusual, and if so, whether their trading is likely to lead to an under- or over-estimate of theta. This is done by considering whether there is any evidence about the effect that the additional trading around ex-dividend events might have on the cum-dividend price and on the ex-dividend price.

In this regard, the AER cites evidence of abnormal trading being associated with an increase (or "run-up") in the cum-dividend price.[260] The explanatory statement cites the report prepared for the AER by McKenzie and Partington (2011), who survey the relevant research and report that there is:

> *Direct evidence of the presence of short term trading about the ex-dividend date in Australia*[261]

[258] AER *Explanatory statement - Draft rate of return guideline*, p.242-243
[259] AER *Explanatory statement - Draft rate of return guideline*, p.242
[260] AER *Explanatory statement - Draft rate of return guideline*, p.242

and that

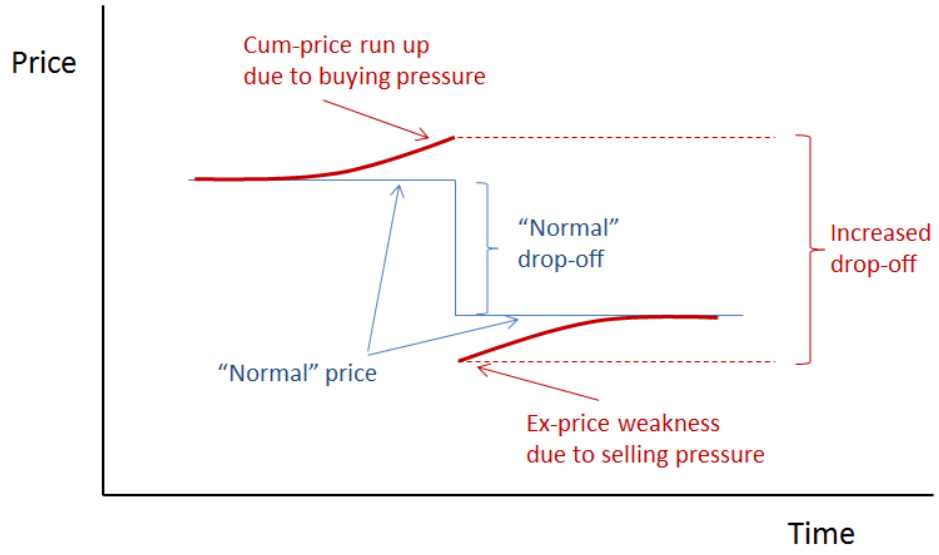
> *Short term traders appear to be arbitraging higher yield franked dividends and low spread stocks.*[262]

They conclude that the result is

> *Buying pressure cum dividend, selling pressure ex dividend, and an abnormal volume of trades. Note however, that these price effects are not just from short-term trading.*[263]

In summary, McKenzie and Partington advise that there is buying pressure from a range of investor types that causes the cum-dividend price to be higher than it would otherwise be (the price run-up) and selling pressure from a range of investor types that causes the ex-dividend price to be lower than it would otherwise be. The result is that the abnormal trading volume causes the dividend drop-off to be larger than it would have been if trading among market participants had been at more normal levels. This is illustrated in Figure below.[264]

Figure 3. Trading activity and drop-off ratios



[261] McKenzie and Partington (2011), p.9
[262] McKenzie and Partington (2011), p.10
[263] McKenzie and Partington, p.10
[264] McKenzie and Partington (2011) suggest that the cum-price run-up due to buying pressure is a stronger and more consistent result than the ex-dividend price weakness dues to selling pressure. Even if there is no ex-price weakness, the strong cum-price run-up causes the measured drop-off to be larger than it would otherwise be.

According to McKenzie and Partington, abnormal buying pressure causes an increase in the cum-dividend price and abnormal selling pressure causes a decrease in the ex-dividend price. To the extent that these effects are material, the result is a dividend drop-off that is larger than it would otherwise be. This results in the estimate of theta being larger than it would otherwise be. That is, to the extent that the increase in trading volume around the ex-dividend date has an effect, it is likely to result in an over-estimate of theta.

7.9.3. Potential effect of short-term traders

The explanatory statement also considers advice from McKenzie and Partington (2011) about the potential impact of short-term investors around the ex-dividend event:

> *McKenzie and Partington identify that if short term traders are highly involved in trading around the cum-dividend/ex-dividend dates, dividend drop off studies would underestimate the value of dividends and franking credits to those traders*[265].

The substance of this advice is that there may be a subset of investors who value the dividend and imputation credit less than the equilibrium market value, and if that subset of investors dominate trading around the ex-dividend event, it is their (lower) valuation that will be reflected in the dividend drop-off estimates.

To understand this argument further, suppose that the representative investor values a $1 dividend and the associated imputation credit at a combined value of $1 (which is consistent with a broad range of empirical evidence as set out below). Also suppose that there is a subset of investors who value the same package at only 80 cents.[266] The McKenzie and Partington argument is that *if* this subset of investors dominates trading around the ex-dividend event, it is their valuation that will be reflected in stock prices and the resulting drop-off will be 80 cents on average, which is less than the value to the representative investor.

However, there are two problems with this argument by McKenzie and Partington. First, it is illogical. It would be impossible for this subset of investors to dominate trading around ex-dividend events thereby imposing their lower-than-average valuation on market prices. If it were the case that the trading of such investors did result in a drop-off of only 80 cents, where the equilibrium value in the market was $1, other investors would surely enter the market to take advantage of the abnormal returns that were on offer. For example, an investor who valued the dividend and imputation credit at the equilibrium value of $1 would seek to buy shares in the cum-dividend period, obtain the dividend and imputation credit which they valued at $1, and then see the stock price fall by only 80 cents, being 20 cents to the better overall. This activity would continue until the cum-dividend buying pressure offset the trading of the "low valuation" subset of investors. That is, the argument that the subset of "low valuation" investors could drive prices around the ex-dividend day is only plausible if it is accompanied by an argument about why all other investors have been excluded from trading around the ex-dividend day. But McKenzie and Partington provide no such evidence – they merely state that an effect *can* occur *if* a subset of investors that *may* exist dominates trading around the ex-date.

[265] AER *Explanatory statement - Draft rate of return guideline*, p.242

[266] This scenario only requires that some group of investors have a valuation that is lower than the representative investor's valuation. The difference may be due to tax positions, transaction costs, or other factors.

