the **australian**
PIPELINE industry
association Ltd

APIA

Australian Pipeline Industry Association

Meeting the ARORO?

A submission on the Australian Economic Regulator's Draft Rate of Return Guideline

11/10/2013

Table of Contents

1. Introduction

This submission from the Australian Pipeline Industry Association (APIA) responds to the Australian Energy Regulator's (AER's) recent draft Rate of Return Guideline (DG) and its accompanying Explanatory Statement (ES). APIA's members welcome some aspects of the proposed DG, such as remaining at ten years for the term used for the cost of equity, allowing a trailing average approach that better captures the structure of actual, efficient debt portfolios and, most importantly, the first steps away from the mechanical application of the CAPM that the AEMC rightly concluded was not able to meet the requirements of the Revenue and Pricing Principles (RPP) or the National Gas Objective (NGO). However, other aspects of the DG are concerning to our members, for example, the proposal to shift the term of debt to seven years, and the proposal to move away from what the Australian Competition Tribunal has deemed a best practice approach to gamma estimation in favour of approaches which it has already ruled do not meet this standard.

In addition to containing discussion on these issues, the submission focuses mainly on three overarching themes, set out in Chapter 2, 3 and 4, highlighting the requirements of the National Gas Rule (NGR) that are not reflected in the DG. In each instance, we have sought not simply to point out problems and leave the AER to develop solutions, but to propose solutions which we believe will assist. We do not propose these as perfect, fully-developed solutions, but rather as avenues of inquiry for further debate which appear, to us at least, to lead to solutions that better meet the allowed rate of return objective (ARORO).

Chapter Two examines the criteria used by the AER. Our main issue with these criteria is not that they are inappropriate for use by regulators when making use of judgement, but the way in which they appear to have been used by the AER. The AER has used its criteria to assess the appropriateness of its methods and methodologies for determining the rate of return for debt and equity in a way that effectively replaces the ARORO. APIA is of the view that this is not what is required by the NGR, which (section 87(14)) is quite explicit that methodologies for determining rate of return must be assessed against the ARORO. This has not occurred and the result has been that decisions made in respect of methods to be used are, in our view, likely to produce rate of return outcomes that do not meet the ARORO. Unless it is made clear how the proposed methods meet the ARORO, decisions made using the Guideline are more likely to face challenge.

Chapter Three addresses what we perceive to be the main shortcoming in the DG; the lack of a proper framework within which risk, and thus similarity in the level of risk (the requirement of the ARORO) are assessed. This means that the process for establishing the Benchmark Efficient Entity (BEE), or more specifically the data which inform the BEE is poorly constructed, leads to substandard outcomes which render estimation of the rate of return on debt and equity more complex than they need to be and creates significant scope for regulatory gaming through its reliance on concepts of risk that do not lend themselves to objective, transparent verification but which can instead only be debated by parties with different points of view. We develop, in Chapter Three, the kernel of an approach which we believe can allow the AER to avoid these problems, and place this aspect of regulation on a much firmer footing.

Chapter Four outlines our considerations in respect of the foundation model approach developed by the AER. Despite the AER's assertions that its approach is transparent and simple to implement, we

find that several key aspects of the approach (such as the likely width of the initial range and the "stickiness" of the initial point estimate) make it very hard to predict how it will work in practice. A case study would assist in understanding this further. Moreover, our initial assessment is that actually using the approach in practice is likely to result in significant problems, due primarily to the high variability in beta estimates, which are not addressed properly in the various checks and balances proposed by the AER. Finally, we share the Electricity Network Association's (ENA's) concerns that the foundation models unequal weighting of models may face legal challenge. We instead put forward a multiple models approach which we believe is less likely to suffer from these beta problems, is simpler and more transparent (as well as requiring less regulatory discretion and judgement) than the foundation model approach and, we believe, better meets the ARORO as it does not favour one imperfect model over other imperfect models.

Our overall conclusion in respect to the DG is that it represents a useful step forward in regulatory practice in Australia, and it certainly moves towards meeting the requirements of the ARORO. However, we believe that some fundamental aspects of the question of risk require more work, and the foundation model approach is but one (important) step along the pathway towards a return on equity modelling approach that meets the ARORO. We look forward to further iterations of the AER's thinking, on these and other key issues, in the final Guideline.

2. Criteria and the ARORO

In this chapter, we present our arguments around one of the most fundamental issues with the DG; the conclusions in the DG do not appear to be substantiated by reference to the ARORO.

The NGR is clear on the relationship between the Guideline and the ARORO, stating (Section 87(14):

> *"The rate of return guidelines must set out:*
>
> *(a) the methodologies that the AER proposes to use in estimating the allowed rate of return, including how those methodologies are proposed to result in the determination of a return on equity and a return on debt in a way that is consistent with the allowed rate of return objective; and*
>
> *(b) the estimation methods, financial models, market data and other evidence the AER proposes to take into account in estimating the return on equity, the return on debt and the value of imputation credits referred to in rule 87A"*

The AER has done the second of these, but it has not done the first. It has instead assessed all of its methodologies via a set of criteria; some outlined and assessed (albeit not against the ARORO) in Chapter Two of the ES and some introduced on an ad-hoc basis throughout the document. We understand the utility of having criteria to show how the AER will make decisions which involve using its judgement, but these criteria should, as the AER itself recognises (ES, p25) sit beneath the NGR and NER; when they are used to assess the methodologies, this is not what has happened in the DG.

It is not only the rules which are clear on the need to make reference to the ARORO. The AEMC provided further clarity in this respect, by making two important points:

- *"While the regulator may choose to determine the rate of return by estimating other values to contribute to the allowed rate of return, the* [AEMC] *considers that assurance that the* [ARORO] *is met can only be gained by considering whether the overall rate of return arrived at meets the stated objective."*[1]
- The ARORO *"should indicate to the regulator how the [other] factors should influence its decision. The regulator should not assume that it may consider the factors (or other relevant provisions) and that this will of itself mean that the objective has been achieved. The overriding consideration for the regulator is the objective."*[2]

What we would like to see is the AER doing what the rules require and mapping the assessment of their respective methodologies directly against the ARORO.[3] This would not only reflect the requirements of the NGR, but would assist the AER in making decisions under the Guideline which are more robust to challenge.

Our main point in this chapter is that criteria are insufficient as assessment tools for the methods used by the AER. However, we believe it is important to assess the criteria themselves, and

---

[1] AEMC (2012, p38)
[2] Ibid, p 37
[3] The ERA's approach in its draft Guideline, of assessing the methods against the criteria and the criteria against the ARORO is insufficient.

ascertain whether these meet the ARORO. To the extent that they do not, then it cannot be concluded that the methods in the Guideline meet the ARORO. We do so in this chapter.

We divide our assessment into two parts. The first examines some of the consequences of assessment against the criteria, rather than the ARORO. What does it actually mean for the return on equity and the return on debt? The second examines the criteria themselves, discussing whether these are likely, in our view, to meet the ARORO. This section is itself divided in two; one part examining the criteria from Chapter Two of the ES, and the other picking up criteria which have been introduced in an ad-hoc fashion throughout the DG and ES.

2.1   Consequences of using criteria instead of the ARORO

The use of criteria, rather than the ARORO itself, has had some fundamental consequences for the DG and ES, producing a document which we consider is quite different from one which would have resulted if the ARORO itself had been used.

For example, in sections 5.3.3 and 5.3.6 of the ES, we are advised that use of the Sharpe-Lintner Capital Asset Pricing Model (SL CAPM) as the foundation model reflects the AER's assessment of the model against its criteria. The AER concludes that the SL CAPM is superior to alternative models for the purpose of estimating the rate of return on equity for the benchmark efficient entity.

This assessment against the criteria has led the AER to an inappropriate conclusion, with important implications for the way in which the foundation model is deployed. The SL CAPM may be superior to alternative models when assessed against the AER's criteria. But such an assessment is not an assessment of whether the SL CAPM is capable of delivering estimates of the rate of return on equity which can contribute to the achievement of the ARORO. Given the well-known problems of the SL CAPM in respect of predicting actual rates of return, and the better performance of other models such as the Fama-French Model (FFM) in this respect, we suspect that an assessment against the ARORO of the different cost of equity models would have reached a materially different conclusion than that which the AER's assessment against its own criteria reached. This is something which the ENA has discussed in some detail, and we would support its conclusions.

Neither the DG, nor the ES, makes either a thorough assessment of the SL CAPM, or an assessment of whether the foundation model can deliver estimates of the rate of return on equity which can contribute to achievement of the ARORO.

In respect of the cost of debt, the assessment is against neither the ARORO nor the criteria listed in Chapter Two of the DG, but is instead against a collection of criteria (see conclusion of this chapter) which have been introduced in an ad-hoc fashion, and whose purpose appears to be solely to support the use of a single cost of debt methodology; there does not appear to be any way that a menu approach could pass the criteria used. This has equally profound consequences for calculation of the cost of debt, because it has lead the AER to a particular conclusion without any assessment of whether that conclusion (or any other in respect of the cost of debt) would meet the ARORO; still less of which approach would best do so.

2.2   Assessing the criteria against the ARORO

In our submission to the Consultation Paper, we raised few significant concerns about the criteria themselves, in the context of their use in supporting the use of judgement by the regulator in making decisions. This remains our position. However, in the DG, we see the criteria used not to support judgement, but as the main decision-tool to assess methods of determining the cost of debt and equity, in lieu of the ARORO. This was not expected, and thus our assessment below focuses on the use of each of these criteria in this somewhat different role, and highlights how the criteria, whatever their merits for supporting the use of judgement by regulators, are insufficient to supplant the role provided for the ARORO in the NGR.

2.2.1 Criteria from ES Chapter Two

Reflective of economic and finance principles and market information

Page 29 of the ES purports to link economic principles and strong theoretical foundations with the NGO through the promotion of efficiency. However, the link to efficiency is not explicitly made, and we doubt whether such a link can be made. The national gas objective is concerned, pragmatically and in our view appropriately, with efficient investment and the long term interests of consumers. It does not use the term "economic efficiency". Where that term is used, in the revenue and pricing principles of section 24 of the NGL, its use refers to practical behaviours in the context of developing, operating and using a specific pipeline system.

We think that economic principles might usefully guide the exercise of judgement, but only when no clear guidance is provided by the NGL and NGR. We note, though, that this is strictly a matter of legal interpretation. No reference is made to the legal interpretation of rule 87 in the DG or ES.

In our view, the DG and ES do not make a case for strong theoretical underpinnings which links to the requirements of the NGL and NGR. In those parts of the ES where the criterion of "economic and finance principles" is invoked, it appears to have been arbitrarily introduced. Any links to the ARORO, and to the requirements of the NGR and the NGL more generally, have been lost.

Moreover, although the criterion heading refers to market information, it is not discussed in this criterion, instead being discussed at criterion five, which appears to partially replicate this criterion. We would support the use of market information (as indeed the NGR requires) but would suggest that what the AER really needs to spell out is what it will do when its interpretation of economic principles is not supported by market information.

Fit for purpose

We agree that economic principles, particularly principles with strong empirical support, may provide some guidance where the rules are silent and an exercise of judgement is required. Reference to such principles may provide support for that exercise of judgement in those limited circumstances where no guidance is provided by the NGL and the NGR.

We are less clear on what role a "fit for purpose criterion" might play, and found little to assist us in the ES. For example, what does "perform best in quantitative and qualitative terms" (ES p30) actually mean? Most particularly, what does it mean in respect of the ARORO?

