Report to the CRG: AER Cross Checks

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Author's Credentials

This report has been prepared by Graham Partington and Stephen Satchell. We have extensive experience as senior finance academics and have published several finance books and many research papers in finance. We also have extensive consulting experience, including work covering the cost of capital and valuation.

We have read the "Federal Court of Australia: Expert Evidence Practice Note", which is attached as Appendix B. This report has been prepared in accordance with the guidance provided by the practice note. An expert witness compliance declaration follows the reference list at the end of our report.

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Executive summary

We have been asked by the CRG to provide expert advice on the potential use of 'cross checks', in determining the allowed rate of return. A general review and critique of the AER's approach is provided, and cross checks are assessed against the NEO and NGO objectives together with criteria specified by the AER and the CRG. We agree with the AER that cross-checks cannot be used to make deterministic adjustments to the allowed rate of return but can provide a useful context in which to apply a sense check. We also agree with the AER that a difficulty with cross checks is that the information that they might contain, regarding the allowed rate of return; can be confounded by other non-rate of return factors. For example, the value of unregulated assets embedded in RAB multiples.

Our review considers all six of the potential cross checks considered by the AER. However, given our brief from the CRG, we focus particularly on financeability, RAB multiples, scenario analysis, and historical profitability. We also discuss in detail the problems of comparison with other regulators' allowed rates of return. We find that financeability tests and investment trends are unsuitable as cross checks. Historical profitability is also unlikely to be suitable as a cross check, but AER documentation makes conflicting statements about this.

The use of RAB multiples as a cross check may provide some useful information, not least because they are widely used in valuation analysis relating to the purchase/sale of networks. We also discuss issues associated with the use and interpretation of RAB multiples and recommend further analysis of RAB multiples by the AER.

We discuss at length the possible uses of scenario testing. We believe that this is a service that the AER could provide at a level accessible to all stakeholders, but we also recommend the AER develops an internal capability in assessing the plausibility and severity of scenarios suggested by stakeholders.

With respect to comparison to other regulators, we argue that there is some merit in examining the methods that other regulators use, but that comparison with the actual returns of regulators internationally is not fit for purpose. Comparison with other regulatory returns domestically suffers fewer problems, but even in this case some caution is required.

The issue of whether any of these cross checks allow for a balanced assessment, without favouring one group of stakeholders at the expense of another, is discussed at length. Our broad conclusion is that many seemingly reasonable activities confer advantages to the networks due to their greater access to human and financial capital.

Introduction

We have been asked by the CRG to provide:

> *…expert advice on the potential use of 'cross checks' to assess whether the AER's estimate of an efficient rate of return is appropriate for a regulated*

electricity or gas network company operating in the national energy market (NEM) and consistent with the relevant national energy objectives, laws and rules.

Our response is set out in this document. At the start of each section we provide, in italics, the specific questions that the CRG has asked us to address, and which are addressed in that section of the document. The full terms of reference are given in Appendix A. In providing our advice we have had regard to the National Electricity Objectives (NEO) and National Gas Objectives (NGO). We have also born in mind the AER and CRG assessment criteria for determination of the allowed rate of return.

General review of the AER's approach

1. *General review of the AER's approach and conclusions in the context of the AER's statement that it is considering the use of overall cross checks for (a) informing the rate of return, (b) the information they can provide and (c) the best approach to incorporate this information into its rate of return decision.*

NEO and NGO objectives

It is worth reproducing the NEO and NGO objectives which we list next. The National Electricity Objective as stated in the National Electricity Law (NEL) is:

to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to: price, quality, safety and reliability and security of supply of electricity the reliability, safety and security of the national electricity system.

The National Gas Objective as stated in the National Gas Law (NGL) is:

to promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas.

It is clear from the NEO and the NGO that the long term interest of consumers is the paramount objective.

Assessment Criteria

Next, we list the criteria used by the AER in making their judgements about methods to be used in determining the allowed rate of return. These include two new criteria (7. and 8.). We also list the criteria recommended to the AER by the CRG in order to promote consumer confidence in the regulatory process and its outcomes. These are the sets of criteria that we bear in mind as we assess the cross checks.

AER criteria

1. Reflective of economic and finance principles and market information
2. Fit for purpose
3. Implemented in accordance with good practice
4. Models are based on quantitative modelling that is sufficiently robust and avoids arbitrary filtering
5. Market data is credible, verifiable, comparable, timely and clearly sourced
6. Flexible to allow changing market conditions and new information
7. Materiality
8. Longevity or sustainability of new arrangements.

CRG criteria

1. Promote behaviours that engender consumer confidence in the regulatory framework
2. Test against consumer impacts on prices
3. Test against impacts on service standards
4. Risks are borne by those best placed to manage them
5. There should be a high bar to change.

We have some observations to make about these criteria. The addition of materiality is an obviously sensible addition to the AER criteria. As is the addition of longevity or sustainability of new arrangements. This is because stability in the regulatory process is important to consumers and networks and is also one of the factors considered by credit rating agencies. The consumer criterion of a high bar to change also reflects a desire for stability.

With respect to the consumer criterion of engendering consumer confidence in the regulatory framework, this is consistent with the long term interest of consumers. It would hardly be in consumers long term interests if they had no confidence in the regulatory framework and considered that the AER's decisions were inimical to the consumers' interests. Testing against outcomes is an obviously sensible criterion and important to enhancing consumer confidence in AER processes. However, it is difficult to see how tests of service standards could be other than ex-post tests. The AER already collects information on the operating performance of networks that could be used for this purpose.

Tests against consumer impacts on prices are more challenging; if the WACC changes, then prices will change. What then is to be the benchmark for assessment of the price outcome? If the impact on consumers is a sudden sharp increase in prices, then clearly the AER should review to ensure that it has the highest levels of confidence in its exercise of judgement about the components of the allowed rate of return calculation. It should also be possible to set the revenue cap in such a way that prices increase gradually but give the same present value of revenue over the regulatory period as an immediate price rise. The principle that risks should be borne by those best placed to manage them is one that has wide application and a great deal of finance in practice is about the reallocation of risks to suit investors' capacity and appetite for risk.

Use of Cross checks

The AER's (2021 Omnibus) general observation about cross checks is (p.119):

Our preliminary position is that the overall cross checks may provide contextual information and/or inform us of potential areas of inquiry and research. As such, we consider we can use them as an overall sense check of our rate of return.

In principle, cross checks seem like a good idea. It is not immediately obvious that additional information can be harmful. The reality is that poor or misleading information can swamp good information and the AER is, in our view, sensible in exercising caution in the choice of cross-checks that may be used. Clearly cross checks should not proliferate without limit. Properly implementing a cross check and then determining what to do as a consequence of the cross check has costs and AER resources have limits. Also, as the number and scope of cross checks increases so does the risk of capitalising on chance. That is, as the number of cross checks increase, so does the chance of finding a cross check that suggests a problem, when no problem really exists.

Even if we all agreed that one or more of the cross checks discussed was interesting, building a mechanism to directly adjust the allowed rate of return seems an impossible task. We, therefore, agree with the AER that with respect to the six cross checks considered (p.120):

> …none of them can be used to inform the rate of return in any deterministic way.

There is a further issue that some of the potential cross checks are backward looking, for example, checks based on profitability or RAB multiples. It might validly be asked how can a forward-looking allowed rate of return be based on historic network performance.[1] In our view, cross checks are best used to suggest whether further investigation and review of the allowed rate of return is merited. This does not imply deterministic adjustments and the lessons of history can validly be used to trigger investigation and review. The AER describes the use of cross checks in this way as an overall sense check on their rate of return.

Sense checks are not amenable to formulaic adjustments to the allowed rate of return. Thus, transparency can only be achieved ex-post by explaining what was considered, and why, and what the response was. It is important to stakeholders' confidence in the regulatory process that if it is said a cross check will be used, that it is actually used.

A sense check could have two outcomes. First, applying the sense check reveals nothing unusual or anomalous about the allowed rate of return and no further action is required. Second, the sense check suggests that something is unusual or anomalous and further investigation is required. Such further investigation might conclude that no further action is required, or that

[1] Historic network performance might be used as a cross check on claims that the AER has previously set allowed rates of return too low or too high.

an adjustment to the allowed rate of return is required, either an adjustment of method or a change in a parameter of one of the models used. Other conclusions might be that the anomaly arises from some other aspect of the regulatory process, or that the anomaly is due to some peculiarity of the cross-check data, or to some transient effect.

We also agree with the AER that a difficulty with cross checks is that the information that they might contain, regarding the allowed rate of return, can be confounded by other non-rate of return factors. For example, the value of unregulated assets embedded in RAB multiples, and the effect of credit rating factors that are not included in financeability tests.

We now provide a brief summary of our views with respect to the six cross checks considered by the AER.

Financeability Test.

We discuss the financeability test at length below and on the basis of that discussion we conclude that it is not fit for purpose.

RAB Multiples.

We discuss RAB multiples at length below and on the basis of that discussion we conclude that using RAB multiples as a cross check meets all eight of the AER criteria, with the qualification that robust modelling will be challenging. Additionally, the analysis of RAB multiples will help meet the CRG criterion of engendering consumer confidence in the regulatory framework, and this is important.

Historical Profitability.

We discuss profitability testing at length below and conclude that it is unlikely to be fit for purpose. This accords with the AER's view as expressed in the rate of return omnibus document. However, there is a problem here as the AER's network performance documents suggest a contrary view. In the interests of engendering consumer confidence in the regulatory framework the AER needs to convince consumers that profitability is not fit for purpose as a cross check.

Investment Trends.