The second problem with the hypothesis that "low valuation" investors may cause a lower-than-equilibrium drop-off to occur is that all of the available evidence suggests the exact opposite. For the observed drop-off to be lower than the equilibrium valuation, it would have to be the case that the cum-dividend price was driven down by the additional trading, whereas McKenzie and Partington note that the evidence is consistent with the exact opposite – a cum-dividend price run-up.

Moreover, there is also direct evidence that "low valuation" investors do *not* dominate trading around ex-dividend events. Again, the evidence suggests the exact opposite – the investors who dominate trading in the cum-dividend period and cause a price run-up are those that have a *high* valuation of dividends and imputation credits. McKenzie and Partington (2011)[267] state that these "high valuation" investors include "long term investors [who] trade cum-dividend to capture dividends" and short-term arbitrageurs (e.g. domestic investors with higher franking credit values).

The ENA submits that, the notion that a subset of "low valuation" investors dominate trading around the ex-dividend date causing the drop-off to be artificially low is directly contradicted by all of the available evidence and should be given no weight.

7.9.4. Consistency with other evidence

The explanatory statement also cites evidence from offshore markets.[268] For example, Frank and Jagannathan (1998) develop a simple model of investor trading around ex-dividend dates to explain why the observed drop-off in the Hong Kong market tends to be less than the amount of the dividend. They explain that investors in the Hong Kong market pay no tax on dividends or capital gains, in which case there is no tax-related reason for trading around ex-dividend events. Indeed, in the Frank and Jagannathan model there is no increase in trading volume around the ex-dividend event. Rather, there is simply a change in the type of investor who initiates a trade. Specifically, Frank and Jagannathan develop a type of "dividend annoyance" model whereby investors would generally prefer not to receive dividends because they involve the administrative costs of having to reinvest them appropriately.

The result of the Frank and Jagannathan model is that trades in the cum-dividend period are more likely to be seller-initiated (as there are relatively more investors seeking to avoid the dividend) and to occur at the bottom of the bid-ask spread. Conversely, trades that occur in the ex-dividend period are more likely to be buyer-initiated (as investors who delayed their purchase to avoid the dividend now seek to buy the stock) and to occur at the top of the bid-ask spread. This has the effect of reducing the measured drop-off.

The no-tax conditions in the Hong Kong market lead to a material number of investors seeking to avoid dividends. However, McKenzie and Partington (2011) report that the Australian market conditions lead to a material number of investors being attracted to dividends.[269] The cum-dividend buying pressure not only results in trades being more likely to occur at the top of the bid-ask spread, but it causes both bid and ask prices to increase in the form of a "cum-dividend price run-up."

[267] See McKenzie and Partington (2011), p.10.
[268] The ENA's view is that the regulator should have regard to offshore evidence if that evidence is relevant and useful. If, however, the AER determines that offshore evidence cannot be used because the benchmark firm is defined to be one operating in Australia, this offshore evidence must be ignored. For example, if the AER determines (incorrectly in ENA's view) that offshore comparables cannot be used to assist in the estimation of equity beta, internal consistency would require that offshore evidence cannot be used to assist in the estimation of gamma.
[269] McKenzie and Partington (2011), p.9-10

In summary, the Frank and Jagannathan model helps to explain why the drop-off is likely to be over-estimated in a setting where there is cum-dividend buying pressure and ex-dividend selling pressure – as is the case in Australia according to McKenzie and Partington (2011).

The explanatory statement also refers to a study of the Finnish stock market by Rantapuska (2008). Rantapuska shows that the subset of investors who (because of their tax and other circumstances) value the dividend most trade more heavily in the cum-dividend period to capture the dividend. Cum-dividend buying pressure then results in the sort of cum-dividend price run-up that McKenzie and Partington (2011) document for the Australian market. That is, to the extent that trading patterns around the ex-dividend day are materially different from other days, it is the subset of investors who value the dividend most that cause the cum-dividend price run-up, which in turn results in a higher drop-off than would otherwise be observed.

To the extent that this Finnish study has any relevance to the Australian market, it is this: cum-dividend trading is likely to be influenced by that subset of investors who value the dividend and imputation credit the most. That subset of investors cause the cum-dividend price run-up and the drop-off being higher than it would otherwise be. This, in turn, results in the estimated value of the dividend and imputation credit (theta) being higher than it would otherwise be. Consequently, to the extent that these effects are material, they would result in an over-estimation of theta.

7.10. The allocation issue

7.10.1. Overview

In its explanatory statement, the AER notes that:

> *Dividend drop off studies only 'directly' identify the combined value of dividends and the attached imputation credit*

and that for the purpose of obtaining an estimate of theta:

> *this combined value of dividends and attached imputation credits must be allocated between the two components.*[270].

It is true that the combined value of the cash dividend and the associated imputation credit must be allocated between the two components. However, it is important to note that the need to allocate the combined value between two components does not affect the reliability or precision of the estimate of the combined value.

7.10.2. Estimates of the combined value

Dividend drop-off studies have consistently reported that the combined value of a $1 cash dividend and the associated imputation credit is very close to $1. At a 30 per cent corporate tax rate, the combined value can be computed from the estimates of the value of cash dividends and theta as:

$$\begin{matrix} Combined \\ Value \end{matrix} = \begin{matrix} Value\ of \\ Cash\ Dividend \end{matrix} + \left(\frac{3}{7}\right) Theta$$

[270] AER *Explanatory statement - Draft rate of return guideline*, Sub-section K.6.1, p.243

since a fully-franked dividend has 3/7 of a dollar of credits attached to every dollar of dividend.[271]

Beggs and Skeels (2006) report annual estimates in their Table 3 and estimates for their various tax regimes in their Table 5. Their estimates of the combined value of a $1 dividend and the associated imputation credit are all very close to $1, as set out in Table 1 below.

Table 1: Estimates of the combined value of a $1 cash dividend and the associated imputation credit from Beggs and Skeels (2006)

Time period	Estimate of combined value
2001	1.03
2002	1.08
2003	1.02
2004	1.08
2001-2004	**1.05**

The recent ERA study by Vo, Gellard and Mero (2013) reports estimates for a range of model specifications and estimation techniques, with and without the standard market correction. Their estimates of the combined value of a $1 dividend and the associated imputation credit are also all very close to $1, as set out in Table 2 below. The average estimate of the combined value is 1.03 when the market correction is applied and 0.99 when it is not.