In our view, the NGR is clear on what is required. There is a clear hierarchy of objectives in rule 87 for the purpose of deciding on how the rate of return is to be determined. At the top of that hierarchy is the ARORO of rule 87(3). The allowed rate of return is to be determined such that it achieves this objective (rule 87(2)).

In accordance with rule 87(4), the allowed rate of return is to be a weighted average of the rate of return on equity and the rate of return on debt. Rule 87(6) then requires that the rate of return on equity be estimated such that it contributes to achievement of the ARORO. Similarly, rule 87(8) requires that the rate of return on debt be estimated such that it also contributes to the achievement of the ARORO. We do not see circumstances arising in which there might be a need to invoke a criterion of "fit for purpose" which exists independently of the primary requirements of rule 87 that the allowed rate of return satisfy the ARORO.

Implemented in accordance with good practice

Implementation of rule 87 in accordance with "good practice" means, according to the ES, that rate of return methods are supported by robust, transparent and replicable analysis derived from credible datasets. These are all, we think, reasonable requirements. There is, however, a risk that, apart from transparency, each of them will conflict with the ARORO.

Robust of methods are desirable, but choice of a method for reasons of its robustness cannot displace the requirement for a rate of return which meets the ARORO. An estimation method, applied to an inadequate model, cannot produce the required rate of return no matter how robust the estimation method might be. Similarly, a criterion that data sets be current and credible is not unreasonable, but the choice of data cannot override the achievement of the ARORO.

Models based on quantitative modelling and market data and other information

These are two separate criteria in the ES, but we have treated them together, as our conclusions on both are very similar.

The criterion concerning quantitative modelling is intended to ensure that any quantitative modelling is not sensitive to errors in estimation and arbitrary filtering of data. We would agree with this criterion, and would suggest that it is the only way in which the requirements of Section 87(5) of the NGR can be fulfilled. However, we are unclear how this is distinct from the criterion of "good practice". In respect to market data, this appears to replicate the requirements of criterion one.

In both cases, it could be argued that it is unclear why these criteria would be needed, as it ought to be taken as read that regulators will make use of robust empirical techniques and appropriate data and, as the AER points out (ES p201) both are required of regulators under broader administrative law requirements. However, in its submission to the ERA's draft Guidelines process, DBP show that a small change in underlying assumptions (the day of the week or month that returns are estimated)

has a profound effect on estimates of beta in the ERA's dataset, which is suggestive that inappropriate filtering was, albeit unintentionally, used in the original ERA analysis. It is therefore useful to have criteria such as these made explicit, to guard against poor empirical work adversely affecting regulatory outcomes.

Have the flexibility to reflect changing market conditions

We see no need for a criterion which examines ability to reflect changing market conditions and new information, especially when that criterion is introduced to "fill the gaps" in circumstances in which the requirements of the rule 87 are silent and the exercise of judgement is required.

The ARORO requires that the allowed rate of return be commensurate with the efficient financing costs of the benchmark efficient entity. It does not indicate that the assessment of commensurability is to be made with respect to efficient financing costs at some time in the past. The use of the present tense in the statement of the objective, and the place of the objective in the regulatory scheme of the NGR, indicate that the rate of return is to properly take into account changing market conditions and new information.

This is reinforced by rules 87(7) and 87(10).

Through its requiring that regard be had to prevailing conditions in the market for equity funds when estimating the rate of return on equity, rule 87(7) requires that account be taken of changing market conditions and new information. Similarly, if the rate of return on debt is to be estimated as the rate that would be required by debt investors in a benchmark efficient entity which raised debt at the time of a regulatory decision, as is permitted under rule 87(10)(a), then account must be taken of market conditions and new information available at that time.

If this is its purpose, then a criterion of ability to reflect changing market conditions and new information is redundant. Rule 87 is clear: the rate of return on equity and the rate of return on debt are to be estimated such that they contribute to the ARORO. Rule 87 provides the criteria for the choice of estimation methods. A further criterion for this purpose, which has no grounding in the NGL or the NGR, does not contribute towards meeting the ARORO.

2.2.2 Other ad-hoc criteria

Although the AER assesses six criteria in Chapter Two of the ES which it says will form the basis of its decisions, these are not the only criteria it uses. We have no problem with the AER using criteria outside those identified in Chapter Two of the ES, but if a criterion is going to be used for something it must be assessed for its ability to meet the ARORO. Failure to do so has two issues. Firstly, there is no way of being sure that this decision tool promotes outcomes consistent with the ARORO unless it is assessed in this light. Secondly, and perhaps more importantly, if stakeholders read the AER saying in one part of a Guideline that it will use particular criteria in making decisions, and then see elsewhere in the Guideline that it does not do so, but introduces new criteria in an ad-hoc fashion, then this does not generate confidence in the notion that the Guideline process will be something that stakeholders can rely upon to reliably predict how the AER is going to regulate. This undermines the regulatory certainty Guideline are intended to create. We trust that, by raising this

issue in respect of the DG, the AER will include a detailed assessment of all of the criteria it actually uses in the final Guideline, rather than introducing new criteria in an ad-hoc fashion.

Familiarity on the part of stakeholders (ES p66)

This is used to support the retention of the SL-CAPM. There is nothing in the NGR which requires that the regulator only use models which it can identify that everyone has familiarity with, and this certainly does not appear to be in-keeping with the AER's intent to interpret "relevant" in Section 87(5a) of the NGR as being a "low threshold" (ES, p61).[4] We consider that this threshold introduces a bias towards conservatism that makes it harder for regulators to move away from the mechanistic approaches that the AEMC has ruled do not meet the requirements of the RPP and NGR.

Moreover, the reason why familiarity is seen as an advantage is that it allows stakeholders to make more reliable predictions of rates of return prior to a determination (ES p67). However, this is arguably not true in practice in respect of the foundation model approach which, as we point out in Chapter Four, actually makes prediction rather difficult. Therefore, it is questionable whether familiarity is even having the beneficial effect the AER ascribes to it.

Multiple models increase complexity for stakeholders (ES p71)

This criterion is used to discount the use of multiple models, and is essentially a flip-side to the criterion above. Again, it is not in keeping with the definition of "relevant" the AER has itself used and, we believe, has introduced a degree of conservatism into the approach which is unwarranted.

Moreover, we do not believe that the different models suggested are particularly complex; the basic ideas behind them are relatively simple, and can be explained in a few paragraphs.[5] Combining them together can also be explained very simply; in fact much more simply (see Chapter Four) than the AER's own foundation model approach. Thus, not only is the criterion wrong in itself, but the conclusion the AER has made about multiple models is also wrong.

Consumers favour a single approach to estimating the cost of debt (ES p75)

This argument is used as support for not allowing a menu approach, but instead requiring all firms to use the trailing average approach proposed by the AER. We agree that consumer views are important. We also agree that most regulated firms also appear to support the trailing average approach. However, the NGR does not ask the AER to take a vote on approaches and choose the single approach which is most popular. The relevant criterion is whether each approach can be shown to meet the ARORO. This, and only this, is the requirement that needs to be met in respect of the cost of debt.

---

[4] The ENA's point about Copernicus in its submission to the Consultation Paper on this point is, we believe, well made.

[5] Explaining how to undertake relevant econometric estimation is harder, but the same is true of the CAPM.

Strong commitment from the AER in choosing the trailing average approach (ES p76)

This criterion is used to support the trailing average approach as the sole method for estimating the cost of debt. The AER is effectively saying "we have made a big change in the way we do things, now get behind us". Again, the amount of change or commitment the AER has made towards a particular approach is not relevant in respect of approaches to the cost of debt; what needs to be demonstrated is that a particular approach meets the ARORO.

Consistency with the principles of incentive based regulation (ES p76)

Consistency with the principles of incentive based regulation is also used to support the trailing average approach as the sole method for estimating the cost of debt.

The principles of incentive regulation may – or may not – have guided the design of the regulatory regime of the NGL and the NGR and, more recently, may or may not have guided changes to rule 87. However those principles are no longer relevant to either the rate of return guideline, or to determination of the allowed rate of return. The rate of return guideline must now be developed to meet the stated requirements of the NGL and the NGR.

3. Risks, the BEE and Similarity

In this section, we examine the key issues of risk and similarity. This is perhaps the most significant shortcoming in the AER's draft Guideline. The basic issue is that the AER has no overall framework, or "theory" of risk upon which it can base its analysis, resulting in a process of analysis which starts from the wrong place, and leads to some incorrect conclusions.

We focus on two key issues in this chapter. The first, relatively brief discussion, is on whether there ought to be one benchmark or several. We believe the AER has erred in providing a single benchmark, particularly when a key reason it gives for doing so seem to be that nobody has provided sufficient evidence of dissimilarity. That is, it has assumed a null-hypothesis of similarity between the energy firms it examines, but has not tested this in a rigorous fashion. In contrast, we present empirical evidence which clearly shows dissimilarity.

The second issue is the more substantive issue of risk and similarity. Once a basic framework is established in this respect, it is not clear whether it is in fact necessary to declare one BEE, or two, or several, and in this respect, the debate on the number of BEEs is largely counter-productive.

3.1 One benchmark or several?

The AER has concluded that there is a need for only one benchmark to cover the energy industry as a whole. However, its basis for doing so is not particularly robust. One might summarise the AER position as follows:

- The only risks that need to be compensated for in rate of are systematic risks that are symmetrical.
- Of the various business risks that firms face, few of these are systematic, and the various aspects of the regulatory system in any case mitigate most of these.
- Gas firms might be different from electricity firms in respect of demand risk and competition risk but:
  - Some electricity firms face the same kinds of risks as gas transmission companies with small numbers of large customers, and not all gas firms face this risk.
  - The ability to use revenue caps mitigates demand risk, and the choice to use such caps is a decision firms, not regulators make.[6]
  - Long term contracts reduce both demand risk and competition risk for gas firms.
  - Competition between gas and electricity is not substantial because of sunk costs on the part of consumers and low demand elasticity.
- There is insufficient evidence of dissimilarity to warrant a different benchmark for the two industries, particularly when it comes to the risks which the AER believes require compensation through rates of return.
- Investors would get confused if there was more than one benchmark.

---

[6] This is not our reading of the NGR. We would welcome the AER and the ERA making formal written statements that neither would oppose, under any circumstances, a regulated firm switching from a price cap to a revenue cap (or vice versa) at any regulatory determination, nor back again at the next determination, and that neither regulator would put any caveats whatsoever on a choice of cap.

The first two issues associated with what is and is not a systematic risk, and the degree to which regulation does or does not mitigate are issues to which the ENA has devoted some effort, and we refer to the ENA's discussion for more detail. However, as we point out in our discussion of risk and similarity, we consider that this debate about what is and is not a systematic risk and how much of it a regulated firm faces to be a methodological dead-end which does little more than cloud debate and hamper the development of better regulation.

This brings us to the several points about the differences between gas and electricity. The fact that some gas companies have lots of small customers and some electricity companies have small numbers of large customers means little or nothing in the debate about similarity. All it really means is that perhaps it is not correct to divide energy firms by what they carry, but that other divisions, such as between transmission and distribution or between those serving predominantly large or small customers, might better elucidate the actual division of risk profiles in the industry.