There have been suggestions that past investment trends (especially discretionary capital expenditure), might be helpful in providing a cross-check on the required rate of return. This seems like a good idea until one comes to look at the detail. There is a useful summary on pages 388 to 390 from the AER, Rate of return instrument: Explanatory statement, December 2018, which discusses various submissions on this topic. They are typically based on two pieces of evidence: changes in RAB multiples and underspending of the CAPEX allowance. RAB multiples should be directly analysed as we discuss below. Given the views expressed in the 2018 report of the strategic approaches to CAPEX allowances employed by the networks, we conclude that there is little clear information in past investment trends that would appear useful as a cross-check.

Information from Other Practitioners.

We agree with the AER that looking at other regulators' and practitioners' methods to possibly improve their own approach seems a potentially valuable exercise. However, we strongly disagree with comparison of the allowed returns of other regulators internationally, which we subsequently discuss at length and conclude that it is not fit for purpose.

In reports to the AER, we have previously discussed the pros and cons of including external companies, such as foreign regulated companies, or domestic companies not regulated by the AER, into the comparator set. This has proved problematical. We have also discussed using estimates of Beta from other sources. Here the problems are very obvious if the companies are non-Australian as the interest rates and market portfolios are different unless we move to a global CAPM. We did discuss the possibility of treating the foreign company as temporarily in the Australian market, but this involves exchange rate risk issues, see Partington and Satchell (2020). There seem no meaningful grounds to make comparisons.

Using Australian regulated companies under different regulatory frameworks may provide some information for cross-checking as interest rates and the market should coincide. This is in line with AER's approach, see (AER, 2021, p. 137) where they say:

For the return on equity, we look at other Australian regulators and other practitioners as part of estimating the market risk premium and return on equity cross check.

However, as our subsequent discussion argues, some caution is required even in domestic comparisons.

Balanced assessment

2. *Specifically, with reference to the 6 cross checks considered by the AER*

- *Do the AER's conclusions represent a balanced assessment that promotes the National Electricity and National Gas Objectives (the NEO and the NGO)*
- *Are there other relevant cross checks that the AER has not identified that might promote a balanced assessment that promotes the NEO and NGO.*

Consumer interests and equality of treatment

The key objective for the NEO and NGO is the long term interest of consumers. Thus, we begin by considering an issue that is obviously of concern to the CRG, that is equitable treatment of consumer interests in the application of cross checks. Consumers are clearly at a disadvantage with respect to lobbying as we discuss in more detail below. It is also clear from the questions that we have been asked to address that the CRG are concerned about disadvantage in the application of cross checks. This issue recurs in other CRG questions in this document.

Under the NEO and NGO, the overarching criterion guiding the regulatory process is the long run interest of consumers. Thus, it is clearly undesirable to have rate of return cross checks operating in a way that favours the networks over consumers. However, it is also undesirable to have cross checks operating in a way that favours consumers over networks. This is because

it is not in consumers' long term interests to have the allowed rate of return systematically biased to either networks or consumers. From a consumer's perspective an allowed rate of return systematically biased to consumers has the benefit of lower prices, but in the long run it will result in insufficient investment in network assets. The consequence will be low quality service with an unreliable power supply and possibly an unsafe network.

Based on the foregoing, we argue that a desirable property of cross checks is two-way operation. For example, let us suppose that financeability cross checks were undertaken. Then two-way operation would mean that if deterioration in credit metrics of the benchmark efficient entity were a basis for considering an upward adjustment in the allowed rate of return, then improvements in credit metrics should also be a basis for considering a downward adjustment.

Equality of treatment between consumers and networks also requires consistent and persistent application of the cross checks. Otherwise, there is the incentive for stakeholders to press for a particular cross check when the outcome is favourable and if subsequently the outcome becomes unfavourable to mount an argument as to why the use of the cross check no longer applies. The consistency and persistence principle is easy to state, but it is not so easy to maintain consistently balanced outcomes, as demonstrated by the current discussion of changes in the use of the trailing average cost of debt.

Lobbying

The main disadvantage that consumers face in lobbying for their interests is a financial one. This is self-evident, but it is instructive to consider a simple example. Consider what happens if the networks could get the allowed return up by ten basis points, this has been argued to be a trivial amount and in terms of the accuracy of rate of return estimates it is. However, it is not necessarily trivial in absolute dollar terms. On a small fraction of the networks' total asset base say $10 billion, it amounts to $10 million per year.

Over the five year regulatory period this is $50 million. Let us suppose networks think that there is only a very small chance, say 1%, that they could successfully lobby for a 10 basis point increase. The expected payoff over five years is 0.01 X $50 million = $500,000. After discounting for time and risk the present value would be less than $500,000, but it is clear that even for this very modest 10 basis point increase in allowed returns with a very low chance of success on only a fraction of the asset base, networks should be prepared to spend several hundred thousand dollars on lobbying. It would be interesting to know how much they actually spend.

Now consider the consumers' position: $50 million spread over millions of consumers is not very much per consumer, so there is a negligible incentive to act individually and to act as a group involves an impossible coordination effort. Even if some coordination was feasible there is another problem, what economists call the free rider problem. All consumers benefit from

successful lobbying, whether or not they contribute to the cost of lobbying, so self-interested individuals won't pay. [2]

Regulatory decisions

The situation described above is the classic case in the regulation literature that gives rise to concerns about regulatory capture.[3] It is argued in that literature that regulatory capture occurs because the regulated have greater incentives and resources to lobby the regulator compared to individual consumers with diverse interests. We wish to be clear, this discussion is not a criticism of the AER, who have a very difficult task and who in our observation work very hard to be objective and to make balanced judgements in setting an allowed rate of return consistent with the NEO and NGO.

No regulator wants to believe they have been captured, and of course this is a matter of degree. It is unlikely that regulators will only be agents for the interests of those they regulate, but it is equally unlikely that regulators will be entirely uninfluenced by lobbying. It is difficult to maintain immunity from influence given skilfully presented and persuasively argued submissions. Thus, in our opinion all regulators are at risk of regulatory capture to some degree.[4]

It seems to us that the in AER's discussion, analysis, and selection of cross checks, there is a genuine attempt to use cross checks to try to ensure the best estimate of the market required return and this is in the interest of consumers. The objective being to set a regulated return that yields no economic rents for networks and that yields just the right amount of investment in network assets.[5] However, a clear commitment to the two way application of cross checks is required to reassure consumers that cross checks will not just be a one way street. There are also some further issues to be considered in relation to the final selection and application of cross checks as contained in our subsequent discussion.

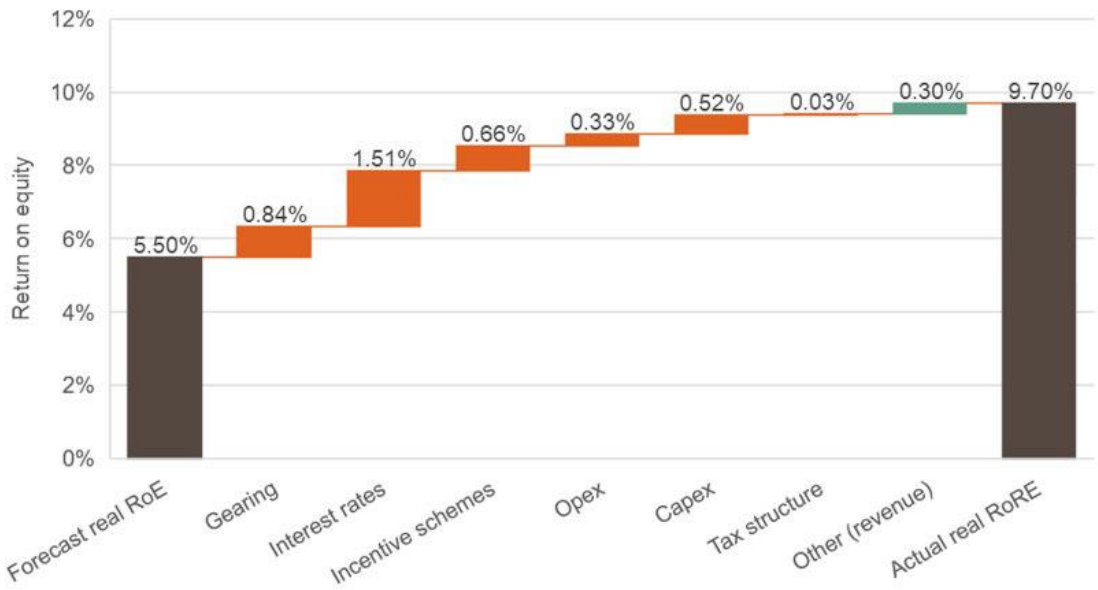
Other cross checks

One additional check which we think has merit has already been undertaken by the AER, although it is not directly used as a cross check on the allowed rate of return. That is an analysis of the incremental contributions to returns on regulated equity, which attempts to explain the components of outperformance by the networks. We reproduce a summary of this analysis in Figure 1. It is very clear from this analysis that the largest part of the outperformance in terms of return on equity comes from leverage and in particular the use of the trailing average cost

[2] We note that commercial energy users have formed their own lobbying group which helps offset some of the imbalance in lobbying resources.
[3] The term regulatory capture comes from the literature on regulation and we wish to stress that this discussion was prompted by our own analysis and was not encouraged by the CRG.
[4] For the AER, acting in the interests of consumers does not reflect regulatory capture by consumers, since acting in consumer interests is the AER's mandate.
[5] This result arises from the application of the NPV = 0 criterion, but unfortunately in the AER's current WACC calculation the use of the trailing average cost of debt is inconsistent with the NPV = 0 criterion.

of debt at a time when networks have been able to refinance at much lower interest rates.[6] However, as footnote 6 explains some caution should be exercised in interpreting the precise magnitude of the interest rate effect. Footnote 6 reflects an aspect of Figure 1 that troubles us. It is not clear how the AER has addressed the problem that we subsequently discuss of reconciling a market based measure of returns with an accounting based measure.

Figure 1: Analysis of sources outperformance for the return on equity



Source: Electricity network performance report AER 2021.

