Response to AER Rate of Return Guideline Consultation Paper

28 June 2013

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1. Executive summary

The Energy Networks Association welcomes the opportunity to respond to the AER Consultation Paper *Rate of Return Guidelines* (Consultation Paper). This is an important phase in the development of the AER guideline, and the ENA considers the manner in which the AER takes into account the material presented in this phase will be critical in determining the overall quality and robustness of the guideline, and its capacity to be applied in future reviews.

Opportunities provided by the rate of rate return guideline

The rate of return guideline is a substantive outcome of the Australian Energy Market Commission's (AEMC's) recent *Economic Regulation of Network Service Providers* rule change process. This rule review process determined that a harmonised rate of return estimation framework should be introduced across the regulated energy infrastructure sector. This new framework envisages a focused sector-wide consultation on key rate of return estimation issues through a cycle of new and revised guidelines, and the application of these approaches to the extent appropriate in evolving market conditions and individual circumstances in ongoing network determinations.

The rate of return guideline represents an opportunity for the AER to:

- provide **critical guidance over how it will interpret and apply key rule provisions** on rate of return estimation issues, thereby promoting investment certainty and efficient financing of long-term infrastructure assets;

- enshrine cost of equity and cost of debt estimation approaches that deliver **lower volatility in revenue and prices to consumers through time**, and which also more closely match both efficient financing approaches, and investors' perspectives about the volatility of required returns over time;

- adopt a rate of return estimation approach that **better draws on a wider available set of relevant estimation methods, models, market data and other evidence** to deliver a more robust, stable and predictable estimate; and

- comprehensively review and better define how the variety of empirical and theoretical evidence is considered and reconciled, and determine how it can be transparently used to reach **a high quality estimate of the rate of return.**

Development of an effective rate of return guideline which achieves these outcomes should promote the long-term interests of both consumers, and energy network businesses, through development of an improved rate of return decision-making framework over the medium-term.

Delivering approaches to benefit the long-term interests of consumers

ENA members understand that customers have an interest in ensuring that rate of return outcomes are efficient and that they are not unduly volatile. It is clear that most customers highly value pricing stability. The ENA supports this objective, subject only to ensuring, consistent with the long-term interests of consumers in continued service and reliability delivery, that network businesses are able to recover at least their efficient costs.

The delivery of the outcomes outlined above will critically depend on the decisions the AER makes in the lead up to the draft guideline on how the new rate of return rules are applied, and its approaches to the outstanding issues on estimating the cost of debt and equity.

Applying the new Rules framework

The new Rules place fundamentally different obligations on the AER than existed under the previous Rules. In electricity the previous rules were prescriptive and in gas the previous rules were interpreted by the AER in a manner that effectively narrowly promoted incumbent methodologies. By contrast, the new rules require the AER to have regard to the full range of relevant methods, financial models, market data and other evidence.

An approach that considers all relevant estimation methods, financial models, market data and other evidence, and which gives appropriate weight to each piece of evidence based on all available information, in a transparent, predictable and replicable way, is most likely to achieve the overall rate of return objective and therefore be consistent with the Rules. Such an approach would lead to more stable cost of capital estimates through time and lower volatility providing more stable investment signals and benefitting consumers. In seeking to identify what is efficient, it is also important that, wherever possible, the guideline look towards the market, and what business practitioners do, rather than relying solely on theoretical or academic approaches.

The ENA considers it essential that the guideline provides confidence regarding how the AER intends to assess the allowed rate of return. The new Rules and the AEMC's policy intent require a robust Guideline that provides as much certainty as is reasonably practical regarding the way the AER is likely to assess the allowed rate of return in individual revenue determinations. It is recognised that the guideline cannot provide complete certainty and that some areas of regulatory discretion are inevitable. The guideline should set out the methodologies, models, data and relevant evidence as far as reasonably possible to maximize the certainty that can be provided. This would also minimize the need to revisit issues at the time of individual regulatory proposals.

To reach a transparent and sound decision-making framework which enjoys the confidence of all parties, it is important for there to be a shared and correct understanding of the way the relevant Rules, Laws and any other considerations introduced by the AER into the process interact. ENA considers that it is clear that the allowed rate of return objective is, and was intended to be, the primary guiding objective for decisions by the AER on rate of return issues.

The NEO, NGO and RPP can assist in interpreting that rate of return objective where there is uncertainty in its application. However, it is critical for the stability and clarity of the rules-based framework that they should not be used to infer additional "criteria" or "principles" unless the policy intent to do so is unambiguous. For this reason, the ENA considers that a number of the AER's proposed criteria have no foundation in the Rules and should be removed. (See Section 3.2).

Approach to estimating a cost of equity under the new Rules

A key difference between the previous and current rules is the guidance provided to selecting a return on equity estimate. This does not appear to have been fully reflected in the Consultation Paper's consideration of alternative approaches.

The ENA submits that the Rules require the regulator to use all relevant evidence to obtain the best possible estimate of the *ex ante* required return on equity, and this will result in more stable regulatory allowed returns and prices and less over- or under-compensation.

The 'one model' or 'several models with fixed weightings' approaches for bringing together evidence from relevant estimation methods, financial models, market data and evidence as outlined in the Consultation Paper are inconsistent with the Rules, inconsistent with the clear intention of the AEMC, and impractical or impossible to implement in the form currently described.

It is the clear intention of the AEMC that the AER should not persist with its previous approach for determining the allowed return on equity. Unless the AER makes it clear in the guideline how a 'primary model with reasonableness checks' approach would properly take into account all of the relevant other methods, models, data and evidence, that approach would also arguably be inconsistent with the Rules and the AEMC's policy intent, as well as being impractical or impossible to implement.

ENA has a range of individual concerns with the set of reasonableness cross checks currently employed by the AER. These relate to both the information value of the cross check, what reasonable inferences may be drawn from their application and the practical impacts of applying these cross checks in a decision which also feature applied asset pricing models. These are detailed in Section 4.3.3.

Industry proposes a 'multi-model' approach

The ENA has previously submitted that four models (Sharpe-Lintner CAPM, the Fama-French 3-factor model, Black CAPM and the dividend growth model (DGM)) should be considered when estimating the required return on equity under the new Rules. The ENA remains firmly of this view.

The network sector is proposing a 'multi-model' or 'portfolio' approach to the AER and has previously provided a detailed written summary on how this could be applied in practice. This submission provides a further worked example of how this model could be implemented, as well as consideration of the other approaches and models outlined.

Promoting stability in key benchmarks and promoting consistency

The rate of return guideline process is also the opportunity to build on the rules requirement to deliver an internally consistent rate of return estimate. Energy networks consider this requirement to be a crucial discipline to the estimation process which supports the goal of high quality and robust estimates.

The networks sector has sought to promote the fulfillment of this requirement in two ways:

- First, by advocating a multi-model approach which features as a key implementation step the development of a consistently derived estimate of the required return for the average firm, to ensure that common assumptions and input parameters are used when applying the models;

- Second, by supporting approaches to parameterizing asset pricing models and estimating the cost of corporate income tax that build on established regulatory approaches in estimating key benchmarks.

The ENA agrees with the position taken in the Consultation Paper – that the gamma parameter should be considered as part of the Rate of Return Guideline and that gamma should be estimated as the product of two components – the distribution ratio (F) and the value of a distributed credit (θ).

The ENA has commissioned an updated assessment of the 'gamma' parameter based on the outcomes of the Tribunal's most recent considerations on appropriate estimation methodologies and techniques and providers this for AER consideration, noting the key linkages which exist between the determination of the benchmark entity required under the rules, and the guidance provided in the rules on the need for internal consistency in parameter estimation.

Applying the new cost of debt framework to achieve flexibility and continuity

The guideline process represents the first opportunity in a decade for the AER to comprehensively review feasible cost of debt approaches, to utilise the flexibility provided in the new rules framework and to outline a stable regulatory decision-making framework in an area of considerable contention over the past five years.

ENA's position on cost of debt is to seek to build consistently upon those areas of practice in the past that remain consistent with the new rules framework, while allowing scope to move regulatory practice on cost of debt forward to use the flexibility provided by the rule change. This mix of continuity and adaptation to incorporate more flexible cost of debt approaches is reflected through networks positions on key issues.

The characteristics of the assumed debt issued by a benchmark business should, ideally, reflect the practices of the market, including network businesses. The characteristics of debt issued should also be internally consistent with the method and data used to estimate the cost of equity. This means that the benchmark credit rating should be achievable given the cash-flows generated by a cost of equity allowance and also the type of debt issued should reflect the practices of networks.

In relation to gearing, the current 60% benchmark gearing is consistent with business practice. However, given the AER's current approach to estimating the cost of equity for a 60% geared company, the resulting cash-flows are inconsistent with the benchmark entity obtaining a BBB+ credit rating. The ENA notes that to some extent the AER's approach to the cost of equity estimation has, due to very low cost of equity allowances, exacerbated this problem. Depending on the likely impact of any changes to the AER's cost of equity methodology it may be possible to support a benchmark credit rating of higher than BBB/BBB-.

A maturity assumption of 10 years continues to provide an appropriate benchmark. In addition, the ENA notes that NSPs issue debt in markets both domestically and internationally and issue a mix of non-callable and callable debt. To the extent that the AER were to perform bespoke estimates of the cost of debt it should take these into account.

The ENA believes that the yield on benchmark debt issuance should be estimated using a credible third party estimate of comparable fair value yields. The best source of such an estimate currently available is the Bloomberg BBB fair value curve, extrapolated from 7 to 10 years. An alternative or adjunct to the Bloomberg fair value curve is estimation of a fair value curve by the AER from individual bond yield estimates published by Bloomberg. The AER should avoid any adoption of sampling approaches similar to those used by the WA Economic Regulation Authority (ERA) and the NSW Independent Pricing and Regulatory Tribunal (IPART). Such approaches unnecessarily exclude data from the sample (e.g. on the basis of maturity) and do not use robust econometric techniques to adjust for within sample differences (e.g. in bond maturity).

Providing for a trailing average approach to apply

There is general acceptance that the trailing average cost of debt is a desirable approach for the majority of businesses. A trailing average cost of debt allowance will better reflect the actual efficient financing practices of these businesses and is more easily hedged by them, removing a previously uncompensated risk to equity holders. It will also lower volatility in revenues and prices between resets. This is contingent on the trailing average being implemented with a mechanism to ensure that annual variations in the cost of debt are reflected in a timely change to the regulatory allowance.

This is not the case for all network businesses, however. The particular circumstances of some businesses mean that they consider a hybrid approach will better reflect their own efficient debt

management practices. Given this, the ENA considers that the guidelines should set out the AER's approach to each possible benchmark (trailing average, hybrid and 'on the day'). This would not preclude the AER from stating that it considers one of these benchmarks to be, in general, superior to the others. If the AER were to choose to include only the trailing average methodology in the guideline, it would need to make clear how this could be made effective in practice for all businesses.

Support for a trailing average approach is conditional on automatic updating both during any transitional period, and during following periods. Network businesses consider that the revenue and pricing volatility as well as cash-flow implications of a potentially significant mismatch between actual and benchmark costs arising from a lack of updating strongly suggest this approach is to be preferred. The ENA notes that the AEMC included a mechanism in the Rules to allow for automatic updating to occur.

Transitions to any new cost of debt approaches

The ENA considers the purpose of transitional arrangements is to provide a mechanism (or mechanisms) to ensure that businesses are able to meet their new regulatory obligations and recover at least their efficient costs. Any transition arrangements need to be fair and reasonable. These considerations may require the AER to take into account the individual circumstances of the business in question. 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.

Where applied, transitional rules provided must be fair and reasonable, include annual updating provisions and enable businesses to appropriately transition to the new methodology. For this reason it is considered that the guidelines should outline appropriate transitional provisions to provide certainty for business and provide businesses with an opportunity to prepare for transition to the new methodology.

Next steps and engagement

The network sector expects that this phase, and the consideration by the AER of responses to a published draft guideline, will be the most material, in shaping the contents and ultimate success of the guideline development.

This submission and associated attachments provides what the sector considers to be critical evidence in ensuring that the development of the guideline draft is rigorous, tested, evidence-driven and pragmatic. It is industry's strong view, however, that further close engagement will be required between the AER and all stakeholders to lay a sound foundation for the rate of return guideline. Recently, the network and pipeline sector put forward a model for how such engagement could ensure that expert evidence is better integrated into the AER's decision processes. The network sector considers this submission provides a starting point for these required discussions.

The recent publication by the AER of the draft Frontier Economics and McKenzie and Partington reports is a concrete example of the need for an ongoing and iterative dialogue in the lead up to the finalization of the guideline. The timing of these reports has meant that the ENA has only been able to provide limited comments in response as part of this submission. The ENA will provide a separate comprehensive response to the issues raised by those papers.

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.

2.2. Structure of submission

The remainder of the submission is structured as follows:

Section 3	sets out the decision-making framework for making the Rate of Return guideline.
Section 4	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 5	sets outs the approach that should be adopted in setting the return on debt.
Section 6	discusses the framework for the recovery of financing costs.
Section 7	outlines initial industry views on the appropriate method for forecasting inflation.

The submission should be read together with the attached expert reports. A list of these reports is provided in Attachment 1.

This submission does not individually address the questions posed in the Consultation Paper. The matters raised in these questions, however, have been comprehensively addressed in the relevant sections.

3. Framework for estimating the rate of return

3.1. Determining the allowance

Key position 1

The new Rules place fundamentally different obligations on the AER than existed under the previous Rules. In electricity the previous Rules were prescriptive and in gas the previous Rules were interpreted in a way manner that narrowed the methodologies that were considered for use. By contrast, the new Rules require that the AER "must have regard" to the full range of relevant methods, financial models, market data and other evidence.

The two key changes that the AEMC rule change implemented were to establish an allowance that should be commensurate with the efficient financing costs of a benchmark efficient entity by:

- bringing to an end the practice of setting the allowed rate of return on equity using solely the SL-CAPM and instead requiring the AER to have regard to the full range of relevant estimation methods, financial models, market data and other evidence; and

- providing for the use of historical, contemporaneous or hybrid sources of data to establish the benchmark for debt.

Further flexibility and discretion is also provided through the explicit authority for the AER to provide for the annual updating for debt.

The new rules now require the AER to have regard to a wider set of evidence, models and methodologies, Clause 6.5.2 of the NER states:[1]

> *"(e) In determining the allowed rate of return, regard must be had to:*
>
> *(1) relevant estimation methods, financial models, market data and other evidence"*

This means that while the relevant rules are less prescriptive than previously applied in electricity, they require a broader analytical task to be undertaken. In many ways they require a fuller and more rigorous exercise of regulatory powers to apply:

> *"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 judgment in the context of the overall objective as to the best method(s) and information sources to use, including*

[1] Rule 87 in the NGR contains identical provisions to clauses 6.5.2 and 6A.6.2 in the NER.

> *what weight to give to the different methods and information in making the estimate."*[2]

The new rules direct AER's attention to ensuring that the outcome of its consideration of models methodologies, market data and other evidence results in the cost of capital estimate meeting the *allowed rate of return objective*:

> *"[t]he rate of return for a [Service Provider] is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the [Service Provider] in respect of the provision of [services]."*[3]

This represents a fundamental shift in how the cost of capital estimates are derived, which requires a rethinking of what have historically been more narrow mechanistic processes in which individual components are built into a final WACC through what was effectively a 'primary model' approach. This requires the AER to redesign and set out the manner in which the wider set of evidence which it is directed to consider will be integrated into a final robust WACC estimate.

Industry's view is that the guideline should develop a regulatory framework in which there is enhanced certainty of process and that produces outcomes that gain credibility and robustness by being based on a thorough review of all the available evidence concerning both the methodologies used in the past and an open, constructive engagement with what new methodologies have to offer. Further, industry proposes that the guideline should provide a clear indication of how the AER will use the range of information, models, methodologies, and other evidence to arrive at a clear WACC estimate – including worked examples in the *Rate of Return Guidelines*.

This is the only approach consistent with the AEMC's guidance that potential investors and networks ought to be able to reasonably assess the rate of return the regulator will apply at any given time.[4] This does not mean that the guideline must provide absolute certainty. Rather, the guideline should provide as much certainty as is reasonably practical to do so.

3.2. Role of additional 'criteria' or 'principles'

Key position 2

The allowed rate of return objective has primacy in guiding the estimation of the rate of return. The NEO, NGO and RPP can assist in interpreting that objective where there is uncertainty in its application. However, these should not be used to infer additional "criteria" or "principles" unless the policy intent is unambiguous.

The ENA has two concerns with the way in which the Consultation Paper gives too much primacy to a set of 'principles'/'considerations' that were initially discussed in the Issues Paper and which now appear in the Consultation Paper.

[2] AEMC 2012, *Economic Regulation of Network Service Providers, and Price and Revenue Regulation of Gas Services*, Final Position Paper, 29 November 2012, Sydney, page 67.

[3] NER 6.5.2(c), 6A.6.2(c) and NGR 87 (3).

[4] The Commission acknowledged a key attribute of a good rate of return framework be "certainty for service providers and their investors as to how the regulator will react to changes in market circumstances and make decisions on an appropriate rate of return", AEMC 2012, Economic Regulation of Network Service Providers, and Price and Revenue Regulation of Gas Services, Final Position Paper, 29 November 2012, Sydney, page 30.

The Consultation Paper notes that the AEMC intended that the AER's determinations in relation to the allowance for the return on capital should be principled. This proposition is not contentious and the ENA considers that further debate concerning what term should be used for these factors is unlikely to be fruitful. However:

- whether these factors are described as 'principles', 'standards', 'criteria' or 'considerations', they must arise from, and cannot supplant, the allowed rate of return objective as the touchstone for AER rate of return decisions.

- if applying the *allowed rate of return objective* does not provide exhaustive guidance and further discretion remains, the factors discussed in the Consultation Paper cannot supplant the NEO, NGO or RPPs (section 3.2.1); and

- the Consultation Paper proposes to adopt principles that do not arise from these legislative sources of guidance and are inconsistent with the legislation (section 3.2.2).

3.2.1 The allowed rate of return objective, the NEO, NGO and RPPs

The first potential flaw in the AER's description of the decision-making framework under the Rules concerns the description of the role that each of the NEO, NGO, RPPs and the allowed rate of return objective play in guiding the AER's transmission or distribution determinations. For example, the Consultation Paper states:

> *"[T]he revenue and pricing principles (RPPs) are an important framework issue for assessing how the national electricity and gas objective and the rate of return objective interrelate."*

and

> *"Everything we do in assessing the rate of return must be consistent with the national electricity and gas objective."* [5]

The AER's power to make the relevant regulatory determination must specifically decide about allowed rate of return elements of the over-all decision.[6]

The return on equity[7] and the return on debt[8] are to be estimated such that each contributes to the achievement of the *allowed rate of return objective*. It is this *allowed rate of return objective*, and only that objective, that the AER must ensure its actions and considerations are consistent with applying.

Consumer and customer groups might seek to persuade the AER that the NEO and NGO should be given a higher prominence in AER decision making than the allowed rate of return objective. Alternatively, network service providers might seek to persuade the AER that the RPP's should be given a higher prominence in AER decision making but if the AER acquiesced to either of these submissions, its decisions would be in error.

[5] Rate of return guidelines - AER Consultation Paper, May 2013, page 10.
[6] NER 6.12.1(5), 6A.14.1(5B) and (5C) and NGR 41(2) and 72(g).
[7] NER 6.5.2(f) & 6A.6.2(f); NGR 87(6)
[8] NER 6.5.2(h) & 6A.6.2(h); NGR 87(8)

Rather, given the existence of rules such as those referred to above, the residual role of the NEO, NGO and RPPs in guiding the AER's decision making are more circumscribed than the role of the rules themselves. The NEL (section 16) and NGL (section 27) provide that:

> *The AER must, in performing or exercising an AER economic regulatory function or power … perform or exercise that function or power in a manner that will or is likely to contribute to the achievement of the national electricity objective."*
>
> and
>
> *In addition, the AER … must take into account the revenue and pricing principle … when exercising a discretion in making those parts of a distribution determination or transmission determination relating to direct control network services*

The key characteristic of the new allowed rate of return rules is that they provide considerably more discretion to the AER in some respects than previously and *within* the context of the powers granted by the rules, the AER is to be guided by the NEO, NGO and RRPs.

If the AER or a participant were to find that that applying the *allowed rate of return objective* failed to meet the NEO, NGO or the RPPs, the sole and correct avenue to address that situation would be to lodge a rule reform proposal with the AEMC. They should not be used to infer additional "criteria" or "principles" unless the policy intent is unambiguous.

Thus, under rule 6.5.2, there may well be circumstances in which the NEO, NGO and RPP have a role to play because, as discussed below, the rules now afford the AER extensive discretion as to how to meet the *allowed rate of return objective*. Where a number of solutions can equally meet the allowed rate or return objective, or where the meaning of that objective is unclear, resort must be had to these broader NEO, NGO and RPPs.[9] It is therefore important to apply each of these instruments correctly.[10]

3.2.2 Inconsistent 'principles'

Uniform incentives across regulated industries

The ENA cautions that the analysis in the Consultation Paper misapplies the RPPs in relation to economic efficiency, and misapplies the NEO and NGO when it comes to the long term interests of customers with respect to security and reliability:

> *"[I]t is important that the regulatory framework delivers incentives on the service providers that are comparable to the incentives faced by firms in the broader economy, whether regulated or not. Inconsistent incentives could lead to distortions between industries, which would diminish the achievement of economic efficiency. To do otherwise would put at risk the long term interest of*

[9] The AEMC's policy intention of increasing discretion to the regulator is generally supported by the inclusion of additional provisions (NER and NGR) which require the regulator to take into account certain factors and considerations to be reflective of good regulatory practice (improve transparency and accountability) and to ensure consistency with the broader governance framework (NEL and NGL) - AEMC 2012, Economic Regulation of Network Service Providers, and Price and Revenue Regulation of Gas Services, Final Position Paper, 29 November 2012, Sydney, page 30.

[10] "[T]he interpretation and application of the rules by the regulator is crucial", AEMC 2012, Economic Regulation of Network Service Providers, and Price and Revenue Regulation of Gas Services, Final Position Paper, 29 November 2012, Sydney, page 34 .

customers with respect to the security and reliability of electricity and gas supplies."[11]

The RPPs provide that service providers should be provided with an incentive to "promote economic efficiency" in relation to the provision of energy network services. If economic efficiency involved providing uniform incentives across all industries the above statement would be true but this is patently not the case. Energy network services are sometimes referred to as 'essential services' reflecting the economic characteristics that the costs of under-investments leading to a loss of supply can be extremely large including when compared with the comparatively modest costs of over-investment. The economic importance of adequately investing in the energy network industry is reinforced by the emphasis the NEO and NGO places on non-price considerations such as safety, reliability, security of supply in detailing what constitutes 'economic efficiency' in the energy network sector. By contrast, in many other industries where the costs of under- and over-investment are more symmetrical, price plays a much greater role in establishing an economically efficient outcome than non-price qualitative factors.

To achieve an economically efficient outcome it is therefore necessary that energy network businesses (like all essential service industries) be given stronger incentives not to under-invest than the average business operating in the economy generally or even non-essential regulated infrastructure businesses. Hence, the clear reference in the RPPs to allowing "at least the business's efficient costs". However there is simply no foundation for the proposition that the RPPs require or empower the AER to seek to apply 'comparable incentives' on the energy network industry and to impose such a fixed rule would lead the AER into legal error and likely also create economic distortions.

The NPV=0 'condition'

The ENA is also concerned by the discussion in the Consultation Paper of the concept of "NPV=0" and in particular that this equation might constitute a "condition" of decision making. The Consultation Paper makes reference to the concept four times in the introductory section and is employed six times in the course of the Consultation Paper's substantive considerations. This simple equation might initially appear to be an intuitively tidy and somehow equitable notion but, upon closer inspection, it cannot be employed in the manner proposed in the Consultation Paper.

The equation NPV=0 previously appeared in the NGR and before it the National Gas Code before it was repealed. The equation has never appeared in the NER.

Rule 6.5.2 and 6.12.1 require that the relevant decisions must achieve a circumstance in which the rate of return for the regulated business must be "commensurate" with that of a benchmark firm for the regulatory years in the regulatory period. The concept of being "commensurate" does not mean that there must be a precise equality.

There is significant discretion provided to the AER as to how it should implement the decision under the rules. Where such discretion arises, as explained above, the NEO, NGO and RPP are relevant in guiding the exercise of that discretion. The RPPs state:

"A regulated network service provider should be provided with a reasonable opportunity to recover at least the efficient costs the operator incurs"[12]

and for this reason, the ENA agrees with the Consultation Paper when it says that:

[11] Rate of return guidelines, AER Consultation Paper, May 2013, page 10.
[12] Section 7A, NEL.

> *"ensure that the net present value of revenues is sufficient to cover service providers' efficient expenditures"*[13]

However, the mathematical way to express the above principle is "NPV≥0" not "NPV=0". A related observation is that there is no legal basis for the suggestion put in the Consultation Paper that the:

> *"allowed revenue should not be set in manner that allows for over recovery of these costs and returns."*[14]

Even if NPV=0 were to be a condition of decision making, it is quite wrong to suggest that:

> *"[A]llowed revenue should not be set in manner that allows for over recovery of these costs and returns. This satisfies the NPV = 0 condition.*[15]
>
> *Similarly, any changes in methodologies should ensure this principle holds over the life of the investment."*[16]

The AER is granted a power under rule 6.12.1(5) and 6.5.2 to set an allowed rate of return only for the *regulatory year* of the *regulatory control period* but electricity and gas assets can last for periods of 70 years or more. The AER has no power whatsoever to engage in a process of examining whether the series of regulatory regimes that have applied in the various States and Territories since the 1940's have, or have not, resulted in the NPV=0 condition being met – nor whether any other criterion has been met over such an extended period. The same position applies in relation to taking into consideration very old regulatory approaches or the regulatory approach that applied immediately preceding the formation of the Guidelines.

Rather, the task of the AER is to establish an allowance for a return on capital that is commensurate with that of an efficient benchmark entity within each regulatory year of the relevant regulatory period (including having regard for the impacts across regulatory control periods that could arise from changing from one methodology to another).

"Well accepted methodology"

The former NGR required that the methodology for estimating an efficient allowance for return on equity had to be a 'well accepted' methodology.[17] As the Consultation Paper acknowledges, that requirement was repealed from the NGR and it has never applied in the NER (which instead mandated the use of the SL-CAPM rather than providing for the possibility of other well accepted methodologies). The Consultation Paper states that the AER proposed to use the following factor to guide decision making:

> *"estimation methods and financial models are consistent with well-accepted economic and finance principles and informed by sound empirical analysis and robust data"*[18]

The Paper also illustrates how the former NGR concept of "well accepted" was applied by the AER previously to endorse the use of the SL-CAPM or reject the Black CAPM:

[13] Rate of return guidelines, AER Consultation Paper, May 2013, page 9.
[14] Rate of return guidelines, AER Consultation Paper, May 2013, page 9.
[15] Rate of return guidelines, AER Consultation Paper, May 2013, page 9.
[16] Rate of return guidelines, AER Consultation Paper, May 2013, page 10.
[17] Rate of return guidelines, AER Consultation Paper, May 2013, page 90.
[18] Rate of return guidelines, AER Consultation Paper, May 2013, page 107.

"This followed the ubiquitous use of the Sharpe–Lintner CAPM amongst regulators, academics and market practitioners."[19]

and

"The Black CAPM was not a well accepted financial model."[20]

There is no support for the on-going consideration of whether a model is "well-accepted" under the new rules and, indeed, the primary purpose and effect of these new rules is to broaden range of material taken into account and to depart from the strongly conservative way in which the previous rules were drafted and interpreted. The AEMC's final determination explicitly removed the term "well accepted" from the harmonized electricity and gas rate of return provision.

It may be that a model that has been used frequently by regulators previously may have resulted in, for example, a broader set of data being available that is suitable for use when applying existing models and something of that concrete nature may be relevant in deciding whether the necessary inputs exist for a model to be employed in a regulatory context but it would be unacceptable to apply a "well-accepted" requirement over-and-above these underlying considerations of substance.

However, the ENA is concerned that the way in which the AER appears to envisage employing the 'well-accepted' principle will lead to conservatism in decision making which runs directly contrary to the intention of the new rule package. For example, it would clearly run contrary to the whole purpose and text of the rule change to engage in a circular process of observing that Australian regulators do not currently use a particular model and using that observation as a basis to shun change. Indeed, to the contrary, the rules now provide that the AER can take a more progressive approach by which the AER assists in over-coming barriers to dynamism in the analysis of equity returns by providing a degree of certainty that new models can and will be given weight in the decision making process to enable the market to invest in collecting the most appropriate data to enable the methodology to contribute to the analysis.

"Simple over complex"

Finally, the ENA is concerned about the Consultation Paper's continued adherence to the proposition that a model needs to be 'fit for purpose' including that it would:

"Promote simple over complex approaches where appropriate"[21]

There is no explicit or implicit support in energy laws or rules for this proposition. Setting a rate of return allowance is both very significant (as the Consultation Paper acknowledges[22] on page 8) and setting any such allowance inherently involves an analysis that would generally be regarded as 'complex'. Reflecting this reality, and the broader scope of considerations to be applied in economic regulation under the new rules, the AER and consumer groups have access to a range of organizational, funding and other supports through the process to enable them to engage in more complex analysis.[23]

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[19] Rate of return guidelines, AER Consultation Paper, May 2013, page 90.
[20] Rate of return guidelines, AER Consultation Paper, May 2013, page 92.
[21] Rate of return guidelines, AER Consultation Paper, May 2013, page 107.
[22] "The return on capital often represents the largest component of the revenue determinations of service providers"; and
"Therefore, the rate of return is a key element of the network charges that consumers pay", see Better Regulation, Rate of return guidelines, AER Consultation Paper, May 2013, page 107.
[23] Standing Council on Energy and Resources, Meeting of Energy Ministers, Communiqué, Sydney 5 October 2012.

In the ENA's view there would be very limited circumstances in which promoting the simple over the complex was appropriate and it endorses the QTC submission that:

> *"Some level of complexity should be afforded given the materiality of the rate of return decision. A method which is complex but has broad support is more likely to generate stakeholder confidence in the rate of return than a method which is simple but controversial. For example, the current five yearly reset of the cost of debt is simple, but creates significant risks for consumers and NSPs."*[24]

3.3 Exercising discretion and decision-making under uncertainty

ENA considers that a critical issue in the guideline drafting and finalization process will be ensuring a robust and transparent approach to the exercise of significant discretions arising in the rate of return decisions the AER is tasked with making.