[271] This is in the ratio of T/(1-T) where T is the corporate tax rate of 30%.

Table 2: Estimates of the combined value of a $1 cash dividend and the associated imputation credit from Vo, Gellard and Mero (2013)

Model	Method	No market correction	Market correction
Model 1	OLS	0.88	0.89
	RR	0.99	1.03
	LAD	1.00	1.02
Model 2	OLS	0.80	0.82
	RR	0.94	1.00
	LAD	1.00	1.02
Model 3	OLS	0.90	0.93
	RR	0.98	1.03
	LAD	1.00	1.03
Model 4	OLS	0.83	0.87
	RR	1.01	1.06
	LAD	1.00	1.03
Average		**0.99**	**1.03**

The updated study by SFG (2013) also reports estimates for a range of model specifications and estimation techniques. Their estimates of the combined value of a $1 dividend and the associated imputation credit are also all very close to $1, as set out in Table 3 below. The average estimate of the combined value is 0.97 using the OLS/GLS estimation techniques and 1.03 when using robust regression.

Table 3: Estimates of the combined value of a $1 cash dividend and the associated imputation credit from SFG (2013)

Model	Estimation method	
	OLS/GLS	RR
Model 1	0.87	1.00
Model 2	0.98	1.04
Model 3	0.97	1.01
Model 4	1.04	1.08
Average	**0.97**	**1.03**

This combined value of $1 is also perfectly consistent with all of the relevant studies using alternative methodologies and data sets. Cannavan, Finn and Gray (2004[272]) report a combined value of $1 in their study of individual share futures contracts, and the updated study of SFG (2013) reports a combined value of $0.99.[273] Cummings and Frino (2008) report that the combined value of a $1 dividend and the associate imputation credit is $1.02.[274] Feuerherdt, Gray and Hall (2010) also report a combined value of $1 in their study of hybrid securities.[275]

In its 2009 WACC Review, the AER accepted that the relevant evidence at that time supported a combined value of $1.[276]

By contrast, the explanatory statement states that "dividends should be worth their face value"[277] and that "[a]ll Australian regulators assume that dividends are at face value within calculation of the cost of equity."[278] Thus, a $1 dividend is assumed to be valued at $1. Attached to that $1 dividend will be a 43 cent imputation credit[279] that the AER assumes to be valued at 70 per cent of its face value. The combined value is therefore 1 + 0.7×0.43 = 1.30. This combined value is materially higher than, and contradicted by, every empirical estimate of the combined value.

[272] Cannavan, D., F. Finn, and S.Gray, 2004. "The value of dividend imputation tax credits in Australia," *Journal of Financial Economics,* 73, 167–197.
[273] SFG (2013), "Using market data to estimate the equilibrium value of distributed imputation tax credits," p. 11.
[274] Cummings, J.R., and A. Frino, 2008. "Tax Effects on the Pricing of Australian Stock Index Futures," *Australian Journal of Management,* 33, 391–406, Sub-section 3.2, Table 2 (p.400). 1.02=0.8+0.52x(3/7).
[275] Feuerherdt, C., S. Gray, and J. Hall, 2010., "The value of imputation tax credits on Australian hybrid securities," *International Review of Finance,* 10, 365–401, Section 6, Figure 4 and Table 4.
[276] AER (2009), p. 461.
[277] AER *Explanatory statement - Draft rate of return guideline*, p. 123
[278] AER *Explanatory statement - Draft rate of return guideline*, p.123, Footnote 338.
[279] T/(1-T)=0.3/0.7=0.43.

The combined value of a $1 dividend and the associated imputation credit has consistently and reliably been estimated by a range of authors to be very close to $1. By contrast, the explanatory statement proposes to set the combined value of a $1 cash dividend and the associated imputation credit to $1.30.

7.10.3. Consistent use throughout a determination

As set out above, the estimate of the combined value of a $1 dividend and the associated imputation credit has been reliably and consistently estimated to be $1 across a range of studies and a range of methodologies. The allocation of that $1 combined value between the two components should be applied consistently throughout the determination – whatever that allocation might be. For example, if the regulator determines that a particular value of cash dividends should be used, that value should be applied consistently throughout the determination. The value of theta that should be used is then that value that would result in the combined value being $1 – consistent with all of the available evidence.

7.11. Other econometric issues

In its explanatory statement, the AER sets out a number of econometric issues to be considered in relation to dividend drop-off analysis. This section reviews each of those issues in turn:

1) Use of cum-and ex-dividend day prices. This issue is simply a repetition of the "[p]roblems with trading around the cum-dividend/ex-dividend dates"[280] that has already been addressed above. To the extent that this is an issue at all, it would have the effect of *increasing* the estimate of theta.

2) Bid-ask bounce. At any time, there are standing offers to buy shares in a particular company (at the "bid" price) and standing offers to sells shares (at the "ask" price). Obviously, the bid price will be somewhat lower than the ask price. If a particular transaction is initiated by a seller, it will likely occur at the bid and if it is initiated by a buyer it will likely occur at the ask. Consequently, even if there is no change in the market's valuation of a particular stock, its price over time may "bounce" between the bid and ask prices. This is an issue for every parameter that is estimated using stock price data.

   Fortunately, symmetric bid-ask bounce has no systematic effect – it simply causes mean-zero noise. This means that in any large sample the mean-zero noise is likely to cancel out and have no material impact on the estimate. Where bid-ask spreads can have an effect is where trading at a particular point in time is more likely to occur at either the bid or the ask, as in the model of Frank and Jagannathan (1998). However, as discussed above, this is likely to *increase* the estimate of theta – to the extent that it has any material effect at all.