Financeability

2.1 *What are the risks that financeability testing as a cross check on the total rate of return will result in an asymmetry that favours networks over consumers? The analysis should cover, but is not to be limited to, the following factors:*

Detailed analysis is given below, and brief responses are provided under each sub-question. Our overall conclusion is that financeability tests fail the fit for purpose criterion.

a. Networks and their owners have advocated for the application of narrow financeability tests such as a single FFO/debt test that is not reflective of the broader quantitative and qualitative tests carried out by ratings agencies, for example. This runs the risk of creating a case for financeability adjustments when they are not required.

Use of a single FFO/debt test for financeability is not appropriate.

[6] The magnitude of the effect is the result of a particular allocation of interest expenses, alternative bases of allocation would yield different results.

b. The RoRI is set as a binding instrument for all networks without reference to other elements of a regulatory determination that impact financeability, such as depreciation rates, and capex profiles and regulatory taxation allowance. Thus, linking financeability outcomes purely to a rate of return decision (or even to a notional "average" network) may result in creating a case for financeability adjustments that are not required for specific networks.

We do not recommend the use of financeability tests but if they are to be used they should not be linked purely to a rate of return decision. There should be reference to other factors that affect financeability such as depreciation allowances and also the full range of financial policy decisions that networks, including the benchmark efficient entity, might use to deal with financeability issues. This causes problems for the hypothetical financeability analysis based on the benchmark efficient entity, because specification of the financial policies of the benchmark efficient entity is substantially incomplete.

c. Financeability testing risks an inherent asymmetry if the only possible adjustment to the rate of return is upwards. Logically, if upward adjustments to the rate of return are legitimate, then so too are adjustments down where financeability testing indicates significant headroom or a higher credit rating than the AER's benchmark. How could financeability testing be made formally symmetric?

If financeability testing was used as a basis to adjust allowed returns upward as credit metrics deteriorate, then it should also be used to adjust allowed returns downwards as credit metrics improve. One mechanism for adjustment would be to make an adjustment to the cost of debt consistent with the change in credit spreads moving from one implied rating grade to another. Such a process would be symmetric with respect to the treatment but not the magnitude of adjustment since changes in credit spreads are not symmetric across rating changes. However, we do not recommend any of this since we do not support the use of financeability tests for cross checks on the rate of return.

Debt ratings and allowed rates of return

We identify several problems with the use of financeability as a cross check that make it not fit for purpose. Note that we do not dispute that the allowed rate of return can affect the rating grade that a network receives. Clearly rating grades are affected by actual and anticipated regulatory decisions on the allowed rate of return. What we do dispute is that rating migrations are a dependable basis for making judgements about whether the allowed rate of return is appropriate. We also dispute the likelihood that a financeability test provides a reliable assessment of the impact of the allowed rate of return on rating grades.

The task of a rating agency is to assess the risk of default. The task of the regulator is to set the allowed rate of return equal to the best estimate of the equilibrium expected rate of return. These are two very different tasks. As a result, there is not necessarily any implication to be drawn about the appropriate allowed rate of return consequent to an actual or foreshadowed credit rating change.

We present below Table 1 that gives the factors that Moody's considers in rating regulated energy networks. The table also gives the weighting that each factor receives. It is clear from this table that the rating depends upon a range of quantitative and non-quantitative factors. It is also clear that the quantitative factors do not just depend on the allowed rate of return, they also depend on other components of regulatory compensation such as OPEX allowances, the network's actual operating costs, and network policies with regard to debt levels and holdings of liquid assets. An analysis that holds everything else constant and just examines the impact of the allowed rate of return will tell you about the hypothetical shift in a financial ratio, or ratios, but it will not give you a reliable assessment of actual changes in a credit rating.

Table 1: Moody's grid for rating factors and their weights

Factors considered	Percentage weighting
Stability and Predictability of Regulatory Regime	15%
Asset Ownership Model	5%
Cost and Investment Recovery (Ability and Timeliness)	15%
Revenue Risk	5%
Scale and Complexity of Capital Program	10%
Financial Policy	10%
FFO + interest/interest	10%
net debt/RAB	12.5%
FFO/net debt	12.5%
RCF/net debt	5%
Total	100%

Even if there were a compelling case that the credit rating is likely to change, this does not necessarily demonstrate that there is anything wrong with the magnitude of the allowed rate of return. The conclusion that there is a problem with the allowed rate of return does not automatically follow even when, as a consequence of changes to the allowed rate of return, there is an actual credit rating change. We now present two scenarios to demonstrate this point.

Assume that over the last regulatory period the regulator had overestimated the allowed rate of return. Also assume as a consequence that managers rationally increased levels of leverage since the gains from leverage were greater, and that they have also reduced the balance of liquid assets since net cash flows were stronger. Now assume the regulator corrects the error and gets the allowed rate of return exactly right. Credit rating agencies respond by downgrading some network debt. There is nothing wrong with the new allowed rate of return, the problem is the weaker financial position of the networks as a consequence of past decisions that they have made.

Now assume the regulator had set the allowed rate of return exactly right in the last regulatory period and gets it exactly right in the current regulatory period. Subsequent to the announcement of the new regulatory return the credit rating agencies downgrade some

network debt. The reason in this case is that the economy is moving into a recession. Rating agency gradings are procyclical, that is the agencies become much more likely to downgrade debt in bad times. Again, no adjustment to the allowed rate of return is required.

Our point is not that there is never a case where the regulator gets it wrong. Rather the point is that a rating grade change, even when linked to a rate of return determination, does not automatically signal a problem with the allowed rate of return.

Focus on one rating factor

If the financeability assessment focusses on a single rating factor, such as the Funds from operations to debt ratio (FFO/Debt), this would be a significant problem. Moodys's (2009) in describing their rating method for electricity networks and gas pipelines state, in respect to the FFO/Net debt ratio that they use, (p19):

> *Although it is not a highly relevant metric to benchmark regulated networks operating under very different regulatory financial models (see Appendix D), its development over a certain period of time gives useful information as to the ability of a company to generate sufficient cash flow to cover future debt repayments.*

Moody's Appendix D demonstrates a clear need to interpret the FFO/Debt ratio jointly with other ratios and in relation to the context of other network expenses and regulatory allowances.[7]

In their 2017 description of their rating methodology for networks and pipelines, Moody's in relation to FFO/net debt again comment on the issue of different regulatory frameworks and go on to state (p.18):

> *More specifically, a higher level of FFO / net debt may not be a sign of financial strength when it is driven by a higher level of regulatory depreciation. Nevertheless, in comparing two companies that maintain a similar net debt / RAB ratio over a period of time, a higher level of FFO / net debt is usually indicative of greater financial strength.*

Moody's also provides an appendix with four examples that highlight the variation in FFO/net debt ratio, with a range from 12% to 18%. This variation in ratios arises from varying regulatory treatment of allowances and also Moody's classification of capital charges. On the basis of the foregoing, using the FFO/Debt ratio as a single metric of financeability is inappropriate.

In any event, focussing on a single metric raises two other problems. The first is that one metric tells you very little about what rating grade the rating agency will actually determine, and indeed use of one metric could very easily lead you to make entirely the wrong prediction about that rating grade. As a consequence, the wrong inference about financeability would be made.

[7] The problem illustrated in Appendix D arises from capital charges that are compensated by the regulator, but which are not classified as operating cash flows.

For example, if the FFO/Debt ratio fails to meet the standard for a particular rating grade and you rely on that information alone you would predict a rating downgrade. In the case of Moody's credit ratings for regulated networks, the ratio of FFO/net debt carries a 12.5% weighting. This leaves the wider set of factors that Moody's considers in Table 1 with an 87.5% weighting. Furthermore, in addition to the factors in the table Moody's allows up to a three-notch uplift for structural features that increase protection to creditors. Moody's also considers liquidity, which they describe as being frequently critical to rating grades, but this is not a factor in Table 1. Consideration of this wider information set could easily lead to the rating remaining unchanged despite deterioration in the FFO/net debt ratio or might even result in a rating upgrade.

The second problem is that accepting a focus on a single credit rating factor is an invitation to gaming. For example, in forming its credit rating Moody's considers the stability and predictability of the regulatory regime. Consideration of this factor alone could be used to support an argument against any regulatory change on the basis that it would cause rating downgrades. However, Moody's only give the stability and predictability of the regulatory regime a 15% weighting. Thus, what would actually happen to ratings as a result of regulatory regime change would depend on Moody's assessment of both the importance of the change and their assessment of the wider information set which carries an 85% weighting.

Our point here is that it is unwise to allow opportunities for cherry-picking. In particular cherry-picking which implicitly overweights one credit rating factor by not considering the joint impact of all credit rating factors on the rating grade.

Rating Hypotheticals

The solution to the cherry-picking problem would be to extend the analysis to consideration of the joint impact of all the factors on the credit rating. Unfortunately, this is not a feasible solution since much of the rating depends on the credit rating agency's assessment of qualitative factors. It is possible to extend the analysis to consider all of the quantitative metrics and conclude on the basis of those metrics that there might be a predisposition to a rating change. However, this conclusion will likely be based on no more than half of the information that rating agencies use and probably less than half. Moody's for example gives the quantitative factors a 40% weighting. Thus, any financeability assessment is both a hypothetical and substantially incomplete analysis of the impact of regulatory compensation on credit ratings.

We argue that a hypothetical analysis of credit rating effects based on the hypothetical efficient leverage ratio of a hypothetical efficient benchmark entity that does not have fully specified financial policies, has little or no value. To begin, we argue that no one knows what the true optimal leverage ratio for the benchmark efficient entity is, and that furthermore the assumed leverage ratio is not critically important to the WACC. We explain the reasons for this at length in Partington and Satchell's (2021) leverage and WACC report, so we will not repeat all the details here. The two key features that are relevant here are first the reason for setting a regulatory leverage ratio and second the effect of leverage on the WACC.