The conclusion the AER draws about the fact that some electricity companies have small numbers of large customers is also incorrect, as the consequences for each type of firm are very different. An electricity firm that loses a large customer will not lose revenues due to the operation of a revenue cap and an under/overs account. In contrast, a gas transmission pipeline subject to a price cap is fully exposed to the revenue losses associated with a large customer being lost. In particular, because of the prevalence of bilateral contracts in the gas sector (a commercial instrument less prevalent in electricity), a gas transmission pipeline is generally not able to raise tariffs to other customers to cover the loss of a single customer. The AER, in making blanket claims about similarity in this respect of our businesses, is ignoring pertinent commercial realities which underpin the two sectors; commercial realities that have arisen precisely in response to the different risks in each industry.

In relation to long contracts and sunk costs which, the AER claims, limit competition between electricity and gas, the AER is again ignoring key commercial realities in each business, as well as ignoring the effects of competition which occur prior to contracts being signed. Once a customer has chosen an energy source, it is true that sunk costs may result in minimal switching.[7] However, before major customers sign contracts alluded to above, they have significant market power over both gas and electricity firms because they can choose which fuel they are going to use,[8] and that choice usually requires a significant sunk cost investment for both parties, that both parties need to be assured can be recovered. Customers subject to these bilateral contracts make use of this

---

[7] This is not necessarily true in all cases; many turbines are dual-fuel (or can be converted at relatively low cost), meaning customers can switch fuels if prices rise. Additionally, gas-fired generation plant is not really a sunk cost for major industrial users, because they can move and sell the turbines in established second-hand markets (see for example, http://www.sirgen.com/) if they are able to acquire a cheaper electricity supply direct from the grid.

[8] The recent example in Queensland of the CopperString proposal to transmit electricity from the NEM to major minerals users in Mount Isa exemplifies this. The miners played the incumbent generator (using local gas-fired generation which required a significant upgrade) off against the proponents of the electricity transmission link until they were able to obtain the most favourable terms for themselves via a long-term supply contract.

bargaining power to negotiate favourable terms for the life of these contracts, and attempt to minimise their own risk exposure in doing so.[9]

The potential for bargaining power at the point of contract signing to bring competitive effects into the industry is a well-known phenomenon. In the railway economics literature, this is sometimes referred to as "location competition" (see, for example, OECD, 2005, or Grimm & Winston, 2000) and refers to the fact that railway shippers in the US have often been successful in obtaining favourable terms and conditions from railways by negotiating prior to the construction of a given rail siding to service their needs. Indeed, the process of negotiating such agreements has become almost institutionalised in the US, resulting in very similar terms and conditions to cover risks between the railway and the shipper (see Pittman, 1992).

The point about insufficient evidence of dissimilarity suggests a mistaken null-hypothesis. If the AEMC had wanted the AER to base its analysis upon a starting point of similarity between energy firms and look for evidence of dissimilarity, it would have made this clear in the NGR. We would suggest that it is in fact the role of the AER to consider similarity to each reference service, and not ask others to provide evidence that gas and electricity firms are dissimilar.

Part of the problem relating to insufficient evidence of dissimilarity seems to be that the AER has been unable to find sufficient data to explore the differences between different types of energy firms (ES p46). We would suggest that the AER has, perhaps, been looking in the wrong place. As part of its submission to the ERA's draft Guidelines, DBP commissioned research from CEG to look into what drives credit risk for different energy firms in the US.[10] Additionally, CEG undertook work for the ENA (2013) as part of its submission to the AER's consultation paper which examined the asset betas of around 70 US energy firms, and SFG also undertook beta estimations for both Australian and US firms. The AER has had access to both of these reports in the formulation of its draft Guideline, but does not appear to have considered the evidence within them when reaching its conclusions about similarity.

The analysis undertaken by CEG for the DBP submission to the ERA's draft Guidelines process was undertaken over a very short time-frame and made use of a database which largely contained financial information, meaning CEG were not able to examine factors such as population, customer composition or terrain and seasonality as factors driving credit risk. For this reason, its analysis opens, rather than concludes a debate and its findings should be viewed as exploratory. Nevertheless, some interesting results emerge.

The first of these is that gas transmission pipelines have a credit rating which is one notch below those of other energy firms (gas distribution, electricity transmission and distribution and mixed utilities). This is in direct contradiction to the AER's conclusion that all energy firms are BBB+, although it is supported by the ERA's analysis in its draft Guidelines, which shows a variety of credit ratios for Australian energy firms and that gas transmission companies have lower credit ratings.

---

[9] See, for example, the Standard Shipper Contract (SSC), which is publicly-available on the DBP website. The terms and conditions of the SSC were negotiated at a time when the ownership of the pipeline was in a distressed state and shippers consequently had substantial bargaining power, which they used effectively. Since the terms and conditions are still in place (indeed they were largely adopted for regulated services as well), this has ongoing effects on the business.

[10] See http://www.erawa.com.au/access/gas-access/guidelines/

What is more interesting is that gas transmission pipelines have lower gearing and a lower EBITDA margin volatility than other energy firms in the US, which ought to give them a higher credit rating, all else being equal. This suggests that other factors, not contained in the dataset used by CEG, are driving the credit ratings of US gas transmission pipelines. It further suggests that, on an equal-gearing basis, such pipelines ought to be several notches below other energy firms. In simple terms, investors in US gas transmission pipelines do not consider them to have the same risks as other energy firms, otherwise they would give them the same, or better, credit ratings.

Different credit ratings would suggest different levels of risk, but it is not clear that the counter position, that the same credit ratings mean the same risks, is true. The AER's consultants (Chairmont, 2012) warn against using Bloomberg fair value curves by pointing out that the set of firms which are used to calculate a particular curve are drawn from a large range of industry sectors which face a wide variety of risks, some of which are very different from those faced by energy firms. We are aware that several consumer groups have voiced similar concerns. If it is the case that, companies facing very different sets of risks can still obtain the same credit rating, we must ask the AER whether similar credit ratings are indeed evidence of similarity from the perspective that the ARORO requires.

In respect of asset betas, the CEG work presented in the ENA (2013) submission to the AER consultation paper suggests a range amongst the 70 companies of between 0.10 and 0.79. We struggle to understand how this could be construed as investors looking at these firms and concluding that they face similar risks.[11]

Thus, in respect of both equity and debt, the market information from the US, where data availability is much less of an issue, flatly contradicts the AER's assertion that electricity and gas companies face similar risks. Australian evidence supports the more comprehensive US evidence. The ERA's draft Guidelines provide evidence of this in respect to credit ratings and debt (see above) and the SFG report on the cost of capital parameters provided as part of the ENA (2013) submission to the AER's Consultation Paper shows the confidence intervals for Australian energy portfolio beta estimates ranging from 0.37 to 0.83, and the OLS estimates (which have the lowest values) for individual energy firms in Australia ranging from 0.26 to 0.81. We would therefore suggest that there is little empirical evidence, in Australia or the US, to support the AER's hypothesis of similarity between energy firms.

The final point, that investors would be confused by more than one benchmark does investors a disservice. Investors in large-scale infrastructure routinely consider large numbers of complex variables in assessing investment opportunities, including credit benchmarks from several different organisations. We find it difficult to believe that two, or even three or four, regulatory benchmarks would confuse them. We would be interested in any specific evidence the AER has which suggests that investors have expressed themselves to be so easily confused.[12]

---

[11] The ERA's draft Guidelines show a much narrower range for beta for Australian regulated utilities, but as we note in Chapter Four, this is because the analysis arbitrarily filtered data, and thus does not capture the true variation.

[12] By this, we mean evidence that investors have expressed a sentiment that more than one BEE would be difficult for them to understand, not generic comments about the need for regulatory certainty, such as the quote from Paul Johnston (ES, p76)

In conclusion, then, the case the AER makes to favour a single benchmark is very weak, and this exemplified by the fact that it is has poor support in market data; neither debt nor equity providers believe, as the AER does, that energy firms face similar levels of risk.

One conclusion which might be drawn from this discussion is that there needs to be more than one benchmark. This is not the conclusion we would draw. Rather, we would suggest that the entire debate about how many benchmarks are needed is counter-productive to the cause of better regulation, and makes it harder to develop approaches which may meet the ARORO.

Rather than being an essential part of the ARORO, the number of benchmarks is a by-product of the approach the AER has taken towards exploring the question of risk and similarity, which relies upon grouping similar firms together, and then giving them all the same value for elements of the cost of capital, such as beta or the cost of debt. Within the particular context of the approach the AER has taken, we can see how a single benchmark might have appeal, particularly from the perspective of consistency. However, the ARORO says nothing about number of benchmarks, noting only that the BEE needs to have similar degrees of risk as the service provider in the provision of reference services. When one starts from that perspective, a different method to assess risk and similarity is possible; one which does not need a debate about the number of benchmarks. It is to this method that we now turn.

3.2 Risk and similarity in the NGR

The core requirement for thinking about risk in respect of rates of return is the requirement of Section 87(3) of the NGR to consider, for the purposes of establishing a suitable rate of return, a benchmark efficient entity which faces a similar degree of risk as those associated with the provision of reference services. That is, it asks regulators to start with the reference service, and to find data to inform the construction of a benchmark efficient entity from firms that face similar risks to those incurred in the provision of the reference service. This requirement is intended to make sure that, when regulators are finding comparison firms from which to draw information to inform the various components of rates of return, those firms actually face similar risks and are thus reflective of the true cost of equity or debt faced in the provision of reference services. It does not ask regulators to collect a group of firms and assess whether they are sufficiently similar to make use of one cost of debt and one cost of equity for all of them. Nor does the NGR ask regulators to choose a particular sub-set of risks when developing the "comparator set" (ES p215) to inform the BEE.[13]

We would argue, therefore, that the starting point of the AER's analysis is incorrect; it should not have started with a set of firms it thought might be similar and then sought to prove its case, but should rather have followed the ARORO and started with each reference service and looked for a way in which it could discover a comparator set of firms that have similar levels of risk and thus form a suitable source of data to inform the BEE.

This is very difficult to do in an ad-hoc fashion. For example, the Goldfields Gas Pipeline (GGP) serves gold mines and is thus exposed to the risk that those mines might close. It is very difficult to

---

[13] The restriction to a particular subset of risks comes later, when applying relevant models; regulators should not include non-systematic risks when using the CAPM, for example, because this would render the results from that particular model wrong.

do an ad-hoc search to try and find a set of firms in the Australian economy (or elsewhere) that face the same risk, let alone the same level of that risk. The task becomes harder still when the next risk is added, and the next, and so on. Worse still, each regulated firm will know this, and an ad-hoc approach such as this gives strong incentives to game the system. From this perspective, we can see why the AER has not used an ad-hoc risk matching process.

However, this is not the only way to approach the requirements of Section 87(3). We believe that it is possible to inject a degree of formalism into the risk-matching process itself, which improves the "discovery" process of firms for the comparator set, and avoids the need to consider only a particular sector of the economy (such as energy utilities), and thus create problems such as the small sample problem which reduces the robustness of estimates of the cost of debt and equity.

3.2.1 A framework for risk and similarity

In this section, we provide our framework for risk and similarity. Note what we are not trying to solve for the cost of debt and equity. Instead, all our approach attempts is to act as a selection mechanism to ensure that the "right" set of firms (those with similar risks as the reference service) enter the comparator set that provides data for the BEE. It is important to keep this in mind as we examine the minutia of the approach outlined below.

The basic problem, we believe, with the AER's approach is that it has no real "theory" of risk; no framework within which it can consider risk, and thus address the issue of similarity. This means that it cannot approach the question of the formation of its "comparator set" in a structured way, and instead must choose firms which appear, on the surface, to be similar (that is, Australian energy firms), and then attempt to argue similarity or dissimilarity via qualitative arguments that can have no objective resolution or quantitative "proof" (see below).