   The ENA submits that it would be wrong for the AER to rely on the bid-ask bounce argument to place less weight on dividend drop-off analysis because:

   i) There is no evidence that any dividend drop-off estimate has been materially affected by bid-ask bounce;

[280] AER *Explanatory statement - Draft rate of return guideline*, p.242-243

ii) The AER has provided no explanation as to why other parameter estimates that are also based on stock price data have not been similarly affected by bid-ask bounce;

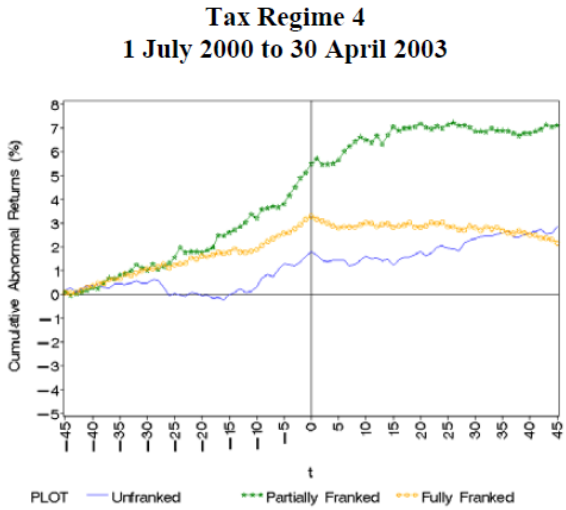
iii) To the extent that bid-ask bounce has any effect, the extraneous evidence (e.g., evidence of a cum-dividend price run-up) suggests that it is likely to *increase* estimates of theta.

3) Delayed incorporation into stock prices. The explanatory statement states that "[t]he complete effects of a market event such as the distribution of dividends can take more than one day to be completely embodied in the trading price"[281] so that "the ex-dividend price may not fully incorporate the value of the imputation credit or the dividend."[282] This is evidently a reference to the advice from McKenzie and Partington (2011) that "[t]he work of Ainsworth, Fong, Gallagher and Partington (2008a) shows that particularly for stocks with a higher bid-ask spread it can take up to three days for the ex-dividend price adjustment to be completed. Thus, the price drop on the ex-dividend date, for such stocks, will not reflect the full value of the dividend. [283]

Ainsworth et. al. (2008) examine data from January 1995 to April 2003. Presumably, as set out above, the only results that are of relevance to the current proceedings are those from the July 2000 to April 2003 period, which is less than three years of data. There are no results for that period that are consistent with it taking "up to three days for the ex-dividend price adjustment to be completed." Consequently, that piece of advice from McKenzie and Partington must not be given any weight, unless the AER determines that pre-2000 data has again become relevant.

Rather, Ainsworth et al. (2008) report that, for their small set of post-2000 data, there are "positive excess returns cum-dividend"[284] and that "the CAR [cumulative abnormal returns] of partially and fully franked stocks stabilises in the ex-dividend period."[285] This is illustrated in Figure 2 from that paper, which is reproduced below. The figure shows that for fully-franked dividends the cumulative abnormal return over the cum-dividend period is more than 3 per cent . That is, the cum-dividend price is more than 3 per cent higher than it would have been if the relevant stocks had moved in line with the broad market. Abnormal returns after the ex-day are not economically significant as the "CAR…stabilises in the ex-dividend period."

[281] AER *Explanatory statement - Draft rate of return guideline*, p.245
[282] AER *Explanatory statement - Draft rate of return guideline*, p.245
[283] McKenzie and Partington (2011), p.11
[284] Ainsworth et. al. (2008), p.18
[285] Ainsworth et. al. (2008), p.18



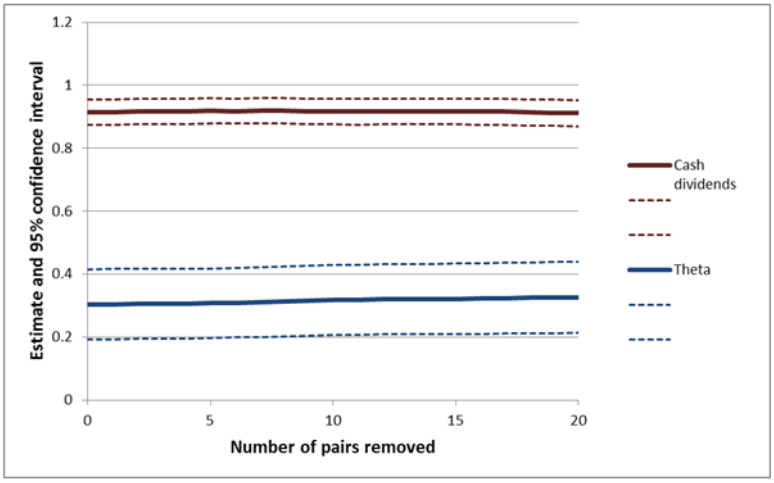
Source: Ainsworth et. al (2008), Figure 2.

In summary, there is no relevant evidence to suggest that the ex-dividend price reaction can take up to three days. The only evidence from the relevant period shows that there is no material reaction subsequent to the ex-date, but that there are abnormal returns in the cum-dividend period. To the extent that this has an effect on the estimate of theta, it would result in an over-estimate.

4) Sensitivity to input data and "extreme multicollinearity." The explanatory statement suggests that "[d]ividend drop off studies are highly sensitive to the input data."[286] However, the SFG studies demonstrate that, where data sets are checked carefully to remove data errors, the results are remarkably stable and consistent. SFG (2011) and SFG (2013) both contain substantial analyses of the stability of estimates and the effect of influential observations. For example, SFG (2013) presents a number of stability analyses such as that in the figure below. These analyses all show that the estimates of the value of cash dividends and the value of theta are remarkably stable as the observations leading to the greatest estimation error are removed from the sample.

[286] AER *Explanatory statement - Draft rate of return guideline*, p.245

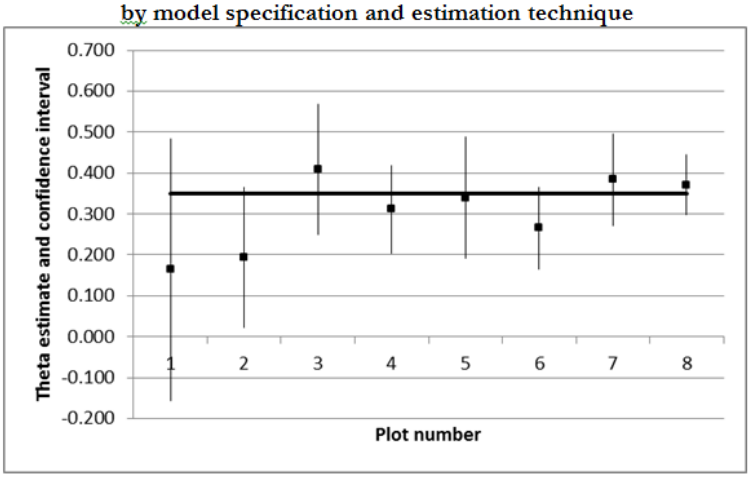
Figure 4
Sensitivity to removal of influential observations: Model 4



Source: SFG (2013), Figure 4.