If the allowance for regulated returns is based on the actual leverage ratio of regulated firms, then there can be an incentive for firms to game the regulated return by changing their leverage ratio. This has been a real issue in US regulatory cases. The solution is to set a regulatory leverage ratio for determination of the WACC and then let firms choose whatever leverage ratio they see as best for themselves. As long as the selected regulatory ratio is reasonably sensible and not too extreme the actual value chosen is not so important. It is clearly observable from AER statistics (see Table 2 below) that the debt ratios for regulated networks vary significantly in both the time series and the cross section, so if there is a well defined optimal leverage ratio for networks, which we very much doubt, then it seems to vary substantially across firms and for the same firm through time.

Table 2: Market value leverage ratio for Networks

	ENV	APA	DUE	AST	SKI	AVE
2007	65%	59%	67%	55%	61%	61%
2008	77%	73%	76%	59%	72%	71%
2009	75%	68%	80%	70%	72%	73%
2010	74%	61%	80%	64%	67%	69%
2011	66%	53%	79%	64%	64%	65%
2012	63%	47%	72%	59%	61%	60%
2013	53%	46%	71%	57%	64%	58%
2014	47%	45%	64%	58%	57%	54%
2015	N/A	50%	62%	59%	58%	57%
2016	N/A	49%	51%	57%	N/A	52%
5 year average	**54%**	**48%**	**64%**	**58%**	**60%**	**57%**
10 year average	**65%**	**55%**	**70%**	**60%**	**64%**	**63%**

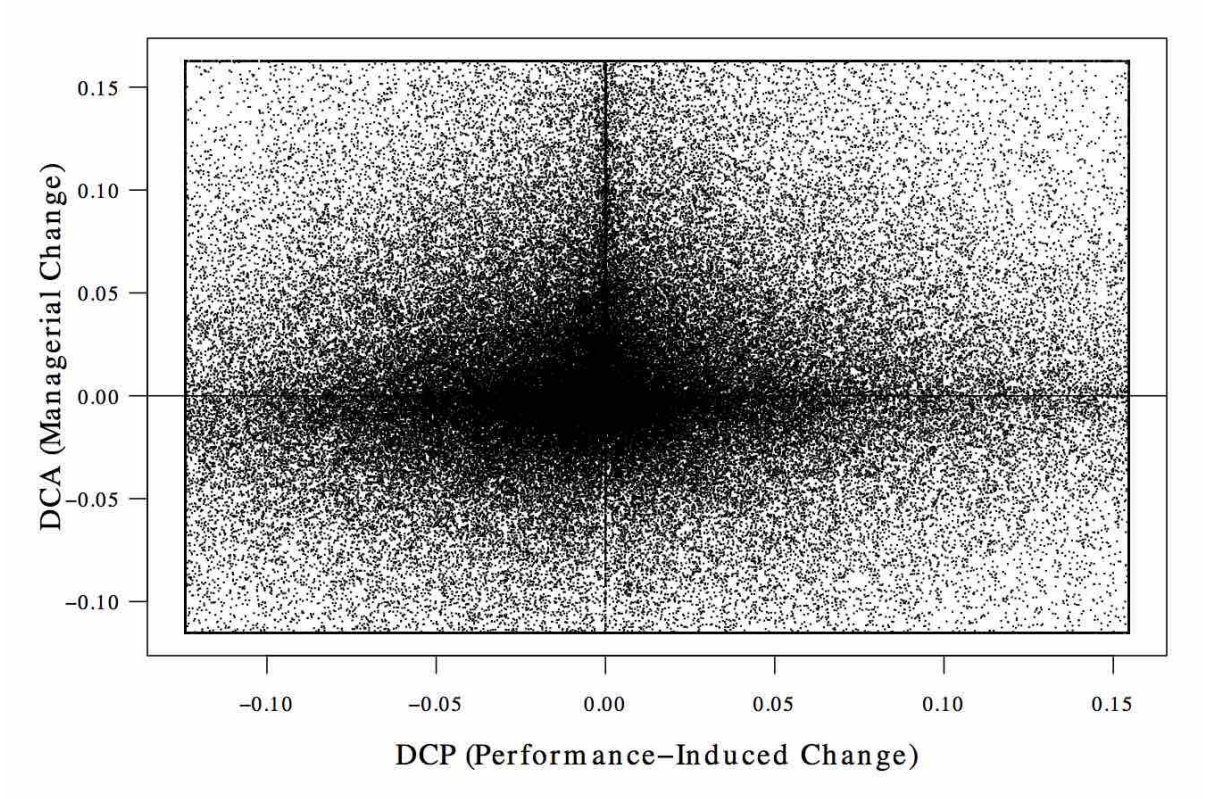
Source: AER Gearing Discussion Paper 2018

One important cause of variation in leverage ratios is changes in the market value of equity and this may move firms away from a target leverage ratio. This clearly is not under the control of management. Book value leverage ratios are more stable, but they are not relevant to the WACC.

While changes in market leverage may not be under management control, neither does it seem that the cost of such uncontrolled variance of leverage is large, as there is little evidence in the AER data of managers swiftly rebalancing the capital structure towards a leverage target. This is consistent with behaviour across companies generally as Figure 2 shows. If companies

responded to shifts in leverage caused by changes in the market value of equity, then managers should offset those changes. As market value leverage falls due to an increase in the value of equity managers should issue more debt in order to increase leverage and vice versa. Thus, market and management induced changes in leverage should be negatively correlated. As Figure 2 shows there appears to be no correlation.

Figure 2: Management induced leverage changes v Market induced leverage changes



The x-axis are leverage ratio changes caused by stock returns (equity value changes). The y-axis are managerially-induced leverage ratio changes (such as issuing activity). If managers wanted to target a leverage ratio, we should see a strong negative correlation between the two.

Source: Ivo Welch website (https://www.ivo-welch.info/home/card-levratio.html). The full paper can be found at https://ssrn.com/abstract=489664.

The exact level of leverage chosen as the efficient benchmark is not so important since the WACC is relatively insensitive to changes in leverage. This would also explain why managers do not swiftly rebalance leverage to some target level. In the AER's calculations, where the plain vanilla WACC is used, in theory the WACC should be a constant independent of leverage. We would expect this to be a good approximation to reality except at extreme levels of leverage.[8]

[8] This may at first sight seem surprising, but it goes back to a point we have repeatedly made in the past; the required rate of return is fundamentally determined by the nature of the underlying assets, since it is these assets that generate the cash flow to the investors and determine the total risk of the portfolio of the firm's issued

There can be side effects from financing choices, such as exploiting tax benefits and tax loopholes, but except at extreme levels of leverage these side effects are second order effects. Also, in reality default risk increases as leverage increases and this leads to an increase in promised returns on debt. We have more to say about promised returns at the end of the financeability section.

The bottom line of all this is that while credit metrics depend on the level of debt, the WACC is little if at all affected by changes to the level of leverage that are not too extreme. Thus, adjusting the level of leverage can adjust the credit metrics while leaving the WACC unchanged. The question then becomes whether the leverage of the benchmark efficient entity would be adjusted to maintain a set rating grade, rising as credit metrics improve, or falling when they deteriorate, or whether leverage would always be fixed at a somewhat arbitrary constant value of 60%. We call this level of leverage somewhat arbitrary because the 60% was not set according to some measure of optimality, rather it was set as an approximation of the average level of network leverage that prevailed at the time the benchmark was set.

The choice is clear, if the assumed change of rating grade is given any credence, either assume an adjustment of leverage to offset this, or accept the assumed change in rating grade. Assuming the leverage is fixed, the assumed change in rating grade may be up or down, depending on whether credit metrics improve or deteriorate. This in turn means that the cost of debt should then be moved up or down according to the direction of the assumed shift in rating grades.[9] In other words, changing credit metrics is not a one-way street.

There is the substantial problem that the financial policies of the benchmark efficient entity are not fully specified. For example, it is to be expected that the benchmark efficient entity would have an investment in cash and liquid assets (cash equivalents). There would be a precautionary component to cover unexpected contingencies and an additional component to provide the desired level of financial slack. The net debt of the benchmark efficient entity would therefore be lower than 60%. How much lower is not known since the extent of cash and liquid asset holdings for the benchmark efficient entity are not specified. It is clear, however, that a net debt lower than 60% would improve three of the four quantitative credit metrics that Moody's use (net debt/RAB, FFO/net debt, RCF/net debt). Also, as Moody's point out, levels of liquidity can frequently be critical to rating grades.

We could also assume, for example, that if the benchmark entity was at risk of a credit rating downgrade it might review its dividend policy. It would probably be reluctant to cut the dividend and so it might institute a dividend reinvestment plan, or if it already had a dividend reinvestment plan it might have that plan underwritten. Possibly the benchmark efficient entity

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securities. Therefore, if you don't change the assets, you don't change the overall required return. With respect to the issued securities the intuition is that if you increase leverage you benefit from the fact that debt is cheaper than equity, but more debt increases the risk of equity, which means that the required return on equity increases. The required return of equity increases in such a way as to exactly offset the benefit of using lower cost of debt and vice versa if leverage is reduced.

[9] This is the logical outcome of the hypothetical financeability process, but we think the process has no merit at all.

has a guarantee from a parent entity that helps protect it from a downgrade or has some other structural features that might give it say a two-notch uplift. The valid complaint about such assumptions would be that they are entirely hypothetical. They are entirely hypothetical and that is exactly the problem, the whole financeability exercise is entirely hypothetical.

What is not hypothetical is that real networks at risk of credit downgrades could and likely would use financial policies such as leverage adjustments and/or dividend policy changes, and/or an anticipatory build-up of cash and liquid assists to offset solvency risks. This is appropriate and is what would happen in a truly competitive market. Solvency risk is the responsibility of management. The counter argument is that rating grades may be affected by the allowed return that the AER sets and that is not something that can be directly managed. However, this is not much of a counter argument as adjustments to leverage can fix such problems without much, if at all, affecting the WACC. Solvency management is the function of management not the AER and we have more to say about this in the next section.