In this section, we present one example of a structured approach for selecting the "comparator set" which is based in a framework for examining risk and similarity that allows the AER to avoid both basing all its conclusions on a small set of firms and an arbitrary risk-matching approach. We do not pretend that it is perfect, or even the best such framework that could be developed. However, we do consider it a useful starting point for considering issues of risk and similarity because:

- It focuses on risk per se, and not on trying to identify whether a particular risk falls into this bucket or that. Moreover, it does not rely on trying to do something impossible, like apportioning systematic risk as calculated by beta across different types of risk (see McKenzie & Partington, 2013).
- It presents an objective framework within which debates about risk can be assessed, and transparent answers derived making it harder for firms to engage in regulatory gaming than is the case with the AER's own approach. It also reduces the incentives for such gaming.
- It provides a way to discover firms that face a particular level of risk that is transparent and objective, rather than arbitrary and ad-hoc, and potentially provides a way for regulators to avoid the small sample problem that bedevils parameter calculation in Australia.
- It does away with the need to have debates about whether there should be one benchmark, or two, or more, and debates about whether the division between firms should be in respect of their task, their customers or some other division; all of which are essentially arbitrary

divisions. In our suggested approach, there is no need to enshrine a BEE, in advance, in a set of Guideline, beyond the conceptual definition (DG p9).

The AER's "framework" for considering risk is to appeal to notions of systematic risk from the CAPM framework, and to then attempt to use this as its "sorting mechanism" to determining how firms ought to be grouped for the purposes of providing data for the BEE. This is not an appropriate use of the concept of systematic risk. In the first instance, the BEE is needed to understand the influence of risk on the cost of debt and equity. As the AER notes (ES, p162) creditors require compensation for risks other than systematic risks, and so using just systematic risks may miss important input data to the BEE and lead it to incorrect conclusions about similarity. Secondly, and perhaps more importantly, using systematic risks requires the AER to enter into a debate about what systematic risks a particular firm faces and how much of said risk it faces, in order to be able to ascertain similarity. This debate doesn't lead anywhere useful. As the AER's own consultants have pointed out (McKenzie & Partington, 2013), there is no feasible way to map from a list of systematic risk factors to a particular observation of beta. Thus, any debate about the AER's conclusions on particular risks, or indeed any debate about other risks that regulated firms subsequently propose, cannot be objectively and definitively settled, but instead provides a wide scope for regulatory gaming and debate between teams of consultants.

In developing our framework below, we have sought to overcome these problems. Our approach is based upon two things. The first of these is our suggestion, in our submission to the AER's Consultation Paper, that a model of risk and similarity ought to be based upon a model of states of the world and consequences (as, for example, the seminal work of Arrow & Lind, 1970), with a risk being defined as a consequence in a particular state of the world and similarity being defined as similar consequences in the same states of the world. Our approach represents a basic operationalization of that idea.

The second is the observation that historical data represent not only the passage of variables through time, but also through states of the world, as changing underlying economic conditions at each point in time mean that each time period is effectively a different realisation of particular states of the world. This means that historical information (if used carefully) can inform a "states of the world" kind of model.

Our approach involves six steps:

- First, take the set of risks (systematic or non-systematic, the distinction is irrelevant at this stage; see below) faced by a firm and find a suitable indicator for each risk. For example, if GGP faces the risk that gold mines it serves might close, a suitable indicator or risk factor that captures this risk might be the price of gold. The mapping is not (and does not need to be) exact, but the risk factors ought to be things for which reliable data are available, and which can be applied to large numbers of companies. This suggests macro variables.
- Second, correlate these, via regression analysis, with the variable being used to measure "consequences" in "states of the world", for the particular regulated asset. Share prices are the most obvious metric in this instance, though they are not always practicable where a company owns several assets. We discuss this further below. The key aim here is to collect the coefficients in this regression, which will be used to translate states of the world into consequences the fifth step below.

- Third, take the same set of risk factors and correlate them to the appropriate consequence indicator in the set of all comparator firms using regression analysis. Where a particular independent variable does not have a statistically-significant coefficient, it should be set to zero. The aim is, once again, to collect the coefficients from each regression. There is no need at this stage to be particularly careful about what firms are in the comparison set. Indeed, having a wide set could be beneficial, because it might give rise to comparison firms which are not obvious in an a-priori assessment. Conceivably, since regression analysis is relatively quick and simple using modern software, this step could be taken for all firms in the ASX 200, all Australian and US energy firms, or both.
- Fourth, generate as many "states of the world" as are considered appropriate by varying the macro variables; being sure to maintain the structure of covariances between these variables to avoid creating situations unlikely to arise in real life (say high GDP growth and high unemployment). Order these states of the world; it does not matter how, so long as they have labels of one, two three etc.
- Fifth, apply the coefficients from each regression in steps two and three above to the states of the world generated in step four (the same states of the world for every firm in the comparator set and the target firm). This generates a set of consequences for each firm, which are ordered in the same way as the states of the world (they have the same labels).
- Sixth, normalise the consequences across all the firms being examined by dividing them by the consequences in one particular state of the world. For example, if stock price is the consequence variable, this would mean dividing the stock price for each firm in each state of the world by the stock price for that firm in the state of the world that had been labelled "one" or "zero". Again, the labels do not matter much, so long as they are consistent across all firms being examined.

The analyst now has a basis for cross-firm comparison of risk. Two firms could be defined as being "the same" in terms of the degrees of risk they face if:

$$\frac{P_n^i}{P_0^i} = \frac{p_n^j}{P_0^j} \quad \forall n, \qquad i \neq j$$

That is, if the proportional change in the consequence indicator (here price *P*) from the base state of the world (here *0*) in each state *n* is the same between the two firms (say both increase by 20 percent), then one might reasonably conclude that these two firms have the same risk profile, because changes in the states of the world give rise to the same changes in the consequence variable.

The task of the regulator is not to look for firms that are the same, but rather those which are similar. This is a looser benchmark. One way of defining it could be to take the distribution of each $\frac{P_n^i}{P_0^i}$ (that is, the normalised consequences for all firms in state of the world *n*), and then define similar to be some distance across each such distribution either side of the value of the (normalised) consequence variable for the regulated asset that is the object of study in each state of the world. Thus, for example, firm *i* might be deemed to be similar to firm *j* if it sits within one decile either side of the normalised consequence variable for firm *i* in every state of the world *n*. Alternatively, the definition might be looser still, and require it to sit within that range for 90 percent of the states

of the world, or a majority of them; whatever the definition, it ought to apply equally to all regulated firms, for the purposes of consistency and could thus be stipulated in Guideline.[14]

As the paragraph above makes clear, it is advantageous to have a large number of potential comparator firms in the third step above, as this increases the likelihood that some firms will meet the relevant definition.[15] It is less advantageous (at least in terms of finding a solution) to have a large number of risk factors or states of the world, because increases in the number of each will decrease the likelihood that a firm is able to meet the relevant similarity criteria. This represents a kind of automatic stabilising mechanism that acts to limit regulatory gaming by providing an incentive for regulated firms not to load up their analyses with every risk they can devise in the hope that some are accepted, because doing so will directly influence the comparator set that is derived; making it smaller. No such automatic mechanism exists in the AER's approach, which instead provides incentives for firms to make as many claims as they can for systematic risks; something with which the AER will be well familiar from the history of regulation in Australia.

The direct link between the method we describe and the ARORO comes in the first and second steps outlined above. In the first step, the regulator (or regulated firm) would need to evaluate what risks are pertinent and choose suitable indicators or risk factors. To link the method to the ARORO, the regulator (or regulated firm) would be required to state its priors for each of the risk factors in the regressions to be performed at stage two in the process above.[16] These would then be tested in the regression analysis; if the priors are confirmed, one could reasonably conclude that the data support the presumption that the risk factors associated with these risk factors are risks incurred in the provision of the reference service, and thus any other firm which exhibits similar levels of these risks (by virtue of passing the similarity test outlined above) can be held to have met the requirements of the ARORO, and thus of being able to provide suitable input data in order to construct the BEE.

Quite apart from meeting the ARORO, the requirement to state and test priors has another advantage; it further limits regulatory gaming. Regulated firms will have a disincentive to try and "load up" risk factors, because doing so increases multicollinearity, increasing standard errors and thus potentially leading variables, which were significant in a more parsimonious model, to become statistically insignificant. It will in fact be of benefit for regulated firms to develop models with fewer explanatory variables; again in direct contrast to the incentives in the AER's approach.

The discussion above suggests that regulated firms would propose risks and risk factors, with the Guideline containing only the overall framework and the definition of similarity. However,

---

[14] A further iteration might be to require at least five firms (say) be deemed similar, and then explore how much relaxation of the similarity criterion is required before this standard is met. This provides an indication of the "uniqueness" of each asset, by showing how far one needs to move before being able to find a pre-set number of peers. In this sense, it is analogous to the SSNIP test used in antitrust.

[15] Having more firms to begin with might also facilitate a further winnowing if the analyst believes that some of the firms deemed similar are not actually efficient. However, the AER appears to believe that this is not an issue, stating(ES p175) that "*in efficient capital markets, all firms operate on the capital frontier. All firms should be priced efficiently and be able to access capital at the cost associated with the risks they face that are priced by investors*". What is not clear is how the AER reconciles this belief with its benchmarking approach; why is it necessary to benchmark if all firms operate on the capital frontier?

[16] Not at stage three; failure of the priors here would show up by the relevant firm failing the similarity requirement at the end of the process, rendering this extra, time-consuming assessment of priors unnecessary.

regulators could go one step further in terms of consistency across decisions and indicate in a guideline document the risk factors they are prepared to consider (or, indeed a core of such factors, providing scope for regulated firms to make a case for addition). It would then be the task of the regulated firm to describe its priors for each of these factors and link them to relevant risks for the particular energy asset. Some of these priors could be zero, if a regulated firm believes it does not face that particular risk. This would increase the degree of consistency across regulatory decisions and, given the number of available macro factors is in any case finite, might not be an overly oppressive constraint for regulated firms.

In Step Two above, we suggest that the relevant variable is "consequences" in states of the world, and that stock price is one potential consequence which might be used as the relevant metric. This is useful if the asset in question is the only asset owned by the regulated company whose price is being assessed,[17] but it would not be useful if the company in question owned many assets, or was not publicly-traded. In this instance, there would be a need to examine a different consequence variable which is reported at the asset level and the firm level and which can be tied to risk; operating profits may be one such variable.[18]

Note in the discussion above that there is no mention of either the number of BEEs or of whether risks are systematic or non-systematic. This is because both things are irrelevant in this framework. Debate about the number of BEEs only occurs because the AER is endeavouring to make a case for a particular set of firms to be considered together, it has no place in a discussion aimed at trying to establish which firms ought to be the set which informs the BEE. Debate about systematic and non-systematic risk is likewise irrelevant because all that is happening at this stage of the process is that a comparator set of firms is being collected to provide data to inform the BEE. The data from these firms is then used in a subsequent stage to calculate the cost of debt and equity. In respect of the cost of equity, if the CAPM is used to determine this, the only data needed from the set of firms informing the BEE for this purpose is their stock price, which is inputted into a standard regression format to determine beta. Thus, no matter what risks were used to get the firms which provide data to inform the BEE, only their systematic risk exposure is finding its way into the determination of the cost of equity and CAPM, for example, is being used properly. For this reason, we consider the whole debate about what is and is not a systematic risk to be a red-herring for regulators.