In addition, the SFG studies show that the estimates of theta are also stable across model specifications and estimation techniques. This stability is demonstrated in several tables throughout the SFG studies and in figures such as that below.

Figure 9
Summary of point estimates and confidence intervals for theta by model specification and estimation technique



For each estimate, the narrow line represents the 95% confidence interval for theta and the solid black marker represents the point estimate. The solid black horizontal line represents the recommended point estimate of 0.35. For all models, the announcement threshold is set to two standard deviations.
Plot 1: Model specification 1, OLS estimation; Plot 2: Model specification 2, OLS estimation;
Plot 3: Model specification 3, OLS estimation; Plot 4: Model specification 4, OLS estimation;
Plot 5: Model specification 1, RR estimation; Plot 6: Model specification 2, RR estimation;
Plot 7: Model specification 3, RR estimation; Plot 8: Model specification 4, RR estimation.

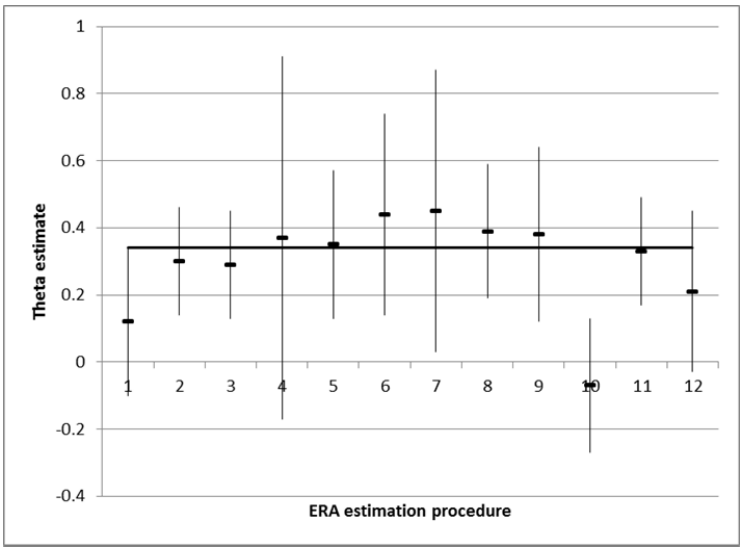
Source: SFG (2011), Figure 9.

The explanatory statement goes on to quote one of the conclusions of the ERA study that "any estimate of theta is essentially a function of the most influential observations due to the extreme multicolinearity (sic) present in the data."[287] The ENA submits that the AER should apply no weight at all on this conclusion for the following reasons:

1) The ERA study uses four different parametric forms, only two of which include dividends and imputation credits as independent variables. In a model with one independent variable, multicollinearity cannot possibly exist. Consequently, any problem caused by or related to multicollinearity cannot affect the results of those model specifications[288];

2) In any event, neither the AER nor ERA have provided any basis at all for linking the effects of influential observations to multicollinearity (even in those model specifications where multicollinearity is possible). Nor has the ERA conducted any statistical tests for the presence of multicollinearity – it has merely asserted that it is a general problem.

3) The ERA's own analysis does not support its conclusion. The ERA's own estimates across four different model specifications and three different estimation techniques are quite stable. The figure below shows the ERA's theta estimates for the case where the standard market correction is applied. The figure shows the point estimates of theta and the corresponding 95 per cent confidence intervals. It also shows the average theta estimate reported by the ERA of 0.34. All but one of the confidence intervals contains the average estimate of 0.34 and the vast majority of estimates are economically close to 0.34. It is only two of the OLS estimates that are materially lower than 0.34.



Source: ERA (2013), Table 5.

4) Zero drop-off observations. The explanatory statement suggests that observations where the ex-dividend price is the same as the cum-dividend price are "likely to reflect thin or no trading in a particular stock."[289] That is, the ex-dividend price may be recorded as being the same as

[287] AER *Explanatory statement - Draft rate of return guideline*, p.245
[288] Of course, even in the specifications with a single independent variable (where multicollinearity cannot exist, by definition) the analysis still produces a pair of estimates (the value of cash dividends and the value of imputation credits) that must be employed as a pair of estimates consistently throughout the WACC estimation process.
[289] AER *Explanatory statement - Draft rate of return guideline*, p.245

the cum-dividend price because there was no trading on the ex-dividend day. This is not the case in the SFG studies, in which every observation is checked to ensure that there was positive trading volume on the ex-dividend day. Every observation is based on a traded market price.

5) Very high standard errors. The explanatory statement suggests that "[e]stimates in dividend drop-off studies have very high standard errors."[290] This is simply untrue. By any metric, the standard errors are not high at all. Consider, by way of example, the results from the SFG (2013) study that are reproduced below. The standard errors are very small relative to the coefficient estimates in all cases.

Model 4	Estimate	Std Err (White)	Std Err (Firm clustering)
Cash	0.9136	0.0203	0.0209
Franking credits	0.3044	0.0557	0.0645
Package	1.0440	0.0139	0.0157
R-squared	0.7193		
Adjusted R-Squared	0.7192		
N	3,642		

Source: SFG (2013), Table 2, p. 18.

7.12. Alternative market value studies

7.12.1. Use of pre-2000 data

The explanatory statement notes that "[b]esides dividend drop-off studies, there are alternative market based implied valuation approaches to estimating the utilisation rate,"[291] involving a comparison of "two security prices where one security includes the entitlement and one security excludes the entitlement."[292] The market valuation of the entitlement is then reflected in the difference between the prices of the two securities. The explanatory statement goes on to note that these studies "are designed to avoid the other influences in the data that affects traditional dividend drop off analysis. In particular, the studies typically use simultaneous price differentials that make them less affected by general market movements."[293]

The explanatory statement Table K.14 sets out a list of alternative market value studies. The first four studies in this table produce estimates based on pre-2000 data. As for the pre-2000 dividend drop-off analyses, the ENA assumes that the AER will place no weight on studies that are based on pre-2000 data, and the ENA reserves its right to make detailed submissions in relation to the relative merits of the methodologies of individual studies if the AER determines that pre-2000 data has once again become relevant.