Changes in ratings

We expect that the AER is interested in the solvency of the networks, but rather than consider hypotheticals about rating grades, we suggest it would be more useful to focus on what rating agencies are actually doing. Rating agencies regularly provide advance guidance on possible or likely changes in ratings, for example S&P's credit watch and rating outlook notices. If such material suggested a threat to rating grades across most networks, then this would be a solid basis for concern about real as opposed to hypothetical credit ratings. However, as we explained earlier, this would not necessarily imply an error in setting the magnitude of the allowed rate of return even if the credit rating agencies cite that return as the reason for the downgrade.

Even more serious would be the case that downgrades below investment grade credit ratings were contemplated. However, we consider that downgrades of networks to below investment grade credit ratings is a low probability event. First there is the inherently low risk as a consequence of being a regulated monopoly, as reflected in the labelling of the equity in networks as a bond proxy. Second networks with credit ratings a notch or two above the boundary between investment and speculative grades are very likely to implement financial policies that reduce the risk of a downgrade.

Suppose there was a real threat of a network credit migration to a speculative grade, or even suppose it was just a threat of widespread downgrades within investment grade ratings. The question then becomes what form of regulatory relief the AER should offer, if any. For example, it is quite possible that improving cash flow by allowing accelerated depreciation would be a more appropriate response than adjusting the allowed rate of return.

We would, however, question an automatic assumption that regulatory action was necessary. It is not at all clear that passing the cost of credit downgrades on to consumers is in the long-term interest of consumers. It can also have perverse consequences for incentives. We recall a comment in a credit agency report to the effect that utility defaults/bankruptcies were very

infrequent and that when they occurred, they tended to be strategic. That is, their purpose was to seek regulatory relief.

It is clear that the AER would wish to avoid a significant disruption of supply due to severe solvency problems being experienced by a network. In such a case it might not be appropriate to solve the problem by loading more costs onto consumers, but perhaps instead to look to managing a smooth transition to new owners for the network. It is not generally appropriate for regulatory decisions to drive companies into insolvency, but it also provides the wrong incentives if consumers are automatically expected to effectively guarantee solvency, or even rating grades. The banking crisis that precipitated the GFC reminds us that severe problems in corporate behaviour can arise from poor incentives. With respect to allowing insolvency, we note the precedent of the UK regulator Ofgem in allowing the failure of a substantial number of "power suppliers" (retailers) in the UK.

Default premiums

Financeability is about rating grades which in turn are about default risk and ultimately default premiums on debt. We therefore conclude our discussion by considering the regulatory treatment of default premiums. Under current regulatory arrangements networks are compensated for the default premium component of the cost of debt since the cost of debt is based on promised rather than expected yields.

Let us clarify what this means with a simple example. Suppose that investors require a 3% expected return on debt. Also suppose that investors expect that there is a 90% chance that the borrower will pay in full and a 10% chance that there will be a default, in which case the lender receives nothing. Now suppose the borrower plans to issue a one year loan at a price of $100 offering a coupon payment of $3 plus $100 repayment of principal at the end of the year. However, in this case lenders will not lend $100. They will value the loan at 0.9 x $103/1.03 = $90. In order to borrow $100, the borrower would have to offer lenders a payment of $114.44 at the end of the year. The loan would then be valued at 114.44 x 0.9/1.03 = 100. The return promised to investors is now 14 44% but the return they expect and require is only 3%. The difference of 11.44% is the default risk premium.

The theory underlying the NPV = 0 criterion adopted by the AER is very clear. Discount expected cash flows at the equilibrium expected rate of return, which is equal to the rate of return that investors require in order to induce them to invest. As the example above shows, investors are promised 14.44% but they only need to expect to receive 3% in order to induce them to invest. In this case, if regulators set a 3% allowed rate of return, then that is all that would be required. In contrast, if networks are allowed the promised return on debt, in this case it would be 14.44%. As this example shows, whatever their rating grade, networks are being overcompensated relative to the expected rate of return on debt. We note however, that the overcompensation would not be so extreme as in this example. The credit spread on BBB rated debt, for example, would be likely to be in the range of 1% to 3% and some component of this spread would probably be due to risks other than default risk.

It is standard practice to use the promised rate return on debt when computing the WACC, but it is debatable whether it should be standard practice for the AER. The AER uses the WACC in a way that is very different to most other users. The AER uses the WACC to establish the allowed cash flow, whereas companies use the WACC in capital budgeting as the basis for the discount rate. For this latter purpose some upward bias is not necessarily regarded as a bad thing. Indeed, many companies add a couple of percent to the WACC when establishing the discount rate (hurdle rate) for use in evaluating investment projects. There are a number of good reasons for this, for example offsetting over-optimistic cash flow forecasts submitted by divisional managers.

It is less clear that biasing the allowed cash flow upwards is in the interest of consumers. Consumers have a valid case that debates about fine tuning debt risk premium measures, or debates about hypothetical effects on rating grades and hence changes in debt risk premiums are of limited relevance, since the more fundamental question is: should any debt risk premium be allowed at all?

RAB multiples

2.2 *What do current RAB multiples indicate in terms of: the attractiveness of the regulated assets to which the 2022 RoRI applies and claims by networks and their shareholders that the current Return on Equity is insufficient?*

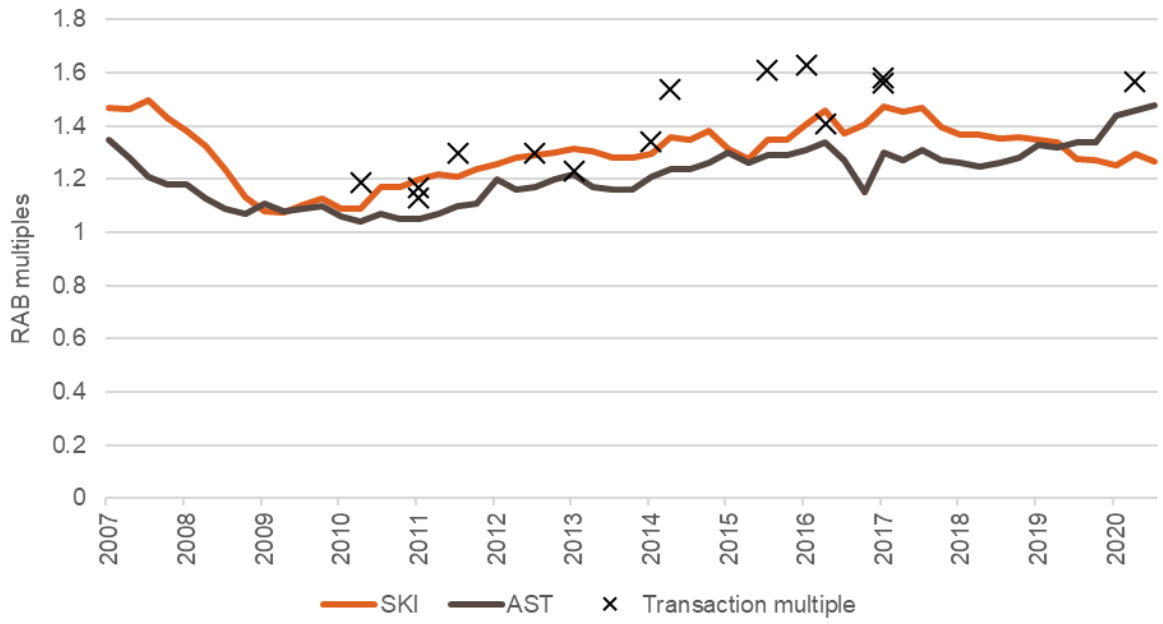
Analysis may be required to break down potential rationales for RAB multiples. These should include but not be limited to: the quantum of unregulated cashflows and the ability of the regulated network to out-earn its allowed cost of capital. While these rationales would be based on expected future cashflows, the CRG considers that historical data and current regulatory settings (such as the 2018 RoRI, which is currently in force) is likely to guide such expectations and thus is relevant
A relevant analytical reference source is this paper by Daryll Biggar.
Data relevant to RAB multiples and historical profitability can be found in the AER's Network Performance reports. The Supplier will also need to obtain RAB multiple data on recent transactions not included in the latest performance reports, including:
Purchase of Spark Infrastructure by KKR/OTPP
Purchase of AusNet Services by Brookfield Infrastructure
Purchase of a 16.8% stake in Ausgrid by APG

Magnitude of RAB multiples

If network businesses had only regulated assets and if they were expected to a earn return on those assets exactly equal to the regulated rate of return, which in turn was equal to the market opportunity cost of capital, then the ratio of the market value of the business to the RAB would be 1. Figure 3 below presents RAB multiples for both takeover transactions and for networks traded on the ASX. It is clear that RAB multiples have been consistently above 1. Unsurprisingly they fell consequent to the GFC and then from 2010 onwards there has been an upward trend. The multiples for the traded networks contain no control premium, but even so have experienced values above 1.4. The AER also reports additional data that arose in 2020 when

the Canadian pension fund OMERS took a 19.99% stake in TransGrid at a RAB multiple of 1.57. There have been three additional transactions since then at substantial RAB multiples and we discuss these next.

Figure 3: AER regulated networks – transaction and trading multiples



Source: Electricity network performance report AER 2021

Recent transactions

It is clear from the three examples below that regulated Australian networks appear as attractive investments for international investors; in the three examples discussed below, the investors are Ontario Teachers (Canadian pension fund), KKR (Investment manager associated with leveraged buyouts), Public Sector Pension Investment Board (Pension fund manager) Brookfield Infrastructure (Canadian infrastructure investors) and AGP (Dutch Pension Fund). These are highly sophisticated investors and whilst the prices they are paying may well include some specific benefits to them (possibly aspects of international diversification and maturity matching with their liabilities) as well as good returns, it seems that the firms being purchased are chosen because their characteristics are appealing in terms of risk and return, even after allowing for currency risk.