At the Workshop held on 4 June 2013 concerning the Consultation Paper, a suggestion was put by the Chair of the meeting suggesting that the requirements in the rules that the AER "must have regard" for the matters identified in 6.5.2(e), (g) and (k) might be discharged by merely giving consideration to those matters and then giving them no weight in the final decision. There has previously been extensive litigation concerning what is required of regulatory decision makers whose rules require that they "must have regard" to particular matters including litigation that involved ENA members and the application of the National Gas Code. The courts have found that it is the totality of the regulatory context that determines whether it is sufficient merely to engage in a consideration of the specified matters followed by a discretion or freedom to give them no weight in the final decision or whether real weight must be given to these matters.

In this context there can be no doubt that the Rules require real weight to be given to each of the matters in rules 6.5.2(e), (g) and (k) because it was clear from the AEMC rule change process that the AEMC saw value in diversifying the range of inputs to regulatory decision making and expected that this would be the outcome of the guideline and decision making process. Additional circumstances that reinforce the conclusion that real weight must be given to the matters set out in those rules are the similarity in the circumstances applying in the regulatory instruments and the fact that when the AEMC chose to use the phrase "must have regard" it was in a context in which energy industry stakeholders were well aware of how that term had been applied in the Gas Code litigation.

This has implications (discussed further below) for whether approaches 1, 2 and 3 to the allowed cost of equity in the Consultation Paper can be implemented in a way that complies with the new rules. This is discussed in the next section.

"Reverse engineering"

There are also extensive requirements for the AER to document the reasons for its decisions. The AER must include, in each determination, its decision on the allowed rate of return for each regulatory year of the regulatory control period. Further, the Rules require that reasons given by the AER for a determination must set out the basis and rationale of the determination, including[25]:

[24] *QTC submission - Rate of return guidelines issues paper* - 15 February 2013, page 2.
[25] NER 6.12.2 and 6A.14.2 and in effect the same requirements expressed more generally apply in gas: NGR59(4)/62(4)

"(1) details of the qualitative and quantitative methods applied in any calculations and formulae made or used by the AER;

(2) the values adopted by the AER for each of the input variables in any calculations and formulae, including:
(i) whether those values have been taken or derived from the [Service Provider's] current building block proposal; and
(ii) if not, the rationale for the adoption of those values;

(3) details of any assumptions made by the AER in undertaking any material qualitative and quantitative analyses; and

(4) reasons for the making of any decisions, the giving or withholding of any approvals, and the exercise of any discretions as referred to in this Chapter 6, for the purposes of the determination, such reasons being expressed by reference to the requirements relating to such decisions, approvals or discretions as are contained in this Chapter."

On page 43 of its Consultation Paper, the AER states that 'reverse engineering' of the final number under Approaches 2 and 4 would not be possible and that the return on equity estimate for those models would instead be based on its own judgment taking account of 'qualitative' information with no explicit weighting.

Although it is not clear what would constitute 'reverse engineering' in this context, there is no reason why a broad range of material cannot be employed in a manner that is transparent and can be replicated or exposed to scrutiny. Indeed, the key point of the Rule change is that it should be. The ENA would be concerned if any approach was implemented in a way that obscured how discretion is being applied.

For example, Approach 4 could be adopted in a way that did provide a high degree of transparency and which could be replicated or held up for scrutiny as follows. If two models were used to estimate the allowance for the return on equity (say one of the CAPM models and a multi-stage DGM model), the initial 'stand alone' calculations in each model might deliver results that diverge by a number of basis points apart. A consideration of the strengths and weaknesses of these models may conclude that the application of each model required the use of uncertain parameters from which a mid-point estimates were taken and that one model is particularly well suited to predicting market wide returns and the other in gauging risk relative to the market. It may be possible to use the output of each model to refine (by recalculating the model using parameter estimates that are at the top or bottom of the range of uncertainty). The reasons for the recalculation and how it is done should be capable of explanation – evidence from the initial specification of model A informed a selection of a different parameter for model B and vice versa.

Or alternatively, it may be that the parameter estimates can be reached with a much higher degree of certainty than in the other model, in which case it may be appropriate to recalculate only one of the models by selecting a higher or lower parameter estimate to verify if both models are capable of giving consistent results in response to what is known about the relative certainty of inputs.

After re-calculating the one or both models, the divergence between the results would necessarily be reduced but may not be wholly eliminated. It may be that there remains a small number of basis points of difference and that less quantifiable qualitative 'expert evidence' can play a role (say from a properly conducted survey of professional investors). It may be that such survey evidence suggests that two thirds of experts regard regulatory returns to be below that required and one third above. This could be a basis used to take a value that is two thirds of the way closer to the result of the model delivering the higher estimate which is one third of the way closer to the model delivering the

lower estimate. The above explanation (with appropriate references and calculation results) would comprise a set of reasons for quantitative and qualitative material and the final number reached would be capable of 'reverse engineering'.

In the ENA's view, it is this form of synthesis and transparent explanation that is both preferable and required under the new rules and that, in relation to the cost of equity, the ENA's multiple model approach does this most effectively.

4. Return on equity

4.1 Implications of the Rules on rate of return approach

Under the previous National Electricity Rules (NER or Rules), the AER adopted a mechanistic approach to estimating the required return on equity in that it:

a. Used the Sharpe-Lintner Capital Asset Pricing Model (CAPM)[26] exclusively;

b. Estimated individual parameters independently and in isolation; and

c. Focused on the justification for individual parameters rather than on the reasonableness of the resulting estimate of the required return on equity.

In its recent rule change process, the AEMC made a number of significant changes to the Rules that prevent the AER from continuing to adopt that approach. The key changes that the AEMC made were:

i. To introduce an "overall rate of return objective" to ensure that the focus is on the reasonableness of the allowed return on equity – eliminating the silo approach that focused separately on each individual parameter; and

ii. Requiring the regulator to have regard to all relevant approaches and evidence – eliminating the focus on a single model (CAPM) that could be used without having regard to a weight of evidence suggesting that the way the regulator implemented that model produced an estimate of the required return on equity that was implausible in the circumstances.

In particular, the new rules require that the allowed rate of return must achieve the allowed rate of return objective:

> *[t]he rate of return for a [Service Provider] is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the [Service Provider] in respect of the provision of [services].*[27]

In applying the rate of return objective, regard must be had to:

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

2. 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

3. any interrelationships between estimates of financial parameters that are relevant to the estimates of the return on equity and the return on debt.[28]

When determining the allowed return on equity regard must also be had to:

[26] Sharpe (1964) and Lintner (1965).
[27] For example, see Rule 87(2)(3) of the NGR.
[28] For example, see Rule 87(2)(5) of the NGR.

the prevailing conditions in the market for equity funds.[29]

In its Final Determination, the AEMC was very clear about its intention that the regulator should not use a narrow formulaic approach, but should have regard to all relevant evidence while keeping a focus on the reasonableness of the allowed return on equity. For example, the AEMC noted that

> *The Commission also expressed concern that the provisions create the potential for the regulator and/or appeal body to interpret that the best way to estimate the allowed rate of return is by using a relatively formulaic approach. This may result in it not considering the relevance of a broad range of evidence, and may lead to an undue focus on individual parameter values rather than the overall rate of return estimate.*[30]

and that the rule changes were designed to:

> *encourage the regulator to focus on whether its overall estimate of the rate of return is appropriate.*[31]

The AEMC was also very clear about the need to ensure that the allowed return on equity is commensurate with the prevailing conditions in the market for equity funds. The AEMC stated that:

> *If the allowed rate of return is not determined with regard to the prevailing market conditions, it will either be above or below the return that is required by capital market investors at the time of the determination. The Commission was of the view that neither of these outcomes is efficient nor in the long term interest of energy consumers.*[32]

and:

> *The second principal requirement is that the return on equity must take into account the prevailing conditions in the market for equity funds. It reflects the importance of estimating a return on equity that is sufficient to allow efficient investment in, and efficient use of, the relevant services. However, this requirement does not mean that the regulator is restricted from considering historical data in generating its estimate of the required return on equity. Rather, it ensures that current market conditions are fully reflected in such estimates to ensure that allowed rates are sufficient for efficient investment and use.*[33]

The AEMC also noted that for a framework to produce an allowed return on equity that is commensurate with the prevailing conditions in the market for equity funds, it must be flexible enough to respond to changes in financial market conditions. One of the AEMC's primary concerns was that the mechanistic CAPM approach was "overly rigid" such that the AER's implementation of the CAPM produced unreasonable results in the current market circumstances. The AEMC stated that:

[29] For example, see Rule 87(2)(7) of the NGR.
[30] AEMC Rule Change Final Determination, p. 40.
[31] AEMC Rule Change Final Determination, p. 41.
[32] AEMC Rule Change Final Determination, p. 44.
[33] AEMC Rule Change Final Determination, p. 69.

> *The global financial crisis and its continuing impact through the European sovereign debt crisis have highlighted the inherent dangers in an overly rigid approach to estimating a rate of return in unstable market conditions.*[34]

and that its rule change would:

> *enable the regulator to better respond to changing financial market conditions.*[35]

In its Final Determination Guidance, the AEMC 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 a mechanistic implementation of the CAPM. 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 should consider, or the manner in which such information should be considered, due to the risk that any such list or instructions itself would themselves 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.*[36]

Rather:

> *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.*[37]

and

> *Implicit in this requirement to consider a range of methods, models and information is that checks of reasonableness will be undertaken.*[38]

The AEMC also noted the need to:

[34] AEMC Rule Change Final Determination, p. 40.
[35] AEMC Rule Change Final Determination, p. 23.
[36] AEMC Rule Change Final Determination, p. 57.
[37] AEMC Rule Change Final Determination, pp. 67-68.
[38] AEMC Rule Change Final Determination, p. 69.

safeguard the framework against the problems of an overly-rigid prescriptive approach that cannot accommodate changes in market conditions. Instead, sufficient flexibility would be preserved by having the allowed rate of return always reflecting the current benchmark efficient financing costs.[39]

Key position 3

The ENA submits that it is the clear intention of the AEMC that the AER should not persist with its previous Sharpe-Lintner CAPM-based approach for determining the allowed return on equity.

If the AER were to simply use the SL CAPM again without properly having regard to other models and other relevant evidence, then it would be in error under the new rules. Properly 'having regard' means that if (and only if) it could be demonstrated that other models and evidence contributed no additional insights into the cost of capital, could they be excluded from being given weight. For each model that does contribute some additional insight into the cost of capital, it must be given actual weight in the final determination reflecting the additional insight they can bring.

4.2 Analysis of approaches set out in the Consultation Paper

In its Consultation Paper, the AER sets out four broad approaches for combining relevant evidence into a single allowed return on equity:[40]

a) **Approach (1): Single model:** Other models are rejected ex ante. Only one model is estimated. No other evidence is considered. No adjustments to the estimate from the model would be made;

b) **Approach (2): Primary model with reasonableness checks**. A primary model is selected and estimated. The output is tested for reasonableness against other evidence, including other financial models. If warranted, the primary estimate may be adjusted in some way;

c) **Approach (3)**: **Fixed weights applied to a small number of models with no external reasonableness checks.** A number of models (and potentially other evidence) are estimated and the results are combined applying fixed weights; and

d) **Approach (4): Multi-model approach.** Set out all relevant information from all methods, models, data, and evidence. Consider the strengths and weaknesses of each. Apply qualitative weights (more/less, high/low) to select a final estimate from all relevant evidence.

This section assesses each of the four approaches against the requirements of the Rules and against economic principles and practical implementation issues.

Approach 1: Single model

The first approach set out in the Consultation Paper is the use of a single model to the exclusion of other evidence:

[39] AEMC Rule Change Final Determination, p. 46.
[40] Consultation Paper, pp. 42-44.

> ***The use of one model**. This approach implies that the outcome of a single model is used to determine the return on equity. Other models would not form part of the estimation. Adjustments of the model outcome would not be made.*
>
> *This model is simple and transparent. Applying this approach will produce outcomes that can be easily replicated and predicted in advance. However, as it relies on a single model, it loses the benefit that estimates from a wider pool of evidence and information may bring. It also does not take into account the fact that no single model is perfect and that all models have uncertainty.*[41]

The ENA considers Approach (1) to be untenable because it is unlikely that a single approach to estimating the cost of equity will always provide a more reliable estimate of the prevailing cost of funds than any other approach or combination of approaches. Approach 1 is not reconcilable with the Rules as it does not assist in discharging the AER's legal obligation to have regard to alternative equity models and other relevant evidence. The AEMC has stated that it does not consider that a framework relying on a mechanistic approach to estimating the rate of return is appropriate any longer and that it is now clear that the "deterministic" use of the SL CAPM by the AER does not achieve the NEO, NGO and the RPP. Adopting a single approach is also inconsistent with the vast amount of academic literature and practitioner evidence that continues to be devoted to different techniques to estimating the cost of equity. Furthermore, it discourages research and submissions on any alternative technique than whatever is the incumbent technique.

Moreover, such a mechanistic implementation of a single model would be inconsistent with the need to "safeguard the framework against the problems of an overly-rigid prescriptive approach that cannot accommodate changes in market conditions."[42] It would also be inconsistent with the need to preserve sufficient flexibility by "having the allowed rate of return always reflecting the current benchmark efficient financing costs."[43] In addition, it would be inconsistent with the clear instruction of the AEMC that "[i]mplicit in this requirement to consider a range of methods, models and information is that checks of reasonableness will be undertaken."[44]

Approach 2: Primary model with reasonableness checks

The second approach set out in the Consultation Paper is the use of a primary model with the application of a set of reasonableness checks:

> ***Use of one primary model with reasonableness checks**. The reasonableness checks could be other return on equity models or information such as broker WACCs and market sentiment. Generally we would expect that the output from the primary model would be adopted as the final return on equity (as per example 1). However, where the reasonableness checks suggest the output from the primary model is not reasonable, the return on equity would be determined based on our judgment taking account of the reasonableness checks (informative use of primary model). In these instances, the weighting of the primary model and reasonableness checks would be qualitative with no explicit weights mentioned. Thus, the final number could not be 'reverse engineered'.*
>
> *This approach would provide the benefit of reducing the significance of weaknesses in one particular model. The approach also maintains simplicity and transparency for most decisions, while providing the flexibility to depart*

[41] Consultation Paper, pp. 42-43.
[42] AEMC Rule Change Final Determination, p. 46.
[43] AEMC Rule Change Final Determination, p. 46.
[44] AEMC Rule Change Final Determination, p. 69.

from the primary model if the model or application of that model leads to unreasonable outcomes.[45]

Under this method, the reasonableness checks could include, among other things:

a) Point estimates of the required return on equity from models other than the primary model;

b) Information that is not in the form of a point estimate of the required return on equity, but which provides an upper or lower bound on the required return on equity;

c) Information about the level of the current required return on equity relative to the historical average (e.g., evidence that current required returns are higher or lower than average); and

d) Information about market practice (e.g., suggesting that expert opinion endorses, or departs from, the primary model in the current market circumstances).

The ENA considers that it will be practically difficult for a regulator to implement a primary model with reasonableness checks under the new Rules. The difficulty particularly relates to the incorporation of information from other financial models. It is inevitable that different financial models will produce different estimates of the required return on equity for the benchmark firm.[46] The new Rules require the regulator to have regard to that information. The difficulty lies in *how* the regulator would have regard to that information under the primary model approach and the AER would need to make this clear if Approach (2) was to work. The ENA is unable to either express support or opposition to this approach unless and until it is further explained by the AER as to how that approach might work.

Unless the AER makes it clear in the guideline how Approach (2) would properly take into account all of the relevant other methods, models, data and evidence, it would also be inconsistent with the Rules and the AEMC's intention and it would be impractical and/or impossible to implement.

Suppose, for example, that the regulator's implementation of the primary model produces an estimate of the required return on equity that is lower than the estimates from all other models to which the regulator has regard. Logically, there are two options available to the regulator. The regulator can either use the information from other models to make an adjustment to the estimate from the primary model, or the regulator can make no adjustment.

If the regulator makes no adjustment, it is giving 100% weight to the estimate from the primary model and zero weight to the estimates from the other models. This raises two potential problems for the regulator. First, there may be questions about whether the regulator did have regard to the other models, as required under the new Rules. To show that it did have proper regard to the other models, the regulator would need to set out reasons why it considered that those other models should be given zero weight against the primary model – why the rate of return objective is best satisfied by giving no weight to any other model. But if the regulator does this, there is a second problem: the regulator has followed Approach (1), rather than Approach (2), in the Consultation Paper – it has rejected the use of other models and "the outcome of a single model is used to determine the return on equity."[47]

If the regulator does decide to make an adjustment to the primary model on the basis of the evidence from other models, it is not clear what adjustment should be made. If the regulator makes

[45] Consultation Paper, pp. 42-43.
[46] However, they will produce similar results for the average firm. This feature is applied as a useful feature in applying a 'multi-model' or 'portfolio' approach.
[47] Consultation Paper, p. 42.

an adjustment to the final estimate of the required return on equity, it is essentially applying a version of the multi-model Approach (4) set out in the Consultation Paper (and discussed in detail below).

The alternative is for the regulator to use the information from other models as the basis for adjusting individual parameter estimates within the primary model. But this approach quickly becomes very difficult to explain. For example, under the Fama-French model[48] returns depend upon exposure to the SMB and HML factors,[49] but under the Sharpe-Lintner CAPM they do not. Suppose the regulator decides to give some weight to the Fama-French model (and the estimate from it) by increasing the beta estimate in the Sharpe-Lintner CAPM – to make up for the fact that the Sharpe-Lintner CAPM omits a factor that may be relevant. In this case:

a) If the adjustment is such that the Sharpe-Lintner CAPM estimate of the required return on equity now agrees with the Fama-French estimate, the regulator has really changed the primary model to Fama-French; and

b) If there is less than "full" adjustment, the regulator would have to explain why. Presumably, this explanation would involve a discussion of the relative merits of the two models, weighed against relevant criteria. But that explanation would be much easier to provide, and would be much more transparent, if the regulator simply set out the estimate from each model and explained why it selected a final estimate somewhere between the two – as would be done under Approach (4).

The discussion above relates only to how the regulator might deal with information from various models under Approach (2). There are also issues relating to other evidence that does not provide a point estimate. For example, in the Victorian Gas Distribution review, one of the reasonableness checks the AER applied was broker WACC estimates. The AER's allowed return on equity was below the minimum broker estimate.[50] This raises questions about:

- How is the primary model selected?
- How many, and which, reasonableness checks should be performed?
- How many, or what proportion of the checks would a particular allowed return on equity have to fail before some action was taken?
- If it is decided that some action must be taken, what precisely would be done? For example, should the allowed return on equity be adjusted until it passes all checks? What if that is not possible (e.g., because two checks are mutually exclusive)?
- If no adjustment is ever made in relation to a reasonableness check, is the regulator really having proper regard to the checks? Are the checks relevant evidence if they have no material prospect of ever affecting the allowed return?

The ENA considers that it will be practically difficult for a regulator to implement a primary model with reasonableness checks under the new Rules:

[48] Fama and French (1993). We refer to the three factor model of Fama and French (1993) as the Fama-French model in the remainder of this submission.
[49] In the Fama-French three factor model, SMB refers to "small minus big," the return on a portfolio of small capitalisation stocks minus the return on a portfolio of large capitalisation stocks. This factor is also known as the size factor. Similarly, HML refers to "high minus low," the return on a portfolio of high book-to-market ratio stocks minus the return on a portfolio of low book-to-market stocks. This factor is also known as the value factor.
[50] Australian Energy Regulator, 2013b. *Access arrangement final decision: Multinet Gas (DB No.1) Pty Ltd and Multinet Gas (DB No.2) Pty Ltd 2013–2017.*

- If the checks lead to no adjustment being made, the regulator is effectively adopting a predestined single model under Approach (1);

- If the checks do lead to some adjustment being made, either:

    i. The approach effectively collapses to the multi-model Approach (4); or

    ii. The adjustment lacks transparency and becomes very difficult to explain.

Approach 3: Several models with quantitative pre-specified fixed weightings

The third approach set out in the Consultation Paper is the use of several primary models with quantitative pre-specified fixed weightings:

> ***Use of several primary models with quantitative but non–complicated fixed weighting.*** *For example, this might entail the choice of two models with broad, simple weightings (such as 70:30).*
>
> *This approach provides the benefit inherent from using more than one model. It reduces the significance of weaknesses in any one model. Additionally, the use of a small number of models with simple weighting and no reasonableness checks provides simplicity and transparency, and avoids the impression of false accuracy by avoiding complicated weightings.*
>
> *The Brattle Group report submitted by APIA provides an example of a US regulator that adopts this approach. The report states 'the Mississippi Public Service Commission annually updated the return on equity for the company using a combination of the Sharpe–Lintner CAPM, empirical CAPM, risk positioning and dividend discount models. In this specific circumstance, the weights assigned to each method are predetermined.'*[51]

The Consultation Paper sets out one example of the application of this approach in which fixed weights of 70:30 are always applied to each of two models. The ENA considers that such a mechanistic approach is not materially dissimilar to Approach (1) and is inconsistent with the AEMC's intention to "safeguard the framework against the problems of an overly-rigid prescriptive approach that cannot accommodate changes in market conditions."[52] This approach would also be inconsistent with the need to preserve sufficient flexibility by "having the allowed rate of return always reflecting the current benchmark efficient financing costs."[53] In addition, it would be inconsistent with the clear instruction of the AEMC that "[i]mplicit in this requirement to consider a range of methods, models and information is that checks of reasonableness will be undertaken."[54]

It was submitted to the AER that the weights do not necessarily need to be permanently fixed in advance, but could alter contingent upon the relative reliability of each estimate in different market circumstances.[55] For example, it might be pre-specified that Model A would receive relatively more weight than Model B during periods of broad economic growth, but that those weights would be reversed during a recession. However, the AER's preliminary view is that altering weights according to market conditions is not appropriate.

[51] Consultation Paper, pp. 42-43.
[52] AEMC Rule Change Final Determination, p. 46.
[53] AEMC Rule Change Final Determination, p. 46.
[54] AEMC Rule Change Final Determination, p. 69.
[55] Australian Pipeline Industry Association (2013).

The ENA considers that there are a number of practical implementation issues with any approach that requires weights be specified in advance:

a) All of the models and evidence that the regulator would have regard to would need to be specified in advance. This causes problems if one or more pieces of evidence are unavailable (e.g., because publication is ceased). It also prevents the regulator from considering new information that was not contemplated at the time of preparing the Guideline;

b) It would be extremely difficult to define, in advance, all possible market conditions which could potentially alter the weights (e.g. economic conditions of growth or recession, market expectations for growth and volatility, liquidity which could affect the reliability of prices, central bank responses to economic conditions which could alter interest rates);

c) It is not clear how relevant evidence that does not produce a point estimate (e.g., evidence that produces a lower bound) could be taken in account under this approach. Evidence that does not produce a point estimate should reasonably be taken into account in determining the outcomes from different models or the weights to be applied to those models, but a pre-specification of the weights on different models makes this implementation more challenging.

For the reasons set out above, the ENA considers that any approach that involves the pre-specification of the evidence that will be examined and the weights that will be applied is practically unworkable, not reconcilable with the Rules and inconsistent with the intention of the AEMC.[56] For clarity, the ENA does not object to the use of quantitative weights in arriving at a final estimate of the cost of equity. As set out below the ENA is of the view that the final cost of equity can most usefully be determined by applying quantitative weights to the outcomes from different techniques. It is the *pre-specification* of different weights that the ENA considers to be the impediment to implementing Approach (3).

In its revised report for APIA, the Brattle Group reaches a similar conclusion:

> *It is the interaction of the models with market and industry circumstances that determines reliability – in our view it is not helpful to rank the models or assign weights without considering the circumstances in which the models are being applied (the market and industry characteristics at the time the cost of equity is being determined). Therefore our recommendation is to review the results of all models[57] and weigh the results according to the market and industry factors operating at the time the cost of equity is being determined. Many regulators in North America do so on a regular basis.[58]*

[56] The AEMC expressed its view that the likelihood of achieving the NEO or the NGO may be increased by examining a range of methods and data and making judgments aided by, for example, the location and/or clustering and/or statistical precision of estimates. That is, formulaic rules such as giving particular methods a fixed weighting may not be the best way to assess the information, AEMC Rule Change Final Determination, p. 58.

[57] A reasonable approach might be for the AER to produce its own estimates based on several of the most commonly-used models (for example, the CAPM, the DDM and one or more CAPM variants). There might be an expectation that other models would be unlikely to bring additional information of value, but that should not preclude parties interested in a particular determination from presenting such information.

[58] Brattle Group (2013), June, p. 26.

Approach 4: Several models without pre-specified fixed weightings

The fourth approach set out in the Consultation Paper is the use of multiple models and other information without pre-specified fixed weightings:

> ***Use of multiple models and other information.*** *The final return on equity would be determined based on our judgment taking into account the models and other information. No explicit weights would be mentioned, but models and other information could be given qualitative weighting (for example, 'most weight', 'less weight', and 'low weight'). Because explicit weights would not be given, stakeholders could not reverse engineer the exact final number or how it was reached.*
>
> *This approach provides the benefit inherent from using more than one model. It reduces the significance of weaknesses in any one model or source of other information, and does not seek a false level of precision. Also, the approach may provide a more stable outcome.*[59]

Under this approach, all relevant financial models are parameterised and considered. The required return estimates from different models might be given different weight on the basis of relevant evidence, including evidence about the general reliability of the models, contemporaneous empirical evidence and evidence drawn from outside the models themselves. Unlike Approach (3), weights depend on contemporaneous empirical evidence, so cannot possibly be specified in advance.

Key position 4

The ENA submits that Approaches (1) and (3) are either inconsistent with the Rules, inconsistent with the clear intention of the AEMC, or impractical or impossible to implement. Unless the AER makes it clear in the guideline how Approach (2) would properly take into account all of the relevant other methods, models, data and evidence, it would also be inconsistent with the Rules, the AEMC's intention and be impractical and/or impossible to implement. The ENA submits that a form of Approach (4), with some modifications to the approach set out in the AER's Consultation Paper, is the only workable approach.

The ENA's views about the range of evidence that should be considered and the way in which that evidence should be used to determine the allowed return on equity is set out in Section 4.3 below. The ENA considers its multiple model approach to be a superior version of Approach (4) because it is transparent in its taking into account of the relevant evidence including allowing stakeholders to a revenue decision to understand how the final number was in fact reached.

4.3 What are the relevant models and evidence?

Key position 5

The ENA submits that an approach that considers all relevant estimation methods, financial models, market data and other evidence, and which gives appropriate weight to each piece of evidence based on all available information, in a transparent, predictable and replicable way, is most likely to achieve the overall rate of return objective and therefore be consistent with the Rules. Such an approach would lead to more stable cost of equity estimates through time and more reliable estimates of the prevailing cost of equity thereby providing more stable investment signals and prices, which benefits consumers.

[59] Consultation Paper, pp. 42-43.

4.3.1. Context

The Consultation Paper notes that the AER has previously relied exclusively on a single financial model, the Sharpe-Lintner CAPM. The previous NER mandated the use of the Sharpe-Lintner CAPM and the previous National Gas Rules ("NGR") required the use of a "well-accepted financial model such as the CAPM." The Consultation Paper also notes that the AER's "previous views reflect the previous rules."[60]

The new Rules set out the allowed rate of return objective:

> *[t]he rate of return for a [Service Provider] is to be commensurate the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the [Service Provider] in respect of the provision of [services].*[61]

and require that in applying the rate of return objective, regard must be had to:

> *relevant estimation methods, financial models, market data and other evidence.*[62]

and to:

> *the prevailing conditions in the market for equity funds.*

That is, the new Rules require the AER to consider all relevant financial models and other evidence and require the AER to produce the best possible estimate of the required return on equity – an estimate that best meets the allowed rate of return objective.

It is the clear intention of the AEMC that regulators should not continue to rely only on the Sharpe-Lintner CAPM to the exclusion of all other financial models. The AEMC would not have made such extensive and fundamental changes to the Rules if it intended regulators to continue the same practices they had adopted under the previous Rules. In particular, in its Final Determination Guidance, the AEMC 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 a mechanistic implementation of the CAPM. 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 should consider, 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*

[60] Consultation Paper, p. 89. The Consultation Paper also notes that these views are likely to be informative of issues the AER will consider when contrasting financial models.
[61] For example, see Rule 87(2)(3) of the NGR.
[62] For example, see Rule 87(2)(5) of the NGR.

> *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.*[63]

Rather:

> *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.*[64]

and

> *Implicit in this requirement to consider a range of methods, models and information is that checks of reasonableness will be undertaken.*[65]

The ENA submits that it would be inconsistent with the Rules, and with the clear intention of the AEMC, for the AER to continue to rely on a single financial model (the Sharpe-Lintner CAPM) to the exclusion of all other financial models.

Moreover, it would be extraordinary to suggest that the overall rate of return objective could be best met by giving zero weight to any estimate of the required return on equity other than that produced by the Sharpe-Lintner CAPM.[66]

4.3.2. Models to be considered

The Consultation Paper (Appendix E) sets out four[67] financial models for potential consideration:

a) Sharpe-Lintner CAPM;

b) Black CAPM;

c) Fama-French three factor model; and

d) Dividend growth model.

Key position 6

The ENA has previously submitted that these same four models should be considered when estimating the required return on equity under the new Rules and confirms that it remains of that view.

[63] AEMC Rule Change Final Determination, p. 57.
[64] AEMC Rule Change Final Determination, pp. 67-68.
[65] AEMC Rule Change Final Determination, p. 69.
[66] This is not to say that the Sharpe-Lintner CAPM has no role to play in determining the required return on equity – just that the rate of return objective would not be met by using *only* that model.
[67] The Consultation Paper also notes the existence of an inter-temporal version of the CAPM, but notes that that model has not been used or proposed in any regulatory determination.

4.3.3. Strengths and weaknesses

The ENA recognises the guideline is not binding and so statements regarding preferred models cannot be entirely definitive. However, the ENA has commissioned NERA to assess the strengths and weaknesses of a number of models that can be used to estimate the required return on equity for the benchmark efficient firm.