[290] AER *Explanatory statement - Draft rate of return guideline*, p.245
[291] AER *Explanatory statement - Draft rate of return guideline*, p.245
[292] AER *Explanatory statement - Draft rate of return guideline*, p.245
[293] AER *Explanatory statement - Draft rate of return guideline*, p.245

7.12.2. Individual share futures contracts

Cannavan, Finn and Gray (2004) examine ordinary shares (which entitle the holder to dividends and imputation credits) and futures contracts on those ordinary shares (which do not entitle the holder to dividends or imputation credits). The implied value of dividends and imputation credits can be estimated by comparing the simultaneous prices of the two securities. In particular, for futures contracts there is a well-known "cost of carry" or "fair value" relationship that stems from the fact that the futures payoff can be exactly replicated by a dynamic strategy of borrowing money to buy the physical shares.

An investor who purchases a futures contract effectively receives a payoff of $S_T - F$ at maturity of the contract where S_T is the stock price at maturity and F is the futures price. An investor who borrows money to buy the stock today and then repays the borrowed funds at maturity receives a payoff of $S_T - S_0(1+r)^T$ where S_0 is the current stock price, r is the interest rate, and T is the time to maturity. Since both of these strategies require no initial investment and because all terms other than S_T are known constants, it must be the case that $F = S_0(1+r)^T$. This relationship does not require any assumptions other than the absence of easy arbitrage opportunities – the most fundamental assumption that is required before market prices can be used for *any* purpose. Cannavan, Finn and Gray (2004) show that this pricing relation holds to within a fraction of a per cent for the data in their sample.[294]

Cannavan, Finn and Gray (2004) then use this no arbitrage condition to estimate the implied value of dividends and imputation credits using a sample of firms that paid a dividend prior to the maturity of the futures contract.

Since this study uses pre-2000 data, the specific results are assumed to be irrelevant for current purposes. However, it is relevant that the methodology and approach was approved by the peer review process of the *Journal of Financial Economics* (JFE), which is one of the top three finance journals world-wide.

SFG Consulting (2013)[295] update the Cannavan, Finn and Gray (2004) study using data from July 2000 to December 2012. They employ the same methodology as was used for the earlier JFE study – they simply apply it to an updated post-2000 data set. They conclude that:[296]

> *This report has been prepared by two of the authors of the Cannavan, Finn and Gray (2004) study. We have used the same data source and applied the same methodology to data from July 2000 to February 2013. The data set consists of 52,041 observations. The simultaneous prices of ordinary shares and matching futures contracts imply that:*
>
> *a) The combined value of a $1 cash dividend and the associated imputation credit is $0.99;*
>
> *b) Cash dividends are valued at 94 per cent of face value; and*

[294] Cannavan, Finn and Gray (2004), Figure 2.
[295] SFG (2013), "Using market data to estimate the equilibrium value of distributed imputation tax credits."
[296] SFG (2013), "Using market data to estimate the equilibrium value of distributed imputation tax credits," p. 3.

c) Imputation credits are valued at 12 per cent of face value.

The explanatory statement also cites the futures-based study of Cummings and Frino (2008) (CF). The ENA submits that this study should not receive any material weight vis-à-vis the SFG (2013) futures study for the following reasons:

1) The CF study examines a total of only 16 futures contracts, whereas the SFG study examines 46 contracts;

2) The CF study uses data that covers a period of less than four years ending in 2005. That study is considerably smaller and more dated than the SFG study which uses data from July 2000 to March 2013, a total of 52,041 observations;

3) Whereas the SFG study analyses individual stocks and takes account of the precise amount and timing of the dividend, the CF study examines the broad stock index and requires broad assumptions about the aggregate dividends and franking credits across the market;

4) Whereas the SFG study ensures that the specific stock and matching futures contract trade simultaneously, that is not possible for the ASX 200 index. As Cummings and Frino (2008) explain "the index calculation utilises stale prices especially for thinly traded stocks, so that the price at which one can buy or sell the index replicating basket of stocks can diverge temporarily from the instantaneously reported value."[297]

5) Like Beggs and Skeels (2006), Cummings and Frino (2008) use unscaled data. However, Cummings and Frino do not use a feasible GLS methodology to control for potential heteroscedasticity.

Cummings and Frino (2008) report that the combined value of a $1 dividend and the associate imputation credit is $1.02.[298] This result is consistent with the combined value of $1 reported by SFG (2013) and with the combined values reported by the dividend drop-off studies above. Cummings and Frino report that cash dividends are valued at 80 per cent of face value and imputation credits are valued at 52 per cent of face value.[299] These results are consistent with the dividend drop-off results of Beggs and Skeels (2006), who examined a similarly short period of data, also using unscaled data.

7.12.3. Hybrid securities

Feuerherdt, Gray and Hall (2010) apply dividend drop-off analysis to hybrid securities. These are securities that have relatively high fully-franked dividends and low price variation over time. For this reason they tend to have a higher signal-to-noise ratio than ordinary shares in the sense that the dividend tends to be large relative to the usual daily price change.

Feuerherdt, Gray and Hall (2010) report that the combined value of a $1 dividend and the associated imputation credit is $1.[300] Because these securities are designed to pay a high fully-franked dividend, there are no examples of unfranked dividends in the sample, in which case attribution of the $1 total value between the dividend and imputation credit requires the value of one of the components to be set using extraneous evidence. The authors note that if the cash dividend is

[297] Cummings and Frino (2008), p.394.
[298] Cummings and Frino (2008), Table 2, p.400. 1.02=0.8+0.52x(3/7).
[299] Cummings and Frino (2008), Table 2, p.400. 1.02=0.8+0.52x(3/7).
[300] Feuerherdt, Gray and Hall (2010), Figure 4 and Table 1.

assumed to be fully valued (as the AER assumes in setting the regulated revenue stream)[301] the implication is that imputation credits do not affect the equilibrium value of these securities – theta is zero.

7.12.4. Rate of return studies

Two more recent studies test whether (other things being equal) firms with higher imputation credit yields are valued more highly by investors. Both studies find that they are not. This implies that equilibrium stock prices are independent of the amount of imputation credits that they generate, which leads the authors to conclude that theta is not materially different from zero, in equilibrium.