It is interesting that very substantial premiums are being paid in these bids because the usual reason for a control premium, gains from synergy/restructuring, seems unlikely to apply in the case of portfolio investors like pension funds, although it might apply in the case of KKR. We discuss details of the three transactions next.

1. Purchase of Spark Infrastructure by KKR/OTPP

On December 22, 2021, KKR, Ontario Teachers' Pension Plan Board ("Ontario Teachers'") and Public Sector Pension Investment Board ("PSP Investments" and together, "the Consortium")

announced the completion of the acquisition of all issued securities of Spark Infrastructure (ASX: SKI) in an all-cash transaction for approximately A$5.2 billion.

Macquarie analysts told clients in July 2021 that a $2.80 a share bid inclusive of any distributions by Spark valued the company at 1.37-times RAB - which is the relevant metric used when valuing poles and wires companies - or 12.1-times earnings, on an enterprise value to EBITDA basis. The final accepted offer was $2.94 per stapled security.

In the KPMG expert's report dated October 11th, 2021, the value to RAB ratio was placed at between 1.38 (low value) to 1.47 (high value) as at June 21, 2021; the variation being due to variation in the enterprise value of the asset. (see page 173, Spark infrastructure scheme booklet, 19 Oct 2021).

2. Purchase of AusNet Services by Brookfield Infrastructure

Grant Samuels provided an independent report in the scheme booklet (pp. 90-228) Scheme-Meeting and Scheme Booklet registered with ASIC. Much of this long report discusses previous use of value to RAB multiple ratios in previous trades of Australian regulated industries. It appears from reading their discussion that the notion of what is a "fair" ratio is at least partly determined by finding a recent partial/total purchase/sale involving a near-identical regulated firm. Also, this history is used to identify factors that may increase/decrease the ratio, for example (page 170, ibid):

> *…scale and greater geographical diversification. Most of the acquisitions involved large electricity transmission or distribution businesses with broad geographical footprints across different states which mitigate exposure to regional risks (e.g. demand and weather). In contrast, the acquisitions of Mortlake Terminal Station, DirectLink and MurrayLink involved much smaller, single infrastructure assets. These smaller transactions occurred at lower EBITDA and RAB multiples compared to the acquisitions of larger businesses;*

On page 183, they provide further detailed discussion on factors that may influence the ratio. In particular, they use the recent purchase of Spark as a benchmark, noting that the macroeconomic factors will be broadly similar and that they will both be at the same stage in the regulatory cycle. These include the corporate structure of Spark. Its exposure to South Australia (which has lower population density, smaller target population and lower growth rates than Victoria). However, they note that the ratio for the Spark acquisition (of 1.47 times) is below the ratio for AusNet's electricity distribution business (of 1.58-1.64 times).

Grant Samuels conclude that AusNet's electricity distribution business should be compared with similar assets in New South Wales given the comparable catchment sizes and high population densities. Using this mode of comparison, they note that recent transactions have been in the range of 1.44 to 1.62. Again, they list a number of considerations as to why the correct ratio should be near the top of this range, listing some caveats as well. They note that Ausnet services should be discounted relative to TransGrid, which took place at 15-17 times

EBITDA (historical and forecast) and 1.60-1.66 times RAB. They list a number of desirable aspects of Transgrid such as its monopoly position in NSW as to why it might be worth more.

These comments show that in the evaluation of RAB multiples as guiding the purchase/sales price, one looks for a close comparator or comparators and evaluates the different features as to whether this would make the purchase more or less attractive and move the ratio accordingly. This is a typical financial problem rather like commercial real estate where the extreme heterogeneity of the firms/assets under consideration makes fair value concepts very imprecise, at best you might get a plausible range.

On page 187, there is a summary leading to suggested ratios. We quote again:

> *Nevertheless, the data provides a reasonably consistent picture. A significant number of acquisitions took place at 12.5-13 times historical and 10-13 times forecast EBITDA and, while RAB multiples have been across a wider range, the majority of small-to-medium sized transactions (i.e. less than $2.5 billion implied enterprise value) have occurred at around 1.2-1.3 times RAB. Higher multiples (14-18 times EBITDA or more than 1.45-1.6 times RAB) have been paid in a number of instances but these reflected the specific attributes and circumstances of the businesses being acquired which do not apply to AusNet's gas distribution business (e.g. operational efficiencies from privatising a government owned business and larger scale). In Grant Samuel's view, implied multiples of 12.5-13.1 times historical and 13.0-13.6 times forecast EBITDA and 1.20-1.26 times RAB, while at the high end of the range of comparable transactions, are justified by the specific attributes of AusNet's gas distribution business.*

They go on to list a number of considerations as to why the ratio would be near the top of the range.

3.Purchase of a 16.8% stake in Ausgrid by APG

Here according to the Ausgrid Debt Investor Presentation, July 2020, 95% of the revenue is regulated. We are unable to find an exact value for the RAB multiple and so have inferred one from the available data. Our calculations are based on the following comment in the Australian Financial Review 10, October 2021:

> *Australian Super and IFM Investors bought a combined 50.4 per cent stake in Ausgrid in 2016, in a deal valuing it at $20.7 billion, or 1.41 times RAB (on an enterprise value to regulated and contracted asset base basis). Multiples for minority stakes in regulated electricity assets have since gone up, as seen by the 1.46-times offered for Spark Infrastructure and 1.6-times at Transgrid last year. Ausgrid had a $14.68 billion RAB at June 30 and is scheduled to hit $15.01 billion at the end of the financial year 2021. A deal at 1.4-times historical RAB would value Ausgrid at about $20.6 billion and the stake at*

$3.5 billion, on an enterprise value basis. However, Ausgrid has debt - $12.6 billion at June 30 2021 according to accounts filed with the SGX - and whoever buys the stake needs to pay an equity cheque, only.

At a ratio of 1.4, the stake purchased would be worth about $1.35 billion. It actually sold for 1.6 billion suggesting a ratio of (1.4 x 160/135) about 1.66, this seems high compared with comments by Grant Samuel that smaller non-controlling stakes would have a lower ratio. It is, however, consistent with some of their comments on page 16 of their report. We do note that this is an estimate, and the actual ratio may differ from this amount.

RAB multiples and the adequacy of the return on equity

From all the foregoing data it is clear that RAB multiples are substantially above one and that substantial premiums continue to be paid despite a reduction in the allowed rate of return. As a minimum this implies that the rate of return allowed by the AER is not a deterrent to investing in network businesses. Claims by networks and their shareholders that the current return on equity is insufficient would be more compelling if stakes in networks were now difficult to sell and required transactions at RAB multiples much lower than those that have prevailed historically. This, however, is clearly not the case. Indeed, RAB multiples in excess of 1.3 seem to have become a standard part of the valuation toolkit.

The substantial RAB multiples suggest that either the allowed rate of return is at least adequate, or overly generous, or that investors are buying something else that more than compensates for any shortfall in the AER's allowed return. If the latter is the case, it would be of interest to consumers and presumably the AER to know exactly what that something else is. It seems to us that this is a rather important issue. In the case of Ausgrid and Ausnet it hardly seems that the something else can be the unregulated segment of the business. Our understanding is that for these businesses, unregulated activities are a small component of the total business. Unregulated revenue for Ausgrid has been about 5% of total revenue and for Ausnet about 15% of total revenue.

Is investigation needed?

The AER's 2021 Electricity network performance report (p.28) quotes Biggar (2018):

Based on the data above and the analysis in this paper, is it possible to suggest a "normal" or "typical" range for RAB multiples?
This is difficult to assess and there is no fully objective perspective. In my view, due to each firm's ability to earn rewards for taking desirable actions, an Enterprise Value (EV)/RAB ratio of slightly above one should be considered normal. This is consistent with the theoretical observation that the regulated firm must be left some "information rents" in an optimal regulatory contract. I therefore suggest that, as a starting point, an EV/RAB in the vicinity of 1.1 should be considered unobjectionable. In addition, due to uncertainties and complexities in the regulatory process, and in the process of estimating the EV

> *and the RAB, I suggest an error margin of plus or minus twenty per cent on this figure could be considered a "normal range".*

Biggar (2018) continues by observing that:

> *In a 2005 report the Queensland Competition Authority drew a similar conclusion: "The Authority notes that, at a recent conference attended by key infrastructure companies, a poll indicated that almost 60% of respondents believed an appropriate RAB multiple was 1.1x to 1.2x and that, for over 40% of respondents, the key factor in deciding an appropriate multiple was the 'spread between the allowed return and actual WACC'."*

Since 2014 RAB multiples have, with the exception of Ausnet, been above the upper boundary of about 1.3 suggested by Biggar (2018) and Ausnet has been above this boundary since 2019. For consumers, looking at both RAB multiples and the profitability of the networks, it is natural to ask are networks being overcompensated? We would encourage the AER to investigate RAB multiples further, not only because the data suggests that this is warranted, but also because it would be a sign of good faith for consumers and so in the words of the CRG criterion 1: "engender consumer confidence in the regulatory framework". It is unlikely to be an easy investigation, but we would encourage the AER to try. It is easy to say that the analysis can't be done, but this is tantamount to saying investors have an impossible task in valuing the network businesses when clearly they do it.

What is the source of high RAB multiples?

The key question is do RAB multiples represent an overly generous allowed rate of return, or as is alternatively claimed, are the high multiples due to outperformance with respect to efficiency benchmarks plus the value of unregulated assets? If high multiples are due to outperformance, then that outperformance is apparently substantial and is expected to continue well into the future. Given the evidence of different networks with multiples consistently well above one, outperformance also appears to be pervasive across networks. If substantial outperformance is expected to continue across time and across networks, the quality of the efficiency benchmarks comes into question. It is probably desirable to leave some money on the table (RAB >1) to motivate efficiency,[10] but is too much money being left on the table (RAB >> 1)?