NERA (2013) [68] note that there is considerable evidence to suggest that the Sharpe-Lintner CAPM produces biased estimates of the required return on equity. In particular, there is evidence that the Sharpe-Lintner CAPM underestimates the required return for firms with low beta estimates and overestimates the required return for firms with high beta estimates. In addition, the Sharpe-Lintner CAPM underestimates the required return for firms with high book to market ratios and firms with low market capitalisation.

NERA (2013, p. 11) [69] note that there are two possible explanations for why the Sharpe-Lintner CAPM provides such a poor fit to the data – either the model is wrong, or the model is right but the empirical estimates of input parameters are poor. However, regardless of the reason, the point is that the evidence shows that Sharpe-Lintner CAPM estimates of required returns are unreliable.

The first problem with the Sharpe-Lintner CAPM is that it underestimates the required return for firms with low beta estimates and overestimates the required return for firms with high beta estimates. This led to the development of the Black CAPM. NERA (2013) [70] note that the Black CAPM corrects this bias, however any bias in relation to size or book to market remains. Since the Black CAPM requires the estimation of an additional parameter (the zero beta premium) its estimate of the required return on equity is likely to be even more imprecise (i.e., have an even wider confidence interval) than the estimate from the Sharpe-Lintner CAPM. Thus, the correction of a material bias may come at the cost of lower precision.

The second problem with the Sharpe-Lintner CAPM is that it underestimates the required return for firms with high book-to-market ratios and firms with low market capitalisation. This has led to the development of the Fama-French three factor model. In their Draft Report for the AER, McKenzie and Partington (2013) note that:

> *The empirical shortcomings of the CAPM have led researchers to consider alternative specifications in the search for a better asset pricing model.* [71]

McKenzie and Partington (2013) also quote William Sharpe (the developer of the Sharpe-Lintner CAPM) who himself recognises the inadequacy of a simple one-factor model:

> *I'd be the last to argue that only one factor drives market correlation. There are not as many factors as some people think, but there's certainly more than one.* [72]

and that the Fama-French model has usurped the CAPM as being the standard method of estimating required returns in academic studies:

[68] NERA (2013), *Review of cost of equity models*, June.
[69] NERA (2013), *Review of cost of equity models*, June.
[70] NERA (2013), *Review of cost of equity models*, June.
[71] McKenzie and Partington (2013), p. 26.
[72] McKenzie and Partington (2013), p. 18 citing a passage from Burton, J. (1998) "Revisiting the Capital Asset Pricing Model", *Dow Jones Asset Manager*, May/June, 20-28.

> *The Fama and French model (often in conjunction with a momentum factor), has become an almost standard control in academic studies that attempt to measure abnormal returns in event studies and to evaluate trading strategies using US data*[73]

NERA (2013)[74] note that the origins of the Fama-French model were in studies documenting the empirical failings of the CAPM. Since that time, however, the model has been structured as a risk-factor model within the context of the Arbitrage Pricing Theory (APT).[75] This method of theoretical development has many precedents in the physical sciences. Prior to 1600, the accepted theory was that planets traversed their sun in a circular orbit. Astronomer Tycho Brahe made a series of astronomical observations, and based on this data, Johannes Kepler proved that the orbits were not circular but elliptical. Kepler published three laws that explained planetary movements in a way that was consistent with the observed data. In the 1700s, Isaac Newton showed that Kepler's laws could all be theoretically justified within his unified theory of gravity.[76] In short, theories are retained, replaced or improved ultimately by reference to their consistency with the evidence. They do not exist in isolation from it.

NERA (2013)[77] conclude that, as for the Black CAPM, the elimination of a documented bias may come at the cost of less precision – as the Fama-French model requires the estimation of additional parameters.

NERA (2013)[78] note that the dividend growth model (DGM) is not an asset-pricing model in the sense that it is not predicated on assumptions about investor behaviour. The term "asset-pricing model" is a technical term which refers to an equation for expressing the cost of capital as a function of a set of risk factors. In the dividend growth model, the risk factors are not specified in advance. Rather it is a mathematical procedure that matches the current price of an asset with the present value of future cash flows derived from ownership of that asset. Thus the theory underpinning the DGM is simply that assets are fairly priced at the present value of expected future cash flows. It is equivalent to estimating the yield to maturity on debt as the present value of projected cash flows to the holders of that debt. In this regard, McKenzie and Partington (2013) note that:

> *In the implied cost of capital approach, the cost of capital is exogenous to the model. Some would argue that this is a strength of these models. They do not rely on a theoretical asset pricing model, but rather extract a forward looking cost of equity capital direct from the data*[79]

Versions of the DGM have been used extensively in US regulation cases to estimate the required return on equity, as noted by McKenzie and Partington (2013).[80] and SFG (2013)[81]. In Australia, the Queensland Competition Authority uses the DGM to inform its estimate of the market risk premium.[82]

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[73] McKenzie and Partington (2013), p. 34.
[74] NERA (2013), *Review of cost of equity models*, June, p.19.
[75] See NERA (2013), *Review of cost of equity models*, June, p.19 and Ross, Stephen, *The arbitrage theory of capital asset pricing*, Journal of Economic Theory 13, pages 341-360.
[76] See, for example, csep10phys.utk.edu/astr161/lect/history/Kepler.html.
[77] NERA (2013), *Review of cost of equity models*, June, p.24.
[78] NERA (2013), *Review of cost of equity models*, June, p.25.
[79] McKenzie and Partington (2013), p. 36.
[80] McKenzie and Partington (2013), p. 38.
[81] SFG (2013), *Dividend discount model estimates of the cost of equity*, June, p. 9.
[82] See, for example, QCA(2012) , The risk-free rate and the market risk premium, November, p. 10 and pp. 23-24.

4.3.3.1. Other evidence informing the WACC estimate

The Consultation Paper sets out the reasonableness checks that the AER has previously applied and a number of other potentially relevant pieces of evidence that could be used to inform the WACC estimate.

The ENA considers that any piece of evidence that has no material possibility of causing the allowed return to be adjusted from what it would have been in the absence of that evidence is not relevant. In particular, some of the "reasonableness checks" that are set out in the Consultation Paper have no material possibility of having any effect on the allowed return and are consequently irrelevant. That is, a piece of evidence that is not used to inform the estimate of any WACC parameter or the relative weights to be applied to different pieces of evidence is irrelevant. For a piece of evidence to be relevant, the proponent would have to explain the circumstances in which, and the mechanism by which, that piece of evidence could have an effect on the WACC estimate. If a piece of evidence could not have an effect on the WACC estimate in any circumstances, it is irrelevant.

Key position 7

The ENA submits that for any reasonableness check or other piece of evidence to be considered relevant, it must have some prospect of having some effect on the allowed return.

This test is applied to the reasonableness checks and other evidence that is discussed in this section.

4.3.3.1.1. Trading multiples

One of the reasonableness checks that the AER applied in the recent Victorian Gas Distribution Review (VGDR) was the trading multiples of four comparable firms. A trading multiple is a measure of the share price of a regulated firm divided by its RAB (expressed on a per share basis). In its Final Decision for Envestra,[83] the AER stated that:

> *A trading multiple above one may imply that the market discount rate is below the regulated WACC.*[84]

However, a trading multiple above one does not inevitably establish that the regulatory rate of return exceeds that required by investors. Rather, trading multiples above one could reflect a myriad of factors, including, but not limited to:

a) The contribution of strongly performing non-regulated assets owned by a regulated firm;

b) The ability of the regulated firm to react to the incentive-based regulation framework that operates in Australia. Every regulated firm has an incentive to implement efficiencies to attempt to beat the regulatory benchmark in relation to every component of the building block approach. An efficiency gain in relation to any component of the regulated revenue allowance could explain a trading multiple above one;

c) The possibility that efficiency gains may occur in the future or that allowed returns or other aspects of the regulatory allowance may be higher in the future. The current share price

[83] We refer to the Envestra Final Decision throughout this section. Similar, or identical, wording is contained in the Final Decisions for the other Victorian gas distribution businesses.
[84] Envestra Final Decision, Appendix B, p.60

reflects more than just the next five-year regulatory period – it also reflects the market's expectations of all future regulatory periods;

d) The potential for growth in the earnings of the regulated firm, whether arising from non-regulated business units or from efforts to increase the demand for regulated services; and

e) The possibility that an acquirer might be prepared to pay a premium for the firm's assets, for instance, because there may be synergies with the acquirer's existing business or because gaining entry to that particular market is of strategic importance to the acquirer; and

f) Measurement error – the AER notes that it has used broker estimates and that it is unaware of how those estimates have been calculated.[85]

That any one or more of these factors could equally explain a trading multiple above one appears to be uncontentious. For instance, McKenzie and Partington (2011) note that:

> *The source of this value premium could arise from economies of scale and synergies in general, from the opportunities for efficiency gains, from opportunities for growth, from the potential to exploit tax shields, or because the allowed regulated return is above the return really required. It is difficult to attribute the value premium across these components*[86]

and Cambridge Economic Policy Associates (CEPA) (2013) state:

> *we accept, as per the arguments put forward by SFG Consulting, that there are limitations in what can be inferred from this market evidence.*[87]

CEPA go on to conclude that there is evidence that trading multiples are above one for the four data points that are available, but that:

> *The degree to which there is outperformance on the cost of equity is unclear.*[88]

The AER also acknowledges that such factors limit the inferences that can be drawn from trading multiples. In its recent VGDR Final Decisions, the AER stated:

> *The AER acknowledges that there are other factors which may explain a trading multiple above one.*[89]

Thus it is generally accepted that there are a number of reasons why the trading multiple may exceed one. Logically, to conclude anything about what the trading multiple implies about the allowed return on equity over the next five-year regulatory period, one would first have to quantify the effects of the plethora of other factors that also affect the trading multiple. The AER has not sought to do this.

Moreover, in the recent VGDR the AER concluded that trading multiples could not be used to inform the estimate of any parameter or the estimate of the required return on equity:

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[85] Envestra Final Decision, Appendix B, p. 60, Footnote 271.
[86] McKenzie and Partington (2011), p. 34.
[87] CEPA (2013), p. 54.
[88] CEPA (2013), p. 54. CEPA go on to conclude that it is unlikely that the "rates allowed" are too low. But without seeking to quantify any contribution of the other components of the premium, it is not clear how such a conclusion has any basis.
[89] Envestra Final Decision, Appendix B, p. 60.

> *it is not possible to use RAB trading multiples analysis as an input when assessing individual parameters. The AER does not place any weight on this analysis during that process.*[90]

It is not clear how trading multiples could possibly have any effect at all on the allowed return on equity. If the multiple is above one, the AER would presumably make no adjustment to its allowed return on equity. If the multiple is below one, there is no basis for any particular adjustment as the AER has already noted that the trading multiple cannot be used to inform the estimate of any parameter. That is, it is unclear how trading multiple evidence could ever have an effect on the WACC estimate. Rather, it is likely that whatever trading multiple was observed, no change would be made to the allowed return on equity. In this case, the trading multiple would not be relevant evidence.

Key position 8

The ENA submits that it is impossible to use trading multiples to draw any conclusion about the allowed return on equity without first quantifying the effect of all other components of the trading multiple. If trading multiples are to be used, the AER should explain precisely how that evidence could cause an allowed return on equity to be different from what it would have been otherwise and how it would quantify the change that it would make to the allowed return that it would otherwise set.

4.3.3.1.2. Transaction multiples/recent regulated asset sales

In the recent VGDR, the AER noted that recent regulated asset sales have generally been at a premium to the regulated asset base, as reflected by a multiple of sale proceeds to RAB exceeding one.[91] The AER concludes, on the basis of stakeholder submissions and reports from its own consultants, that:

> *A range of factors may contribute to a difference between market and book values.*[92]

In its Final Decisions, the AER sets out a list of some of the factors that might explain a transaction multiple above one. This list includes the reasons why a trading multiple might be above one (as set out above). The AER recognises[93] that its list is not exhaustive and that stakeholders have proposed additional factors including:

a) The acquirer's expectation of potential future growth in earnings from the operation of the regulated assets, whether because of an increase in demand for regulated services, howsoever arising, or because of an expectation that regulation will be relaxed;

b) The acquirer's perception that acquiring the asset would confer certain intangible or strategic benefits of value to the acquirer. This could be the case if, for instance, the purchase of a regulated asset granted a foreign investor entry to a market that they perceive to be of strategic importance;

c) The inclusion of certain non-regulated assets that are of value to the acquirer in the sale;

[90] Envestra Final Decision, Appendix B, p. 62.
[91] Envestra Final Decision, Appendix B, p. 57.
[92] Envestra Final Decision, Appendix B, p. 57.
[93] Envestra Final Decision, Appendix B, p. 57.

d) The acquirer's expectation that they could exploit synergies between their existing business and the regulated asset that lead to increased revenues or reduced costs; or

e) The possibility that certain efficiencies might be available to the acquirer that are not available to an efficient benchmark service provider.

That is, as for trading multiples, it is generally accepted that there are many factors that might result in a transaction multiple above one. Consequently, it is logically impossible to conclude anything about what the trading multiple might imply about the allowed return on equity for the assets that were the subject of the sales without first quantifying the effect of the other factors.

Moreover, as for the trading multiples, it seems that there is no mechanism for the transaction multiple evidence to have any effect on the allowed return on equity – the allowed return on equity would be the same regardless of what transaction multiples had been observed.

Key position 9

The ENA submits that it is impossible to use transaction multiples to draw any conclusion about the allowed return on equity without first quantifying the effect of all other components of the transaction multiple. If transaction multiples are to be used, the AER should explain precisely how that evidence could cause an allowed return on equity to be different from what it would have been otherwise and how it would quantify the change that it would make to the allowed return that it would otherwise set.

4.3.3.1.3. Broker WACC estimates

The Consultation Paper proposes that broker discount rates (or WACC estimates) could also be used as a reasonableness check.[94] The use of broker WACC estimates as a source of evidence with respect to the actual cost of capital faced by regulated businesses is subject to many known limitations, a number of which are set out in the VGDR Final Decisions:

- the broker reports generally do not state the full assumptions underlying their analysis, or provide thorough explanations of how they arrive at their forecasts and predictions. As such, caution should be exercised in the interpretation of these broker reports;
- the five listed companies considered undertake both regulated and unregulated activities, which are assessed by brokers in aggregate. However, only the regulated activities are directly relevant to the risk in providing reference services;
- it is generally not clear what assumptions the brokers have relied upon when developing their WACC estimate. Further, variation in WACC estimates suggests that these assumptions are not consistent across the different brokers; and
- the broker reports do not always provide sufficient information for the AER to calculate a nominal vanilla WACC estimate. Only those brokers who report the WACC in nominal vanilla form or provide sufficient detail to enable conversion to this form were considered. These figures are not necessarily precise estimates of the broker's nominal vanilla WACC, since the AER has relied on its interpretation of the information provided.[95]

[94] Consultation Paper, pp. 80-81.
[95] Envestra Final Decision, Appendix B, p. 63. These limitations are also set out in the Consultation Paper.

The Australian Competition Tribunal also noted these limitations in the recent Envestra matter, but determined that the AER's use of broker WACC estimates did not give rise to a reviewable error on the basis that they had no effect on the allowed return. They were not used in the process of estimating the allowed return, and their consideration caused no revision of that estimate – they did no harm.[96]

As with the trading and transaction multiples above, it seems that there is no circumstance in which broker WACC estimates would ever have any effect on the allowed return on equity.

In its recent VGDR Draft Decisions, the AER noted that the range of broker WACC estimates in its sample was 7.76% – 10.02%, and that its proposed allowed WACC of 7.16% was 173 basis points below the mid-point of the range and 60 basis points below the minimum value in this range. From this, the AER concluded:

> *Broker WACC estimates do not demonstrate that the overall rate of return, which is based on the analysis of individual parameters, is not commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services.*[97]

In response, a number of businesses questioned the purpose of this test when the allowed return clearly failed the test (by any definition) and nothing was done about it. This outcome reinforces the ENA's concerns about using a primary model with reasonableness checks (Approach 2 in the Consultation Paper). It is unclear how any reasonableness check would ever have any relevance if no adjustment is made to the allowed return even when that allowed return clearly violates the reasonableness check.

For the VGDR Final Decisions, the AER identified one broker WACC estimate for one company that was one basis point (0.01%) below its allowed return, with all other estimates above the AER's allowed return. From this, the AER again concluded that:

> *Broker WACC estimates do not demonstrate that the overall rate of return, which is based on the analysis of individual parameters, is not commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services.*[98]

In summary, it seems that there is no broker WACC evidence that would lead the AER to alter its allowed return. Even when the allowed return was outside the entire range of broker WACC estimates (or one basis point within it), no adjustment was made. That is, as a reasonableness check broker WACC estimates would seem to have no effect on the allowed return.

Unlike trading and transaction multiples, it is possible to use broker WACC estimates directly in the estimation process – because they are rate of return estimates, rather than just a ratio. However, the Tribunal decision in the recent Envestra case would seem to prevent their use in that manner, due to the accepted limitations.

Consequently, it seems that the broker WACC evidence is irrelevant in that the allowed return would be the same irrespective of the broker estimates.

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[96] Australian Competition Tribunal, *Application by Envestra Ltd (No 2) [2012] AComp T 3*, 11 January 2012, Paragraph 166.
[97] Envestra Draft Decision, Appendix B, p. 63.
[98] Envestra Final Decision, Appendix B, p. 64.

Key position 10

The ENA submits that if broker discount rates are to be used, the AER should explain precisely how that evidence could cause an allowed return to be different from what it would have been in the absence of that evidence – what would the evidence have to show before it would lead the AER to set an allowed return different from what it would otherwise be, and how would the AER quantify the extent of the adjustment that would be made.

4.3.3.1.4. Recent decisions by the AER and other regulators

The Consultation Paper proposes that recent decisions by the AER and other regulators can be used a reasonableness check.[99]

There is clearly a large degree of circularity involved in checking the reasonableness of the AER's current decision against the AER's previous decisions. Such a process would have the potential to perpetuate and even compound errors in the decision making process. This is because the proposal is to check the reasonableness of a current decision of the AER against recent previous decisions of the AER.

Similarly, where other regulators have adopted an approach or a parameter value on the basis that the AER had adopted that approach or parameter value, the decision of the other regulator should not be considered to provide a meaningful independent cross check of the reasonableness of the AER's decisions.

In relation to the circularity issue, the Consultation Paper states that the AER:

> *did not agree with proposals which stated that there is circularity in considering our recent decisions against our current decision. Rather recent decisions are more likely to reflect similar market conditions.*[100]

If:

a) One decision follows quickly after another decision;

b) The evidence available for each decision is essentially the same; and

c) The two businesses being regulated are essentially identical in all relevant respects,

then consistency would demand that the allowed returns should not be materially different.

However, this is not a "reasonableness" check, but a "consistency" check. It is entirely possible that two consistent decisions are both unreasonable because they have perpetuated the same error.

Moreover, even if past regulatory decisions are to be used as a reasonableness check, it is not clear how they could ever lead to an allowed return being different from what it would otherwise be. An allowed return that was materially the same as in a previous decision would presumably constitute a pass. And if there was a material difference between two decisions, there would presumably be some explanation for it. All that would be accomplished by such a "test" is to ensure that, if considering the same set of evidence, the regulator would make the same decision. This is not a reasonableness test but a basic requirement of administrative decision-making.

[99] Consultation Paper, p. 82.
[100] Consultation Paper, p. 83.

Key position 11

The ENA submits that past regulatory decisions cannot be used as a reasonableness test. At best, they can be used as a test of consistency – that the same evidence leads to the same outcome. If past regulatory decisions are to be used as a reasonableness test, the AER should explain precisely how that evidence could cause an allowed return to be different from what it would have been in the absence of that evidence – what would the evidence have to show before it would lead the AER to set an allowed return different from what it would otherwise be, and how would the AER quantify the extent of the adjustment that would be made.

4.3.3.1.5.Comparison of return on equity and return on debt

The Consultation Paper notes that one of the reasonableness tests that the AER has previously used is a comparison of the allowed return on equity and the allowed return on debt in the same determination. The AER concludes that:

> *Equity investors are residual claimants on a firm's assets in the event of default. It is typically expected, therefore, that equity investments are riskier than debt investments, and that the return on equity should exceed the return on debt.*[101]

The Consultation Paper goes on to examine two specific issues. The first issue is that financial models provide an estimate of the expected return on equity, whereas the yield on debt is a promised return such that the expected return is lower to the extent that there is a chance of default.

> *The return on equity estimated by us has been an expected return, while the return on debt is a promised return. That is, debt returns are calculated based on promised cash flows (or coupons), while equity returns reflect market expectations of returns. SFG, in a report commissioned by the Victorian gas networks, supported this view.*[102]

> *The importance of comparing debt and equity premiums on a consistent basis is that any adjustments will widen the spread between the two premiums. That is, promised returns will always exceed expected returns. As such, if the return on debt was adjusted to reflect an expected return, the return would fall. The corresponding spread, therefore, would increase. This has provided us with some comfort that the recent spread between allowed returns on debt and equity have been reasonable.* [103]

In effect the AER is arguing here that the seemingly small difference between equity and debt returns is an underestimate of true 'like for like' difference because equity returns are expected returns and debt returns are promised returns.

McKenzie and Partington (2012) have similarly advised the AER that:

[101] Consultation Paper, p. 83.
[102] The Consultation Paper fails to mention that the SFG report that it quotes goes on to explain in some detail why it is not logically open to a regulator to justify a lower allowed return on equity on the basis that the revenues it has allowed result in the regulated business facing a material chance of insolvency; SFG (2012), The required return on equity: Response to the AER Victorian Gas Draft Decisions, pp. 35-38.
[103] Consultation Paper, p. 84.

> *The promised return is only same as the expected return for debt where there is no default risk. For all other debt the promised return is higher than the expected return.*[104]

In its recent VGDR Final Decisions, the AER concluded that:

> *it is not unreasonable for the promised return on debt to exceed the expected return on equity.*[105]

It is self-evidently true that the yield on debt is a promised return. However, any argument that the expected return on debt is materially lower than the promised return is also an argument that there is a material probability of default. If there is a material probability of default then there is, by definition, a material probability that equity holders will lose their entire investment (earn a return of -100%). If this is the case then the regulator's allowed rate of return is also best interpreted as a promised (not an expected) return by the regulator. Consequently, the argument provided by the AER collapses because both returns are promised returns.

By way of illustration, suppose the CAPM estimate of the expected return on equity is 12% and there is a 5% chance of default. In this case, the regulated firm should be allowed to charge prices that would be sufficient to provide a return to shareholders of 18%. Thus shareholders would receive a return of 18% if the firm remains solvent (95% probability) and would lose their investment if it does not (negative 100% return with 5% probability). Shareholders would thus face an expected return of 12%,[106] consistent with the CAPM estimate.

In summary, if the regulator considers that there is a material probability of default for the benchmark firm, that probability should be identified so that the allowed return on equity can be appropriately grossed-up as set out above. Moreover, if there is a material probability of default then there must be an even higher probability of financial distress (noting that not all financial distress need turn into default but all default is preceded by financial distress).

These costs are real and significant. If a business faces a financial crisis the existing value of the company can be 'eaten up' in short-term management decisions (e.g., through a failure to invest in otherwise valuable capital maintenance), fractured management decisions (driven by different stakeholders' interests), selling assets at "fire-sale" prices in order to raise cash and the legal fees of bankruptcy and/or restructuring. If there is a material difference between the expected and the promised yield on debt then these transaction costs of financial distress would be material also and would need to be compensated for by the regulator on an actuarially expected basis.

Also, a regulatory determination that results in there being a material chance that the revenue that the regulator has allowed will be insufficient to keep the firm solvent would appear to be inconsistent with the long term interests of consumers, incentives for efficient investment, and with the rate of return objective.

The Consultation Paper also raises the issue of pre-tax returns versus post tax returns.[107] This appears to confuse the rationale for the comparison. The point is to compare the returns that investors require from different types of investment in the benchmark firm. The regulatory return on equity and debt are estimates of the returns required at the investor level – what would it take to convince an investor to invest in the benchmark firm. In that sense, no adjustment would seem to be required for corporate tax considerations. If the AER considers that an adjustment should be made

[104] McKenzie and Partington (2012), p. 22.
[105] Envestra Final Decision, Appendix B, p. 67.
[106] That is, 0.95 × 18% + 0.05 × (-100%) = 12%.
[107] Consultation Paper, p. 84.

to one or more of those quantities before they can be compared, the specifics of the adjustment should be set out.

Finally, we note that non-resident investors, who do not benefit from imputation credits, can only expect to receive a return on equity of $\left[\frac{1-T}{1-T(1-\gamma)}\right] r_e$.[108] To the extent that the allowed return assumes that it would be rational for non-residents to invest in equity in the benchmark firm, their expected return on equity must be higher than their expected return on debt in the same firm.

Key position 12

The ENA submits that the expected return on equity should be higher than the expected return on debt for all investors in the benchmark firm. To the extent that the AER considers there to be a material chance of the benchmark firm defaulting, the probability of default should be quantified so that the allowed return on equity can be grossed-up accordingly.

The ENA submits that redemption rates cannot be used for any purpose other than as an upper bound for theta.

4.3.3.1.6. Financeability and credit metrics

The Consultation Paper includes financeability and credit metrics among the list of potential reasonableness checks, but concludes that:

> *…financeability testing would only be used by the AER to ensure consistency between the assumptions used to set the allowances, and the overall impact of the determination on the benchmark efficient entity's financial stability.*[109]

In their Draft Report for the AER, Frontier Economics (2013) set out a list of several Australian and UK regulators that perform financeability tests.[110] The ENA submits that a proper financeability test is one that ensures that the allowed revenues are sufficient to support the assumed credit rating – "financeability" means more than not becoming insolvent during the next regulatory period.

Key position 13

The ENA agrees that financeability and credit metrics should not be used as an ex post reasonableness test. Rather, that information should be used to ensure that the estimates of gearing, credit rating and debt issuance (and other related) costs are robust and internally consistent.

[108] This is the downward adjustment for the assumed value of imputation credits that is made to the allowed return on equity in the AER's post-tax revenue model.
[109] Consultation Paper, p. 87.
[110] Frontier (2013), p. 23.

4.3.3.1.7. MRP survey information

The Consultation Paper discusses the use of survey information in relation to market risk premium (apparently erroneously under the heading of "Comparison with takeover valuation report discount rates.")[111]

The ENA submits that the appropriate place to consider such material is when estimating the expected return on the market – not as an ex post reasonableness check. To the extent such information is relevant, it should be reflected in the expected return on the market.

However, many concerns have been identified in relation to the use of survey responses. A number of these have been considered by the Tribunal, which noted that the survey evidence on which the regulator (the AER in that case) had sought to rely has been criticised for not providing a sufficient real world context to give the survey results any real meaning and concluded that:

> *Surveys must be treated with great caution when being used in this context. Consideration must be given at least to the types of questions asked, the wording of those questions, the sample of respondents, the number of respondents, the number of non-respondents and the timing of the survey. Problems in any of these can lead to the survey results being largely valueless or potentially inaccurate.*
>
> *When presented with survey evidence that contains a high number of non-respondents as well as a small number of respondents in the desired categories of expertise, it is dangerous for the AER to place any determinative weight on the results.*[112]

In essence, the Tribunal requires that three conditions must be met for survey responses to be given any material consideration:

a) The survey must be timely – there must have been no change in the prevailing conditions in the market for funds since the survey was administered;

b) There must be clarity about precisely what respondents were asked so that there is no ambiguity about how to interpret their responses; and

c) The survey must reflect the views of the market and not a sample that is small, unresponsive, or without sufficient expertise.

The Consultation Paper states that:

> *Lally also supported the use of survey evidence and suggested the recent Fernandez survey is the most relevant survey evidence.*[113]

Fernandez et. al. (2011) posed a single question to potential respondents on the value of MRP: "The market risk premium that I am using in 2011 for my country is X%?" The respondents were not asked what they were using the market risk premium for, how they were using it, or what values they were using for any other parameters. For example, some of the survey responses were analysts for stockbroking firms. They may be using an MRP number to assist them in making a case that their

[111] Consultation Paper, p. 81.
[112] *Application by Envestra Ltd (No 2), ACompT 3*, Paragraphs 162-163.
[113] Consultation Paper, p. 82.

clients should buy shares in a particular firm. Many of the responses were from university lecturers who may be using an MRP number in their class examples, and so on.

Moreover, the survey was administered in March 2011 when the yield on 10-year Commonwealth Government bonds was 5.5%. At the time of the Consultation Paper, the yield had fallen to just over 3%. It is entirely possible that some of the survey respondents use a long-run historical MRP estimate together with a long-run historical estimate of the risk-free rate. It is also entirely possible that the MRP that respondents were using in a market where government bond yields are 5.5% is materially different from the estimate that would be used in a market where government bond yields are 3%.

The Fernandez et. al. (2011) survey has only 40 responses in relation to the Australian market – 15 academics, 21 broker analysts, and 4 corporate managers. Their responses ranged from 3% to 14%.

In summary, the Fernandez et. al. (2011) survey is:

a) Not timely, in that respondents were surveyed in market conditions that were materially different from those at the time of the Consultation Paper;

b) Unclear, in that there is no information about what the respondents used the MRP estimate for, how they used it, or how its value might be related to other parameters such as the risk-free rate; and

c) Unrepresentative, in that there were only 40 respondents and no information about the non-response rate.

It is difficult to imagine that any survey could fare worse against the evidentiary evaluation criteria set out by the Tribunal.

Key position 14

The ENA submits that survey evidence in general should be tested against the criteria set out by the Tribunal.

4.3.3.1.8. Independent expert valuation reports

The Consultation Paper includes a heading "Comparison with takeover valuation report discount rates,"[114] but the discussion under that heading refers to survey information in relation to market risk premium.

In the VGDR, the NSPs submitted a report that summarised the relevant practice documented in independent expert valuation reports.[115] The NSPs submitted that this was relevant evidence because:

a) The independent experts are required to be appropriately qualified and operate under a regime of statutory duties;

b) They are required to be unbiased and transparent; and

[114] Consultation Paper, p. 81.

[115] Available at http://www.aer.gov.au/sites/default/files/Attachment%209.12%20Ernst%20%26%20Young%20-%20Market%20Evidence%20on%20the%20Cost%20of%20Equity%20-%208%20November%202012.pdf.

c) Material sums of money have changed hands on the basis of these reports.