Lajbcygier and Wheatley (2012)[302] summarise their results as follows:

> *The provision of imputation tax credits can in principle lower the returns that investors require on equity. Whether in practice imputation credits lower the returns that investors require depends in large part on the impact of foreign investors on equity prices. This is because foreign investors in general cannot use the credits that domestic equities provide. We use a range of pricing models and monthly data from July 1987 to December 2009 to test whether, holding risk constant, equity returns are related to credit yields. We find no evidence that the provision of imputation tax credits lowers the returns investors require on equity.*[303]

They conclude that:

> *If a representative long-term investor assigns no value to the credits that firms distribute, and our results cannot reject that hypothesis, then in assigning a value to credits regulators are likely to underestimate the cost of equity for these firms.*
> [304]

The results of Lajbcygier and Wheatley (2012) have recently been corroborated by Siau, Sault and Warren (2013)[305] who summarise their results as follows:

> *We investigate the value placed on imputation credits in the Australian stock market by examining whether they are capitalised into prices using two main methods. First, we relate stock prices to the present value of dividends and imputation credits under a discounted cash flow valuation model. Second, we regress earnings yields on imputation credit yields plus a range of control variables. We find no substantial evidence that the presence of imputations credits has any significant marginal influence on the overall level of share prices. Our results align with Lajbcygier and Wheatley (2012), who uncover no evidence of any negative relation between imputation credits and realised returns. Together these findings suggest that imputation credits are not priced from the perspective of longer-term buy-and-hold investors. The implications are that such investors*

[301] AER *Explanatory statement - Draft rate of return guideline*, p.123
[302] Paul Lajbcygier and Simon Wheatley (2012), Imputation credits and equity returns, The Economic Record, 88, 283, 476-494.
[303] Lajbcygier and Wheatley (2012), p. 476.
[304] Lajbcygier and Wheatley (2012), p. 491.
[305] Shaun Siau, Stephen Sault and Geoffrey Warren, (2013), "Are imputation credits capitalised into stock prices?" Working Paper, Australian National University.

> *might expect to fully benefit from their imputation credits, and that it may be inappropriate to incorporate imputation effects when estimating cost of capital.*[306]

The attached report from NERA (2013)[307] updates the Lajbcygier and Wheatley (2012) study and summarises the results from this strand of the literature. This literature recognizes that the total required return on equity depends on systematic risk factors. Under the Sharpe-Lintner CAPM, for example, the total required return on equity depends on beta. Imputation credits are relevant only to the extent that the total required return is partitioned between imputation credits on the one hand and dividends and capital gains on the other. If imputation credits are highly valued by the representative investor, firms with high franking credit yields would require lower returns from dividends and capital gains, other things (including systematic risk) equal. However, NERA (2013) show there is *not* an inverse relationship between franking credit yield on the one hand and dividends and capital gains on the other. NERA (2013) conclude that this literature suggests that there is no evidence that a material value for imputation credits is factored into stock returns or capitalized into stock prices.

These studies are broadly based on the same methodology of the studies that the AER has previously used to support its use of the Sharpe-Lintner CAPM, rather than a version of the CAPM that allows for dividends and capital gains to be differentially valued.[308] In the 2009 WACC Review, the AER stated that:

> *the evidence from US dividend yield studies indicates that cash dividends are fully valued in total equity returns. In turn, this implies that there is no clear evidence to replace the Sharpe CAPM with an alternative tax-adjusted CAPM (e.g. Brennan CAPM), even if this option were available to AER under the NER.*[309]

The "US dividend yield studies" on which the AER relies to support its assumption that cash dividends are fully valued (as per the assumption of the Sharpe-Linter CAPM) compare the returns of companies with high dividend yields with the returns of companies with low dividend yields. Because there is no difference between the returns of each group, the authors conclude that returns are independent of dividend yields. If dividends were valued less than capital gains, high-dividend yield companies would require higher total returns.

The franking credit yield studies show that returns are independent of the imputation credit yield. If imputation credits were materially valued, firms with high imputation credit yields would require lower returns (from dividends and capital gains) – but this is not the case.

7.13. Summary and conclusions

The current Rules do not provide sufficient latitude for a new conceptual approach to be adopted for gamma in the way that the draft guideline proposes. The required concept for gamma is that it be a valuation (not a utilisation) of imputation credits, established in a manner that is consistent with the WACC more broadly.

[306] Siau, Sault and Warren (2013), p. 1.
[307] NERA (2013), "Imputation credits and equity prices and returns.", October 2013
[308] For example, the model of Lally and van Zijl (2003).
[309] AER (2009), p.461, p.465

There is a sound basis derived from the NEO/NGO, Revenue and Pricing Principles and the allowed rate of return objective why the gamma valuation needs to be consistent with equity market clearing prices.

Taxation statistics cannot be used for establishing gamma. Even if taxations statistics were robust, stable and internally consistent, they are not capable of producing a valuation. Additionally, there are significant problems with taxation statistics that are frequently revised and which are currently showing an internal inconsistency of many tens of billions of dollars, a figure that is progressively growing over time.

By contrast, market based valuations such as dividend drop-off studies, studies of futures trading data and rate of return studies are observable valuations of the prices that investors have collectively set for this component of the return on their investments and they use data sources that are consistent with those used for other aspects of the WACC.

None of the potential issues raised in the explanatory statement concerning these market based valuation methods have been found to exist in practice and there is no basis to reject them as a robust and accurate source for the valuation that investors place on the returns that they obtain through imputation credits.

7.14. Technical note: Reduction in allowed return on equity implemented via tax allowance

The following calculations set out the implementation of the building block approach under the Rules. The point of this exercise is to show that the estimated value of gamma is used to reduce the return on equity that the benchmark firm is able to pay to its shareholders out of allowed revenues. Although the technical implementation occurs via the tax allowance, the objective and the effect is to reduce the return that the benchmark firm is able to distribute to its shareholders.

The figures in this example are drawn from a submission to the AER from ETSA Utilities at the time of the last SA Electricity Distribution Review. References are to the Rules at the time of that review and parameter estimates are those adopted by the AER in that review. The new Rules have not changed the way the estimate of gamma has its effect on the allowed return on equity via an implantation through the tax allowance.