There is one issue in the framework approach above which we acknowledge is a potential weakness; historical data might reflect only a small part of the panoply of possible states of the world, particularly if only a few years of data are used. Thus, for example, if interest rates are taken to be a risk factor and only range in the dataset from two to five percent, then any prediction about what the consequences for either the regulated firm or comparator firms in a state of the world where interest rates are 25 percent is likely to be highly inaccurate. This is a fairly standard out of sample prediction problem. In this instance, it may not matter if the out of sample prediction problem

---

[17] Note that for the comparator firms in step three above, there is no need to consider the particular assets they own; we are interested in the risk exposure of the entity as a whole, in order that we might compare it to the risk profile of the particular asset which we are interested in.

[18] We note the SIRCA Share Price and Price Relative Database (www.sirca.org.au/tag/sppr) as a potential source for both consequence variables and for consistent data to implement our approach more generally. We have, however, not been able to assess this database in detail for this submission, as it sits behind a subscription pay-wall.

produces the same kinds of errors for the regulated asset as it does for each of the comparator firms, but it does matter if these errors differ. It might also be of limited significance if the future is expected to be much the same as the past; if there is no expectation of 25 percent interest rates.

As a final point, we note that the approach outlined above, although it has its empirical complexities, is highly transparent. The risk factors, definition of similarity and set of potential comparators can all be established in advance such that, if any stakeholder wants to undertake an analysis to see what the regulator's conclusions would be from the framework at any point in time, this could be very easily done with the appropriate level of technical skills. At the same time, it preserves considerable flexibility such that important differences between firms can be accommodated if they are sufficiently material that they ought to be taken into consideration. The same cannot be said of the AER's current approach, which deems firms as similar unless evidence can be shown to the contrary; preserving certainty, but at the expense of flexibility.

3.2.2 Using the results of the framework

The outputs from the approach outlined above will be a set of comparator firms that have been shown to face the "similar" consequences in the same states of the world as the service provider faces in providing the reference service, and thus able to satisfy the similarity of risk requirements of the ARORO. The question now becomes what to do with the data from these firms.

In essence, the process is very simple. All the AER needs to do is take data from the firms in this comparator set and use it to establish the cost of debt and their cost of equity for the BEE with whatever model(s) are deemed to be appropriate; this is not an approach which is restricted to certain models. It could thus forms an input into the AER's foundation model approach, or CAPM, or any other cost of equity approach; including our own preferred multiple models approach (see below). In respect of the cost of debt, the AER could take the average credit rating of all of the firms in its sample and apply the Bloomberg Fair Value Curve. However it may not be necessary to do so; if a key reason for following this approach is, as the AER suggests (ES, p99) to avoid debate about whose debt instruments ought to be selected, then the fact that the sorting mechanism of our framework above is not arbitrary but rather delivers the set of firms that best meets the ARORO (and can be objectively demonstrated to do so) may mean that the AER can make use of the actual bond yields of the firms in question through a Nelson-Siegel process, or something similar.

The process outlined above also contains an "automatic" check and balance at its conclusion. For example, say the cost of debt for the firms in the comparator sample that results from following the steps in the previous section ranges from three to 15 percent.[19] In such an (admittedly exaggerated) case, if the thesis that like risks ought to be priced alike, something has gone wrong in the similarity process above, and allowed non-similar firms to slip into the comparison set. Thus, the outcomes can be used to check the process of analysis in a transparent fashion which is absent from the risk and similarity framework proposed by the AER.

---

[19] The same could occur for beta estimates in the cost of equity, and it would be useful to consider different sub-portfolios rather than just all the firms as a single portfolio, to ensure this has not occurred.

3.2.3 Practical considerations

It appeared to us in following the AER's approach that, perhaps, it had examined the possibility of looking first at the risk profile of the reference service and then looking for firms with a similar risk profile and discovered quickly that any kind of ad-hoc risk-matching process would become mired in a quagmire of analytical problems and regulatory gaming. One logical next step from such a finding would be to look to "likely" firms for the comparator set, and ascertain whether these firms were similar enough to make use of one benchmark cost of equity and debt, or whether several such benchmarks might be required based upon different groupings of the firms. This led to the single benchmark that the AER has provided.

Our aim here has been to show that, although the ad-hoc risk-matching approach will not work, it is not the only way in which to approach the risk and similarity problem, starting with the actual risks involved in providing the reference service. We appreciate that our approach is very different from that of the AER as outlined in the DG. We appreciate that it would require several layers of econometric estimation. We appreciate that, as described in this brief submission, it is not complete. We appreciate, finally, that it might not be the only, or even the best way to solve the risk and similarity problem in a way that meets the ARORO by having particular reference to each reference service. For these reasons, we recognise that further work is required to operationalize this approach.

However, we would suggest that, since we have demonstrated that the AER's approach is difficult to reconcile with the ARORO, creates a small sample problem that bedevils calculation of the rate of return parameters and contains much more scope for regulatory gaming than our own approach, further discussion and debate are worthwhile on what is after all a fundamental component of the rate of return framework. In the same way that the AER's foundation model approach in respect to the cost of equity is a stepping stone along a logical pathway to a multiple models approach that better meets the ARORO in respect of the cost of equity (see below), it may be possible to develop semi-formal treatments of risk and similarity involving a wider set of firms (say all Australian utilities and overseas energy firms, as the AER suggests in ES p215, but stopping short of any firm in the ASX for want of a proper framework to ensure dissimilar firms do not enter the comparator set) and qualitative, rather than regression-based examination of their risk structures. We would welcome discussion of such approaches by the AER, and hope that our description above of one framework for addressing the risk and similarity issue stimulates such debate.

4. The Foundation Model Approach

The AER has taken what we consider to be an important step forward in regulatory practice in Australia in the formulation of its "Foundation Model" approach. This is because, for the first time, it has moved beyond the narrow framework of considering evidence only from the CAPM (a model with long-recognised flaws) and from the mechanistic application of the CAPM that the AEMC ruled would not be likely to deliver outcomes that meet the NGO and RPP (AEMC, 2012, p42).

It is difficult for us to assess the foundation model in much detail, because some of its core operational aspects have yet to be detailed. We have no understanding, for example, how wide (even in principle) the range established at Stage Three of the AER's foundation model approach will be, no information on how much weight of evidence will be required to move from the initial point estimate at Stage Three (nor even how that weighting process will occur) and no idea how the AER will actually use the suite of other evidence to find points in the range if it does move from it is initial estimate. Whilst we share the ENA's concern that any foundation model kind of approach which places more weight on one imperfect model (and excludes some relevant evidence) than on others may have legal implications in respect of meeting the NGR, we believe that a foundation model approach might satisfy the economic intent behind the NGR if the initial range was sufficiently wide that no single method dominates in practice and the suite of methods used to move from the initial point estimate is suitable for the purpose. Our conclusion from our assessment, detailed below, is that this particular foundation model approach is unlikely to meet these requirements. More importantly, we conclude that a suitable multiple model approach (detailed below) is simpler, more transparent and more likely to meet the ARORO. Thus, it is not clear whether "improving" the foundation model is the best approach.

Our discussion below centres around two key issues. Firstly, does there need to be a "benchmark of truth" at the core of the return on equity model, whereby one method (such as CAPM) is given more weight than others? Secondly, if the CAPM is to be the model which has the status in the model as the "benchmark of truth", is it likely to create a model which is, in practice, workable. In both cases, our assessment is that the answer is "no".

4.1 Does there need to be a "benchmark of truth"?

The AER's foundation model approach gives one method primacy and then uses other methods to challenge and refine the conclusions drawn from the use of the first. This is not, we believe, what the NGR anticipates, and we note the ENA's conclusion that the approach may therefore face legal challenge. Moreover, we do not consider it necessary to rely upon what is essentially a crutch that leaves regulators hobbled to any single approach, when all have flaws; indeed, professional investment analysts make use of multiple models in a way analogous to our approach below precisely to avoid this kind of problem.

Our preference, like that of the ENA, is for a multiple models approach. We made this point in our response to the Consultation Paper, but the AER appears to have misunderstood our approach, adding layers of complexity which do not exist. Our approach is very simple:

- Make use of several different models (SL-CAPM, Black CAPM, DGM, APT and FFM, say; we see no need for more than these few), and for each model, provide a range of estimates of

the rate of return that that model produces using the data sourced from suitable "similar" firms that inform the BEE.[20] Ideally, this range would be a statistical confidence interval; say the 95 percent confidence interval.

- Examine the range(s) of overlap between models, and draw the final answer from within that range.
    - o If there is only one range of intersection, make use of a simple rule, such as choosing the mid-point unless there evidence to move above or below the mid-point is material. This is the approach proposed by IPART (2013) and used by FERC in the US (see our submission to the Consultation Paper).
    - o If there are several ranges over which models intersect (that is, some models intersect over one range, and other models over another), make use of other information such as that which the AER proposes to use to inform the overall return on equity (see DG Table 2) to determine which range of overlap is most suitable, and then go through the step above to find a point in that range.

We are aware of concern from some consumer stakeholders about multiple models giving rise to wider and wider ranges of estimates, with no real way of understanding where in the range the answer ought to lie. This is not correct; we make use of multiple models to reduce the range within which choice must be made, from the range of estimates that are statistically robust for a single model to the intersection between two or more such ranges. Mathematically, the intersection between two or more ranges must be no larger than the smallest of the initial ranges. Moreover, although judgement is required to determine where in the range of overlap the solution is found, this judgement is more restricted than in the AER's foundation model approach, and is in any case likely to be over a much smaller range.

We are unclear why this kind of an approach could be viewed as being complex, non-transparent, uncertain or incapable of being replicated. Indeed, we would suggest that it is the AER's proposed foundation model approach that has these problems; we do not know, for example, what the range of estimates will be for the foundation model, nor what weight of evidence will be required to move from the initial estimate (how "sticky" it will be), nor finally how the various other evidence will actually be used in practice to find a point in the range.

If one were to provide any reasonably competent analyst with data for a set of companies that inform the BEE (the same input as goes into the AER's foundation model approach), and hand that analyst the four dot points above and the AER's description of its own methodology from the DG, we would contend that the analyst would be much more able to come up with an estimate of the cost of equity (or capital) following our approach compared to the AER's. This is because our approach relies on little more than basic statistical inference (the confidence intervals) and some simple decision rules for the final choice. Moreover, we would suggest that doing the same with a second analyst would be much more likely to come up with the same answer. This may be a useful, independent test that the AER could examine. Part of the problem in this ongoing debate is that

---

[20] This could be a return on equity or an overall WACC. If there is just one approach being used for the cost of debt, for gearing and for gamma, then it doesn't matter whether the range alluded to above is for return on equity or WACC.

nobody has (at least publicly),[21] actually tried to implement the AER's and our proposed models in practice to see what difficulties arrive in respect of each.

As outlined above, our multiple models approach suffers none of the problems ascribed to it by the AER in its draft Guideline. In particular:

- Each model is used only once, and the information in each model is used only once, so there is none of the "double-counting" that the AER appears concerned about.[22] There is also no need to form any weights for different models, nor to use models differently based on different economic conditions.

- Any stakeholder can make a reasonable estimate of the returns expected prior to a determination, provided he or she can ascertain which firms would be included in the relevant set to estimate the BEE, which our approach outlined for risk and similarity makes possible. This cannot be done in the AER's approach when it is not even clear how the initial range will be determined.