In its Final Decisions for the VGDR, the AER considered the independent expert evidence. The AER's use and interpretation of that evidence differed from that of the NSPs who proposed its use – and this is one of the issues currently before the Tribunal.[116] The ENA's proposed use of independent expert evidence is set out in Section 4.5 below.

Key position 15

At this point, the ENA submits that independent expert valuation reports do contain relevant evidence that can inform the estimation of the required return on equity for the benchmark firm.

4.4 Stability of the allowed return on equity

The Consultation Paper notes that "numerous stakeholders have referred to the desirability of stability in the return on equity estimate."[117] The Consultation Paper states that:

> *A relatively stable regulatory return on equity would have two effects:*
>
> - *it would smooth prices imposed upon consumers*
> - *it would provide service providers and investors with greater certainty about the outcome of the regulatory process.*[118]

The Consultation Paper goes on to express a concern that, if the allowed return on equity was more stable than the true required return on equity, the inevitable result would be some periods of over-compensation and some periods of under-compensation:

> *The theoretical and empirical evidence does not suggest the return on equity is precisely stable over time. Accordingly, the adoption of, a stable regulatory return on equity would at times arguably produce an estimate that would not reflect prevailing estimates. Therefore, a stable return on equity may over compensate service providers at times, while at other times it may under compensate them.*[119]

In considering this issue, it is important to distinguish between three different notions of the return on equity:

a) The ex-post outcome return on equity. This is the observed return on equity that was actually achieved by a particular business over a particular period.

[116] The APA Group has sought leave to appear before the Tribunal in relation to the VGDR.
[117] Consultation Paper, p. 44.
[118] Consultation Paper, p. 44.
[119] Consultation Paper, p. 44.

b) The ex ante required return on equity. This is the true forward-looking expected return on equity that investors would require before committing equity capital to the benchmark firm.

c) The regulatory allowed return on equity. This is the regulator's estimate of the true ex ante required return on equity in (b).

The stability or volatility of the ex post return on equity of a particular business is irrelevant to the regulatory stability issue. The only issue here is whether the regulatory allowance in (c) is commensurate with the ex ante required return in (b). If not, there is either under- or over-compensation and the allowed rate of return objective will not be met.

The ENA's previous submissions on this issue have been that the ex ante required return on equity is more stable than the regulatory return on equity that has been allowed by the AER under the old Rules. That is, the return that investors actually require to invest equity capital is more stable than the regulatory allowance. This inevitably results in some periods of over-compensation and some periods of under-compensation. The ENA submits that in recent times, the result has been material under-compensation.

The approach adopted by the AER under the old Rules has been to set the allowed return on equity as the contemporaneous 10-year government bond yield plus a fixed constant premium for risk. In recent times, government bond yields have been at historical lows, in which case the AER's allowed return on equity has correspondingly been at historical lows. The ENA submits that the true cost of equity has not been at historical lows since the onset of the GFC. Evidence in support of this proposition is set out in detail below, and includes (a) independent expert valuation professionals do not consider that the cost of equity is at historical lows, (b) investment banks and corporate finance advisory firms do not consider that the cost of equity is at historical lows, (c) market-based empirical estimates do not suggest that the cost of equity is at historical lows, and (d) other regulators do not consider that the cost of equity is at historical lows. An exemplar of the problems with the approach adopted by the AER is provided by CEG in their analysis of the cost of equity determined during the averaging period for the Roma to Brisbane Pipeline in 2012[120]

In this regard, at the AER's Forum on 18 June 2013, Frontier Economics stated that they did not believe that required returns on equity have, since the onset of the GFC, been lower than at any time in the previous 40 years – which is what the AER's previous approach implies. Rather, Frontier Economics stated that it is likely that the material reduction in government bond yields has been offset by a material increase in risk premiums. Frontier Economics also stated that the true required return on equity is likely to be relatively stable over time.

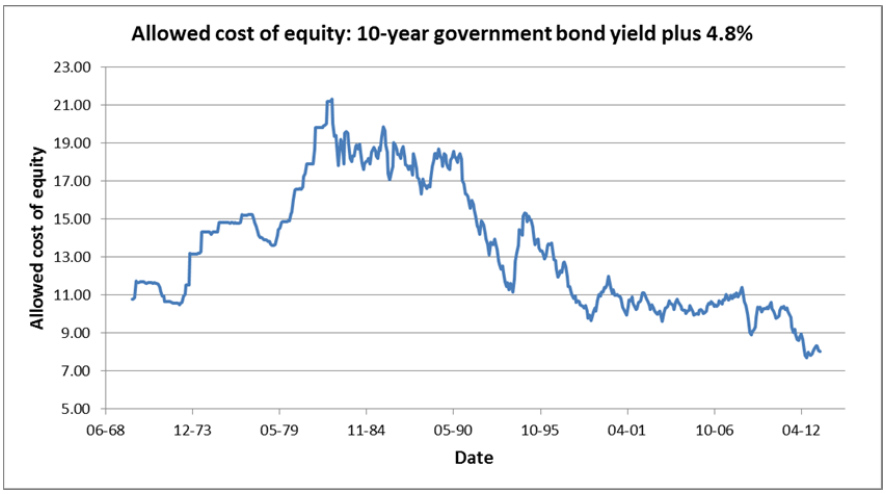
The ENA's submission on this point is that an approach that gives proper regard to a much broader range of evidence than the AER has relied on under the previous Rules is likely to provide a better regulatory estimate of the required return on equity. Thus, the regulatory estimate (and hence the allowed return on equity) would be more commensurate with the true required return on equity, and consequently more stable over time. This has dual benefits for both consumers and regulated businesses – the amount of over- or under-compensation is reduced (i.e. returns and prices are closer to being fair) and there is less volatility in observed returns and prices over time.

The Consultation Paper implies that some stakeholders may be seeking a regulatory allowed return on equity that is (artificially) more stable than the true ex ante required return on equity – that stability should be pursued for its own sake. That is not the position of the ENA. The ENA's position is that:

[120] Section 3, CEG *Estimating the E[Rm]: in the context regulatory debate*, June 2013

a) The Rules require the regulator to use all relevant evidence to obtain the best possible estimate of the ex ante required return on equity; and

b) The *ex ante* required return on equity is more stable over time than the AER's estimate of it under the previous Rules, as set out in the figure below.



Source: Reserve Bank of Australia, http://www.rba.gov.au/statistics/tables/xls/f02d.xls?accessed=2013-06-25-14-13

Consequently, a better estimate of the ex ante required return on equity will result in more stable regulatory allowed returns.

In this regard, the Consultation Paper notes that a multi-model approach (such as that advocated by the ENA below) "may provide a more stable outcome."[121] The ENA agrees with that assessment and notes that the reason it may provide a more stable outcome is that the multi-model approach is likely to provide a better estimate of the true ex ante required return on equity, which itself is more stable over time relative to the AER's previous regulatory estimates.

That is, the ENA is of the view that the volatility in the AER's previous regulatory estimates of the required return on equity is not due to volatility in the true required return on equity, but due to estimation error. The source of that estimation error was the previous approach to implementing the Sharpe-Lintner CAPM and the inability or unwillingness to consider a range of other relevant evidence.

Key position 16

The ENA submits that the Rules require the regulator to use all relevant evidence to obtain the best possible estimate of the ex ante required return on equity, and this will result in more stable regulatory allowed returns and prices and less over- or under-compensation.

[121] Consultation Paper, p. 43.

4.5 Multi-model methodology for determining the cost of equity estimate

4.5.1 Background and context

In its response to the AER's Issues Paper, the ENA proposed a four-step approach to estimating the required return on equity for the benchmark firm as follows:

> Step 1: Identify the relevant methods, models, data and evidence;
>
> Step 2: Compute the best estimate of the required return on equity for the market/average firm;
>
> Step 3: Compute the best estimate of the required return on equity for the benchmark firm using each approach/piece of evidence; and
>
> Step 4: Distil from that an estimate of the required return on equity for the benchmark firm.[122]

In this section, the ENA applies this four step approach using evidence compiled by several advisers to the ENA.

Consistent with the ENA's proposed approach, at the AER's Forum of 18 June 2013, Associate Professor Partington noted the evidence that "multiple forecasts generally give better outcomes" which led to his support for "a portfolio approach to asset pricing models."

Step 1: Identify the relevant methods, models, data and evidence

In its response to the AER's Issues Paper, the ENA stated that:

> *This step may identify a range of different models (e.g., Sharpe-Lintner CAPM, other versions of CAPM, dividend growth models, etc.). It may also identify evidence of current market practice (e.g., current independent expert reports) or evidence of the returns that equity investors reasonably expect from comparable investments where the reasoning for these expectations is made reasonably transparent. The latter could be of particular relevance in establishing whether an allowed return is commensurate with the prevailing conditions in the market.*[123]

For the purpose of estimating the required return on equity the ENA has examined four financial models:

a) The Sharpe-Lintner CAPM;

b) The Black CAPM;

[122] ENA *Response to the AER rate of return guidelines – Issues paper*, February 2013, p. 22.
[123] See also National Electricity Rules 6.5.2 (g) and 6A.6.2 K(g) and National Gas Rules 87(7).

c) The Fama-French three factor model; and

d) A multi-stage version of the dividend growth model.

These four financial models have been discussed in a number of recent regulatory determinations and in the Consultation Paper. Because they have been considered in a number of recent determinations, they are relatively more familiar to stakeholders and there is a baseline level of knowledge about the relative strengths and weaknesses of each. The ENA is open to the consideration of other financial models that can be properly parameterised and consistently applied. For example, the Consultation Paper also proposes consideration of a consumption/inter-temporal version of the CAPM and there are other models including international models and heterogeneous agent models. The ENA has submitted four financial models that are relatively well understood in the regulatory setting. The reasons for focusing on these four models are set out in more detail in Section 4.3 above and in NERA (2013)[124].

The data and evidence that the ENA has used to estimate the required return on equity consists of:

a) Financial market data (including stock returns, bond yields, information about dividends and imputation credits);

b) Observations of market practice (including information about the practice of independent expert valuation professionals and other market professionals);

c) Forecasts of market professionals in relation to near-term dividend expectations.

This information and evidence is used for two purposes:

a) To inform the estimation of parameters for each of the financial models; and

b) To inform the relative weights to be assigned (ex post) to each of the estimates of required return.

The precise nature and source of the information that is used is summarised in the discussion of each financial model below, and is set out in more detail in the relevant expert reports. Similarly, a number of different estimation methods – commensurate with the different types of data that are available and the different parameters that are to be estimated. Again, detailed information about the methods used, and the reasons for using them, are set out in the expert reports that are cited throughout the remainder of this section.

Step 2: Compute the best estimate of the required return on equity for the market/average firm

Introduction

A key concept in the asset pricing literature (that has produced the CAPM and Fama-French models) is the market portfolio. This is a broadly diversified portfolio that consists of all assets in the economy. For this reason, the market portfolio is also taken to represent the average asset in the economy; in particular, an asset of average risk. Consequently, the required return on equity for the market is the same as the required return on equity for the average firm which is the same as the required return on equity for the average asset – all of these terms can be, and are, used interchangeably.

[124] NERA (2013) *Review of cost of equity models*, June.

The Sharpe-Lintner CAPM, Black CAPM and Fama-French model all begin with the same required return on equity for the average firm. They then determine the required return for a particular firm by adjusting the estimate for the average firm according to the risk differences between the particular firm and the average firm. The models differ only in terms of how the risk differences are assessed and quantified. Consequently, the Sharpe-Lintner CAPM, Black CAPM and Fama French models must all have the same value for the required return of the average firm. The dividend growth model (whatever version of it is used) can also be applied to the broad market to produce an estimate of the required return on the market. A common estimate of the required return on the market, based on a holistic consideration of all available evidence, should be used consistently across all financial models.

There are a number of reasons to support the inclusion of this step in the process:

a) It is already a part of the implementation of the asset pricing models listed above. As noted, all of the models begin with an assessment of the required return on the average firm, then make adjustments for individual firms to the extent that they differ from the average. That is, this step requires no additional work – it is just a matter of being transparent about each step of the implementation of the models;

b) It ensures that the models are parameterised so that they are internally consistent in the value they use for the required return on the average firm. This ensures that the models will vary in terms of their estimates of the required return on equity for the benchmark firm only to the extent that they make different adjustments for the extent to which the benchmark firm differs from the average firm. That is, this step helps to ensure that the range of final estimates is internally consistent and narrower than it would otherwise be (i.e., if inconsistent estimates of the required return on the average firm were used in the various asset pricing models);[125]

c) Some of the relevant evidence pertains only to the average firm rather than the benchmark firm. For example, independent expert reports give a clear indication of the estimated required return for the average firm, but not for the benchmark firm (since so few of them pertain to firms that are comparable to the benchmark);

d) This step is already effectively performed under the old Rules, where the AER uses only the Sharpe-Lintner CAPM and provides estimates of the risk-free rate and MRP; and

e) At a practical level, transparency about the regulatory estimate of the required return on equity for the average firm is likely to assist in narrowing and clarifying areas of dispute (relative to having potentially inconsistent estimates buried within each financial model).

In the sections below, the ENA presents estimates for the required return on equity for the market under current market conditions and under long-term average market conditions, and summarises the evidence supporting these conclusions. Obtaining an estimate of the required return on the market in the current market conditions and in average market conditions allows the two estimates to be contrasted, and compared with other evidence about whether required returns in the current market conditions are considered to be higher or lower than the long-term average.

[125] Note that NER 6.5(e) and 6A.6.2(e) and NGR 87(5) require that regard must be had to the desirability of the interrelationships between parameters and the consistent application of any parameter estimates.

Current market conditions

The estimate of the required return on equity for the average firm under current market conditions is 12.2%.

The ENA commissioned CEG to provide an estimate of the required return on equity in the current market conditions.[126] CEG (2013)[127] review the available evidence noting that dividend growth models are typically used to estimate the contemporaneous required return on the market. CEG (2013)[128] discuss a range of issues relating to the estimation of the contemporaneous required return on the market, providing a number of criticisms in relation to approaches previously employed by the AER and its consultants. CEG (2013)[129] particularly note the estimate of the contemporaneous required return on the market provided by SFG (2013)[130] another report commissioned by the ENA,

The ENA proposes a contemporaneous market cost of equity estimate of 12.2%, consistent with the estimate from the dividend growth model analysis conducted by SFG.[131] This is a market capitalisation weighted average of the cost of equity for 251 Australian-listed firms with data available through to the end of December 2012, grossed up to include the value of imputation credits consistent with the process and estimates in recent AER decisions. The SFG report presents estimates of the required return on equity for the market over every six month period from 1 July 2002 to 31 December 2012.

With respect to imputation credits, SFG present estimates of the required return to equity holders from dividends and capital gains. This estimate is 11.0% over the six month period ending 31 December 2012, the most recent time period for which data is available.

The AER currently sets the corporate tax rate parameter to 30% and the gamma parameter to 0.25. This value for gamma was set out by the Australian Competition Tribunal on the basis of a dividend drop-off analysis conducted by SFG.[132] SFG has since updated this analysis to incorporate data until the end of December 2012.[133] The original dataset ended in September 2010. Analysis of this updated dataset did not lead SFG to alter its original conclusion. So for the basis of the calculations below a value for gamma of 0.25 has been used.[134]

In estimating the cash flows under its post-tax revenue model, the AER incorporates the following equation presented in Officer (1994), where τ is the corporate tax rate and γ (gamma) is the market value of a dollar of corporate tax paid. The AER accounts separately for the value of tax paid in its cash flow estimates, but the manner in which it makes this adjustment is exactly equivalent to making an adjustment to the cost of equity capital according to the equation below:

$$r_e^* = r_e\left[\frac{1-T}{1-T(1-\gamma)}\right]$$

[126] CEG (2013), *Estimating the return on the market*, June.
[127] CEG (2013), *Estimating the return on the market*, June.
[128] CEG (2013), *Estimating the return on the market*, June.
[129] CEG (2013), *Estimating the return on the market*, June.
[130] SFG (2013), Dividend discount model estimates of the cost of equity, June.
[131] SFG Consulting (2013), Dividend discount model estimates of the cost of equity, June. The estimates contained in this report rely upon the modelling framework adopted by Fitzgerald, Gray, Hall and Jeyaraj (2013).
[132] The decision reported in ACT, *Application by Energex Limited (Gamma) (No 5) [2011] ACompT 9*, May 2011, applied the estimate reported in SFG (2011), Dividend drop-off estimate of theta, March.
[133] SFG (2013b).
[134] The current regulatory estimate of gamma (0.25) is used here to illustrate the point.

where r_e is the total required return on equity and r_e^* is the required return on equity net of the effect of imputation credits.

Applying this to the 11.0% estimate of the return from dividends and capital gains (i.e., net of the effect of imputation credits), a corporate tax rate of 30% and a value for gamma of 0.25 the estimate for the total required return on equity is 12.2%, as shown below:

$$11.0\% = r_e\left[\frac{1-0.3}{1-0.3(1-0.25)}\right]$$
$$\Rightarrow r_e = 12.2\%.$$

It should be noted that the dividend growth model estimate is not an estimate of the cost of equity relevant only to the next year or the next regulatory period. It is an estimate of the discount rate that sets the present value of all expected future cash flows to equity holders equal to the share price. That is, the dividend growth model estimate has already taken into account the potential for discount rates to change in the future. Put another way, the yield to maturity on 10-year government debt is the single discount rate that sets the present value of expected payments to bond holders equal to the bond price. This single long-run rate already incorporates the extent to which future one-year rates might be higher or lower than current one-year rates – it is the average annual return that is required over the long run (10 years in this case). The dividend growth model estimate is computed under the same rationale – it is an estimate of the average annual rate of return that investors currently require over the long run holding of their investment.

CEG (2013)[135] also consider a simpler version of the DGM that has been implemented in practice by AMP Capital. CEG note that both approaches provide relatively stable estimates of the required return on the market over time over a range of market conditions:

> *the DGM estimates and the historical average Rm figures are similar. This is not a surprise, both the SFG and AMP applications of the DGM model tend to give stable estimates of E[Rm] over time that are consistent with the historical average Rm. This can be seen in Table 4 of the SFG DGM report[136] (where E[Rm] does not deviate far from its average of 11.8% (including imputation credits)… and in* ***Error! Reference source not found.*** *below (where the AMP method gives very stable estimates of E[Rm] of…11.5% in nominal terms and including imputation credits).* [137]

That is, both approaches provide relatively stable estimates of the required return on the market with an average in the range of 11.5-12.0% (inclusive of the current assumed value of imputation credits).

The current estimates from both approaches are slightly above their average levels. The current SFG estimate is 12.2% (relative to an average of 11.8%) and the current AMP estimate is 11.8% (relative to an average of 11.5%).

Two other estimates are also available. CEG (2013)[138] examine an approach advocated by Associate Professor Lally that is based on the conjecture that investors may require lower returns

[135] CEG (2013), *Estimating the return on the market*, June.
[136] SFG, *Dividend discount model estimates of the cost of equity*, June.
[137] CEG (2013), *Estimating the return on the market*, p. 23.
[138] CEG (2013), Estimating the return on the market, June.

over the next one or two regulatory periods and then much higher returns subsequent to that. CEG identify a number of problems with Associate Professor Lally's calculations including:

1. Lack of any empirical basis for assumed long-run growth rates;

2. Calculation errors, whereby the calculations do not match the descriptions in the text; and

3. Speculative logic, whereby Lally's conjecture that required returns over the next regulatory period might be lower than required returns further in the future has no empirical basis; and

4. Conceptual errors, whereby Lally misunderstands or misrepresents past criticisms of his conjectures.

CEG (2013) report that:

> *there are a number of problems with Lally's calculations and fixing only some of these raises the range to 10.7% to 13.2%.*[139]

The mid-point of that range is 12.0%.

Finally, SFG (2013)[140] also report the estimate of the required return on the market portfolio that is published by Bloomberg. That estimate is currently 12.6% (including the AER's current regulatory adjustment in relation to imputation credits). The SFG report explains the reasons for preferring the SFG approach to the Bloomberg approach. In particular, the Bloomberg approach begins with higher short-term growth forecasts and then converges to price-earnings ratios that are systematically below empirically observed values. Although these two effects acts to offset each other, the result is less stability in estimates over time.[141]

The ENA proposes an estimate of the contemporaneous required return on the market (including imputation credits) of 12.2%. This is based on:

1. The SFG DGM estimate of 12.2%;
2. The AMP DGM estimate of 11.8%;
3. The corrected Lally estimate of 12.0% and
4. The published Bloomberg estimate of 12.6%.

The ENA has placed primary weight on the SFG DGM estimate due to its robustness, transparency, replicability and commercially reasonable estimates (demonstrated across industries and over time). Less weight has been applied to the other approaches for reasons including the volatility of estimates over time and the lack of justification for the proposed structure of the model. Noting that some of these other approaches produce estimates above 12.2% and some slightly below, the ENA proposes 12.2% as its estimate of the contemporaneous required return on the market.

Long-term average market conditions

The required return on equity for the average firm under long-term average market conditions is 11.8%.

[139] CEG (2013), Estimating the return on the market, p. 23.
[140] SFG (2013), Dividend discount model estimates of the cost of equity, June.
[141] SFG (2013), Dividend discount model estimates of the cost of equity, June.

The estimate of the required return on equity for the market/average firm in average market conditions can be estimated as a long-term historical average. Self-evidently, an average computed over a particular period will reflect the average conditions that occurred during that period. Consequently, a long-run average will reflect the average across all of the different market conditions that occurred over that long period.

NERA (2013)[142] examine the long-run historical returns information (beginning in 1883) that has previously been used by Brailsford, Handley and Maheswaran (2012)[143] and relied upon in a number of AER determinations. NERA correct a number of errors and inaccuracies in the analysis of Brailsford et. al. and report a long-run average market return of 12.1% p.a. NERA show that this estimate can be disaggregated into an average long-dated government bond yield of 5.5% and a long-run average historical market risk premium of 6.5%.

The long-run historical period examined by Brailsford et. al. and NERA contains a whole range of different market conditions – expansions and recessions, periods of high and low inflation, periods of high and low government bond yields and so on. It is for precisely this reason that a long-run average is computed – to reflect the average over the whole range of conditions that might occur.

However, it is sometimes argued that there are aspects of the historical data that are unlikely to be repeated in the future. For example, in mid-1993 the Reserve Bank of Australia was formally charged with the responsibility of targeting inflation to within a band of 2-3% p.a. Since that time there have been no periods of double-digit inflation such as was observed in the 1980s. If the bond yield data is taken only since inflation targeting began in 1993, the average 10-year government bond yield is 6.0%.

CEG (2013, Section 6.1 [144] note that the NERA (2013)[145] analysis implies an average real return on the market of 8.84% p.a.. Adding expected inflation of 2.5% (the mid-point of the current RBA target band) produces an estimate of 11.6% p.a., which is an estimate of the average return on the market, consistent with expected inflation of 2.5%. If expected inflation is set to 2.7% (based on the average of actual inflation outcomes since RBA inflation targeting began)[146] the estimate is 11.8%.

In its dividend growth model analysis SFG (2013)[147] compiled estimates of the cost of equity for the market, as a market capitalisation weighted average of individual firm estimates, over 21 six-monthly intervals from 2H02 to 2H12. The average market expected return from dividends and capital gains over this period was 10.6%. Using the same equation adopted above to incorporate the value of imputation credits, the average cost of equity capital over this period is 11.7%.

Placing weight on the long-run average estimate of 12.1%, the inflation-adjusted estimates of 11.5-11.8%, and the implied cost of equity estimate of 11.7%, the ENA adopts 11.8% as its estimate of the required return on equity for the average firm under historical average market conditions.

Comparison of current vs. average market conditions

The ENA has proposed an estimate of the contemporaneous required return on the market of 12.2%. The ENA has also submitted that the required return on the market in average market

[142] NERA (2013), *The market, size and value premiums*.
[143] This was an update of the paper published by Brailsford, Handley and Maheswaran (2008) to include more returns information subsequent to the global financial crisis.
[144] CEG (2013), *Estimating the return on the market*, June.
[145] NERA (2013), *The market, size and value premiums*.
[146] Average annual change in All Groups CPI value since June 1993, http://www.rba.gov.au/statistics/xls/cpi-analytical-series.xls?accessed=2013-06-24-18-13-39.
[147] SFG (2013), *Dividend discount estimates of the cost of equity*, June.

conditions is 11.8%. That is, the ENA submits that the required return on the market in the current market conditions is slightly higher than the required return in average market conditions. The support for this proposition lies in a range of evidence, much of which has previously been presented to the AER. That evidence includes the following:

1. DGM estimates of the required return on the market are currently uniformly above their historical average estimates;[148]

2. A number of economic variables that have been shown in the finance literature to be correlated with required returns on equity currently differ from their long-run means in a way that indicates higher required returns. [149] IPART has recently stated that it will use these indicator variables to estimate the contemporaneous market risk premium;[150]and

3. A number of investment banks and corporate finance advisory firms are currently advising clients that required returns on equity are above long-run average levels.[151]

In relation to this last point, Zenner and Junac (2012)[152] from JP Morgan Corporate Finance Advisory note that US government bond yields are currently low, but conclude that the cost of equity is now relatively high – and certainly not the lowest on record:

> *So even with a relatively low Treasury rate, the currently high equity risk premium leads to a cost of equity higher than it has been historically. The cost of equity has been lower almost 68% of the time, primarily driven by a market risk premium that has been lower 97% of the time.*[153]

Zenner and Junac (2012) reach this conclusion by comparing, over time, a number of relatively simple methods for estimating the prevailing cost of equity and the prevailing equity risk premium. They do not suggest that these methods produce accurate or definitive point estimates of either. Rather, they compare current values with historical values to determine whether the current cost of equity and the current equity risk premium are likely to be high or low relative to historical levels. Their conclusion is that:

> *The debt risk premia (i.e., credit spreads) for both investment grade and high yield debt remain elevated relative to history. More strikingly, the equity risk premia, however estimated, have rarely been this high.*[154]

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[148] Supporting evidence on this point has been set out above.

[149] Supporting evidence on this point was provided to the AER as part of the VGDR. See, for example, SFG (2012), The required return on equity: response to the AER Victorian Gas Draft Decisions, November, available at http://www.aer.gov.au/sites/default/files/Attachment%209.21%20SFG%20Consulting%20-%20The%20required%20return%20on%20equity%2C%20Response%20to%20AER%20Victorian%20Draft%20Decisions%2C%207%20%20November%202012.pdf.

[150] IPART (2013), *WACC Methodology*, June, available at http://www.ipart.nsw.gov.au/Home/Industries/Electricity/Reviews/Retail_Pricing/Review_of_regulated_electricity_retail_prices_2013_to_2016/17_Jun_2013_-_WACC_methodology_-_Interim_Report/WACC_Methodology_-_Interim_Report_-_June_2013.

[151] Supporting evidence on this point was provided to the AER as part of the VGDR. See, for example, SFG (2012), The required return on equity: response to the AER Victorian Gas Draft Decisions, November, available at http://www.aer.gov.au/sites/default/files/Attachment%209.21%20SFG%20Consulting%20-%20The%20required%20return%20on%20equity%2C%20Response%20to%20AER%20Victorian%20Draft%20Decisions%2C%207%20%20November%202012.pdf.

[152] Zenner and Junac (2013), *Musings on low cost of debt and high risk premia*, JP Morgan, April.

[153] Zenner and Junac (2012), p. 3.

[154] Zenner and Junac (2012), p. 3.

They go on to conclude that the MRP is currently higher than in 97% of their sample period – the record highs in MRP more than counteract the record lows in government bond yields.

Although the Zenner and Junac analysis relates to the US market, the ENA notes that the relevant conditions are the same in the Australian financial markets – government bond yields are at historical lows and corporate debt spreads remain at elevated levels.

Similarly, Nelson, Ferrarone and McGuire (2012)[155] from UBS use a multi-stage DGM and conclude that the MRP for Australia is currently higher than at any point in the last 20 years.
The ENA submits that an estimate of the contemporaneous required return on the market of 12.2%, relative to a long-run average estimate of 11.8%, is reasonable in light of the evidence that suggests that required returns on equity are currently above their long-run average levels.

Recent AER estimates of the required return on the market

As noted above, the recent approach of the AER has been to estimate the required return on the market as the sum of the contemporaneous 10-year government bond yield plus a fixed premium of 6%. Since 10-year government bond yields are at historical lows, the AER estimate of the required return on the market is commensurately at historical lows. The AER approach to estimating the required return on the market implies that, since the GFC, equity capital has been cheaper than at any time in the previous 40 years. For the reasons set out in Section 4.4 above, the ENA submits that there is compelling evidence that the GFC did NOT result in equity capital becoming cheaper than ever before, and that the AER method for estimating the required return on the market should not be used – at least in the current market conditions.

The market return is the initial reference point

A number of asset pricing models begin with the required return of the market/average firm and then make adjustments according to estimates of how the risk of the firm in question might be above or below average. That is, one starts with an estimate of the required return on the market and then makes an adjustment based on estimates of the relevant risk factor(s).

In their Draft Report for the AER, McKenzie and Partington (2013) note that the task of estimating the adjustment for the relevant risk factors(s) is an extremely difficult one that is subject to a high degree of estimation error. For example, McKenzie and Partington refer to:

> *the well documented problems that exist in estimating the firms exposure to market risk*[156]

and note that:

> *There are numerous, well documented difficulties associated with implementing the CAPM* [157]

They conclude that model-based estimates of the required return on equity are "woefully imprecise."[158] In the AER's forum on 18 June, Associate Professor Partington referred to CAPM estimates as being "egregiously bad."

[155] Nelson, Ferrarone and McGuire (2012), *Implied equity risk premium*, UBS Global Investment Strategy, October.
[156] McKenzie and Partington (2013), p. 19.
[157] McKenzie and Partington (2013), p. 25.
[158] McKenzie and Partington (2013), p. 34.

The ENA submits that the difficulty of estimating the parameters of the relevant models is an important consideration. The extent to which estimates are "fraught with problems," [159] "woefully imprecise" [160] or "egregiously bad" should be reflected in the relative weight that is ultimately assigned to them. If one had no faith at all in a set of estimates, the proper response would be to make no adjustment on the basis of them. In this case, there would be no proper basis for considering that the firm in question differed from the average, so the appropriate estimate of the required return of the firm in question would be the required return of the market/average firm.