Some may argue that the value over and above the RAB comes from expected value growth in the networks, since a RAB multiple is analogous to a market to book ratio and stocks with market to book ratios greater than one are considered growth stocks. However, value creation only comes when the expected return on an investment exceeds the market discount rate. This then leads us back to the point that such value growth from investment in networks comes

[10] If efficiency standards are too tight and are increased to offset any efficiency gains achieved, then the incentive is to stop trying.

from either an allowed rate of return higher than the market rate of return, or expectations of substantial continuing outperformance.

It may well be that network businesses have a value component that arises from real options. Typical real options are options to expand, options to contract, and options to switch technologies. However, if it is deemed that real options do contribute significantly to explaining the high RAB multiples, then those options should be identified and valued. Valuing real options is challenging, but there are techniques to do it. If there are significant real options and their value arises from the existence of the regulated network, then shareholders are enjoying an additional source of value over and above the compensation provided by the allowed rate of return. It is then an open question whether at least part of this value should be shared with consumers.

Scenario testing.

2.3 *The CRG is supportive in principle of scenario testing. However, there are two key issues we have identified:*

Scenario testing runs the risk of being asymmetric – that it only prompts adjustments to the AER's decisions where there is potential harm to network investors. A balanced use of scenarios should also guide the AER's decision when there are unacceptable impacts on consumers and consumer investment decisions.

Scenario testing opens up a whole new area of debate within the process – what scenarios should be run, how can probabilities be assigned to them, what other inputs are relevant to the model, what response is appropriate to extreme scenarios that cast doubt on the appropriateness of the rate of return, etc? This debate inherently favours stakeholders with greater resources, i.e. networks and their shareholders.

An example of scenario testing prepared by the Energy Networks Association (ENA) can be found on the AER's website https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/rate-of-return-omnibus-papers/initiation (under "Supporting Information"). The Supplier may wish to comment on this model in the context of the issues raised above.

In many problems of economic forecasting, especially when we wish to forecast a number of periods ahead, it is necessary to project forward, not just the variable of interest, say, for example, the level of the stock market, but also a range of exogenous variables as well.

In the stock market example, we may wish to compute discounted earnings per share as a driver of stock market levels which in turn may depend upon future interest rates and inflation and general economic growth inter alia. This dependence may lead to dramatically different forecasts depending on whether we predict a boom or a recession in the economy.

Consequently, we may look to project two different cases, boom and recession, and have two different forecasts. These can be thought of as conditional forecasts and if we are prepared to

weight each forecast by an assumed probability of occurrence, we can arrive at an unconditional forecast.

We would wish to emphasise that the last step is not always necessary as the pertinent information is in the conditional forecasts and the probabilities are often difficult to estimate due to the ever-changing nature of the economy. However, the unconditional forecast is a high-level number that policy makers like and it also acts as a consistency check on the overall analysis.

Scenarios balance and equity

Turning now to the two concerns of the CRG, which are listed above, we agree that, as things stand, the adoption of scenario analysis would massively favour the networks and their shareholders. Whilst scenario analysis is not intrinsically complex (we shall investigate a specific example below) it would require maintenance and updating and being able to choose and tailor the scenarios to one's own position confers a strategic advantage to the chooser. Scenarios submitted by networks are unlikely to highlight unacceptable impacts on consumers, so it is incumbent upon the AER to check for such impacts and address them. We repeat our earlier point about avoiding a one way street, scenario analysis may suggest outcomes unfavourable to networks, but they may also suggest outcomes unfavourable to consumers. Corrective action should be considered in either case, indeed the NEO and NGO suggest that it is more important in the latter case.

The fact that the use of scenarios would open up a whole new area of debate on choice of scenarios, use of probabilities, and choice of model inputs, we do not see as intrinsically bad. However, in debates about these issues it is clear that consumers would be at a disadvantage. The obligation of the AER, acting in the long-term interests of consumers, is to tackle this disadvantage. We have some suggestions to address consumer concerns in the section below entitled AER scenario analysis

Scenario example

We have looked at the spreadsheet and supplementary notes provided by Frontier Economics which provides a detailed and thorough tool to employ scenario analysis when using a dividend discount model (DDM) to calculate the market risk premium (MRP) under different scenarios for inputs. It has been very well put together. It should be mentioned that the software could be used without DDM modelling but we focus on DDM modelling here because of its use in this area of regulatory economics.

The modelling is done to address two concerns of the AER which led to the AER not using DDM's to estimate the MRP. These were (a) difficulties in determining the long-run growth rate of dividends, and (b), a belief that such a procedure might lead to an upward bias in the price level.

Whilst the spreadsheet does not really advance the cause of the DDM in terms of its usefulness for the AER, it does demonstrate the versatility of scenario analysis and the advantages that the networks would have relative to consumer groups in that this is a fairly sophisticated tool that

requires a well-organised data-base and some confidence in constructing the various scenarios. In later discussion we address some concerns about scenario analysis that both the CRG and AER may have.[11] As we point out below methods exist to infer some notion of probability of specific scenarios. Concerns as to how scenarios are selected are harder to address. They may be simply a forecast of the future, but they typically have a function to advance a point of view about the risks of an existing policy. The choice of values for input variables can be very subjective which is why we focus on the plausibility metric, discussed below, as being one of the few checks that can be applied.

Use of DDM

It is worth digressing somewhat to discuss the strengths and weaknesses of the DDM. It's biggest strength, like the CAPM, is that it is very widely understood and used and provides intuition in many contexts. It differs from the CAPM in that it is very easy to manipulate strategically and is, as a consequence, quite unsuited for regulatory work.

The reason for this ease of manipulation lies in its formulation. As is well-known, a general version of the DDM can be written as

$$P_t = \sum_{s=1}^{\infty} E_t\left(\frac{D_{t+s}}{\prod_{k=1}^{s}(1+R_{t+k})}\right) \quad (2.1)$$

Here D_{t+s} is the dividend paid at time *t+s* whilst R_{t+k} is the discount factor appropriate to the asset at time *t+s*. E_t is the expectation at time *t.* In its most general formulation these two variables may be jointly stochastic. Also, the expectations may be specific to the investor. If the future discount factors are known at time *t*, we can rewrite (2.1) as

$$P_t = \sum_{s=1}^{\infty} \frac{E_t(D_{t+s})}{\prod_{k=1}^{s}(1+R_{t+k})} \quad (2.2)$$

Switching now to MRP calculations, this is now assuming a known at time *t* term structure of market risk premia and interest rates. This version is amenable to scenario analysis as it can be simulated along with assumptions about the forecasts of future dividends. However, this version is not the one adopted by Frontier Economics. Further simplifications are a constant MRP through time and various assumptions for the numerator; we shall describe a small subset of the possible variations. Let us assume a constant discount rate *R*, then we get

$$P_t = \sum_{s=1}^{\infty} \frac{E_t(D_{t+s})}{(1+R)^s} \quad (2.3)$$

We could assume that we have only two (or three or four) forecasts of dividends but that after that they grow at a constant rate g, we could assume that dividends are better replaced by free cash-flow since this might act as a proxy for dividends plus buy-backs, and so on. We have not

[11] The CRG would like us to acknowledge that the ENA has demonstrated their model to the CRG. However, the CRG has concerns with how the scenarios are to be selected and the absence of any probabilities attached to them.

discussed the possibility of varying expectations. The point is that with so much choice you can come to any conclusion whatsoever.

The second major failing of DDM's is that it does not seem to be particularly suitable for forecasting, not withstanding its description as a forward looking calculation. Evidence for this can be found in Duarte and Rosa (2015), (DR). When DR investigate 20 different models for the MRP they use the first principal component of the covariance matrix of the twenty models (p. 11-12, DR). In Table 7 they provide (column 3), the weights of the 20 models in the first principal component; six of the 8 DDM models have a negative weight, one is near to zero, only one version of the Gordon growth model is relatively large and positive. When the correlation with the long-run mean of excess market returns is calculated, five of the models are negatively correlated whilst three have small positive correlations. We find these results disturbing and suggest to the AER that any version of the DDM considered for adoption should first be thoroughly investigated statistically.

Forming probability distributions

There is a more sophisticated version of scenario analysis where the variables of interest are specified (eg. interest rates, inflation, MRP) and the software selects randomly from a history taken over the period of interest which is then used to calculate say the MRP. This is done a large number of times and the moments of the simulated MRP distribution can be calculated. These techniques are based on what is called re-sampling, where the historical data is used in various ways, singly or in blocks, to create the necessary data to form the MRP distribution. Usually this is done by sampling with replacement.

Another approach is termed Monte Carlo simulation. In this approach the relation between the variables of interest is modelled in an equation or set of equations. Each input variable in the equations has a probability distribution associated with it. The distributions for the variables can be specified a-priori, or historical data can be used to determine the parameters of the distribution in question. Values for the input variables are then selected at random from their associated distributions. The values are then fed forward through the equations and output values, say for the MRP, are recorded. This process is repeated many thousands of times and the result is a probability distribution for the variable of interest.

AER Scenario analysis

Perhaps the way forward is for the AER to produce its own scenario analysis. The programming skills required would not be excessive, AER would have access to the relevant data and could provide a range of scenarios; usually best/worst/status quo scenarios would do as a minimum.

The AER could provide guidelines as to what are the key projections in the calculations and stakeholders could be invited to submit their own projections subject to them being consistent with the AER software. This would allow consumer groups much easier access to the process. Users could also input scenario probabilities if they wished but we see no obvious need for the scenario probabilities to be provided by the AER, and if they were provided, to be anything more than suggestive. Overall, such a procedure would be consistent with the AER's interest in

providing a balanced assessment of the rate of return that promotes the National Electricity and National Gas Objectives.

We would favour the first version of scenario analysis discussed above, rather than the simulation based methods. This is because the latter methods would require more explanation and a deeper understanding of the assumed distributions to design scenarios that stakeholders can participate in. Again, assuming the networks have greater access to human capital, it would give them too great an advantage. Our stance is consistent with the NEO and NGO objectives.