- Any stakeholder needs to only undertake five runs of different regression models, all of which are fairly standard models in the literature.[23] It is true that not every stakeholder can do econometrics, but this basic problem underpins the AER's approach as well. In any case, it is hardly a reason not to do something; it would be a short-lived investment bank, for example, that insisted its "quants" made no use of complex models from quantum physics because the CEO had never gotten further in her mathematical studies than basic calculus. The argument by the AER about "increasing the arcane nature of the debate" is subject to a similar response. We are concerned that the AER is misusing its own simplicity criteria, and using it to create a lowest common denominator approach that is not robust.

- The approach we have outlined above has much less scope for regulatory gaming than the AER's own approach. This is because of its reliance on robust statistical methods and several models. It might be possible to game one or two of the more complex models and not get caught, but it would be much harder to game the intersection of the respective confidence intervals. Indeed, we suspect it would be much harder to do so than the AER's own foundation model approach, which relies upon judgement for key elements such as determining how wide the initial range is (something no stakeholder has been able to ascertain from the draft Guideline) and determining whether the weight of evidence is sufficient to move away from the initial point estimate of the foundation model.

In summary, our basic point is that the AER is hobbling the regulatory process by insisting upon a single model as a foundation model. This is not only methodologically incorrect, because no cost of equity model has any greater claim to "truth" in the literature, but it results in an approach which is

---

[21] In Australia at least; multiple model approaches are routinely used elsewhere, as we detail in our submission to the Consultation Paper.
[22] We note that, for this to be true, the AER could not use the DGM to inform the MRP in the SLCAPM, but since there are other ways of informing this parameter, that is not necessarily an issue.
[23] The AER's reference to the 900 pages of evidence from the ENA is misleading. It is almost always the case that the explanation of how to do something when it is first proposed is longer than the documentation of what has been done after the fact. Sharpe and Lintner's own papers which underpin the SL-CAPM, for example, are much longer than the descriptions of the model in most finance textbooks (which omit all the mathematical proofs unnecessary for teaching the model), and these in turn are usually longer than a description of the implementation of the model and its results.

far more complex, far less transparent and replicable, and far more subject to regulatory gaming than the simple multiple-model approach we have outlined above. As a final point, it is also less faithful to the requirements of the rules, which merely note that the AER need make use of "relevant" models, and not that it favours one model over others; a point also made by the ENA. Arguably, if the AEMC had wanted to AER to bolster CAPM results with the results from other models, it would have made this clear in the rules. We have developed our multiple model approach based on the requirements of the ARORO, rather than a need to preserve the dominance of models from the past.

4.2 If there is a "benchmark of truth", is this the right one?

As we make clear above, we do not consider it appropriate for any model to be a "benchmark of truth"; all models have flaws, which is precisely why the AEMC moved away from reliance on just one. However, the AER has chosen to use just one foundation model, and so it behoves us to examine its appropriateness further. This we do in three parts. First we look at the problems of the CAPM in providing a basis for determining rates of return, and secondly we look at whether the AER's proposed "fixes" to some of the problems of using the CAPM will likely work. We close with some brief conclusions about the CAPM as a benchmark of truth.

Before beginning our assessment, we would note that we do not consider that the CAPM can play no role at all in cost of capital estimation; we have always stated and continue to believe, that it must play a role, but just not the role it has played in the past, nor the role of foundation model that the AER has devised for it. Moreover, we re-iterate that this conclusion is not limited to the CAPM alone; we don't believe that any model is suitable as a foundation model, because the foundation model approach itself has flaws.

4.2.1 Problems with the CAPM as a foundation model

In this section we provide a brief overview of our considerations as to the problems associated with the use of the CAPM as a foundation model. This is not intended to be a critique of the model itself; we have provided such critiques in the past, as have many hundreds of other academic and non-academic papers and the core problems of the CAPM are well known to almost everyone in the regulatory community.

We focus on three key three components of the CAPM as implemented by the AER which are intended to produce a range (of indeterminate size) of estimates at Stage Three of its process; the risk-free rate, the market risk premium and beta. The risk-free rate is relatively non-controversial and we thus do not discuss it further. This leaves us with the market risk premium and beta.

In respect of the market risk premium and potential problems with assuming it is constant, the AER is proposing to have regard to the implementation of the SL CAPM proposed by Professor Wright. Professor Wright's implementation of the model does not require an estimate of the market risk premium as a parameter in its own right.

The AER is proposing to use Professor Wright's implementation of the SL CAPM to inform the range of the rate of return on equity estimates, and to inform the overall rate of return on equity. This is a

further step in ensuring that the "right" estimate of the rate of return on equity is used in determining the rate of return.

Professor Wright's implementation, in our view, accords more closely with the theoretical foundations of the SL CAPM than an implementation which treats the market risk premium as a parameter, and uses an average of historical excess returns over a long period as the estimate of that parameter.

The SL CAPM is derived by assuming that investors choose, at a point in time, portfolios of financial assets which yield returns one period later. Those returns are uncertain, and each investor is assumed to obtain expected utility from the random distribution of end of period wealth which depends only on the mean and variance of the portfolio returns.

An investor with a one period time horizon and concerned with maximising expected utility will choose a portfolio from among the financial assets which are available to minimise the variance of portfolio returns for a given level of expected return on the portfolio.

The financial assets available to the investor are:

- a risk free asset with a certain rate of return, r_f; and

- a set of risky assets, each of which provides a rate of return, r_i, at the end of the period which is not known with certainty when a portfolio is chosen at the beginning of the period.

Although the returns on the risky assets are not known when portfolio choices are made, the joint probability distribution of those returns is assumed to be known by each investor.

In these circumstances, the expected rate of return on risky financial asset i is given by:

$E(r_i) = r_f + \beta_i \times [E(r_m) - r_f]$,

where:

- $E(r_i)$ is the expected return on asset i;

- β_i is the covariance of the return on asset i and the return on the market portfolio of all financial assets divided by the variance of return on the market portfolio; and

- $E(r_m)$ is the expected return on a market portfolio.

This is the SL CAPM.

If the SL CAPM is to be used to estimate the expected rate of return on a particular financial asset (asset i), estimates are required of:

- the risk free rate of return, r_f, at the time investors are choosing portfolios;

- β_i (the equity beta of asset i); and

- the expected rate of return on the market portfolio, $E(r_m)$, at the time of portfolio choice.

The difference $E(r_m) - r_f$ is usually referred to as the market risk premium (MRP). It is often, and in APIA's view incorrectly, treated as single parameter which must be estimated for application of the SL CAPM. Estimation of this single parameter usually proceeds from historical data on the equity risk premium.

If a long term average of observed risk premiums is used to estimate the MRP, this implies that $E(r_m) - r_f$ is estimated as

$$\frac{1}{n} \sum_{t=1}^{n} (r_{mt} - r_{ft}) = \bar{r}_m - \bar{r}_f$$

where $\bar{r}_m$ is the average return on the market over the n years of the averaging period, and $\bar{r}_f$ is the average risk free rate over the same historical period.

$\bar{r}_m$ might be used as an estimate of the expected return on the market portfolio.

However, there is no place in the SL CAPM for a long term average of the rate of return on the risk free asset; there is no place for $\bar{r}_f$. In keeping with the derivation of the model, and its focus on the current choice of a portfolio of financial assets, the conceptually correct estimate of the risk free rate of return is the estimate of that rate at the time of portfolio choice. Investors are choosing, at that time, portfolios comprising the risk free asset with its known (at the time of portfolio choice) rate of return, and risky assets with uncertain rates of return but in relation to which the market portfolio has expected return $E(r_m)$.

The use of a long term average of past risk free rates is not only incorrect. It is also unnecessary. At the time the expected rate of return on financial asset i is to be estimated, an estimate of the current risk free rate is available.

If the MRP is estimated as a long term average of observed market risk premiums, the conceptually correct current risk free rate of return in the model is replaced – incorrectly – by an average of the risk free rate over some prior period. The result is an estimate of the rate of return on equity which might, only by chance, be an estimate which contributes to the allowed rate of return objective. We therefore believe that the use of Wright's CAPM model is a useful step forward in terms of the problems that arise from assuming a constant market risk premium

In respect of beta, the CAPM has major practical issues. We appreciate that the AER has not released any of its own considerations about beta yet, and we look forward to the opportunity to comment on this work in due course. We trust that this work will be rigorous, and will not be subject to arbitrary filtering of input data that has the effect of producing a misleading impression of the precision of the estimates.

Despite not having any evidence on beta from the AER, we do have several recent estimates which highlight some key issues in respect of beta for the AER. In its submission to the ERA's draft Guidelines process, DBP asked CEG to take the dataset used by the ERA and undertake exactly the same analysis, but with one key difference; the day of the week and month upon which returns are calculated.[24] This ought to make little difference to results; there is nothing in CAPM that says that

---

[24] See http://www.erawa.com.au/access/gas-access/guidelines/

Tuesday's beta is more methodologically correct than Thursday's beta.[25] However, as shown in Figure 1, there is a significant difference in beta estimates, even just in the average across the set of firms in the sample, when different days of the week or month are used.

Figure 1:   **Beta at different calculation days**
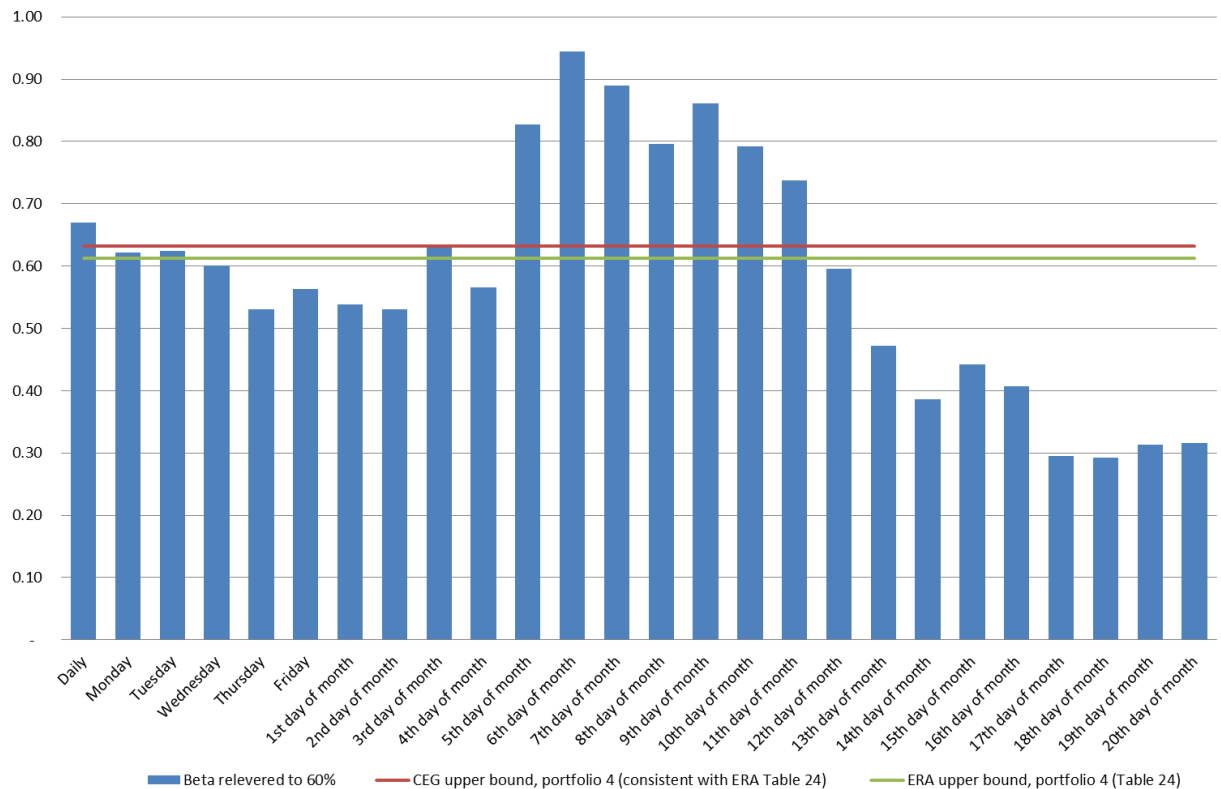
In a practical sense, then, unless the AER is going to ignore its own criteria about arbitrary filtering and insist upon beta being based on a single return day's estimate, the range of the return on equity formed at Stage Three of the AER's approach is likely to be very large; some several hundred basis points.[26] From the perspective of reducing the weight of the SL-CAPM has in providing information which determines the final conclusion in respect of the return on equity (and therefore moving closer to a multiple models approach), this is desirable. However, it does require that the different models used to cross-check in Stages Four to Six of the AER's proposed foundation model approach need to be particularly robust. It is therefore to this question that we now turn.