In summary, when estimating the required return on equity for the benchmark firm, the starting point should be the required return of the average firm and not a Sharpe-Lintner CAPM estimate that is egregiously bad, woefully imprecise and fraught with problems.

Step 3: Compute the best estimate of the required return on equity for the benchmark firm using each approach/piece of evidence

Introduction

In this section, consideration is given to estimates of the required return on equity for the benchmark firm by applying each of the financial models set out above. As with the analysis of the average firm, estimates are presented under current market conditions and long-term average market conditions.

All models are applied in a consistent manner. Where a parameter is common to two or more models, the same value is used throughout the estimation process, and where a parameter is used in more than one place within a model, the same value is used throughout the estimation process. For example, the same estimates of the risk-free rate and the expected return on the market are applied to all models, and the same estimate of the risk-free rate is used in the two places in which it occurs in the CAPM.

Risk-free rate

The risk-free rate of interest is common to a number of asset-pricing models, so it is considered prior to the detailed analysis of individual models.

The Sharpe-Lintner CAPM, Black CAPM and Fama French three-factor model require an estimate of the risk free rate of interest. There are two elements to the estimation of the risk-free rate – the term to maturity and the proxy (data source) to be used. For the NSPs that are regulated by the AER, there has been long-standing stability on both elements. The AER has adopted a 10-year term to maturity and has used the yield on 10-year Commonwealth Government Securities (CGS) as a proxy. The CGS yield is observed over a 20-40 day rate-setting period shortly before the beginning of the regulatory period, and is converted into an annualized rate.[161]

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The ENA submits that a ten year risk-free rate continues to be consistent with theory and observed financing practice, and this proxy must be implemented consistently across AER analysis.

The ENA also submits that the annualised contemporaneous yield on 10-year Commonwealth Government Securities continues to be an appropriate proxy for estimating the risk-free rate.

[159] McKenzie and Partington (2013), p. 10.
[160] McKenzie and Partington (2013), p. 34.
[161] See, for example, CEG (2013), *Estimating the return on the market*, June.

The ENA further submits that, to preserve internal consistency, whatever term is used to estimate the risk-free rate, that same term must be used when estimating the historical average market risk premium or expected return on the market.

The ENA commissioned Incenta Economic Consulting (Incenta)[162] to provide an expert opinion on the term of the risk-free rate. Incenta (2013) conclude that:

> 1. Theory provides no particular guidance about the appropriate term of the risk-free rate. For example, the Sharpe-Lintner CAPM (which is one of the theoretical models that may be used) is a one-period model where the length of the period equals the lives of the assets;
>
> 2. The approach of setting the term of the risk-free rate to the five-year length of the regulatory period, while estimating market risk premium with reference to a ten-year risk-free rate would be internally inconsistent;
>
> 3. The dominant market practice is to set the term of the risk-free rate to ten years when evaluating regulated and unregulated infrastructure businesses.

Moreover, it is not necessary to set the term of the risk-free rate to the length of the regulatory period to preserve any NPV=0 principle, were this to be the accepted objective.[163]

The ENA has also commissioned SFG to examine the practice of independent expert valuation professionals. SFG (2013)[164] shows that:

> 1. The almost universal practice of independent expert valuation professionals is to use a 10-year term to maturity when estimating the risk-free rate in asset-pricing models; and
>
> 2. The only deviation from that dominant practice occurs where the expert notes that the life of the assets being valued is less than ten years.

The current yield on 10-year CGS is 3.2% and the long-run average yield on 10-year CGS is 5.5%.[165]

Sharpe-Lintner CAPM

Implementation of the Sharpe-Lintner CAPM

According to the Sharpe-Linter CAPM, the required return on equity for the benchmark firm can be computed using the following equation:

$$r_e = r_f + \beta_e \times (r_m - r_f)$$

[162] Incenta (2013), *Term of the risk-free rate for the cost of equity*, June.
[163] See, for example, SFG (2012) at http://www.qca.org.au/files/R-AurizonC-Submissions-DAU13-513.pdf, and the references therein.
[164] SFG (2013), Evidence on the required return on equity from independent expert reports, June, pp. 21-22.
[165] These figures are available from the Reserve Bank of Australia at http://www.rba.gov.au/statistics/tables/xls/f02d.xls?accessed=2013-06-24-19-50-09

where r_e is the cost of equity for the benchmark firm, r_f is the risk-free rate of interest, r_m is the required return on the market portfolio and β_e (beta) is an estimate of systematic risk for the equity in the benchmark firm.[166]

Estimates of the risk-free rate of interest and required return on the market under current and long-term market conditions have already been set out above. For the risk-free rate of interest, these estimates are 3.2% (current) and 5.5% (average), respectively. For the required return on the market, these estimates are 12.2% under current market conditions and 11.8% under long-term average market conditions. What is now required is an estimate of systematic risk to populate the model.

The way in which the CAPM is implemented (in terms of the estimate of equity beta) depends upon the regulatory framework that applies. According to the theoretical development of the CAPM, the equity beta is defined as the covariance between excess asset returns and excess market returns divided by the variance of excess market returns. However, as NERA (2013)[167] has shown, when regression *estimates* of beta are used in the Sharpe-Lintner CAPM the output estimates of required returns are downwardly biased for firms with low beta estimates, firms with low market capitalisation, and firms with high book-to-market ratios. Whether this is due to model mis-specification error or estimation error is a moot point – the feasible implementation of the model produces these known biases. But how this information effects the implantation of the model depends on the regulatory framework.

For example, under the old Electricity Rules, the regulator was required to use the Sharpe-Lintner CAPM formula to produce its estimate of the required return on equity for the benchmark firm. In that setting, the question is "what number, when inserted into the Sharpe-Lintner CAPM formula for beta, produces the output that provides the best estimate of the required return on equity for the benchmark firm?" In answering that question, one would have regard to the documented biases that have been identified with the empirical implementation of the Sharpe-Lintner CAPM. This would, for example, lead to a regression-based estimate of beta being increased for a value firm with a low beta estimate – to offset the documented biases in order to provide a better estimate of the required return on equity.

The ENA submits that the current Rules allow a better way of addressing the documented biases in Sharpe-Lintner CAPM estimates of required returns. Under the new Rules, evidence from all relevant models can be considered and weighted appropriately. Any documented bias from a particular model can be addressed in terms of the weight that might be applied to the estimate from that model. In this setting, a simple regression-based beta estimate could be used in the Sharpe-Lintner CAPM and the resulting estimate of the required return on equity could then be compared with other evidence that might not suffer from the biases that affect the Sharpe-Lintner CAPM. Consequently, in the remainder of this section, the ENA considers only the best available regression-based estimates of equity beta.

Conversely, if the Sharpe-Lintner CAPM was to be given special and unique significance as a primary model, the ENA submits that it would have to be implemented in a way that addressed the known biases, as set out above.

[166] β is also termed market risk or economic risk and represents the risk associated with overall market movements, in contrast to the risk associated with company-specific events. In statistical terms it is the covariance of excess stock returns and excess market returns, scaled by the variance of excess market returns. The term "excess returns" refers to returns in excess of the risk-free rate of interest.

[167] NERA (2013), *Estimates of the zero beta premium*, June.

That is, the ENA submits that there is no such thing as "the" CAPM estimate of the required return on equity. There are different ways of employing the CAPM, within different regulatory frameworks, to produce an appropriate estimate of the required return on equity for the benchmark firm.

Regression-based estimation of equity beta

In its previous determinations the AER has relied upon regression-based estimates of systematic risk from a set of nine Australian-listed firms, of which five currently remain available for analysis. In its last review of WACC parameters in 2009, the AER applied ordinary least squares (OLS) regression and least absolute deviation (LAD) regression to different samples of data. Since that time, the AER has adopted a beta estimate of 0.8 for all NSPs.

The ENA considered several pieces of evidence in order to arrive at an appropriate estimate of equity beta.

The first issue is whether OLS and LAD estimation are likely to generate an appropriate estimate of equity beta. The ENA commissioned SFG to consider the relative reliability of OLS and LAD estimates of equity beta. Brooks, Diamond, Gray and Hall (2013) report that LAD estimates of equity beta have a material downward bias and OLS estimates of equity beta are unbiased (albeit imprecise).[168] This bias leads to the average LAD beta estimate being understated by approximately 0.15. On the basis of this material bias LAD estimates of beta are not considered further. Moreover, it is not accepted market practice to use LAD to estimate equity beta. LAD estimation was only used in the last WACC review due to the AER instructing its consultant in that review (Dr. Olan Henry) to use that technique.[169]

The ENA submits that the LAD estimation technique should not be employed to estimate equity beta.

The second issue is the reliability of beta estimates generated exclusively from a small sample of Australian-listed stocks, of which just five are currently available. The ENA also commissioned Brooks, Diamond, Gray and Hall to investigate this question. Brooks, Diamond, Gray and Hall (2013)[170] examined this issue in a repeated sampling analysis to estimate the range of outcomes that could be observed if different samples of firms in the same industry could be analysed. The results show that the dispersion of average beta estimates is reduced by approximately 30% if sample size is increased to 18 firms and by approximately 50% if sample size is increased to 27 firms. The results also show that there is substantial variation in beta estimates over time for the same sample of firms. The implication of this analysis is that reliance upon such a small sample of firms is very likely to lead to substantial estimation error.

The results set out above compel the analysis of beta estimates from a larger sample of relevant businesses, such as is available in the United States. CEG (2013)[171] selected a set of 56 U.S.-listed stocks which had regulated assets comprise at least 50% of their asset base, which were classified as "Power" or "Gas utility" by SNL Financial, and which did not suffer from illiquidity.

The ENA submits that the small handful of data points that is available in Australia is insufficient to provide any sort of reliable beta estimate and, consequently, the data set should be expanded to include the large set of comparable firms that are available in the US.

[168] Brooks, Diamond, Gray and Hall (2013), *Comparison of OLS and LAD regression techniques for estimating beta*, June.
[169] Henry (2008), *Econometric advice and beta estimation*, November, p. 4.
[170] Brooks, Diamond, Gray and Hall (2013), *Assessing the reliability of regression-based estimates of risk*, June.
[171] CEG (2013), *Information on equity beta from US companies*, June.

A similar point has been made by the AER's advisors Frontier Economics in a report for the Economic Regulation Authority of Western Australia:

> *In its recent Review of WACC Parameters, the AER considered equity beta estimates for the small number of firms that were considered to be comparable to the benchmark electricity distribution or transmission firm. Having examined the empirical data and a range of beta estimates, the AER has adopted a point estimate of 0.8. In our view, this estimate is neither robust nor compelling. It is based on a very small number of "comparable" firms, the majority of which did not even have data available for the full estimation period.*[172]

The dangers of using a data set that is too small to provide statistically reliable results has previously been addressed by the Australian Competition Tribunal. In the *Jemena Case*, the Tribunal noted that there was a paucity of Australian BBB+ bonds with more than four years to maturity:

> *The problem is that in Australia there is relatively little corporate bond activity. There are only five issuers of BBB+ bonds in Australia with a maturity of greater than four years and this represents too small a population on which judgments can be made with any real confidence.* [173]

The fact that five data points was considered too few to provide any sort of statistical reliability led the Tribunal to expand the data set:

> *Given the paucity of relevant BBB+ bonds, it is appropriate to have regard to bonds (fixed and floating) with other credit ratings. There is the issue of what weight should be given to those bonds. We do not agree that greater weight should be given to the BBB+ bonds merely because they match the task of estimating the cost of 10 year BBB+ debt. That would defeat the purpose of including bonds with other credit ratings in the sample.*[174]

Moreover, CEG (2013) consider whether the (larger) sample of US firms provides a relevant proxy for a regulated Australian energy network. CEG conclude that:

> *I have also examined whether industries in Australia and the US tend to have correlated betas. This is relevant to an assessment of whether one can expect that betas measured for US firms provide a reasonable proxy for betas of Australian firms. I conclude that industry betas in Australia and the US are positively correlated which supports the intuitively reasonable conclusion that the US utility betas provide information relevant to an assessment utility relative risk in Australia. I also note that differences in the Australian and US tax regime would, if anything, tend to depress US utility betas relative to Australian utility betas. My conclusion is that relative risk estimates for the 56 companies in the mostly regulated US sample provide a relevant proxy for a regulated Australian energy network.*[175]

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[172] Frontier Economics (2009), *Review of weighted average cost of capital estimate proposed by Goldfields Gas Transmission*, August, pp. 31-32, http://www.erawa.com.au/cproot/8024/2/20091009%20Frontier%20Economics%20-%20Review%20of%20WACC%20estimate%20proposed%20by%20GGT%20%20Final%20Draft%20Report%20Prepared%20for%20the%20ERA.PDF

[173] Australian Competition Tribunal [2011] ACompT 10, Paragraph 69.

[174] Australian Competition Tribunal [2011] ACompT 10, Paragraph 55.

[175] CEG (2013), *Information on equity beta from US companies*, June, p. 8.

When estimating equity beta, another issue that arises is whether estimates can be improved by applying statistical adjustments that (a) have been proposed in the literature as a method of improving the reliability of beta estimates, and (b) are applied in practice by commercial data providers. In particular, Brooks Diamond, Gray and Hall (2013)[176] considered whether an improvement can be made to OLS estimates of beta by applying the Vasicek (1973) adjustment. Incorporating this adjustment means that some weight is placed upon a beta estimate of one and some weight is placed on the OLS beta estimate.

The value of one for the Vasicek adjustment is referred to as the "prior expectation" on the basis that it is the expectation of beta *prior* to compiling a regression-based estimate. The use of a prior estimate of one has been a point of contention in the past and the issue is discussed by Brooks, Diamond, Gray and Hall (2013).[177] The reason for a prior estimate of one, as opposed to some other estimate, is that the task is to make an estimate of systematic risk for the average network service provider. If the only information used to make this beta estimate is to perform regression analysis of stock returns on market returns, then the prior expectation can only be the market beta of one. In the absence of information other than the regression analysis there is simply no way to determine whether the equity in a network is exposed to more or less systematic risk than the average firm in the market. In this regard, at the AER's Forum on 18 June 2013, Frontier Economics confirmed that there is no a priori reason to expect that the benchmark firm's lower-than-average business risk would outweigh its higher-than-average gearing and operating leverage. That is, there is no a priori expectation that the *equity beta* for the benchmark firm would be less than one. Frontier Economics stated that this is a matter for empirical evidence not a priori assumption and the ENA agrees with that assessment.

The weight placed on the OLS beta estimate is inversely related to the standard error of the beta estimate. Brooks, Diamond, Gray and Hall (2013)[178] demonstrate that these adjusted estimates have a greater ability to explain realised stock returns relative to OLS estimates. Incorporating the Vasicek adjustment also reduces the dispersion of beta estimates. Consequently, beta estimates were compiled using the Vasicek adjustment.

SFG (2013)[179] were commissioned to compile equity beta estimates for the sample of nine Australian-listed firms (four of which are no longer listed) and 56 U.S.-listed firms, all of which remain currently listed.

SFG (2013)[180] Table 4 sets out regression-based beta estimates for comparable firms from Australia (5 currently listed firms, 9 firms in total[181]) and the United States. For each sample, and for the combined sample, SFG (2013) report the equity beta estimate for the average sample firm and for an index consisting of all sample firms. These estimates were all computed under an assumption that the benchmark firm takes on gearing of 60%.

SFG (2013)[182] give the Australian firms twice as much weight as the US firms in the sample and report a final regression-based equity beta estimate of 0.82. They explain the rationale for assigning disproportionate weight to the Australian data as follows:

[176] Brooks, Diamond, Gray and Hall, (2013), *The Vasicek adjustment to beta estimates in the Capital Asset Pricing Model*, June.
[177] Brooks, Diamond, Gray and Hall, (2013), *The Vasicek adjustment to beta estimates in the Capital Asset Pricing Model*, June.
[178] Brooks, Diamond, Gray and Hall (2013), *The Vasicek adjustment to beta estimates in the Capital Asset Pricing Model*, June.
[179] SFG (2013), *Regression-based estimates of risk parameter for the benchmark firm*, June.
[180] SFG (2013), *Regression-based estimates of risk parameters for the benchmark firm*, June.
[181] That is, the estimate reflects data up to the time the firm was delisted – up to seven years ago.
[182] SFG (2013), *Regression-based estimates of risk parameters for the benchmark firm*, June.

> *The next question is to consider how much weight should be placed on the evidence from Australian-listed firms and the U.S.-listed firms. In reaching a conclusion we considered the issues of relevance and reliability. Ideally we would have a large number of Australian-listed firms to analyse. But the reality is that this sample is so small that to consider it in isolation leads to estimates which are highly unreliable. It should also be noted that the set of comparable firms from the United States was carefully scrutinised by CEG (2013) with respect to the proportion of assets under regulation, their industry classification and their prior use in comparable firm analysis for regulatory decision-making. So in reaching our final parameter estimates we allowed for each observation of an Australian-listed firm to count for twice as much weight as a U.S.-listed firm.*[183]

The ENA submits that this approach is consistent with the approach laid out by the Tribunal in the *Jemena Case* – that a sample that is too small on its own to provide reliable estimates must be supplemented with other relevant data, where more weight can be assigned to data points that are considered to be more relevant.

The ENA submits that the best available regression-based estimate of the CAPM equity beta for the benchmark efficient firm is 0.82.[184]

This is not the estimate of beta that would be adopted if the Sharpe-Lintner CAPM was the only model available for use, as was the case under the previous Rules. It is the ENA's view that, if a beta estimate of 0.80 was incorporated into the Sharpe-Lintner CAPM, the estimated cost of equity would fall below the true cost of funds. The empirical evidence is that Sharpe-Lintner CAPM-based estimates of the cost of equity for the benchmark firm, when populated with regression-based estimates of beta, are downwardly-biased and highly imprecise and should therefore be given little weight.[185]

That is, the ENA submits that the best available regression-based estimate of the CAPM equity beta is 0.82. However, the ENA recognises that even this best estimate is "woefully imprecise" [186] and "egregiously bad."[187] The ENA also recognises that there are documented biases in Sharpe-Lintner CAPM estimates of required returns. These points go to the weight that should reasonably be applied to the Sharpe-Lintner CAPM estimate of the required return on equity. If, however, there was some restriction that the required return on equity could only be estimated using the Sharpe-Lintner CAPM, the question becomes "what value for beta, when inserted into the Sharpe-Lintner CAPM, produces the best estimate of the required return for the benchmark firm?" In that case, the ENA submits that a higher value of beta would be used to correct for the documented bias and the fact that even the best possible estimates are egregiously bad.

Potential exogenous impacts on systematic risk

In its Draft Report for the AER, Frontier Economics (2013) suggest the possibility of a link between the method that is used to determine the allowed return on debt and the systematic risk of equity, citing the SFG (2011) report commissioned by the AEMC:

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[183] SFG (2013), *Regression-based estimates of risk parameters for the benchmark firm*, June.
[184] SFG (2013), Regression-based estimates of risk parameters for the benchmark firm, June.
[185] If the Rules or regulatory practice required the use of the Sharpe-Lintner CAPM only, the ENA would propose that a different beta estimate should be used – one that reflected the documented empirical failings of the Sharpe-Lintner CAPM and other evidence about the required return on equity for the benchmark firm. Such modification is unnecessary under the current Rules, which allow full consideration of all relevant evidence in its own right.
[186] McKenzie and Partington (2013), p. 34.
[187] Associate Professor Partington, AER Forum, 18 June 2013.

> *One final point is worth making in relation to the trailing average approach. As noted above, regulated businesses have a strong incentive to match their funding costs to funding allowances made by the regulator. As SFG (2011) points out, a mismatch between the two would flow through to equity investors as more volatile returns. If proponents of the trailing average approach are correct that the mechanism would align better the businesses' actual funding costs with regulatory allowances, the volatility of equity returns should fall. Recognition of this point should, all else being equal, reduce the firms' cost of equity.*[188]

The SFG (2011) report to the AEMC noted that, under the previous Rules, for most NSPs there was a mis-match between the regulatory allowance for the return on debt and the firm's actual debt service costs – and that the difference (which could be positive or negative depending on the market circumstances) flows through to equity holders. However, SFG (2011) point out that under the old Rules, that mis-match had the effect of *reducing* the systematic risk of equity:

> *In our view, it is likely that the equity risk premium is higher-than-average during periods of financial market crisis and turmoil and lower-than-average during periods of strong stable growth. Under a regulatory approach that applies a constant equity risk premium, the allowed return to equity will be:*
>
> *a) Less than the true required return during periods of financial market crisis; and*
>
> *b) More than the true required return during periods of strong stable growth.*
>
> *The current regulatory approach is to fix a constant average market risk premium when estimating the regulatory allowance for the return to equity. This fixed premium is then applied to the observed government bond yield, which is currently at all-time lows. The result is that the regulatory estimates of the required return on equity are also at historical lows – the implication being that equity finance is currently cheaper than it has ever been since government bonds were first issued.*
>
> *The way the regulated return is currently estimated provides somewhat of a natural hedge in the sense that:*
>
> *a) During periods of financial market crisis:*
>
> *(i) The allowed return on debt is higher than the firm's debt service payments, resulting in surplus cash flow that would flow to the equity holders; and*
>
> *(ii) The allowed return on equity is lower than the required return on equity, which is offset to some extent by the surplus cash flow above; and*
>
> *b) During periods of strong stable growth, the reverse occurs.*[189]

SFG (2011) recommended that the AEMC should not retain the old approach simply to preserve the natural hedge as that would involve making one error to offset another. Rather, under the new Rules, there is potential for the allowed return on equity and the allowed return on debt to both be set at levels that more reasonably reflect the financing costs of a benchmark efficient entity.

[188] Frontier Economics (2013), p. 57.
[189] SFG (2011), Paragraphs 175-177.

However, if the allowed return on equity was set using the same approach as was adopted under the old Rules, and if the allowed return on debt was properly reflective of the efficient debt service cost, the result would be an *increase* in the systematic risk of equity.

Frontier Economics (2013) also document two important developments since the AER's last review of WACC parameters in 2009. They note that "Australian interest rates have become more volatile"[190] and that "Australian government bond yields have fallen sharply [because] in the face of significant global financial market uncertainty, investors have sought out 'safe have' investments such as debt issued by creditworthy sovereigns."[191] Frontier Economics concludes from this that:

> *In our view, these two developments mean that the refinancing risk faced by Australian energy networks (as well as any other business in Australia) has increased.*[192]

Since refinancing risk is borne by equity holders and is systematic in nature (i.e., refinancing is more likely to be a problem during a recession than a boom), this would also suggest an increase in the forward-looking systematic risk of NSPs, which have double the leverage of the average firm.

Sharpe-Lintner CAPM estimate of the required return on equity

Incorporating the equity beta estimate of 0.82 into the Sharpe-Lintner CAPM results in the following benchmark cost of equity estimates:

a) **Under current market conditions the Sharpe-Lintner CAPM-based estimate is 10.6% (3.2% + 0.82 × [12.2%-3.2%] = 10.6%).**

b) **Under long-term average market conditions the Sharpe-Lintner CAPM-based estimate is 10.7% (5.5% + 0.82 × [11.8%-5.5%] = 10.7%).**

Black CAPM

The Black CAPM relaxes one of the restrictive assumptions of the Sharpe-Lintner CAPM – that all investors can borrow or lend as much as they like at the risk-free rate. The relaxation of this strong assumption results in the base return (or intercept) in the model being able to diverge from the risk-free rate. In essence, the risk-free rate is replaced by the required return on a zero-beta asset:

$$r_e = r_z + \beta_e \times (r_m - r_z)$$

where r_e is the cost of equity for the benchmark firm, r_z is the required return on a zero beta asset, r_m is the required return on the market portfolio and βe (beta) is an estimate of systematic risk for the equity in the benchmark firm.

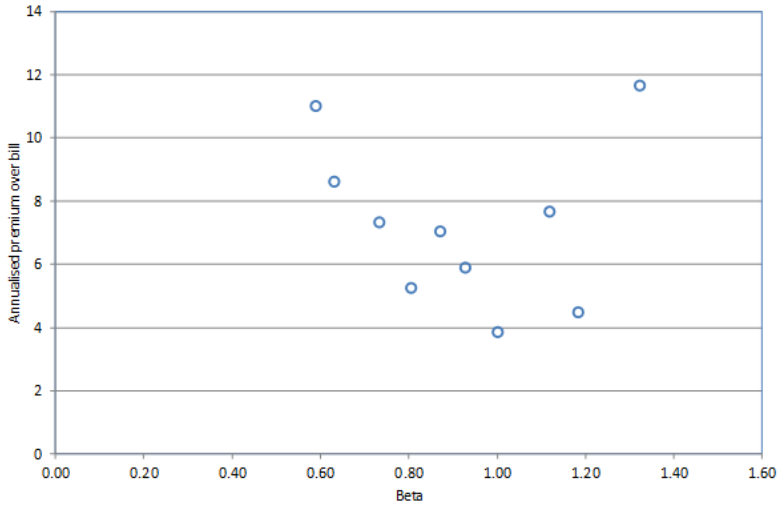
Implementing the Black CAPM requires an estimate of the zero beta premium – the difference between the expected return on a zero beta asset and the risk-free rate. The return on a zero beta asset is expected to be (and in prior studies is found to be)[193] above the risk-free rate, which means that low beta stocks have higher expected returns under the Black model than under the Sharpe-Lintner CAPM, and vice versa for high beta stocks.

[190] Frontier Economics (2013), p. 66.
[191] Frontier Economics (2013), p. 67.
[192] Frontier Economics (2013), p. 67.
[193] See NERA (2013), *Estimates of the zero beta premium*, June, pp. 1-2.

The ENA has investigated the use of the Black CAPM. In its empirical analysis on this issue, NERA (2013)[194] demonstrated (using the standard methodology that is applied when estimating the zero beta premium) that there is no association between beta estimates from regression analysis and subsequently realised stock returns. Stocks with low beta estimates do not systematically earn lower returns than the market/average firm, and stocks with high beta estimates do not systematically earn higher returns than the market/average firm. That is, regardless of the beta estimate for a particular firm, the best estimate of the expected return for that firm is simply the expected return of the average firm.

This is illustrated in the following figure from NERA (2013)[195], which shows the average relationship between portfolio beta estimates and subsequent stock returns using data from 1974 to 2012.

Figure 5.1
Annualised premium over bill against beta for 10 portfolios formed on past estimates of beta



Consequently, the Black CAPM evidence suggests that the best estimate of the required return on equity for the benchmark firm is the required return on equity for the market/average firm.

There are two potential reasons why the empirical evidence is that there is no association between beta estimates and subsequent returns:

a) The Sharpe-Lintner CAPM does not provide a good description of reality – in reality there is no relationship between systematic risk and required returns because investors consider other things when investing; or

b) The Sharpe-Lintner CAPM does provide a good description of reality, but the estimates of the relevant parameters are so poor that the useful implementation of the model is impossible. For example, the model requires a market portfolio that consists of all assets, but a stock portfolio must be used as a proxy. Also, beta estimates are so imprecise that they may bear little resemblance to true systematic risk.

[194] See NERA (2013), *Estimates of the zero beta premium*, June.
[195] NERA (2013), *Estimates of the zero beta premium*, June, Figure 5.1, p.14.

Regardless of the explanation, the outcome is the same – the evidence shows that there is no relationship between beta estimates and stock returns. This does not disprove the CAPM as a theoretical model because the true market portfolio can never be obtained.[196] However, it does show that the feasible implementation of the model tells us nothing about required returns. In particular, it shows that the way in which the AER implements the Sharpe-Lintner CAPM produces estimates of required returns that have no discernible relationship with actual returns.

NERA (2013)[197] estimate the zero beta premium and show that their point estimate is remarkably stable over time. They also address a number of criticisms of the Black CAPM that have previously been leveled by McKenzie and Partington in work commissioned by the AER. NERA show that these criticisms are either wrong (e.g., caused by McKenzie and Partington muddling up two figures) or of no practical consequence (e.g., because they consider scenarios that are inconsistent with the observed data) or both. Even if the McKenzie and Partington criticisms were correct they would not be relevant to the current discussion because the only point the ENA takes from this analysis is that there is no reliable relationship between regression-based beta *estimates* and stock returns – a result that has been widely replicated and which is widely accepted in the finance literature, as outlined in NERA (2013).[198]

The ENA submits that the evidence in relation to the Black CAPM shows that there is no reliable relationship between regression-based beta estimates and stock returns. In this case, beta estimates cannot be used to determine the required return on equity. Consequently, under the Black CAPM, the same estimate of the required return on equity would be used for all firms regardless of their beta estimate – and the estimate of the required return that should be used for that purpose is the estimate that applies to the market/average firm. That estimate is 12.2% in the current market conditions and 11.8% in long-run average market conditions.

Fama-French three factor model

According to the Fama-French model, the required return on equity for the benchmark firm can be computed using the following equation:

$$r_e = r_f + \beta_e \times \left(r_m - r_f\right) + s \times SMB + h \times HML$$

where r_e is the required return on equity for the benchmark firm, r_f is the risk-free rate of interest, r_m is the required return on the market portfolio and β_e (beta) is an estimate of systematic/market risk of equity in the benchmark firm, *SMB* is the expected return to a portfolio of small market capitalisation stocks minus the expected return to a portfolio of large market capitalisation stocks, *HML* is the expected return to a portfolio of high book-to-market stocks minus the expected return to a portfolio of low book-to-market stocks, and s and h represent the sensitivities of expected returns to the SMB and HML factors.

At the AER's Forum of 18 June 2013, Associate Professor Partington noted that the Fama-French model provided a "reasonable" fit to the data (actual stock returns) whereas the performance of the Sharpe-Lintner CAPM was "egregiously bad."

[196] In a famous paper, Roll (1977) shows that the CAPM can never be disproved as a theoretical model because the answer to any negative evidence could always simply be that the CAPM applies to the market portfolio of all assets and the researcher used an invalid proxy – so it was not the CAPM that was being tested.
[197] NERA (2013), *Estimates of the zero beta premium*, June, Figure 5.2, p.17.
[198] NERA (2013), *Estimates of the zero beta premium*, June, pp.1-2.