Rule 6.5.2(b) requires the use of the CAPM to estimate the required return on equity. In the SA Final Decision, the AER implemented the CAPM as follows:

$$k_e = r_f + \beta \times MRP$$
$$= 5.89\% + 0.8 \times 6.5\% = 11.09\%.$$

Rule 6.5.2(b) also requires that the required return on debt is to be calculated by adding a debt risk premium to the risk-free rate. In the SA Final Decision, the AER's implementation of this step was as follows:

$$k_d = r_f + DRP$$
$$= 5.89\% + 2.98\% = 8.87\%.$$

Rule 6.5.2(b) also requires the rate of return to be computed according to the nominal post-tax WACC formula that is usually called the "vanilla" WACC. In the SA Final Decision, the AER's implementation of this step was as follows:

$$WACC = k_e \frac{E}{V} + k_e \frac{D}{V}$$
$$= 11.09\% \times 0.4 + 8.87\% \times 0.6 = 9.76\%.$$

Consider a generic benchmark firm with initial RAB of $1,000. Consequently, the cash flow that must be available to provide a return to investors over the first year of the regulatory control period is:

$$9.76\%. \times 1{,}000 = 97.6.$$

The amount of equity financing is 40 per cent of the RAB, or $400. The return to equity holders is computed by multiplying the amount of equity by the required return on equity:[310]

$$11.09\%. \times 400 = 44.4.$$

Rule 6.5.3 requires the estimated cost of corporate tax to be computed as a function of the pre-tax income, the corporate tax rate (30 per cent), and the assumed value of gamma (0.65).

In the absence of certain firm-specific complexities,[311] the firm's pre-tax income is computed as:

$$ETI = \frac{\text{Total Return to Equity}}{(1 - r(1-\gamma))} = \frac{44.4}{(1 - 0.3(1-0.65))} = 49.6.$$

Rule 6.5.3 is then implemented as follows:[312]

$$ETC_t = (ETI_t \times r_t)(1-\gamma)$$
$$= (49.6 \times 0.3)(1 - 0.65) = 5.2.$$

Rule 6.4.3 provides that the annual revenue requirement is to be computed as the sum of a number of "building block" components. For this illustration, we assume that regulatory depreciation is 50 and operating expenses are 100. We note that the choice of values for these two elements is irrelevant to the calculations being performed below as they simply wash out of the analysis – whatever these costs are, the revenue requirement is simply increased to accommodate them and

[310] The amount of debt financing is 60% of the RAB, or 600. The return to debt holders is computed by multiplying the amount of debt by the required return on debt: 8.87% x 600 = 53.2. Note that the return to equity plus the return to debt is equal to the total required return from applying the aggregated WACC to the RAB, as above: 44.4+53.2=97.6.

[311] Such as a difference between tax and regulatory depreciation, and customer contributions that are outside the regulatory framework except for the effect they have on tax paid.

[312] The PTRM sets this out as the difference between corporate tax payable and the assumed value of franking credits. In this case, corporate tax payable is pre-tax income multiplied by the corporate tax rate $49.6 \times 0.3 = 14.9$ and the assumed value of franking credits is equal to the amount of tax paid (which is also the amount of franking credits created) multiplied by the assumed value of gamma $14.9 \times 0.65 = 9.7$ in which case the expected tax cost is $14.9 - 9.7 = 5.2$.

the pre-tax profit, tax paid, and assumed value of franking credits is unchanged. The implementation of Rule 6.4.3 is then as follows:313

Return on Equity		44.4
Return on Debt		53.2
Regulatory Depreciation		50
Operating Expenses		100
Tax Payable	14.9	
Less Value of Imputation Credits	-9.7	5.2
Annual Revenue Requirement		**252.8**

Note that the estimated cost of corporate tax (5.2 in the last two rows of the table above) is *added* here and has the effect of *increasing* the annual revenue requirement. That is, annual revenues must be sufficient to pay the expected tax cost.

Now consider the equity holders, who are entitled to the residual cash flow, after all expenses have been met. The cash flow to equity holders is set out in the following table:

Total revenue	252.8
-Interest to debt holders	53.2
-Regulatory Depreciation	50
-Operating Expenses	100
-Corporate tax	14.9
Cash flow to equity	**34.7**

That is, the equity holders receive the residual cash flow of 34.7. In addition, the firm pays corporate tax of 14.9, which creates franking credits with a face value of 14.9. Each of these franking credits is assumed to be worth 65 per cent of its face value, giving a total value of $0.65 \times 14.9 = 9.7$. The total return to equity holders is then:

$$\begin{aligned}\text{Return to Equity} &= \text{Residual Cash Flow} + \text{Assumed Value of Franking Credits} \\ &= 34.7 + 9.7 = 44.4.\end{aligned}$$

Consequently the proportion of the total return to equity that is assumed to be delivered in the form of franking credits is:

$$\frac{\text{Assumed Value of Franking Credits}}{\text{Return to Equity}} = \frac{9.7}{44.4} = 22\%.$$

Non-resident investors do not benefit from franking credits. Consequently, they receive only the 78 per cent of the return to equity that is provided by means other than franking credits. This means that the return on equity available to non-resident investors is:

$$0.78 \times 11.09\% = 8.67\%,$$

which is lower than the return on first-ranking fixed-income debt in the same firm.

313 Note that some items may not add exactly due to rounding.

Note that the return available to non-resident investors here is:

$$k_e \frac{1-T}{1-T(1-\gamma)} = 0.1109 \times \frac{1-0.3}{1-0.3(1-0.65)} = 8.67\% .$$

Appendix C: List of expert reports

Attachment 1	NERA *The Fama-French Three-Factor Model*
Attachment 2	SFG Consulting *Reconciliation of dividend discount model estimates with those compiled by the AER*
Attachment 3	NERA *The Market Risk Premium: Analysis in Response to the AER's Draft Rate of Return Guidelines*
Attachment 4	NERA *Imputation Credits and Equity Prices and Returns*
Attachment 5	SFG Consulting *Using market data to estimate the equilibrium value of distributed imputation tax credits*
Attachment 6	Neville Hathaway *Imputation Credit Redemption ATO data 1988-2011*
Attachment 7	PWC *Responding to AER's criticism of PwC's report on the benchmark term of debt*
Attachment 8	Competition Economists Group *Response to AER criticisms of estimates of average term of debt at issue*
Attachment 9	Competition Economists Group *Mechanistic cost of debt extrapolation from 7 to 10 years*
Attachment 10	Competition Economists Group *Review of Lally and Chairmont Report*

Appendix D: JonesDay Memorandum

This document has been provided as a separate attachment.