---

[25] Days of the month are a little different in this respect, because they involve monthly, not weekly betas. As IPART (2013) and Levy (2011) point out, it is necessary to match, as closely as feasible, the observation horizon in the empirical analysis with the investment horizon over which stocks are actually held to deliver a return. There is a trade-off in terms of data availability which means that annual data (for all that it might match actual investment holding periods, see, *http://topforeignstocks.com/2010/09/06/duration-of-stock-holding-period-continues-to-fall-globally/ and http://www.businessinsider.com.au/no-the-average-stock-holding-period-is-not-11-seconds-2010-10)* might not be used frequently by analysts, but the AER (and ERA) would need to show that the use of weekly betas was not biasing results before making use of them in the regulatory debate. We would consider it likely that they do introduce such bias.

[26] This is if the AER makes use primarily of Australian utilities in forming the beta. Using data from overseas and/or increasing the sample set of firms that inform the BEE through using the risk/similarity framework we outline in the previous chapter can reduce the range.

4.2.2 Do the other methods solve the problems of CAPM?

The key practical issue associated with the use of the SL CAPM in the foundation model is that that it gives rise to a wide range in the initial estimate at Stage Three of the AER's foundation model approach. This is not, in and of itself, an issue, because the AER has other models and approaches to determine points in the range. Thus, discussions about problems with the foundation model boil down to an assessment of these other models and approaches. Our conclusions in respect of the methods proposed by the AER drive the distinction we make in the introduction to this chapter between the appropriateness or otherwise of foundation model approaches in general and this particular foundation model approach favoured by the AER.

In respect to historical excess returns, the dividend growth model, implied volatility studies and the survey data, the AER proposes to use these to inform estimates of the market risk premium, so they will not assist with the beta issue above. Likewise, whilst using the Black-CAPM is proposed as a way of addressing beta estimation issues, it seems unlikely that it will address the issues outlined above, because the Black-CAPM estimates beta in essentially the same way and would likely be equally affected in the small sample of Australian energy utilities by the same wide variance.[27] That leaves the following from Table 5.3 in the ES:

Wright CAPM approach	To find points in the range
Takeover and valuation reports	To find points in the range
Broker's rate of return estimates	To find points in the range
Other regulators' return on equity estimates	To find points in the range
Debt spreads	To find direction of likely movement
Dividend yields	To find direction of likely movement
Comparison with the return on debt	To find direction of likely movement

The Wright CAPM approach corrects for errors associated with assuming a constant market risk premium, but estimates beta in the same way as the SL-CAPM, and thus does not appear to solve the problem outlined above. To the extent that other regulators and/or brokers have made use of the CAPM, they will suffer from precisely the same problem as outlined in Figure 1 above. However, this may not be apparent if those preparing the reports are not specific about how they have estimated the CAPM (or even whether they have used it at all), and whether they have considered the impact of different days of the week and month. This might mean that such estimates appear to offer much more precision than they do in reality; this was precisely the problem in the ERA draft Guidelines that the CEG paper referred to above was responding to. For these reasons, we would urge caution before simply accepting these sources of information as suitable reference points; in some instances, they may add no new information at all if they have examined essentially the same companies over essentially the same timeframe as in the AER's Stage Three of the foundation model approach.

Debt spreads, dividend yields and comparisons with the return on debt have been highlighted by the AER as being only sufficient to provide an indication of the direction in which a "correct" answer might lie from the initial point estimate found in Stage Three. We would not disagree with this assessment by the AER, which raises the obvious problem that they will therefore not be sufficiently

---

[27] In other words, the Black CAPM and DGM have not been used effectively by the AER; each would be more effective if used in the same way as the Wright CAPM approach.

robust to ascertain where in the several-hundred basis point range the true cost of equity is likely to lie. Thus, the only remaining element is takeover and valuation reports. We note that these may also be based, at least partially, on the CAPM, facing the same issue as other regulatory determinations and broker reports referred to above. Even if they do not, there is still the issue that the AER itself notes (ES p202) that such reports are only released on a sporadic basis and are not always clear about the assumptions that have underpinned them. We are therefore not convinced that these studies will be sufficient to overcome the "beta problem" alluded to above.

4.2.3 Conclusions about this benchmark of truth

Our overall conclusions, therefore, is that it is highly likely that, once the AER actually uses its foundation model for the first time, it will find that it is insufficient to overcome the problems that making use of the CAPM at its core will cause. Something will need to change. If the AER avoids using arbitrary filtering to artificially reduce the range of the beta by choosing only a single day of the week or month, then it essentially has three (not necessarily mutually-exclusive) choices:

- A "de-minimus approach of adding more models to Steps Four and Five of its process in its foundation model approach, which are more robustly able to find suitable points in the range. We would suggest the Black CAPM, DGM and FFM (which we believe can be shown to meet the ARORO), and would concur with the ENA in its assessment of the flaws in the AER's analysis of the strengths and weaknesses of these models.
- Making better use of a wider dataset to avoid the small-sample problem which gives rise to the wide range of beta estimates. This could include using overseas data more prominently and/or making use of a formal risk-similarity approach (see Chapter Three) to "discover" comparator set firms more robustly than is the case at present.
- Making use of a proper multiple model approach.

We note that the second solution could easily and effectively be used in conjunction with the third, and the first and third approaches may not be substantively different in outcomes. The key difference is that the third approach is simpler and more transparent in its process.

It is for this reason that we consider it vital that the AER go through the exercise of a proper case study (that is, not one which arbitrarily filters data to restrict beta, or any other parameter) as part of its final Guideline. This would help all stakeholders understand the extent to which the problems we outline in our discussion above manifest themselves in practice, and whether the AER is able to deal with them effectively within its existing foundation model approach. Since it seems likely that this process will occur the very first time a draft decision is made using this Guideline, it seems much more efficient to iron out any problems now, rather than through an expensive challenge process before the Australian Competition Tribunal.

4.3 Where can we move to from here?

As we have noted above, we continue to believe that a multiple models approach remains the approach most likely to meet the requirements of the ARORO. Moreover, we believe that it is a more transparent, robust and, in light of the problems of the CAPM, practicable approach. The ideal

approach would therefore be to move in this direction, jettisoning the complex, opaque and impractical foundation model approach. We recognise the AER may have difficulties doing so, but we would suggest that, as a minimum, the final Guideline contains the following:

- A worked example of the AER's proposed foundation model showing how it deals with all of the problems we explore in this chapter, in a realistic case study which includes all the variation in beta, and not an artificially-restricted sub-set. This might also include an example of how adding other methods to Stages Four and Five might improve the foundation model.
- Clarification of how the AER will make a decision to move away from the initial point estimate in the foundation model based on other evidence; how "sticky" the initial point estimate is. This is particularly opaque at present, and delivers little certainty to investors.
- Clarification of exactly what would cause the AER to go back and re-estimate the CAPM range. It is not sufficient to say, as on DG p 19 that the AER *may* reconsider input parameter estimates or the foundation model itself; provision of certainty to investors and other stakeholders requires the AER to be specific about the circumstances under which it *will* undertake such reconsiderations.

We do not consider that these minimal steps will solve all problems, and certainly we do not believe that they will be sufficient to produce a model which meets the ARORO. However, they would represent a useful step forward, both in terms of providing more stakeholder certainty and in beginning a pathway of evolution in the AER's approach to the cost of equity towards a methodology which can be shown to meet the ARORO.

5. Remaining Issues

Our previous three sections have dealt with three major "themes" of issues associated with the AER's draft Guideline. Not all of our issues fit within these three major themes, and we therefore devote this final chapter to discussing some remaining issues. The grouping together of these issues in a final chapter should not be taken as evidence of their being relatively less important than the remainder of our submission; they remain important issues which the AER needs to address. These are:

- The term used for estimating the cost of debt, of seven years.
- The AER's differing approaches to gamma, which appear to ignore recent Australian Competition Tribunal precedent and rely upon archaic concepts of value.
- The AER's insistence upon a single model for the cost of debt.
- What the AER might intend upon doing in relation to inflation rate forecasts.

5.1 Term for debt

The AER has made a number of recommendations in respect to debt, beyond the use of the trailing average approach which we comment upon below. In respect to the averaging period of 40 days, we do not have a particular issue, and indeed the approach the AER has taken of agreeing with the service provider as to which 40 days will be chosen before the fact and keeping that information confidential is, we believe, a sensible solution to the problem which arises where markets know firms must hedge debt over a short time period.[28] That said, we are aware that some consumer groups have suggested a one-year average, as currently occurs in the UK, and we do not perceive that this would cause any in-principle problems either. In principle, unless doing so can be shown to be against the ARORO, if the AER is to allow different averaging periods, it should be at the discretion of the regulated firm, with the obvious proviso that the firm must make the choice ahead of knowledge about what interest rates will be over the averaging period to prevent regulatory gaming, and we suspect that this may cause problems, particularly at the determination stage, which ought not take more than a year to complete.[29]

In respect to the use of third-party data, such as the fair-value curves from Bloomberg, we also do not have a particular issue, except that they may not be necessary if the risk and similarity framework outlined in Chapter Three is used. The fair-value curve approach, therefore, is best viewed as a "second-best" solution; it is better than the ERA's arbitrary and non-transparent bond-yield approach but it is inferior to an approach better grounded in a more robust framework of risk and similarity.

---

[28] Though we note that, once markets see a firm starting to hedge its debt, knowing the 40-day rule exists, they will know that the firm is in the period is in the period where it must hedge its debt. Thus, whilst the risk for regulated firms has been reduced, it has not been eliminated.

[29] The approach might be more workable for the annual updates; a firm could have an initial 40-day averaging period at the determination stage, and then use annual averages (ie – year to the day) for each subsequent annual update of debt rates, following the AER's trailing average approach. We make the further point that current market expectations for future interest rates contained in the RBA's zero-coupon series suggests sufficient stability over coming years that there would be little practical difference between a one-year and a 40-day average; although we note that this may not always be the case.