Estimates of the risk-free rate of interest and the required return on the market under current market conditions and long-term average market conditions have been set out above. What is now required are estimates of systematic risk, and the risk premium for the benchmark firm associated with the size and book-to-market factors ($s \times SMB$ and $h \times HML$).

In compiling these parameter inputs it should be noted that the market beta estimate will not necessarily be the same as that incorporated into the CAPM. If the risks associated with the SMB factor and the HML factor were entirely independent of risks associated with the market factor, then the beta estimates used in both models would be the same. But unless these risks are entirely uncorrelated the beta estimate will be different. This is not an inconsistency, rather it is a recognition that the definition of the market beta differs between the two models.

In estimating parameters for the Fama-French model, the ENA relied upon the same set of comparable firms from Australia and the United States, the same time period for analysis, the same OLS regression technique and the same re-gearing equation as was used for the CAPM.[199] The only variation is that there is no Vasicek adjustment to the coefficients estimated in the Fama-French model. The reason there is no Vasicek adjustment is that it is unclear how the Vasicek adjustment should be incorporated in a multi-factor model, and it is unclear what the prior expectation should be for exposure to the SMB and HML factors. This is discussed in detail in the supporting evidence.[200] As for the estimation of the equity beta for the Sharpe-Lintner CAPM above, Australian estimates are afforded twice as much weight as US estimates.

In forming estimates for the Fama-French model from the Australian- and U.S.-listed firms, the overall risk premium from the size factor ($s \times SMB$) and the book-to-market factor ($h \times HML$) need to be considered. The magnitude of the coefficients (s and h) and the risk factors (SMB and HML) will be different because the risk factors directly result from the dispersion of firms in the two markets in terms of market capitalisation and book-to-market ratio.

For instance, suppose two markets have exactly the same volatility, investor base and liquidity and are the same on any other dimension which could affect overall market expected returns, but one market had a wider range of stocks in terms of size. When the size factor is constructed, the market with more variation of stocks in terms of size will have a higher value for SMB. This occurs because there will be a bigger difference in the portfolio of small market capitalisation stocks relative to the portfolio of large market capitalisation stocks. This means that the exposure of a given firm to the SMB factor (the s coefficient) will be different depending upon whether that exposure is measured relative to the market with high or low dispersion of stocks in terms of size. In this example, the stock's cost of capital will be the same in both markets. In other words, the risk premium associated with the size factor ($s \times SMB$) will be the same regardless of which market the stock is placed. But the individual components will be different.

SFG (2013) Table 4[201] sets out estimates for the Fama-French factor premiums for the Australian and US markets and for the combined weighted-average. For both markets the size (S*MB*) premium is insignificantly different from zero and the value (*HML*) premium is significantly positive. The magnitude of the *HML* premium is higher for the Australian market than the US market, however a very small data set is available for the Australian market – as for the estimate of equity beta above. To increase the statistical reliability of the estimates, SFG expand the sample to include US data. Whereas the inclusion of US data had the effect of increasing the equity beta estimate, it has the effect of decreasing the estimate of the value premium. Full results are set out in Table 4 of SFG (2013),[202] which is reproduced below.

[199] SFG (2013).
[200] SFG (2013 beta estimates).
[201] SFG (2013), *Regression-based estimates of risk parameters for the benchmark firm*, p. 16.
[202] SFG (2013), *Regression-based estimates of risk parameters for the benchmark firm*, p. 16.

COEFFICIENT ESTIMATES AND IMPLIED RISK PREMIUMS FROM SFG (2013), TABLE 4.

		CAPM	Fama-French				
		β	β	*s*	*h*	*s* × *SMB*	*h* × *HML*
Australia	Firms	0.60	0.59	0.03	0.50	0.10	3.87
	Index	0.55	0.46	0.01	0.36	0.05	2.79
	Average	0.58	0.52	0.02	0.43	0.08	3.33
United States	Firms	0.85	0.86	–0.05	0.11	–0.17	0.53
	Index	0.91	0.88	–0.09	0.12	–0.32	0.59
	Average	0.89	0.87	–0.07	0.12	–0.25	0.56
Australia & United States	Firms	0.84				–0.14	0.99
	Index	0.86				–0.27	0.89
	Average	0.85				–0.20	0.94
Parameter estimates		0.82	0.79			–0.17	1.23

For the Fama-French model, the risk premium estimates are the product of *s* × *SMB* and *h* × *HML*. The set of 65 comparable Australian and U.S.-listed firms is an estimate from placing equal weight on an Australian- and U.S.-listed observations. The parameter estimates presented in the final row are the result of placing twice as much weight on an Australian-listed observation as a U.S.-listed observation. So the weight on the Australian evidence is 18/74 = 24% and the weigh on the U.S. evidence is 56/74 = 76%.

In summary, the cost of equity estimates from the Fama-French model rely upon the following parameter inputs:[203]

a) The risk-free rate is 3.2% under current market conditions and 5.5% under long-term average market conditions.

b) The required return on the market is 12.2% under current market conditions and 11.8% under long-term average market conditions.

c) The market beta estimate is 0.79, which implies a risk premium for systematic risk of 7.11% under current market conditions (0.79 × [12.2%-3.2%] = 7.11%) and 4.98% under long-term average market conditions (0.79 × [11.8%-5.5%] = 4.98%).

d) The risk premium associated with the SMB factor is -0.17%, as set out in Table 4 of SFG (2013)[204]

e) The risk premium associated with the HML factor is 1.23%, as set out in Table 4 of SFG (2013).[205]

Incorporating these parameter estimates into the Fama-French model results in the following benchmark cost of equity estimates:

a) Under current market conditions the Fama-French-based estimate is 11.4% (3.2% + 7.11% – 0.17% + 1.23% = 11.4%).

b) Under long-term average market conditions the Fama-French-based estimate is 11.5% (5.5% + 4.98% – 0.17% + 1.23% = 11.5%).

[203] More detail on the estimation of these parameter inputs is provided in SFG (2013), *Regression-based estimates of risk parameters for the benchmark firm*.
[204] SFG (2013), *Regression-based estimates of risk parameters for the benchmark firm*, p. 16.
[205] SFG (2013), *Regression-based estimates of risk parameters for the benchmark firm*, p. 16.

Dividend growth model

Under the dividend growth model the cost of equity can be estimated as the discount rate that sets the present value of all expected future dividends equal to the current stock price. This discount rate will be determined by investors' required return for bearing risk, but there is no disaggregation of the expected return associated with separately-identified risk factors.

In forming an estimate of the cost of equity from the dividend growth model, as with the asset pricing models considered, it is important to take account of the expected return for the average firm. The reason this is important is that embedded within the dividend growth model analysis is an implicit assumption about the expected return on the market. If the dividend growth model analysis is applied to all listed firms, the market capitalisation-weighted average of these cost of equity estimates is an estimate of the required return on the market. If this differs from the expected market return incorporated into the Sharpe-Lintner CAPM or the Fama-French model, this difference in assumption will contribute to different outcomes from the three models.

This consistent assumption of the market return is taken into account in SFG (2013)[206] in the following manner. For all Australian-listed firms for which data is available there is an estimate of the required return on equity performed over every six month period from 2H02 to 2H12. Applying market capitalisation weights to these required return on equity estimates results in a market cost of equity estimate for every six month period. This is compared to the risk-free rate every six months to form an estimate of the implied market risk premium every six months.

Then, for the same set of Australian-listed firms used to compiled the Sharpe-Lintner CAPM and Fama-French cost of equity estimates, there is a dividend growth model estimate of the cost of equity computed every six months. There are 85 of these cost of equity estimates over the entire sample period and these estimates are compared to the risk-free rate to form estimates of the equity risk premium for these comparable firms.

The risk premium associated with these individual firm estimates is compared to the market risk premium in the corresponding six month period to provide a set of risk premium ratios. Across the 85 individual firm observations the average ratio is 0.96, implying that the average listed network has an equity risk premium which is 96% of the market risk premium.

This average risk premium is then applied to the implied market risk premium at any point in time, which is then added to the risk-free rate to estimate the cost of equity for the benchmark firm.

The reason this is important is because there are only a small number of comparator firms. So if these firms were considered in isolation the cost of equity estimates over time are likely to be materially affected by estimation error.

However, even if there were a very large number of firms available for comparison, it would still be important to adopt a consistent assumption about the market return across estimation techniques. This consistent assumption would not necessarily be incorporated in the same manner as adopted by the ENA in this instance (the constant risk ratio assumption) but it would still be important. Ensuring a consistent market return assumption means that debate about estimates from different models can be readily partitioned into debate over the market return versus benchmark-specific issues, and each issue can be resolved independently.

[206] SFG (2013), *Dividend discount model estimates of the cost of equity*, June.

SFG (2013)[207] demonstrate that the DGM estimates of the required return on equity for the benchmark efficient firm (including the effect of imputation credits where gamma is set to 0.25) are as follows:

a) Under current market conditions the dividend growth model-based estimate is 11.8%.

b) Under long-term average market conditions the dividend growth model-based estimate is 11.5%.

Step 4: Distil an estimate of the required return on equity for the benchmark firm

Overview

All relevant evidence should be used, as appropriate, to assign relative weights to each of the financial models.

The ENA's view is that transparency requires that the regulator:

a) Clearly sets out all evidence that it considers to be relevant;

b) Clearly explains the reasons for rejecting any piece of evidence as being irrelevant;

c) Clearly explains how it has arrived at each parameter point estimate; and

d) Clearly explains the weights that it has assigned to each financial model and the reasons for assigning those weights.

As set out above, if the weights assigned to different financial models are well-reasoned and explained in a transparent manner, it is a small step to quantify them. Quantification of the weights adds to the transparency of the decision. Consequently, the ENA's analysis below specifies the reasons for assigning different weights to different models and ultimately quantifies those weights.

For emphasis, the focus should be on the qualitative assessment of the relativities of the estimates. The weights are assigned simply to the level sufficient to properly reflect those relativities. So, for example, if there were four estimates, the starting point would be that they each attract roughly one quarter weight. The qualitative assessments may perhaps weight one of these at one eighth with another at three eighths and the remaining two one quarter each. Applying more refined weightings than this (say, down to the level of several decimal places) would require very specific and compelling evidence to justify it.

This quantitative weightings approach is designed to reflect that there is an inherent element of judgement involved in factoring in all the relevant evidence. Thus, the quantitative weightings are designed to be "precising" rather than "precise", that is, accurate to the level the evidence makes clear but not *artificially* accurate.

Weight assigned on the basis of all relevant evidence

All relevant evidence should be used, as appropriate, to assign relative weights to each of the financial models. This includes historical evidence (e.g., evidence about the relative empirical performance of different models) and contemporaneous evidence (e.g., about the relatively poor performance of a particular model in the current market circumstances).

[207] SFG (2013), *Dividend discount model estimates of the cost of equity*, June.

Because all available evidence, including contemporaneous evidence, should be used it is not possible for fixed weights to be set on an ex ante basis under a version of Approach (3) as set out in the Consultation Paper. Rather, all available evidence should be assembled and considered holistically, and then reasons provided for the different weights assigned to different financial models.

Model estimation issues

In their Draft Report for the AER, McKenzie and Partington (2013) note that the task of estimating parameters for the purpose of computing the required return on equity is an extremely difficult one that is subject to a high degree of estimation error. For example, McKenzie and Partington state that:

Determining the risk of the assets that constitute the investment is difficult.[208]

and that:

> *The cost of equity cannot be directly observed and is particularly difficult to estimate.* [209]

and that:

> *risk is the covariance of returns on the asset with returns on the market for capital assets. Unfortunately, even measuring this covariance is fraught with problems.* [210]

McKenzie and Partington also refer to:

> *the well documented problems that exist in estimating the firms exposure to market risk*[211]

and note that:

> *There are numerous, well documented difficulties associated with implementing the CAPM* [212]

They conclude that model-based estimates of the required return on equity are "woefully imprecise."[213]

The ENA submits that the difficulty of estimating the parameters of the relevant models is an important consideration. Among other evidence, a number of models will be used to estimate the required return on equity for the benchmark efficient firm. The extent to which these estimates are "fraught with problems" and "woefully imprecise" should be reflected in the relative weight that is ultimately assigned to them.

In this regard, McKenzie and Partington (2013) suggest that a more comprehensive model (that includes risk factors that are known to be relevant) may produce less reliable estimates due to the estimation error associated with the additional parameters:

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[208] McKenzie and Partington (2013), p. 6.
[209] McKenzie and Partington (2013), p. 10.
[210] McKenzie and Partington (2013), p. 10.
[211] McKenzie and Partington (2013), p. 19.
[212] McKenzie and Partington (2013), p. 25.
[213] McKenzie and Partington (2013), p. 34.

> *Thus, including additional risk factors, even if it could be theoretically justified, does not necessarily mean that a superior estimate of the cost of capital will result. It is entirely possible that the estimation errors associated with these additional factors could mean that a more complex model produces a less reliable result.*[214]

This logic applies to all models that require the use of woefully imprecise parameter estimates. For example, a number of asset pricing models begin with the required return of the market/average firm and then make adjustments according to estimates of how the risk of the firm in question might be above or below average. In making these adjustments, consideration should be given to the precision and reliability of the estimates of how the risk of the firm in question differs from that of the average firm. If one had no faith at all in these estimates (e.g., because they were considered to be woefully imprecise), the proper response would be to make no adjustment on the basis of them. In this case, there would be no proper basis for considering that the firm in question differed from the average, so the appropriate estimate of the required return of the firm in question would be the required return of the market/average firm. This is consistent with the suggestion of McKenzie and Partington (2013) that a more reliable estimate might be obtained by not using estimates of risk factors that are imprecise and unreliable.

Thus, the weight that might reasonably be assigned to a model-based estimate of the required return on equity depends, among other things, upon the precision and reliability with which the parameters of that model can be estimated.

Summary of relevant evidence

The analysis presented in Step 3 above produced a number of estimates for the required return as summarised in Table 1 below.

TABLE 1. ESTIMATES OF THE REQUIRED RETURN ON EQUITY CAPITAL (% P.A.)

Model	Current market conditions	Long-term average market conditions
Sharpe-Lintner CAPM	10.6%	10.6%
Black CAPM	12.2%	11.8%
Fama & French	11.4%	11.5%
Dividend growth	11.8%	11.5%
Market/Average firm	12.2%	11.8%

Rationale for relative weights

Expected return on the market

When estimating the required return on the benchmark firm, there are a number of reasons to assign some weight to the estimate of the required return on the market:

a) All of the asset pricing models begin with the required return on the market and then make adjustments for the extent to which the risk of the benchmark firm is considered to differ from the risk of the average firm. There is no compelling evidence to support the precise specification of any asset pricing model. Indeed there are two sources of error in relation to each – model error (the model may not provide a full specification of reality so there may be omitted risk factors or mis-specified risk factors) and estimation

[214] McKenzie and Partington (2013), p. 19.

error (the parameters of the model must be estimated, often using inadequate data). Moving away from the estimate of the required return on the market would then be done on the basis of models that are potentially mis-specified and certainly mis-estimated to at least some extent. Consequently, it is reasonable to apply at least some weight to the required return on the average firm – as any movement away from this neutral position is known to be affected by error;

b) The current evidence from the examination of the Black CAPM documents a lack of any relationship between beta estimates and returns. This suggests that the best CAPM based estimate of the required return on equity is the estimate of the required return on the market;

c) The current evidence in relation to the other models is that the parameter estimates are generally imprecise, in which case the estimate of the required return on equity is also imprecise;

d) There is no settled view on which (or even how many) systematic risk factors should be included in a model of the required return on equity. If it is the case, as McKenzie and Partington (2013) suggest, that simpler models may provide more reliable estimates of the required return on equity even if they omit relevant (but hard to estimate) risk factors, the simplest model of all is to estimate a single required return for all firms.

Dividend growth model

The reasons for assigning some weight to the DGM estimate of the required return on equity include:

a) The DGM estimate is "model free" in the sense that it does not build up an estimate of the required return on equity from a set of assumptions about investor behaviour and which risk factors affect required returns. Rather the DGM simply determines the return that sets the present value of a set of expected future cash flows equal to the current market price. The DGM is therefore less affected by model mis-specification error. This is not to say that no econometric choices need to be made , just that the DGM estimates the return on equity by simply matching observed market prices;

b) The DGM estimates exhibit less dispersion across firms than the asset pricing models;

c) There are a number of versions of the DGM that currently provide corroborating estimates of the required return on equity for the market;

d) The DGM is extensively used in practice, including by other regulators; and

e) The version of the DGM that has been proposed by the ENA exhibits stability over time in market return estimates that are consistent with an expectation that the cost of equity and market risk premium increased during the global financial crisis, rather than decreased.

Asset pricing models

The Sharpe-Lintner CAPM, Black CAPM and Fama-French models are asset pricing models that begin with the required return on the market and then make adjustments for the extent to which the risk of the benchmark firm is considered to differ from the risk of the average firm. As noted above, these asset pricing models are affected by model error (the model may not provide a full

specification of reality so there may be omitted risk factors or mis-specified risk factors) and estimation error (the parameters of the model must be estimated, often using inadequate data).

The AER's consultant has noted that the estimates of the required return on equity are "fraught with problems,"[215] and "woefully imprecise" [216] and that whereas the Fama-French model provides a reasonable fit to the data, the performance of the Sharpe-Lintner CAPM is "egregiously bad."[217]

Also, the evidence from independent expert valuation reports suggests that independent expert valuation professionals do not implement these asset pricing models in the way they are specified. Rather, they make modifications to these models to account for their perceived failings.[218]

The current evidence in relation to the Black CAPM suggests that there is no perceivable relationship between beta estimates and returns.[219] Consequently, under the Black CAPM the best estimate of the required return of any firm, including the benchmark NSP, is the required return on the market. As noted above, this evidence in relation to the Black CAPM suggests that further weight should be applied to the required return on the market.

This leaves the Sharpe-Lintner CAPM and the Famna-French model. There is evidence that cost of equity estimates from both the Sharpe-Linter CAPM and Fama-French models vary substantially across sample firms from the same industry and over time.[220]

Nevertheless, there are reasons to assign some weight to these models on the basis that:

a) Asset pricing models are used in corporate and professional practice (albeit often in a modified form);

b) Both asset pricing models are used by other regulators, although use of the Sharpe Lintner CAPM is more common (albeit as a secondary model in many US regulation cases); and

c) Asset pricing models (and indeed the two under consideration here) are used extensively in the finance literature to estimate required or "normal" returns.

Allocation of weights

The preceding discussion sets out a number of reasons to support weight be assigned to three kinds of estimates of the required return on equity:

a) An estimate based on the required return on equity for the average firm, that is free from any model specification error or estimation error in relation to risk sensitivities or the price of risk;

b) A model-free estimate that is based on reconciling expected future cash flows to their observed present value; and

[215] McKenzie and Partington (2013), p. 10.
[216] McKenzie and Partington (2013), p. 34.
[217] Associate Professor Partington, AER Forum, 18 June 2013.
[218] SFG (2013), *Evidence on the required return on equity from independent expert reports*, June.
[219] NERA (2013), *Estimates of the zero-beta premium*, June.
[220] Brooks, Diamond, Gray and Hall (2013), *Regression-based estimates of risk parameters for the benchmark firm*, June..

c) Asset pricing models that adjust the estimate of the required return on equity for the average firm based on assumptions about the relevant risk factors.

The ENA proposes that all three classes of estimate should receive material weight. Specifically, in the current market conditions, the ENA proposes to assign one third weight to each type of estimate (namely, one-third weight to the market return, one third weight to the dividend growth model estimate and one-third weight to the asset pricing model estimates).

The current evidence in relation to the asset pricing models suggests that they should not receive more than one third of the total weight. There is uncertainty about which asset pricing model should be used, the specification of risk factors and about all parameter estimates. The estimates from these models are neither precise nor reliable.

The estimate of the required return on equity for the average firm is supported by DGM analysis that exhibits more stability across firms and over time than estimates from other approaches and by evidence of market practice suggesting that required returns on equity have, since the onset of the GFC, been higher than their long-run average. Also, the DGM estimates are relatively precise in that they do not require separate estimates of many parameters.

The estimate of the required return for the market can also be considered to be the estimate from the Black CAPM according to the evidence presented by NERA (2013).[221] Within the asset pricing class, there are two models to consider – the Sharpe-Lintner CAPM and the Fama-French model. In relation to the relative weights to be assigned to each of these models, the following pieces of evidence are relevant:

a) Both models are theoretically based in that they can be mathematically derived from a set of economic assumptions. The origins of the Fama-French model lie in the observation of the systematic failure of the Sharpe-Lintner CAPM to fit real-world data. A theoretical derivation within the context of the Arbitrage Pricing Theory has since been developed;

b) It is clear that the inclusion of the size and book-to-market factors increases the explanatory power of the models. The Fama-French model provides a materially better fit to real-world data (improving the fit from “egregiously bad” to “reasonable”);

c) The Fama-French model is used far more extensively by academics as a risk benchmark than the Sharpe-Lintner CAPM;

d) The Sharpe-Lintner CAPM is used more extensively by market practitioners, although frequently in a modified form;

e) The Sharpe-Lintner CAPM is used more extensively by regulators.

The ENA proposes that, given the evidence that is currently available, each of these models should receive equal weight – simplicity and use counting in favour of the Sharpe-Lintner CAPM and empirical performance counting in favour of the Fama-French model.

[221] NERA (2013), *Estimates of the zero-beta premium*, June.

Determination of allowed return

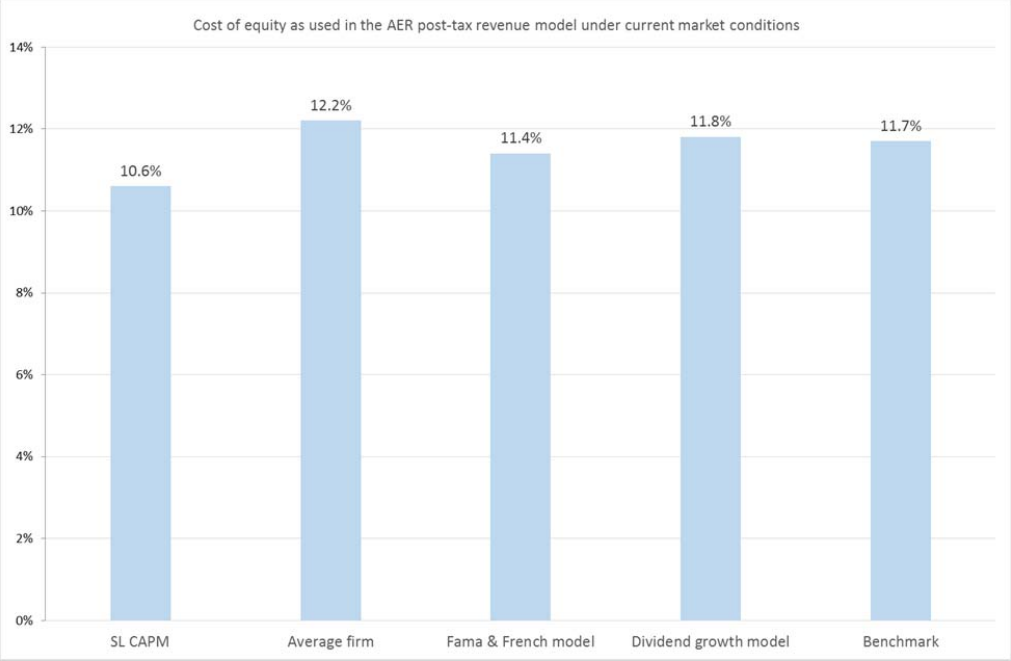
Expected return on the market

The four cost of equity estimates are presented in the table below and illustrated in Figure. Weights incorporated in the final estimate are presented in the table and the rationale underpinning those weights is set out above.

TABLE 2. ESTIMATES OF THE COST OF EQUITY CAPITAL (%)

Model	Current market conditions	Long-term average market conditions	Weight
Sharpe-Lintner CAPM	10.6%	10.7%	1/6
Black/market/average firm	12.2%	11.8%	1/3
Fama & French	11.4%	11.5%	1/6
Dividend growth model	11.8%	11.5%	1/3
Weighted average	11.7%	11.5%	

FIGURE 2. ESTIMATES OF THE COST OF EQUITY CAPITAL (%)



4.6 Gamma

4.6.1 Gamma as a cost of capital parameter

The Consultation Paper (p. 58) notes that under the post-tax nominal vanilla WACC framework, and within the context of the AER's Post Tax Revenue Model (PTRM), the gamma parameter does not directly affect the estimated WACC. Rather, the gamma parameter affects the quantum of corporate tax that is included in the annual revenue requirement. SFG (2013a, Paragraph 10) contains a numerical example of the way gamma affects the allowance for corporate tax.

Key position 18

The ENA agrees with the position taken in the Consultation Paper – that the gamma parameter should be considered as part of the Rate of Return Guideline.

The reasons for this include:

f) It is well known that the adjustment to the tax cash flow under the NER and NGR and in the PTRM is identical to and perfectly equivalent with a downward adjustment to the allowed return on equity to reflect the assumed value of imputation credits; and

g) Internal consistency requires that there should be no aspect of the estimation of gamma (or component parameter) that is inconsistent with the estimation of any other WACC parameter.

4.6.2 Two components of gamma

The Consultation Paper (p. 58) notes that in the regulatory setting, gamma is estimated as the product of two components:

$$\gamma = F \times \theta$$

where F is the distribution ratio (the proportion of created imputation credits that are distributed to shareholders) and θ is the value of a distributed credit. Imputation credits are created whenever a firm pays a dollar of Australian corporate tax. But to distribute all of the imputation credits it creates, a firm would have to distribute 100% of its (Australian) profits as dividends. The average firm does not do this, because it retains some profits to finance future capital expenditure.

If firms distribute 70% of the imputation credits they create and if those credits are each valued at 35% of face value, then gamma would be:

$$\gamma = F \times \theta = 0.7 \times 0.35 = 0.25.$$

This would mean that 25% of the corporate tax that the firm pays is assumed to flow back to shareholders, so the grossing up for corporate tax would be reduced accordingly.

Key position 19

The ENA agrees that gamma should be estimated as the product of two components – the distribution ratio (F) and the value of a distributed credit (θ).

4.6.3. Australian Competition Tribunal review

4.6.3.1 Distribution rate

The Consultation Paper notes that the regulatory precedent for all gas and electricity DNSPs is to set the distribution rate to 0.7 and theta to 0.35, giving a value of gamma of 0.25. The AER has adopted that value in every determination since the Tribunal's decision in 2009[222]. The value of 0.25 was set by the Tribunal. SFG (2013a, Paragraphs 15 to 32) sets out the context of that review and summarises the Tribunal's reasoning.

In its submissions to the Tribunal prior to the hearing, the AER acknowledged that an estimate above 0.7 for the distribution rate was unsupportable, as there was no evidence for it, and therefore that the distribution rate should be set to 0.7. In summarising the AER's position on this issue, the Tribunal stated that:

> *The AER accepts that on the material presently before the Tribunal, there is no empirical data that is capable of supporting an estimated distribution ratio higher than 0.7. The AER therefore accepts that it is open to the Tribunal to adopt a substitute distribution ratio of 0.7.*[223]

The Tribunal then concluded and ordered that:

> *In light of these submissions and the material before the Tribunal, the Tribunal concludes that the distribution ratio is 0.7 for the calculation of gamma.*[224]

4.6.3.2 Theta

Two techniques for empirically estimating theta were considered by the Tribunal:

a) Tax statistics about the proportion of distributed imputation tax credits that had been redeemed by shareholders, obtained from the Australian Taxation Office (ATO); and

b) Dividend drop-off analysis, whereby the implied value of imputation tax credits is inferred from the price change that occurs over ex-dividend days.

The Tribunal held that the ATO tax statistic approach did not produce an estimate of market value and that the AER was wrong to have interpreted tax statistic estimates in that way.

This left the Tribunal with dividend drop-off analysis. On this point, the AER had sought to rely entirely on a single study by Beggs and Skeels (2006). The Tribunal held that the AER was wrong to rely on an out-dated and methodologically unsound dividend drop-off study. The Tribunal then directed that a "state-of-the-art" dividend drop-off study should be conducted to assist the Tribunal.[225] The Tribunal also directed that the dividend drop-off study to be performed by SFG

[222] *Application by Energex Limited (Distribution Ratio (Gamma)) (No 3) [2010] ACompT 9* (24 December 2010).
[223] Ibid, Paragraph 2.
[224] Ibid, Paragraph 4.
[225] *Application by Energex Limited (No 2) [2010] ACompT 7* (13 October 2010), Paragraph 146.

"should employ the approach that is agreed upon by SFG and the AER as best in the circumstances."[226]

The ensuing SFG report concluded that the best available dividend drop-off estimate of theta was 0.35. The Tribunal accepted the estimates from the SFG state-of-the-art study:

> *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.* [227]

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.*[228]

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.*[229]

There has been no new theoretical or empirical material advanced by interested parties or the AER since SFG conducted its 'state of the art' dividend drop-off analysis for the AER to now be able to conduct a further review of the issue.

4.6.3.3. Final estimate of gamma

Having determined that the appropriate distribution rate is 70% and that the best dividend drop-off estimate of theta is 0.35, the Tribunal had no more work to do other than to multiply these two estimates together to obtain a gamma estimate of 0.25.

In every subsequent case where the AER has had to determine a value for gamma, it has adopted a value of 0.25.

4.6.4. Role of other regulators' decisions

The Rules set out the substantive considerations that the AER should take into account in setting the Gamma parameter and consistency between regulatory decisions such as those referred to in the Consultation Paper (Table H-1, p. 126) is not one of the relevant considerations. The only relevance of decisions made by other Australian regulators would be if those decisions had identified and considered some new material (substantial theoretical or empirical evidence) not already before the Tribunal in its Gamma case. Even where such other regulators have considered other material not made available to the Tribunal, care should be taken as these other regulatory decisions apply differently drafted regulatory frameworks applying to regulated sectors of the economy whose businesses are distinct from the energy sector.

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[226] Ibid, Paragraph 147.
[227] *Application by Energex Limited (Gamma) (No 5) [2011] ACompT 9* (12 May 2011), Paragraph 22.
[228] Ibid, Paragraph 29.
[229] Ibid, Paragraph 38.

The Consultation Paper (Table H-1, p. 126) sets out the AER's summary in relation to the value of gamma adopted in recent decisions by other Australian regulators. That table shows that:

a) The ERA (WA) decision[230] and IPART decision[231] adopted the Tribunal's value of 0.25;

b) Other regulators have adopted higher values of gamma (ranging from 0.45-0.5).

With regard paragraph (b) above, the following decisions by other regulators clearly rely on material and analysis that pre-dates the Tribunal's decision in the Gamma case either because the decision occurred beforehand or it did not take account of that decision:

a) The ESC decision[232] in 2008 was made prior to the Tribunal's decision in the Gamma case;

b) The QCA decision cited a gamma estimate of 0.5 for SunWater.[233] The QCA noted that the value of 0.5 was consistent with its own previous values for water utilities and with the values applied by other regulators to water utilities (all of which pre-date the Gamma case). Further, the QCA noted that its value of 0.5 had been endorsed by a consultant – again prior to the Gamma case (but made express reference to gamma in that case being set at 0.25).[234] The QCA had received no submissions from any stakeholder other than SunWater. If the approach of the QCA in its water decision were to be applied in the energy sector post-the Gamma case the decision would be in error.

   Further, it is clear that the appropriate value for gamma for water utilities is not settled, as evidenced by the Queensland Competition Authority Statement of Regulatory Pricing Principles for the Water Sector:

   > *"Australian regulatory experience with dividend imputation is still at an early stage, and particularly so for the urban water sector. Of the various regulatory cost of capital determinations made for urban water businesses in Australia, only one (ACT) has specifically addressed the issue of dividend imputation. In this case, an imputation effectiveness of 25 per cent was applied."* [235]

c) ESCoSA has also adopted its previously used value of 0.5, being "mindful of the importance of regulatory stability for regulated entities."[236] The ESCoSA decision was distinguished on its particular facts from the Gamma case. It is clear from the Commission's approach in the ESCoSA decision that gamma decisions in the water regulated sector are treated differently (on the facts and the law) from those in the

[230] Economic Regulation Authority (Western Australia), *Final decision on proposed revisions to the access arrangement for the Dampier to Bunbury natural gas pipeline*, October 2011, p. 141.
[231] Independent Pricing and Regulatory Tribunal, *Review of imputation credits (gamma*), March 2012, p. 1.
[232] Essential Services Commission (Victoria*), Gas access arrangement review 2008–12—Final decision*, March 2008, p. 489.
[233] Queensland Competition Authority, *Final report, Sunwater irrigation price review 2012–17*, Volume 1, May 2012, p. 498.
[234] Queensland Competition Authority, *Final report, Sunwater irrigation price review 2012–17*, Volume 1, May 2012, p. 498.
[235] Statement of Regulatory Pricing Principles for the Water Sector, the Queensland Competition Authority Statement of Regulatory Pricing Principles, 2002, pg 91-92.
[236] Essential Services Commission of South Australia, *Advice on a regulatory rate of return for SA Water — Final advice*, February 2012, p. 49.

electricity regulated sector. If the ESCoSA case were to be applied to the electricity and gas rules then any resulting decision would be a decision in error.

The Consultation Paper concludes (p. 125) that "[t]his shows that regulators have not universally adopted that (sic) the Tribunal's decision on gamma." Whilst the appropriate value for gamma is not settled amongst Australian regulators, in interpreting those different values adopted by other regulators, it should be noted that the reasons cited by the ACCC for adopting a value of 0.45 for Telstra were:

- The ACCC proposed a value of 0.45 in its Discussion Paper and considers that "regulatory certainty and predictability are desirable" [237] and that "[a] reasonable degree of certainty and predictability in the value of gamma will, in the ACCC's view, support past investments and promote industry confidence in making future investment decisions;" [238]

- The ACCC determined that Telstra can be distinguished from energy DNSPs on the basis that Telstra is likely to have a different distribution rate and a different shareholder base. The point here is that the ACCC has estimated a specific value of gamma for Telstra, rather than providing a market-wide benchmark estimate of gamma. This should not be treated as setting any precedent for energy DNSPs.[239]

In summary all of the decisions referred to in Table H-1, p. 126 of the Consultation Paper either:

a) Adopt the current AER and ERA estimate of 0.25;

b) Estimate gamma for a specific individual firm with unique characteristics, rather than for a market benchmark; or

c) Adopt a value other than 0.25 on the basis that a different value had been previously adopted and regulatory stability and predictability demanded that the previously adopted value should be maintained.

The extent to which regulatory stability and predictability are relevant considerations under the new NER and NGR is still to be fully determined. However, to the extent that this is a relevant consideration at all, it would provide support for the maintenance of the current gamma value of 0.25.

Key position 20

The ENA submits that, other than the ACCC's analysis of the actual firm-specific practice of Telstra, no regulator has performed any estimation of gamma since the Tribunal's decision.

4.6.5. Market-wide or industry-specific gamma estimate

The strong regulatory precedent has been to estimate gamma as a market-wide parameter. The only exception to this practice was the ACCC's 2011 determination in relation to Telstra. In that determination, the ACCC had particular regard to:

[237] Australian Competition and Consumer Commission, *Inquiry to make final access determinations for declared fixed line services—Final report*, July 2011, p. 75.
[238] Ibid, p. 75.
[239] Whereas the ACCC has considered the specific shareholder base and distribution practice of the specific firm being regulated, the NER and NGR require the consideration of an efficient benchmark firm rather than the specific firm being regulated.

- The amount of imputation credits that Telstra actually distributed – concluding that because Telstra actually distributed more imputation credits than the average firm, a higher than average value of gamma might be appropriate; and

- The proportion of Telstra shares actually owned by foreign investors – concluding that because Telstra had relatively lower foreign ownership, a higher than average value of gamma might be appropriate.

If an industry-specific estimate of gamma was to be contemplated for energy DNSPs, the relevant characteristics of the firms that the ENA has previously used as benchmark comparables include that the relevant firms have a materially higher proportion of non-resident shareholders, relative to the average firm in the Australian market. It is clear that, in practice, shareholders in the benchmark comparable firms obtain little or no value from imputation credits.

Key position 21

The ENA submits that the AER should either continue its regulatory precedent of estimating gamma as a market-wide parameter or examine the actual payout ratio and the actual shareholder base of the relevant firms as a key aspect of its measurement of theta, as the ACCC did in the Telstra case. If the approach in Telstra which uses a combination of an industry specific payout ratio with a market-wide estimate of theta were used in a decision applying the NER or the NGR, it would be in error.

4.6.6. Estimating the distribution rate

4.6.6.1. Empirical evidence

In its last WACC Review, the AER sought to increase its estimate of the distribution rate to 100%. In the ensuing appeal before the Tribunal, the AER accepted that it had erred in setting the distribution rate to 100% and that there was no evidence to support an estimate greater than 70%.[240] The 70% estimate that was ultimately adopted by the Tribunal was supported by two pieces of empirical evidence:

- An estimate of 71% from Hathaway and Officer (2004) using data from 1988 to 1992;

- An estimate of 69% from Hathaway (2010) using data from 1998 to 2008.

Both of these estimates were based on an analysis of tax statistics provided by the Australian Taxation Office. Both reports provided an estimate of the average ratio of:

- The total amount of imputation credits distributed each year; divided by

- The total amount of imputation credits created in that year.

[240] Application by *Energex Limited (Distribution Ratio (Gamma)) (No 3) [2010] ACompT 9* (24 December 2010), Paragraph 2.

The ENA engaged NERA Economic Consulting to provide an updated empirical estimate of the distribution rate. NERA have obtained the most recently available taxation data and estimated the imputation credit distribution rate in two ways:

- The average annual distribution rate, estimated using two different empirical methods; and
- The cumulative distribution rate since the taxation data has been available.

NERA's conclusion is that:

> *The cumulative payout ratio and the two measures of the annual payout ratio estimated from the latest published ATO taxation statistics support a dividend payout ratio of no more than 0.70.*[241]

4.6.6.2. Issues raised in Consultation Paper

Lally estimate

The Consultation Paper questions whether gamma should be estimated as a market parameter or as an industry-specific parameter. That issue is addressed in detail in a separate section below. If the regulatory practice of estimating gamma as a market parameter is to be maintained, the empirical evidence universally supports a distribution rate in the order of 0.7, as set out above.

The Consultation Paper refers to a note prepared by Lally (2002), which examines the distribution rate of eight firms during a single year. Even apart from the tiny sample size and period length, that analysis should logically be given no weight because:

a) If gamma is to be estimated as a market parameter, all relevant market data should be used; and

b) If gamma is to be estimated as an industry-specific parameter, firms from the relevant industry should be used.

Key position 22

The ENA submits that 0.7 remains the best empirical estimate of the distribution rate.

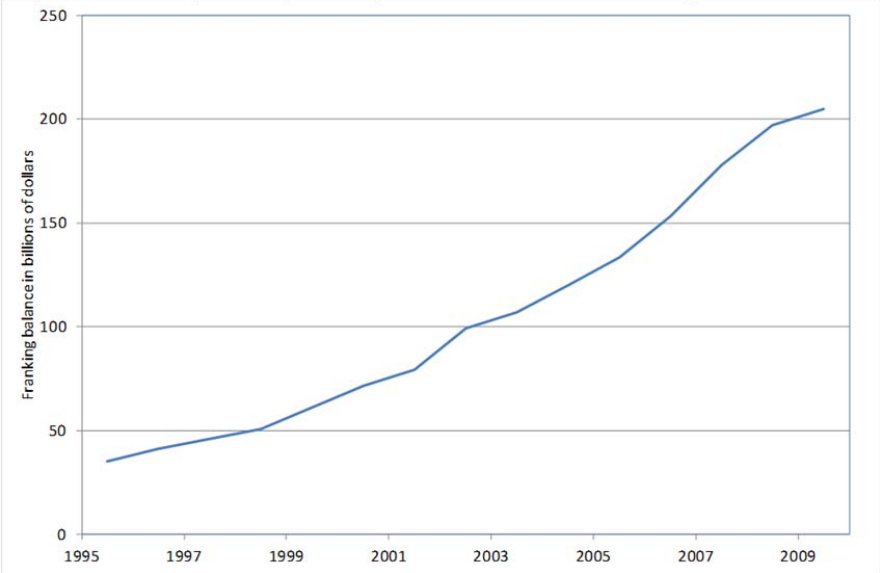
Theoretical assumption

The Consultation Paper notes that at the time of its last WACC Review, the AER's consultants advised that the empirically observed distribution rate of 70% could be replaced with an assumed distribution rate of 100% on the basis that, within the next two years, shareholders would devise a scheme to access undistributed credits. Such a scheme would have to be invented within the next two years, otherwise the store of undistributed credits would materially lose time value and a 100% assumption would no longer be appropriate. Also, the scheme would have to be new – all current methods for accessing imputation credits (share buybacks, special dividends, etc.) are already included in the 70% distribution rate that has been observed empirically.

The ATO data shows that the stockpile of undistributed credits grows materially every year. In an average year, 70% of the credits that are created that year are distributed (by all means), and 30% are added to the stockpile of undistributed credits. The ATO data shows that there are now more than $200 billion of undistributed credits, as summarised in Figure 3 below.

[241] NERA Economic Consulting, *The payout ratio*, (May, 2013), p.12.

Figure 3: The growing stockpile of undistributed imputation credits.



Source: NERA Economic Consulting, *The payout ratio*, (May, 2013), p. 8.

The assumption of a 100% payout rate is based on the notion that the growth in the stockpile of undistributed credits will reverse in the very near future. The Consultation Paper notes that the AER has been advised that the continued growth in the stockpile of distributed credits, which has occurred consistently every year to date, is "unlikely":

> *In particular, these experts observed that it is unlikely franking account balances could increase indefinitely without shareholders accessing these retained credits.*[242]

The above advice may have made sense at the time it was made but it was speculative. More than 10 years has passed since that statement was made and there is no evidence that the distribution rate is reducing and, to the contrary, sufficient time and investment cycles have now elapsed to conclude that franking account balances can increase for extended periods without shareholders accessing the retained credits (or in some cases that companies can be would up with positive franking account balances).

That advice also assumes that the Australian Taxation Office and Federal Treasury would not respond as they have comprehensively done in the past to protect the Federal Government tax revenue base.

The Consultation Paper also speculates that:

> *…companies now have the ability to pay dividends out of net assets rather than only out of net earnings. This may cause companies to re-evaluate their dividend policies, which would affect the distribution of imputation credits.*[243]

[242] Consultation Paper, p. 129.
[243] Consultation Paper, p. 130.

There are many considerations that potentially affect the distribution of imputation credits. However, the empirical evidence is very clear – the average distribution rate is consistently in the order of 70%. If something causes a material change in the actual distribution rate, such a change will manifest itself in the observable data. At that time, the relevant evidence would be used to estimate an appropriate distribution rate. It is not appropriate for a regulator to make speculative assumptions about what the future distribution rate might be – particularly when those assumptions are inconsistent with all available evidence.

Key position 23

The ENA submits that the distribution rate (like all other WACC parameters) should be estimated on the basis of empirical evidence and not on the basis of speculative assumptions that are inconsistent with all available evidence.

Moreover, the Consultation Paper is wrong to characterise a 100% distribution rate as forming part of the "range of reasonable estimates with expert support."[244] The Consultation Paper provides no indication of any "expert support" that wasn't already available at the time of the Gamma Case – when the AER conceded, and the Tribunal accepted, that it had no evidence to support such an assumption. The 100% distribution assumption is logically and empirically untenable.

4.6.7. Estimating theta

4.6.7.1. Face value or market value

Consider a company that pays a $1 dividend with a 43 cent imputation credit attached. The face value of that imputation credit is 43 cents. The market value of that credit is the extent to which the stock price is higher than it would otherwise be without the entitlement to that credit. That is, the face value is the amount of credits that are distributed and the market value indicates the extent to which those credits might affect stock prices and returns.

Theta is the market value of imputation credits. Under the PTRM, the AER first estimates the total return that shareholders would require. That return is then reduced according to the assumed value of gamma. For example, when gamma is set to 0.25 and the corporate tax rate is set to 30%, approximately 10% of the total return to shareholders is assumed to come from imputation credits.[245] That is, the value that shareholders are assumed to receive from franking credits is used to reduce the return that they would otherwise receive.

Using the amount of distributed imputation credits in place of the value of distributed imputation credits would result in the return to shareholders being offset by the amount of credits they receive rather than by the value of those credits.

That is, there are not two different notions of the "value" of distributed credits as the Consultation Paper implies. Rather, there is the amount of distributed credits and there is the value of distributed credits. It is the value that must be used in the PTRM since the value of imputation credits is used to offset the value of other returns to shareholders. By analogy, suppose a person is owed $100 and the borrower offers to pay them 100 Malysian Ringgit, where each Ringgit is worth a third of a dollar. The lender will reduce the loan balance by the value of the Ringgit (to $67) not by the number of

[244] Consultation Paper, p. 128.

[245] Under the NER and NGR and PTRM, the proportion of the total return on equity that is attributable to imputation credits is given by $\frac{\gamma T}{1-T(1-\gamma)} = \frac{0.25 \times 0.3}{1-0.3(1-0.25)} = 10\%$.

Ringgit received (to $0). The same applies in the PTRM – the revenue requirement for the return on equity is reduced by the value of imputation credits, not by the number of them.

Moreover, every other WACC parameter is measured in terms of market value rather than face value. Bond yields are not estimated with reference to face value but with reference to market value. The face value of shares is never used, only their market value, and so on.

Even though it may be easier to estimate the amount of imputation credits that are distributed than it is to estimate their market value, it is the market value and not simply the amount that is required when estimating the cost of capital in financial markets. By analogy, if the task is to estimate the diameter of a rockmelon, one cannot substitute an estimate of the diameter of an orange – even if the latter can be more easily or more precisely estimated. Moreover, it would also be quite wrong to consider a rockmelon estimate and an orange estimate to form any sort of "reasonable range."

Key position 24

The ENA submits that theta, like every other WACC parameter, should be estimated as a market value. The *amount* of distributed credits should not be used in place of the market *value* of those credits.

4.6.7.2. Dividend drop-off analysis

Dividend drop-off analysis can be used to estimate the value of distributed credits by observing the stock price change around the ex-dividend date, when the dividend and associated imputation credit separate from the share.

In the Gamma Case, the Tribunal directed that SFG should be retained to perform a "state of the art" dividend drop-off study. That study ultimately concluded that the appropriate estimate of theta was 0.35, paired with an estimate of the value of cash dividends of 0.85 to 0.90.

The Tribunal strongly endorsed the estimates from the SFG state-of-the-art study:

> *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.* [246]

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.*[247]

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.*[248]

[246] Application by *Energex Limited (Gamma) (No 5) [2011] ACompT 9* (12 May 2011), Paragraph 22.
[247] Ibid, Paragraph 29.
[248] Ibid, Paragraph 38.

The ENA has retained SFG to update the dividend drop-off study that was prepared for the Tribunal. SFG (2013a) uses the same econometric specifications, estimation methods and data sources as in the study prepared for the Tribunal. The updated study also includes a wide range of sensitivity analyses, robustness checks and stability analyses. SFG concludes that:

> *In our view, the conclusions from our earlier study remain valid when tested against the updated data set.*[249]

Key position 25

The ENA submits that the best available dividend drop-off estimate of theta is 0.35.

The Consultation Paper sets out a number of issues relating to dividend drop-off analysis, each of which is addressed in turn below:

- **Effect of arbitrage activity:** The Consultation Paper (p.131) notes that certain types of investors may be motivated to trade to capture dividends. Logically, if different investors place a different value on the package of dividend plus imputation credit, those that place the highest value will buy cum-dividend and sell ex-dividend. This will result in an increase in the drop-off ratio and result in a higher estimate of the value of the dividend and imputation credit;

- **Allocation:** The value of the package of dividend plus imputation credit must be allocated between the dividend and imputation credit. The only way to distribute an imputation credit is to attach it to a dividend, so this issue applies to every method of estimating theta;

- **Multicollinearity:** This is a statistical issue in regression analysis that occurs when there are two or more independent variables that are highly correlated. In two of the specifications in the SFG drop-off analysis, there is only one independent variable in the analysis, in which case multi-collinearity is impossible; and

- **Noise and other measurement errors**: Stock prices change for reasons other than the ex-dividend event, so it is impossible to determine what the stock price would have been in the absence of that event. But this issue applies to every empirical estimate. It is mitigated by using a large sample, eliminating observations that are contaminated (e.g., by a contemporaneous capitalisation change), using a range of econometric specifications and estimation methods, and by applying a battery of robustness tests and sensitivity analyses, as in the SFG study.

4.6.7.3. Redemption rates

The redemption rate is the proportion of distributed credits that are redeemed by shareholders. Redemption rates provide no information about the value of imputation credits – a credit would rationally be redeemed whether it was worth 100% or 5% of its face value.

In the Gamma Case, the Tribunal held that redemption rates do not produce an estimate of market value and that the AER was wrong to have interpreted tax statistic estimates in that way. In particular, the Tribunal held that redemption (or utilisation) rates provide no more than an upper bound check on estimates of theta obtained from the analysis of market prices:

> *utilisation rates derived from tax statistics provide an upper bound on possible values of theta.*[250]

[249] SFG (2013a), p. 27.

The Tribunal was also very clear that:

> *…any downward adjustment to a properly derived upper bound would be inappropriate as a means of deriving an estimate of theta.*[251]

The Consultation Paper posits that redemption rate data can be useful in that the redemption relates only to the imputation credit, separate from the cash dividend that was used to distribute it:

> *The main advantage of tax statistic estimates is that they are based on direct observation of the only occasion on which imputation credits are 'traded' separately.*[252]

However, there are three problems with this conclusion:

- Redemption rates are not based on direct observation. The AER's primary source of redemption rate estimates has been Handley and Maheswaran (2008). That paper assumes a redemption rate for resident investors – there is no observation of the redemption rate, direct or otherwise;
- Any analysis of redemption rate data requires a series of assumptions to disentangle the flow of credits between companies, trusts, funds and individuals. The Consultation Paper notes that the methods used to try to disentangle the flow of credits has been the source of much debate in the past;[253] and
- Even if the redemption rate could be observed (or estimated or assumed) it could only ever be used as an upper bound for theta, not as a point estimate.

There also remain significant unresolved issues with the use of tax statistics to measure redemption rates including significant measurement issues with taxation office data, issues relating to required adjustments and the inclusion of private companies in the data[254]. The Consultation Paper notes that Handley (2010) had responded to criticisms of the Handley and Maheswaran tax study yet these issues remain unresolved and the response could not be considered to be an independent examination of the issues in question. These deficiencies cast additional doubt on the usefulness of tax studies to measure the value of theta and are not easily resolved.

Key position 26

The ENA submits that redemption rates cannot be used for any purpose other than as an upper bound for theta.

4.6.7.4. Simultaneous trading of shares with and without entitlements

The Consultation Paper notes that from time to time there may be simultaneous trades of certain shares with, and without, entitlement to a dividend and imputation credit. The Consultation Paper cites three such studies. These studies use exclusively pre-2000 data, which the AER has previously rejected on the basis that it precedes the July 2000 rebate provision.

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[250] Application by *Energex Limited (No 2) [2010] ACompT 7* (13 October 2010), Paragraph 91.
[251] Ibid, Paragraph 95.
[252] Consultation Paper, p. 132.
[253] Consultation Paper, p. 133.
[254] Expert Report prepared in respect of certain matters arising from the AER's Merits Review – Determination of Gamma, Prepared for ETSA Utilities, Energex and Ergon Energy, R.R. Officer, 18 April 2011.

In any event, these studies involve extremely small sample sizes (one of the studies involves only one single company) and small "special" markets. There is no reason to believe that they have any relevance to the estimation of the market value of theta.

4.6.7.5. Simultaneous trading of shares and futures contracts

It is possible to infer the value of dividends and imputation credits from the simultaneous prices of ordinary shares (which entitle the holder to receive dividends and imputation credits) and futures contracts on those same shares (which provide no such entitlement).

Cannavan, Finn and Gray (2004) develop an econometric framework to estimate theta in this setting. That paper was published in the *Journal of Financial Economics*, which is one of four finance journals (world-wide) to be given an A* rating in the 2010 Commonwealth Government review of research performance and one of six finance journals (world-wide) to be given an A* rating by the Australian Business Deans Council.[255] In it last WACC Review, the AER gave no weight to this paper on the basis that it included pre-2000 data.

The Consultation Paper states that Cummins and Frino (2008) "extended the Cannavan, Finn and Gray [CFG] approach for the period January 2002 to December 2005.[256] This is not correct. Cannavan, Finn and Gray carefully match observed share and futures prices for individual companies with individual dividends and imputation credits paid by the relevant companies. Cummins and Frino examine the broad stock market index and an estimate of the overall dividend yield and average franking percentage on that index. Both of these papers pre-date important analysis that met the standard of rigour required for a formal Tribunal review process in the Gamma case. There has been no new theoretical or empirical theta material advanced by interested parties or the AER since then.

Key position 27

The clear policy intention of the AEMC[257], as reflected in the final Rules 6.5.3, 6A.6.4 and 87A, is that the allowed rate of return to be determined on a nominal vanilla WACC basis with proper regard to dividend imputation (gamma). The explicit exclusion of the current prescription of the gamma value of 0.5 is intended 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. The ENA submits that appropriate regard should be given to all relevant evidence.

In giving appropriate regard to all relevant evidence, a regulator should ensure that each piece of evidence is interpreted in the correct way. For example, an estimate of an upper bound should not be re-interpreted as a point estimate. And theoretical assumptions that are inconsistent with all available evidence should not be given material weight. Nor does it imply that an estimate of an upper bound should be re-interpreted as a point estimate.

In general, it is wrong to replace an estimate of one quantity (which might be difficult to estimate) with an estimate of a different quantity (even though it might be easier to estimate).

[255] See website: http://www.abdc.edu.au/3.43.0.0.1.0.htm.
[256] Consultation Paper, p. 136.
[257] AEMC 2012, *Economic Regulation of Network Service Providers, and Price and Revenue Regulation of Gas Services, Final Position Paper*, 29 November 2012, Sydney, page 68.

4.6.7.6. Professional and market practice

In its 2009 Review of WACC parameters, the AER considered commercial market practice in relation to the treatment of imputation credits. It is generally recognised that no adjustment to the discount rate or the tax cash flows is made by:

a) Australian companies;

b) Independent expert valuation professionals;

c) Government treasuries; or

d) Credit rating agencies.

In the 2009 review, the AER concluded that market professionals may make no adjustment in relation to imputation credits because they are using an approach to estimate the cost of capital that bypasses the need to separately estimate gamma. In its Final Decision, the AER concluded that:

> *There does appear to be 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 equity.*[258]

By contrast, the approach adopted by the AER to date makes two adjustments in relation to gamma:

- The estimate of MRP is increased to incorporate the assumed value of imputation credits; and
- The return to equity holders in the regulated firm is decreased to incorporate the assumed value of imputation credits.

The result is an ex-imputation credits estimate of the required return on equity – which is used in the PTRM to determine the revenue requirement in relation to the return on equity.

The AER's conclusion above is that there is a market practitioner approach that circumvents the need to estimate gamma. This approach provides a direct estimate of the ex-imputation credits required return on equity. That is, there are two ways to estimate the ex-imputation credits required return on equity:

- The AER approach, which requires the two adjustments based on the estimate of gamma as set out above; and
- The market practitioner approach, which provides a direct estimate without the need to estimate gamma at all.

[258] AER, *Review of the weighted-average cost of capital (WACC) Parameters: Final Decision*, (May, 2009), p. 409.

Key position 28

The ENA submits that the market practitioner estimate of the (ex-imputation credits) required return on equity is highly relevant evidence to corroborate the outcome of the work separately estimating a discrete gamma variable in the CAPM. At a minimum, having regard to all the available evidence, the market practitioner estimate should be compared with the AER estimate and the reasons for any differences should be considered and explained.

5. Return on debt and gearing

5.1. Summary and structure

This section summarises the ENA's submission on matters relating to the return on debt and gearing as well as providing an overview of the structure of the ENA submission.

Section 5.2 describes the characteristics of debt, including the amount of debt, that a benchmark efficient business can be assumed to issue in order to finance itself. The ENA submits that a benchmark efficient firm should be assumed to have gearing of 60%, have a credit rating of BBB/BBB-, issue 10 year debt both domestically and internationally including some debt that has callable features.

This involves a proposal to reduce the credit rating relative to current benchmark assumed by the AER. The rationale for doing so is that this reflects actual credit ratings and the cash-flows generated in recent AER decisions (as modelled within the PTRM) would be insufficient to sustain a BBB+ credit rating for a benchmark business receiving those cash-flows. This in part reflects the contribution of very low cost of equity allowances provided by the AER in reducing cash-flows. For the reasons already described, the ENA's position is that, in current market circumstances, the method applied by the AER underestimates the true cost of equity. Remedying this may allow a higher than BBB/BBB- credit rating to be adopted as the benchmark in the guidelines.

Section 5.3 describes how the ENA proposes that the yield on debt should be estimated and this proposal is independent on whether the benchmark financing strategy is 'on the day' or a form or 'trailing average' (discussed in section 5.4). The ENA proposes that the AER estimate the cost of issuing 10 year debt by extrapolating the Bloomberg BBB fair value curve to maturity of 10 years. The ENA considers that it would be reasonable for the AER to complement this by estimating its own fair value curve using relevant data – with that fair value curve potentially being used as a 'fall back' if the Bloomberg fair value curve ceases to be published and/or to extrapolate the Bloomberg fair value curve to 10 years. The ENA strongly submits that the sampling approaches adopted by the ERA and IPART are inferior to either of the approaches proposed by the ENA.

Section 5.4 describes the ENA position on determining the efficient debt management strategy. The ENA remains of the position that the guideline should set out the three methodologies contemplated in the Rules. ENA notes that there is strong support within its membership for the adoption of a trailing average cost of debt provided that there is annual updating of the cost of debt during the regulatory period. Relative to the 'on the day' approach, a trailing average cost of debt allowance will better reflect what those businesses actually do and is more easily hedged by them. It will also lower volatility in revenues/prices between resets. However, businesses with certain characteristics (for example, smaller portfolios) might find the application of a trailing average benchmark problematic. Those businesses may therefore prefer an alternative methodology or the application of a different transitional mechanism. The AER should explain in the guideline how such issues should be addressed. At a minimum, those businesses should have the opportunity to argue an alternate to the trailing average cost of debt in their framework and approach / regulatory proposal such as 'on the day' or a 'hybrid' and demonstrate that this would reflect an efficient financing strategy.

Section 5.5 sets out the ENA position on whether there should be transition arrangements set in place to transition to the trailing average. In the ENA's view the purpose of transitional arrangements is to provide a mechanism (or mechanisms) to ensure that businesses are able to meet their new regulatory obligations and recover at least their efficient costs. Any transition arrangements need to be fair and reasonable. This may require the AER to take into account the

individual circumstances of the business in question and, in some circumstances, it may be that no transition is required if the business already uses a debt financing approach consistent with the efficient benchmark or this facilitates a business to hedge its efficient interest costs to the regulatory allowance. Where a transitional mechanism is applied, it must be fair and reasonable, include annual updating provisions and enable businesses to appropriately transition to the new methodology. For this reason it is considered that the guidelines should outline appropriate transitional provisions to provide certainty for business and provide businesses with an opportunity to prepare for transition to the new methodology.

5.2. What are the characteristics and amount of debt issued by the benchmark firm

Key position 29

The characteristics of the assumed debt issued by a benchmark business should, ideally, reflect the practices of NSPs. The characteristics of debt issued should also be internally consistent with the method and data used to estimate the cost of equity. This means that the benchmark credit rating should be achievable given the cash-flows generated by a cost of equity allowance and also the type of debt issued should reflect the practices of NSPs used to estimate the cost of equity.

In relation to gearing, the current 60% benchmark gearing is consistent with business practice. However, given the AER's current approach to estimating the cost of equity for a 60% geared company, the resulting cash-flows are inconsistent with the benchmark entity obtaining a BBB+ credit rating. On this basis the ENA considers that the benchmark credit rating should be BBB/BBB-. The ENA notes that to some extent the AER's approach to the cost of equity estimation has, due to very low cost of equity allowances, exacerbated this problem. Depending on the likely impact of any changes to the AER's cost of equity methodology it may be possible to support a benchmark credit rating of higher than BBB/BBB-.