Our main issue here is in respect of the term of debt, which has been reduced from the current ten years to seven years. The AER has based its move to seven-year debt term on three key points:

- It has found evidence that the average term of debt is less than ten years.
- It is hard to extrapolate the seven-year fair-value curve produced by Bloomberg to a ten-year term as part of the annual update process.
- The difference in premium between seven and ten years is not material.

In respect of the average term of debt, once swaps are taken into consideration, the average term may indeed be seven years. However, we would make two points. Firstly, the swaps have been entered into primarily to match, as closely as possible, the regulatory period of five years, under the existing regulatory practice of estimating one regulatory cost of debt in the period up to each regulatory period. With a trailing average approach, these swaps are no longer necessary, and will change results.

Secondly, we agree with the AER that the rate of return on debt should be estimated using the term at issuance (as distinct to the term to maturity) for the BEE. We note that the AER has rejected the CEG and PwC work which had suggested an average term at issuance of ten years, but the ENA has advised us that CEG and PwC have revised their methodologies (see ENA submission), responding to the issues raised by the AER, but still producing similar results. We note the evidence collected by the ERA also shows that the average term of bonds at issue of Australian regulated firms is more than ten years.[30]

In these circumstances, issues which might arise in the automatic updating of the trailing average portfolio return, and the materiality of the difference in the term premium at seven years and at 10 years, are not factors to be considered in setting the benchmark term. They are not factors which can justify a change in the assumed benchmark from the average term at issuance of the debt of the benchmark efficient entity

We would also urge the AER to examine the debt-raising activities of overseas utilities, and the term of that debt. The ENA has also provided information about this in its submission to the AER's Consultation Paper, which shows terms are longer than in Australia. Our understanding, from speaking with treasury officers in our member firms, is that Australian utilities would very much like to issue longer-term debt, but that there is little appetite for this debt in the Australian marketplace, most particularly over the past few years following the global financial crisis. Our understanding is further that this is not specific to energy firms or even utilities, but is a general phenomenon across the spectrum of corporate debt; something we would urge the AER to confirm with its own consultants. Thus, what is actually happening is that investors in Australian infrastructure have a desire (in terms of the tenor of debt) which cannot be fulfilled within the Australian marketplace.[31]

---

[30] The ERA, in its explanatory statement, made use of the term to maturity of this debt to argue for its preferred position of five years. This is, of course (and as both DBP and APA argued in their submissions to the ERA's draft Guidelines), erroneous, because the average term to maturity at a given point in time is nothing more than an average of numerous different past investment decisions which tells the analyst nothing at all about the company's investment horizon.

[31] Issuing debt in foreign marketplaces is not a trivial exercise given risks such as exchange rate risk and different regulatory and reporting requirements, as well as the difficulty in raising debt in markets where Australian firms may be relatively small, and relatively unknown.

If regulation is meant to provide incentives for investors, we would suggest that further reducing the incentives in the market place to provide demand for long-term debt by reducing the incentives for infrastructure owners to issue it represents a poor policy position. This does not mean the AER should move to a term on debt which matches that for utilities in the US or Europe, but rather that this evidence should form part of a decision to establish the term of debt for regulatory purposes.

In respect to the difficulty of extrapolating Bloomberg data on seven year fair value curves to ten years, we note that difficulty ought not prevent a regulator from taking an action, if it meets appropriate principles. We note further that the ENA has presented suggestions which may alleviate these difficulties.

Finally, in respect of the difference between seven and ten year bonds, the AER has indicated that these are "not material". We are aware that the ENA has provided more detailed evidence around this issue. However, we would note that recent information on corporate bond issues from the ANZ shows that ten year bonds have a spread that is, on average, 30 basis points higher than a seven-year corporate bond.[32] This translates to a difference in WACC of around 18 basis points, which would represent around $2 million per annum for a $1 billion pipeline. If the AER believes that $2 million per annum per billion dollars-worth of asset is a threshold for materiality, might we presume that this holds across the board, and therefore that the same threshold would be applied to assessment of operating costs and other elements of regulatory decisions? We would welcome clarity from the AER on precisely where its materiality threshold lies, and how it proposes to implement such a threshold in a consistent manner across its regulatory decisions.

5.2 Gamma

As we understand was the case for other stakeholders, we were surprised at the considerable departure in the DG and ES on the topic of gamma from the Consultation Paper and what we understood to be best practice regulation, following the numerous Competition Tribunal rulings on the matter. We understand the issue of gamma is one which the ENA has devoted considerable resources to addressing, and we would endorse its findings. In particular, we are concerned about the AER's proposal to make use of taxation statistics, which do not accurately reflect redemption rates and, at a more fundamental level, its use of an "equity ownership" conceptual framework when we believe that the requirement of Section 87A of the NGR to consider the value of imputation credits quite clearly contains an expectation that the market value would form the core of any such estimate of value. Indeed, we would suggest that if the AER is proposing to suggest that the value of imputation credits is something other than the value which a competitive market places upon them, then the onus is on the AER to show why markets are incorrect in their assessment of value. We do not consider that this has been done in the draft Guideline.

We appreciate that the estimation of market values for gamma is an ongoing econometric debate within the relevant literature. However, this is hardly unique to this particular corner of finance, but is pervasive across economic; indeed it is what economists point to when underpinning their claims for economics as a science. In such a situation, the appropriate response is for the regulator to do

---

[32] This is for A- to A+-rated bonds, as there were no BBB+ 10-year bonds in the sample.

the same thing as the Australian Competition Tribunal did; make use of the best empirical evidence available to make a decision, cognizant that no empirical evidence will be perfect.

The AER, by contrast, deviated down a path well-trodden in the history of economic thought since the days of Aristotle; perceiving difficulties in respect of market prices as measures of value (here econometric difficulties), it has attempted to examine value from some kind of "first principles" approach. The AER's approach to gamma mirrors that followed by St Thomas Aquinas and the medieval Scholastics, and their attempts to discover a "just price". After several centuries of debate (itself informed by Aristotle, Justinian and earlier Christian thinkers), the Scholastics concluded that the best measure of a just price was the price formed in a competitive marketplace, and thereby set the foundations for modern economics.[33] We trust that the AER will likewise reach a conclusion that market prices form the best foundation for understanding value in the final Guideline.

5.3 Multiple debt models

We note that the AER has favoured a trailing average approach in its draft Guideline, and has precluded the use of any other approach, including either an on-the-day or a menu approach. We do not have a particular problem with the former, and believe the availability of a trailing average approach will enhance efficiency within the energy industry. Where we have issue is with the preclusion of other approaches to the cost of debt, which the NGR has deemed to be acceptable; an on-the-day and a hybrid approach.

The AER's justification for precluding all other models allowed under the NGR appears to be as follows:

- The AER has made a major change in moving to a trailing average approach, and this requires a strong degree of "commitment" from regulated firms.
- Having several options provides the potential for regulatory gaming.

The first of these reasons is spurious. The requirement on the AER is to ensure, and demonstrate, that the choice it has made in respect of the cost of debt (and equity) meets the ARORO (NGR, Section 87(14)). There is nothing at all in the rules which requires regulated entities to commit to a particular position just because the regulator has made changes from a previous position, and we struggle to understand how the degree of regulatory commitment is relevant to an objective test like the ARORO.

Additionally, while we take the AER's point that, so long as its approach satisfies the rules, the NEO and the NGO, it does not need to take individual circumstances into account in this particular context,[34] we would remind the AER that the rules also require it to provide support for or against methodologies that makes direct reference to the ARORO. The AER has not done this; neither its support for its trailing average approach nor the reasons it gives for not supporting for other models

---

[33] See, for example, Sewall, 1901 and DeRoover, 1958.

[34] There is a need to take individual circumstances into account in the ARORO itself, which requires that the BEE face a degree of risk similar to that in providing the reference service.

makes reference to the ARORO. Consumers might like consistency, and investors certainty,[35] but the requirement on the AER under the rules is to demonstrate appropriateness with reference to the ARORO.

In respect to gaming, the AER appears to be arguing that, because multiple models could be gamed, there ought to be only one. If this is a general position on the part of the AER, then it cannot use the CAPM as a foundation model, because the wide range of betas which are likely to result (see Chapter Four) are likely to give rise to significant opportunities for gaming. This is of course, a ridiculous position, and in respect of the cost of equity, the AER has developed a framework in its foundation model by which it hopes to limit gaming. If it believes there is scope for gaming in the cost of debt, it ought to do the same (or show that nothing can prevent gaming), not preclude a methodology because gaming is possible.

5.4 Inflation rate forecasts

The draft Guideline contains nothing in regards to what the AER proposes to do in respect of inflation rates; a topic which it discussed in the Consultation Paper. We understand that the AER will advance a position on inflation rates in its final Guideline and that, unlike gamma in the Draft Guideline, it will not represent a major shift from previously stated positions.

APIA's view on inflation rates remains the same as in our submission to the AER's Consultation Paper; that applying the Fisher equation using returns on nominal and indexed Commonwealth Government Securities is preferable where it can be demonstrated that both markets are sufficiently liquid to ensure that the measure is not inadvertently picking up a liquidity premium, but that RBA forecasts and its charter inflation target band of between two and three per cent are superior when liquidity issues arise. We would urge the AER to adopt a similar viewpoint in its final Guideline.

---

[35] Though we see problems in taking both of these statements at face-value; consumers would like consistency a lot less if it supported higher prices, rather than lower prices, and it is unclear whether Paul Johnston was talking about the specific context of trailing average versus other methods in the quotation, or whether this quotation has been taken out of context.

Bibliography

Arrow, KJ & Lind, R, 1970, "Uncertainty and the Value of Public Investment Decisions", *American Economic Review,* 60(3), 364-78.

Australian Energy Market Commission, 2012, *Rule Determination, National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, 29 November 2012

Chairmont Consulting, 2012, *Debt Risk Premium Expert Report*, February 2012, available from http://www.aer.gov.au/node/18859.

DeRoover, R, 1958, 'The Concept of the Just Price: Theory and economic policy', *Journal of Economic History* 18(4), 418-34.

Energy Networks Association (ENA), 2013, *Response to AER Rate of Return Guidelines Consultation Paper*, June 2013, available from http://www.aer.gov.au/node/18859.

Grimm, C & Winston, C, 2000, "Competition in the Deregulated Railway Industry: Sources, effects and policy issues" in Peltzman, S & Winston, C (eds) *Deregulation of Network Industries: What's next?*, AEI-Brookings: Washington DC, 41-72.

Independent Pricing and Regulatory Tribunal (IPART), 2013, *WACC Methodology,* Draft Research Report, September 2013, available from http://www.ipart.nsw.gov.au/Home/Industries/Research/Reviews/WACC/Review_of_method_for_determining_the_WACC .

Levy, H & Levy, M (2011), "The small firm effect: A financial mirage?", *Journal of Portfolio Management* 37(2), pp129-38.

McKenzie, P & Partington, G, 2013¸ *Risk, Asset Pricing Models and WACC: A report to the AER,* June 2013, available from http://www.aer.gov.au/node/18859.

OECD, 2005, *Structural Reform in the Rail Industry,* available from http://www.oecd.org/regreform/sectors/35911008.pdf

Pittman, R, 1992, "Specific Investments, Contracts, and Opportunism: The Evolution of Railroad Sidetrack Agreements," *Journal of Law and Economics*, 34(2), 565-89.

Sewall, HR, 1902, 'The Theory of Value Before Adam Smith', *Publications of the American Economic Association*, 3rd Series, 2(3), 1-128.