A maturity assumption of 10 years continues to provide an appropriate benchmark. In addition, the ENA notes that NSPs issue of debt in markets both domestically and internationally and issue a mix of non-callable and callable debt. To the extent that the AER were to perform bespoke estimates of the cost of debt it should not exclude such debt from those estimates.

5.2.1. Gearing and credit rating

The ENA considers that the AER's approach to estimating the cost of equity has, in the context of current low CGS yields, resulted in insufficient cash-flows for a benchmark 60% geared entity to retain a BBB+ credit rating. Analysis performed by Kanangra (Table 14 of Kanangra report) estimates that the cash-flows are consistent with a marginal S&P credit rating of between BBB- to BBB.

This estimate is based on cash flows allowed in the PTRM for the most recent AER final decision for Victorian gas businesses and Electranet in South Australia. The best estimate of the Moody's credit rating would be Baa2 and the best estimate of the S&P credit rating would be BBB- to BBB.

A credit rating of less than BBB+ would also be consistent with the actually observed credit ratings for regulated businesses. Table 15 of the Kanangra report estimates that the average S&P credit rating is between BBB and BBB+. On the other hand, most of these business's cash-flows reflect much higher regulatory allowances for the cost of equity than would be allowed prospectively under current AER methodologies. This tends to raise the actually observed credit ratings above the benchmark credit rating associated with the AER's current approach to estimating the cost of equity.

The ENA also notes that since the benchmark credit rating was last assessed in 2008 the credit ratings of NSPs have been stable (see section 7 of the Kanangra report).

A 60% gearing assumption is consistent with the range of the gearing estimates used by SFG in its analysis of the 5 currently listed Australian entities with regulated NSP assets plus HDF (which was recently acquired by APA). The average gearing for these six firms was 60% and the range was 48% to 77%). This is over the entire period of analysis. Using the most recently available year the average was 56% and the range 37% to 72%.

The ENA notes that the AER Consultation Paper has set out how it intends to approach an assessment of the benchmark gearing and that this would have regard to actual practices of NSPs. The AER has set out, in Appendix G, its view on how it would collect and measure gearing data – including data from 2007 to 2012. The ENA has two concerns about the approach that the AER has set out.

First, the AER has not set out in similar detail how it would approach the assessment of the benchmark credit rating associated with any benchmark gearing data estimated. In the ENA's view, the chosen benchmark gearing and cost of equity estimates must generate cash-flows that are internally consistent with the chosen benchmark gearing.

Second, the AER has not set out how it would make sure that it has estimated a benchmark gearing estimate that is internally consistent with its parameter estimates used in the relevant cost of equity models. If the benchmark gearing is materially different from the gearing of the comparator companies then the AER's benchmark cost of equity estimates will depend heavily on the form of leverage formula used by the AER (used to adjust the comparator cost of equity estimates to the benchmark cost of equity estimate). This is a potential source of error that can be avoided if the actual and benchmark gearing are set consistently.

5.2.2. Term of debt issue

The ENA considers that the benchmark term of debt issue should reflect the average term of debt at issuance for firms comparable to the benchmark firm. The actual business practice of comparable firms is driven by a complex set of real world constraints. While short term debt tends to have lower interest costs it also exposes businesses to heightened insolvency/bankruptcy costs if they are unable to refinance large amounts of debt in a short period of time.

In order to manage the expected value of these uncompensated transaction costs firms tend to issue long term debt. The regulatory regime needs to recognise the existence of these real world forces driving businesses to finance themselves in this way.

PwC estimates that the average term of debt at issue for ASX listed regulated energy businesses to be 10.2 years. For US and UK regulated network infrastructure businesses the term of debt issuance is longer still 21.3 years and 18.9 years respectively. CEG arrives at consistent estimates.

Based on this analysis the ENA believes that a benchmark term of debt at issuance should be at least 10 years.

The ENA notes the position of some state based regulators, such as IPART and the ERA, who assume a term of debt issuance of 5 years to match the term of the regulatory period. This is justified based on stylised arguments, devoid of the real world transaction costs described above, that this is the term of interest rates that investors would use to value revenues over the regulatory period. The ENA considers that this approach is an extreme example of the failure to recognise transaction costs.

The ENA also notes that the ERA and IPART approaches similarly fail to adjust estimated sensitivity of equity returns to risk factors (such as CAPM beta) for the fact that the assumed term of debt issuance is shorter than that of the actual term of debt issuance of comparable companies.

5.2.3. Type of debt issue

As with the term of debt issued, the ENA considers that the type of debt issued by the benchmark firm should reflect the actual practices of businesses that are comparable to the benchmark firm. These practices are driven by the need to manage real world risk sensitivities and transaction costs.

For example, Australian regulated energy businesses commonly issue debt in foreign currencies such as the US dollar. There are a number of reasons for doing this. Having a presence in multiple debt markets, including a large deep debt markets such as the US market, increases the flexibility that a business has to manage its financing risks. This includes reducing its exposure to disruptions to domestic markets. Similarly, a firm that has issued some callable debt is in a better position to reduce its exposure to interest rate volatility (by giving it the option to call or not call debt in the future).

In this context the ENA considers that the benchmark efficient debt management strategy should ideally not strictly specify a single type of debt issuance (such as Australian dollar, fixed rate non-callable debt). Rather, the benchmark efficient debt management strategy should ideally be defined to include the issuance practices actually observed in the market.

In this regard the ENA notes analysis by CEG that demonstrates:

- 41% of bonds issued by Australian comparable regulated energy businesses are callable;
- 35% of debt issued by listed Australian comparable regulated energy businesses is issued in a foreign currency.

5.3 How should the yield on benchmark debt be estimated

Key position 30

The ENA believes that the yield on benchmark debt issuance should be estimated using a credible third party estimate of comparable fair value yields. The best source of such an estimate currently available is the Bloomberg BBB fair value curve (extrapolated from 7 to 10 years).

An alternative/adjunct to the Bloomberg fair value curve is estimation of a fair value curve by the AER from individual bond yield estimates published by Bloomberg.

An unacceptable alternative to the Bloomberg fair value curve is the adoption of a sampling approach such as those used by the ERA and IPART. These unnecessarily exclude data from the sample (e.g., on the basis of maturity) and do not use econometric techniques to adjust for within sample differences (e.g., within sample differences in bond maturity).

5.3.1 Use of third-party data source

The AER has to date used the Bloomberg Australian dollar (AUD) Corporate BBB fair value curve to estimate a BBB yield at 7 years (the longest maturity currently available) over the relevant averaging period. This yield has been extrapolated to 10 years (using a variety of methods) and then used to estimate the benchmark cost of debt.

The cost of debt could be estimated either by reference to an estimate developed by a third-party data source (such as Bloomberg), or by collecting as wide a range of yield data as possible and fitting curves through that data using econometric techniques that use all the relevant information and are capable of distinguishing the impact of credit rating and maturity on bond yield. CEG has set out an appropriate methodology for undertaking such econometric curve fitting and has shown that this gives rise to a BBB+ fair value curve that is entirely consistent with the Bloomberg BBB fair value curve in the relevant period.

There are material advantages of using a third party data source for the actual benchmark cost of debt estimate such as the Bloomberg BBB fair value curve. Firstly, data sources such as this are provided on a commercial basis for the use of market practitioners and are developed separately from the regulatory process. It is, therefore, not possible for any individual stakeholder to influence the estimate in order to suite their own objectives. Secondly, the exercise of any judgement in the construction of the fair value curve is carried out by experts with access to a comprehensive financial database available using techniques developed and applied across many different countries. Bloomberg has teams dedicated to collecting and interpreting financial data and has a strong commercial incentive for their estimates to always be based on the latest data and continuously developed and improved to withstand scrutiny from their large customer base. Thirdly, reliance on Bloomberg estimates will reduce the resource costs of stakeholders in consulting on the development and implementation of alternative estimation techniques.

While the ENA believes that the AER should rely on Bloomberg fair value curves when estimating the benchmark cost of debt. The ENA also notes that the Bloomberg FVC is based solely on Australian dollar bonds and where the estimated impact of options has been removed. Ideally, for the purpose of estimating the benchmark cost of debt under the Rules, Bloomberg would produce an Australian BBB curve that included bonds issued in foreign currency and including callable bonds (in the proportion that these bonds are issued by NSPs). For example, the failure to take into account the impact of callability on some bond yields will tend to cause the Bloomberg fair value curve to underestimate the benchmark cost of debt (given the benchmark should include callable bonds and callable bonds tend to have higher yields other things equal).

This reflects the fact that Bloomberg does not produce its fair value curve specifically with the benchmark under the Rules in mind. This is both an advantage (in terms of the independence of the Bloomberg estimate from any single stakeholder) and a disadvantage (in terms of failing to include bond data that would be relevant to the benchmark). In the ENA's opinion, when the advantages and disadvantages of using Bloomberg fair value curves are weighed against each other the Bloomberg fair value curve remains the best source of an estimate of the benchmark cost of debt.

However, that does not imply that, if the AER were to attempt a curve fitting exercise on its own, it should simply attempt to replicate the Bloomberg fair value curve analysis. That is, just because Bloomberg fair value curves do not include the impact of callabiltiy or bonds issued in foreign currency does not provide a rational for the AER excluding these bonds in any analysis of raw data that it performs.

5.3.2 Extrapolation

Ideally Bloomberg would publish an AUD Corporate BBB fair value curve at 10 years to maturity. However, this is not currently available due to a lack of underlying data meeting Bloomberg's criteria for inclusion in the AUD Corporate BBB fair value curve. The longest dated data point on this curve is currently 7 years. This value can be extrapolated to 10 years using different methodologies to estimate a 10 year value.

Possible extrapolation methodologies include using:

- the difference between the yield at 7 and 10 year yields estimated using econometric techniques, as outlined by CEG, to fit a yield curve to a dataset of bonds as described above;
- the shape of the most comparable Bloomberg fair value curve which has yields between 7 and 10 years to maturity; and
- 'bond pair' analysis, i.e. the difference between yields on bonds by the same issuer which are approximately 7 and 10 years from maturity.

In the ENA's view, each of these options has different advantages and disadvantages.

- The curve fitting approach has the advantage of not only providing an extrapolation estimate based on the most comparable available data but also provides a potential 'fall back' if, or whatever reason, Bloomberg ceases to publish its fair value curve;
- Relying on the shape of the most comparable Bloomberg fair value curve is simpler than going through a bespoke curve fitting process. This could involve pre-specifying a hierarchy of different curves (e.g., from domestic A, domestic AA, domestic AAA, USD BBB (swapped back to AUD), domestic State Government. However, it may require relying on a curve that cannot reasonably be assumed to have the same shape as the domestic BBB fair value curve (such as the domestic AA or State Government fair value curves); and
- Bond pair analysis is also relatively simple and direct. However the quality of the estimate depends on their being sufficient pairs of bonds issued by the same issuer with BBB credit rating and with maturity of approximately 7 and 10 years.

If the AER were to adopt a curve fitting methodology the ENA believes that the method set out by CEG could be sufficiently well specified to allow it to be used for automatic annual adjustments to the cost of debt as required by the rules.

5.3.3 Critique of ERA and IPART methodologies

In the ENA's view, the methodologies relied upon by the ERA and IPART are not fit for the purpose of reliably estimating the DRP associated with a benchmark credit rating and maturity. Both methodologies rely upon an approach that sets the benchmark DRP as an average of yields for a sample of bonds that meet defined criteria. As observed by CEG, these approaches fail to use

econometric techniques to make the best use of the available data and to appropriately use that data to arrive at an estimate of the yield for the benchmark maturity and credit rating. Put simply, taking a simple (or even a weighted) average of a subset of the available data will not make the best and most efficient use of all the relevant bond yield information that is available.

The effect of this is that the application of these methodologies produces a result that is consistent with the maturity and credit rating of the bonds that are sampled and not of the desired benchmark. Neither the ERA nor IPART attempt to adjust for these differences between the maturity and credit rating characteristics of their samples and the benchmark debt issue. This can be contrasted against reliance on the Bloomberg BBB fair value curve or econometric approaches that specifically control for these features.

The ENA further considers that, aside from this important shortcoming, the methods applied by the ERA and IPART are further compromised by unnecessarily restrictive exclusions of large amounts of relevant data. For example:

- both the ERA and IPART use bond yield data exclusively from Bloomberg. As summarised by PwC this approach excludes large amounts of fixed and floating rate note yield data available from UBS and potentially other providers. Since Bloomberg does not report yield data on floating rate notes, a further effect of this exclusion is to set aside reliance on all floating rate note yield data; and
- both the ERA and IPART arbitrarily exclude certain categories of bonds from their analysis without reasonable justification or explanation. CEG note that the ERA excludes all bonds denominated in foreign currencies, while IPART excludes credit wrapped bonds and bonds with embedded options as well as foreign currency bonds other than those denominated in United States dollars; and

Both PwC and CEG point to shortcomings in the ERA's reliance on weighting bond yields by issue amounts. The ERA provides no evidence or argument in support of a theory that yield data for larger issues is proportionally more reliable than for smaller issues.

Finally, the reasons given for departing from reliance on Bloomberg's fair value curve, or placing significantly reduced reliance on it in the case of IPART, are not adequate. PwC show that the ERA's analysis purporting to show the unreliability of Bloomberg's 7 year DRP did not establish this, and the retrospective analysis showed that its bond-yield approach would have underestimated Bloomberg fair value yields in the period prior to the GFC. CEG's curve fitting analysis demonstrates that the Bloomberg fair value curve is a good fit to the relevant bond yield data.

The ENA considers that reliance on the Bloomberg BBB fair value curve, extrapolated as described above, or a fair value curve estimated following CEG's methodology would be expected to produce superior and more accurate estimates of the DRP than either of the methodologies proposed by the ERA or IPART.

5.4 On the day versus a trailing average or hybrid

The ENA remains of the position that the guideline should set out the three methodologies contemplated in the Rules.

The ENA notes that the trailing average approach would be likely to benefit consumers in terms of reduced volatility and that, for most businesses, it would best reflect their long term efficient financing practice. This is contingent on the trailing average being implemented with a mechanism to ensure that annual variations in the cost of debt are reflected in a timely change to the regulatory allowance for the cost of debt (discussed in section 5.5 below).

However, businesses with certain characteristics (for example, smaller debt portfolios) might find the application of a trailing average benchmark problematic. Those businesses may therefore prefer an alternative methodology or the application of a different transitional mechanism. Thus, were the AER to set out only the trailing average methodology in the guideline, it would also need to set out in in the guideline how such issues should be addressed. At a minimum, those businesses should have the opportunity to argue an alternate to the trailing average cost of debt in their framework and approach / regulatory proposal such as 'on the day' or a 'hybrid' and demonstrate that this would reflect an efficient financing strategy.

The general preference for a trailing average reflects the fact that, for most businesses, a trailing average of 10 year BBB+ debt yields, would provide the best estimate of a cost of debt that is commensurate with their efficient financing costs. The advantages of this benchmark for those businesses are:

- a trailing average better reflects what they businesses actually do and, for them, is more easily hedged than the alternative benchmarks.
- consistent with the first point above, a trailing average has the potential to lower transaction costs.
- a trailing average lowers the cost of estimation error (due to the annual nature of the process rather than a single estimate every 5 years); and
- a trailing average with annual updating mimics the costs of a business that follows standard commercial practice for infrastructure owners (namely to issue long term debt with staggered maturities).

However, the ENA believes that businesses should have the opportunity to argue an alternate to the trailing average cost of debt in their framework and approach / regulatory proposal such as 'on the day' or a 'hybrid' and demonstrate that this would be an efficient means of financing the benchmark entity as defined. [

The ENA recognises that some stakeholders have expressed concern that having the option to propose an alternative benchmark could lead to strategic behavior. Presumably this would take the form of a business proposing a benchmark not because it is consistent with its long run efficient financing strategy but because it believes it will, in the short run, maximise expected revenues. The ENA notes that, ultimately, the AER retains the power to reject proposals and it can and should reject such a proposal if it is not well reasoned in terms of the business recovering efficient financing costs. The ENA also notes that the AER can elicit individual business's views on this well in advance of even the framework and approach process for an individual regulatory determination. The current Guidelines process provides one forum for such views to be elicited. It would therefore likely be transparent if a business proposes a different benchmark in its proposal purely because it was expected to deliver higher revenues.

5.4.1. Annual updating

The ENA is firmly of the opinion that, for those businesses whose revenue allowance is set using a trailing average, the revenue allowance should be updated annually.

There are two possible alternatives to annual updating. Under both of these approaches the cost of debt would be set based on the value of the trailing average cost of debt immediately prior to a business's regulatory period. There would be no adjustment within the regulatory period for changes in the trailing average cost of debt but:

- Under one approach a 'true up' is performed at the beginning of the next regulatory period. This involves keeping track of the over/under compensation to businesses as a result of not annually updating during one regulatory period and applying a decrement/increment to regulated revenues in the next regulatory period that has the same present value;
- Under another approach no 'true up' is performed. Any over/under compensation due to the trailing average cost of debt falling/rising during the period is simply retained/borne by the business in question (and *vice versa* for customers). This was the preliminary preferred position expressed in the RDB April 2013 discussion paper *Estimating the cost of debt*.

Annual updating is critical to businesses' ability to manage their cash-flows efficiently. A 'true up approach' is a poor substitute for annual updating as it requires businesses to incur costs in managing their cash flow and exposes customers to the potential for large price shocks at each regulatory determination. CEG has estimated, using a 90 year history of US (Moody's Baa rated) corporate debt yields, that 'true up' amounts would have been in the order of $30m+ on every $1bn of RAB (both up and down).

Moreover, CEG notes that large 'true ups' tend to be associated with large natural increases in the cost of debt – such that they tend to amplify pre-existing volatility. That is, large true ups tend to occur when interest rates during the regulatory period have risen/fallen above/below the trailing average. Consequently, not only will the 'true up' be positive/negative but so will the change in the trailing average to which it is added.

In the ENA's view, there is no potential benefit from implementing a 'true up' that could offset the costs associated with not having annual updates within the regulatory period. The Rules require that annual updating be 'automatic' in nature and the basis for the calculation will need to be set out with a high degree of certainty within the initial regulatory decision – a fact that is true whether there are annual updates or a 'true up'. By its nature this means that the information and process for estimating the cost of debt, and the ultimate estimate itself, will be the same whether an annual update or a 'true up' is being performed. Consequently, the only difference is that a 'true up' is implemented later with the consequent volatility in prices/cash-flows described above.

The ENA rejects as unreasonable any option that does not annual updates. Such an approach will expose investors and businesses to the same kind of risk of under/over recovery of efficient costs that exists currently under the on the day approach. The QTC has presented evidence,[259] which demonstrates that it cannot be assumed that under/over-recovery from failure to annually update will

[259] CEG Mismatch modelling, preliminary results for discussion.

be small nor that it will quickly reverse (i.e., a period of over recovery will be followed by a period of under recovery and *vice versa*). Using the same 90 years of US data that CEG relied on, QTC showed that average annual under/over recovery in each 5 year regulatory period could be as high as 1% and was strongly positively correlated across consecutive regulatory periods. That is, the US data series suggested that if under/over compensation occurred in one regulatory period it was very likely to occur in the next regulatory period.

It is the ENA's position that there is no good policy rationale for exposing businesses and customers to these types of windfall gains and losses (and the associated costs placed on businesses and customers in managing these). All of the data required to apply annual updating will be collected in the process of estimating a trailing average. Consequently, there is no additional difficulty for the regulator using that information to eliminate these windfalls and to make regulatory allowances better reflect efficient financing costs.

5.4.2. Detailed implementation of the trailing average

There will be detailed implementation issues associated with measurement of the cost of debt and also the practical application of annual updating. Some decisions that must be made include:

- Should there be quarterly semi-annual, annual observations or something else?
- Should there be a single cost of debt estimate (estimated in one averaging period) or should the cost of debt estimate be comprised of separate estimates (measured at different times) for DRP (relative to 10 year swaps) and 10 year swap rates?
- Should some/all averaging periods be set at the discretion of the businesses to suite their hedging strategy?
- Should the trailing average should be weighted by the actual (or PTRM modelled) levels of net capital expenditure?
- Should annual updating (or the 'true up') be achieved simply by running the PTRM with the actual trailing average and the decision trailing average and adjusting revenues in the relevant year for the difference in unsmoothed PTRM revenues?
- Should the trailing average be specified in real or nominal terms?

These, and no doubt others, are issues that the ENA recognises will need to be resolved but on which the ENA currently does not have a firm position.

5.5 TRANSITION

In the ENA's view the purpose of transitional arrangements is to provide a mechanism (or mechanisms) to ensure that businesses are able to meet their new regulatory obligations and have the opportunity to recover at least their efficient costs. The ENA considers that any transition arrangements need to be fair and reasonable. This may require the AER to take into account the individual circumstances of the business in question and, in some circumstances, it may be that no transition is required if the business already uses a debt financing approach consistent with the

efficient benchmark or this is the best way of facilitating a business to hedge its efficient interest costs to the regulatory allowance.

That said, where transitional mechanisms are appropriate to be applied, they must be fair and reasonable, include annual updating provisions and enable businesses to appropriately transition to the new methodology. For this reason it is considered that the guidelines should outline appropriate transitional provisions to provide certainty for business and provide businesses with an opportunity to prepare for transition to the new methodology.

The ENA notes that the current regulatory 'on the day' methodology and the proposed 10 year trailing average both have in common an assumption of a 10 year term for the cost of debt. The ENA also notes that this is the term of debt regulated businesses actually issue at. Whatever transition arrangements are put in place, this 10 year term assumption must be retained in the transition. In the ENA's view it would be illogical to 'transition' from a starting point which assumed 10 year maturity to an end point which assumed 10 year maturity via some other assumed maturity. The ENA notes that the RDB April 2013 discussion paper *Estimating the cost of debt* proposed a transition that violated this principle and the ENA rejects that proposal as not fair and reasonable.

The QTC has outlined a concrete form of transition that does not use any historical data but only uses the cost of 10 year debt after the beginning of the transition – with the first year's cost of debt initially receiving 100% weight but gradually declining by 10% each year as new years are added to the trailing average. There are other possible transitions of this type – such as all yearly data points in the transition being given the same weight. Annual updating during a transition of this kind would be especially important because there is the potential for the starting point of the transition to not reflect efficient business costs. Consequently, it will be important to as quickly as possible reflect new market conditions in the regulatory allowance for the cost of debt.

It would be also possible to adopt a transition that is a hybrid of these approaches – using some but not the whole 10 years' of historical data and giving the remaining weight in the transition to prevailing/yet to be estimated data points. The ENA notes that if a common date was set for the time at which historical data begins to be used, then all businesses sharing that date would be on the same transition path (rather than the transition path starting at the time of their regulatory proposal) and the transition path would end sooner for all such businesses than it would if only prospective information was used during the transition.

Given the fact that businesses' current debt management strategies differ, it will be important for the AER to consult widely on any proposed transition arrangements and for the AER to develop these in conjunction with businesses. For example, some businesses have floating rate debt exposure that means that locking in historical data into the transition may create risks for these businesses – just as locking in only prevailing debt may create risk for businesses with fixed rate debt exposure. Given this disparity in business practice there is the potential for a single transition arrangement, especially if it has not been developed in conjunction with all businesses, to create undue risks and, ultimately, not be fair and reasonable.

The AER should consider these issues when considering what, if any, transition arrangements are fair and reasonable.

6 Debt and equity raising costs

6.1 Framework for recovery of debt and equity raising costs

In the Consultation Paper, the AER acknowledges that an efficient company may incur costs in raising debt and/or equity to finance its activities but also expresses a preliminary view that disproportionate amount of regulatory effort has been expended on the issue of debt and equity raising costs given the small sums permitted in past regulatory decisions. [260]

Energy network operators, on the other hand, consider that debt and equity raising costs are an important cost of operating maintaining and expanding their operations and in exercising discretion in making its regulatory determination, the AER is required to the principle that a regulated business should have a reasonable opportunity for recovering at least its efficient incurred costs.[261] The starting point in evaluating how the regulatory framework should best accommodate these costs is to properly understand their nature and scale before deciding where they should appear within the building blocks of the regulatory determination.

The current methodology used by the AER is one developed by the Allen Consulting Group in the Powerlink decision in 2007. It is now timely to re-evaluate this methodology and how the AER has implemented because:

- It is apparent that previous AER decisions have implemented the ACG method is not taking account of all the costs by nature or scale, there are inconsistencies with other aspects of regulatory decisions and some assumed financing practices are not sustainable in the medium to long term; and

- the guideline consultation process is considering changing the way the debt allowance is calculated from the 'on the day' approach to a trailing average or hybrid approach which implies a different way of raising debt.

For example:

- on the equity side, the 'pecking order' theory or its implementation appears to make unrealistic long run assumptions about retained earnings that woud be unsustainable in the long term and inconsistent with regulatory practice in other jurisdictions;

- on the debt side, the proposal to move to a trailing average method comprised of 20 evenly spaced bond issues over ten years implies a different frequency and scale of bond issues;

- there appears to be some confusion about what was intended within the ACG report concerning the some of the cost categories such as what is meant by 'underwriting' costs;

- there appear to be heads of cost that are not recognized at all in the current methodology such as the impracticality of perfectly aligning the timing of raising capital and employing it to retire pre-existing capital or to fund new projects resulting in a requirement to raise debt or equity capital somewhat before the funds are employed; and

[260] Rate of return guidelines, AER Consultation Paper, May 2013, page 63.
[261] Revenue and Pricing Principles NEL, section 7A(2).

- that data drawn from secondary equity and debt markets may not be an appropriate basis may not be commensurate with the costs of issuing new equity or debt.

The ENA agrees with the Consultation Paper there are a number of possible 'homes' for equity and debt raising costs within the building block model:

> *"This could be [accommodated] either through the estimates of the return on debt and return on equity, or through incorporation into the capex and/or opex allowances."*[262]

However, in the ENA's view, until the costs are properly identified and assessed it is not possible to reach final conclusions of the following nature until these issues are fully considered and it is also not possible to confirm the following proposition without the details of the approach being set out in detail:

> *"This decision will not lead to inadequate compensation for efficient financing costs as we will seek to remunerate these costs elsewhere in the revenue building blocks."*

For example, it may be that underwriting costs, legal costs and the like may appropriately be treated as expenditure items while any new issue premiums for debt or equity may be better accounted for in the WACC.

While it may be possible that a particular cost could equally be taken into account in different parts of the building block determination, it is important that the issue is not over-looked by falling between the separate WACC and opex/capex regulatory reform discussions and that there is consistency with other parts of the regulatory decision. For example, the decision needs to make consistent assumptions about:

- the corporate structure of the benchmark firm – for example whether or not it has a parent may affect the nature and size of equity capital raising;
- the level of earnings retained, dividends paid out, dividends reinvested and the assumed value for gamma;
- the volume and timing of capital expenditures and the need for new capital raising costs;
- the frequency and scale of debt raising;
- where equity or debt needs to be raised in sufficient time before capital expenditures are made or previous capital is retired, any opex or capex allowances would need to be consistent with the WACC inputs; and
- a quantification of any underwriting fees that is consistent with the scale and credit rating assumptions.

The ENA intends to engage further with the AER on the above issues during the WACC guideline process to ensure that, even if the costs are appropriately treated as expenditure items, there is consistency with the approach to establishing the WACC.

[262] Better Regulation, Rate of return guidelines, AER Consultation Paper, May 2013, page 62.

7 Method of forecasting inflation

The ENA is seeking expert advice on these issues. However, its preliminary position is set out below.

The AER's current approach to estimating inflation has generally worked well since implemented. The problems with bond market break even estimates, which gave the impetus for the original change in AER methodology, remain – with this inflation estimate being dependent on the (time varying) vagaries of market scarcity premiums (for indexed CGS), liquidity premiums and compensation for inflation risk (as opposed to just expected inflation). Swap market estimates of expected inflation are subject to the same issues as the bond market estimates plus additional issues associated with transaction costs and counterparty risk for private traders in that market.

That said, there was a period during the worst of the 2008/09 global financial crisis when there was a significant reduction in bond market break-even inflation estimates but not in RBA forecasts. It is possible that the market was then factoring some possibility of a 'worst case' deflationary episode not reflected in the RBA forecasts.

The ENA considers that the AER should continue to rely on its current approach. However, in extreme market conditions, such as those prevailing in late 2008/2009, it should have regard to the breakeven inflation estimates.

The Energy Networks Association
28 June 2013

Attachment 1 – List of accompanying reports

Area	Report	Author (Provider)
Overall rate of return	1. Review of Cost of Equity Models	Wheatley / Quach (NERA)
	2. Estimates of the Zero-Beta Premium	Wheatley / Quach (NERA)
	3. Dividend discount model estimates of the cost of equity	Gray / Hall (SFG)
	4. Evidence on the required return on equity from independent expert reports	Gray / Cannavan (SFG)
	5. Estimating the return on the market	Hird / Grundy (CEG)
	6. Estimating E[Rm]: in the context of recent regulatory debate	Hird (CEG)
Beta	7. Regression-based estimates of risk parameters for the benchmark firm	Gray / Hall (SFG)
	8. The Vasicek adjustment to beta estimates in the Capital Asset Pricing Model	Gray / Hall / Brooks / Diamond (SFG / Monash)
	9. Information on equity beta from US companies	Hird / Hansson (CEG)
	10. Comparison of OLS and LAD regression techniques for estimating beta	Gray / Hall / Brooks / Diamond (SFG / Monash)
	11. Assessing the reliability of regression-based estimates of risk	Gray / Hall / Brooks / Diamond (SFG / Monash)
Gamma	12. The Payout Ratio	Wheatley / Quach (NERA)

	13. Updated dividend drop-off estimate of theta	Gray (SFG)
Risk free rate	14. Term of the risk free rate for the cost of equity	Balchin / Lawriwsky (Incenta)
Risk premium	15. The Market, Size and Value Premiums	Wheatley / Quach (NERA)
Cost of debt	16. Credit Ratings for Regulated Energy Network Services Businesses	Howell (Kanangra)
	17. Debt strategies of utility businesses	Hird
	18. Estimating the debt risk premium	Hird (CEG)
	19. Energy Networks Association: Debt financing costs	Balchin / Lawriwsky (PwC)
	20. Energy Networks Association: Benchmark term of debt assumption	Balchin / Lawriwsky (PwC)
	21. Energy Networks Association: Potential impact of the ERA's DRP methodology	Balchin / Lawriwsky (PwC)