However, for internal purposes, the probabilities are of some importance. The AER would benefit from being able to assess whether a particular proposed scenario is very likely/unlikely and also whether it would have any impact. Methods to do this are available and fall under the general description of second-generation scenario analysis. The general principles for scenario design and evaluation are that the scenarios should be severe but plausible. Such capability would allow the AER to assess scenarios suggested by any party. Some of these procedures involve an evaluation of how far a particular scenario would be from the mean scenario. A recent paper that includes discussion and results in this area is Scenario Design for Macro-Financial Stress Testing, Emanuele De Meo (2022). To quote from the paper:

> *An intuitive approach to the measurement of plausibility is to compare the extreme realization of a risk factor with its expected value: the further away from the expected value, the less plausible the scenario can be considered.*

We suppose that variables *y* whose future behaviour will be considered in the scenario have mean μ and covariance matrix Ω. These parameters can be estimated from historical data The vector of variables *y* can be a single variable considered over multiple time periods or a set of variables considered over one time period or multiple variables over multiple periods. In the last case, one would need to derive an expression for Ω.

Let *ys* be the scenario vector, then the Mahlanobis distance, Maha(*ys*) is defined as Maha(*ys*) $=\sqrt{(ys-\mu)'\Omega^{-1}(ys-\mu)}$ and one can define plausibility as the inverse of this quantity. The intuition is clear if the scenario was at the population mean then the distance would be zero and the scenario would be infinitely plausible. If the scenario was a long way from the mean, then the distance would be large so the plausibility would be low. If we wished to get some sense of comparability between a range of scenarios, we could normalise the plausibilities so that they add up to one. This would allow us to detect whether a given choice of scenario might be much less likely than another. Such an approach holds out promise for sorting out the wheat from the chaff but requires a good grasp of statistics/econometrics.

We conclude with some remarks about the appropriate policy for the AER in relation to examining the results of scenario analysis. Clearly if parties (NSPs or consumer groups) advance scenarios that look extremely severe but are highly implausible the AER should be wary of responding in any concrete way. It is hard for us to be overly prescriptive as worst-case analysis boils down to judgements about regulators' utility functions. In this context, scenario analysis with respect to severity and plausibility can have two roles. Firstly, the AER should be able to

detect scenarios that are constructed to further the self-interest of the claimant without the scenario being remotely credible, that is a scenario that is severe but not plausible. Secondly, in the event that the scenario is both severe and plausible, the AER would then have an early warning of an impending problem and be in a position to take appropriate actions. That might not require any immediate action, other than monitoring to determine whether the severe scenario is increasing in probability of occurrence to a point where action becomes prudent.

Historical Profitability

The CRG's consumer research indicates that consumers consider that the 'historical profitability' of the networks should be a key check on the AER's decisions. The AER has now adopted a position that it does not consider historical profitability has a role to play in the assessment of the allowed rate of return in the 2022 RoRI (see Table above).

In light of consumers' concerns with this, the CRG requests the Supplier to review the AER's preliminary position and to indicate if historical profitability can be useful guide to the 2022 rate of return decision and if so, how might it be implemented in the context of the RoRI.

Figure 4 below shows a comparison of the real ROA (EBIT/RAB) actually achieved compared with the real rate of return allowed as given by the WACC. It is clear that both are trending down, but the ROA is consistently above the WACC.

In the light of data such as given by Figure 4 it is quite understandable that consumer's feel the historical profitability of networks should be a key check on the AER's decisions. The more so, as in their performance assessment documents, the AER say this can be done. For example, in the AER's explanatory note on the return on assets 2021 they say:

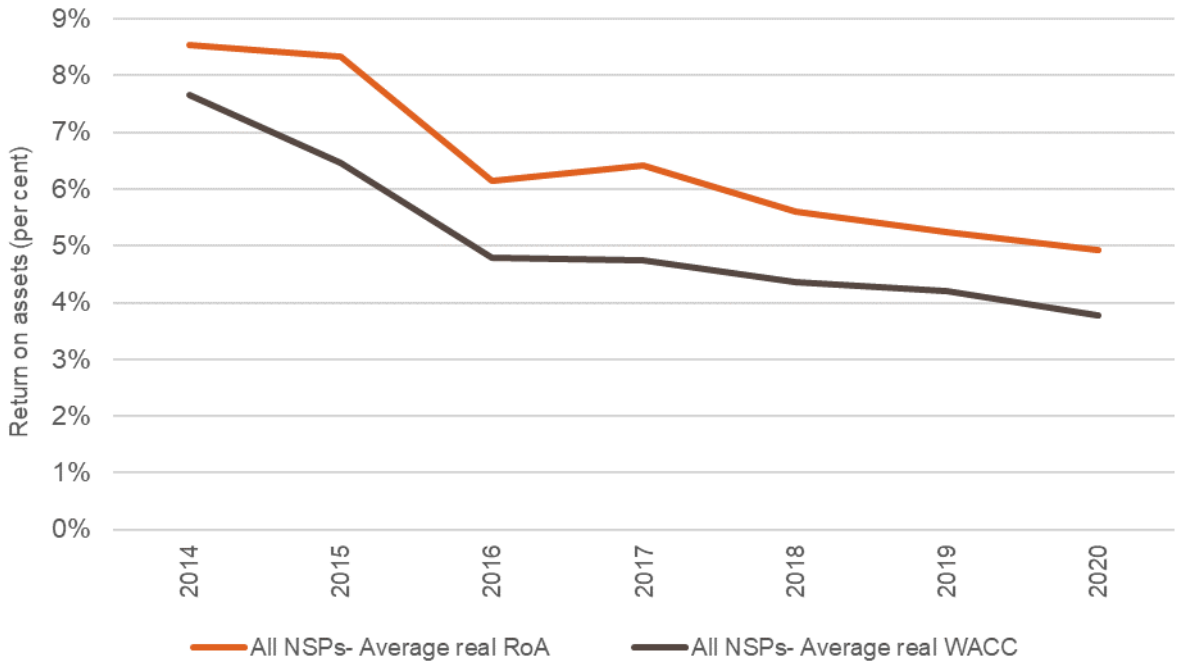
> *The ROA ratio is suited to capital intensive businesses and allows us to compare NSP profits against their allowed rate of return.*[12]

We wish it could be compellingly so since this would be a relatively simple cross check to apply and would give some comfort to consumers. However, given the problems we discuss below it is unlikely to be so.

We note that the CRG have suggested that some of the problems we discuss below may be mitigated by the specific nature of the information that the AER collects from the networks using the RIN process. While we recognise the efforts of the AER in developing a consistent set of data, it is not clear to us that this resolves the inherent difficulties in using accounting data and then comparing the results to market rates of return.

[12] The ROA or return on assets is an accounting measure of operating performance, which in the AER's case is defined as EBIT/RAB. Where EBIT is earnings before interest and taxes and RAB is the regulated asset base.

Figure 4: WACC v ROA over time



Source: Electricity network performance report, AER 2021

Both the WACC and the ROA are measures of the return on assets, but great caution should be exercised in comparing them. The ROA (EBIT/RAB) is a before corporate tax measure of returns and the WACC is usually an after corporate tax measure of returns. So, care must be exercised to ensure that the WACC used in the comparison is a before corporate tax version of the WACC. The more fundamental problem is that the WACC is a market measure of returns, while the ROA is a measure of returns based on accounting profits. These are fundamentally different things.

The problem in using accounting profitability measures as a cross check on the allowed rate of return is succinctly stated by Fisher and McGowan (1983, p.83) in their paper On the Misuse of Accounting Rates of Return to Infer Monopoly Profits.[13]

> *Accounting rates of return are frequently used as indices of monopoly power and market performance by economists and lawyers. Such a procedure is only valid to the extent that profits are indeed monopoly profits, accounting profits are in fact economic profits and the accounting rate of return equals the economic rate of return.*

As our subsequent discussion shows, accounting profits are not economic profits, and the accounting rate of return is thus unlikely to equal the economic rate of return, but these are not the only accounting problems that we identify. Thus, the use of profitability as a cross check

[13] This paper raised a storm of protest and opposition since a substantial number of economists were heavily invested in using accounting profitability across several areas of research.

on the allowed rate of return is unlikely to be fit for purpose. However, we admit an exception. If all the accounting is done on a cash basis with no allocation of joint costs and if the RAB is taken to be equal to the market value of investment, then it is possible to compute the correct net cash flow and the change in the RAB. This can then be used as a measure of economic income, which is net cash flow plus change in market value. The economic income can then be used to compute an economic rate of return for comparison against the allowed rate of return.

Profitability and confounding factors

There are three substantial problems in using accounting profitability as a cross check. The first problem is that the use of accounting profitability as a cross check is confounded by other factors. Profitability for a network depends not just on the profitability of regulated activities, but also on the profitability of unregulated activities. So first the profitability of unregulated activities must be removed from the company's profit measure. This is achieved by gathering data that only relates to regulated activities through the RIN process. Assuming this successfully purges the effect of unregulated activities on revenue and expenses, we now have a measure of the profitability of regulated activities.

Measures of the profitability of regulated activities are affected by both efficiency gains and also by cost allocations. So, a network may be able to validly claim that good profitability is driven by efficiency gains. The basis of cost allocations is also important to the measure of profitability. There are likely to be costs that are jointly incurred by the regulated and unregulated activities and also revenue generated by shared assets. The joint costs must then be allocated between the two types of activity. As any well trained accountant knows, all cost allocations are arbitrary.[14] So the profitability calculated for the regulated network depends upon the accounting policies chosen for the arbitrary allocation of joint costs.

Accounting measurement and the rate of return

The second and more fundamental problem lies in the nature of accounting. Regulators use capital market returns rather than the accounting rate of return as a basis for regulation. Corporate finance textbooks go to some lengths to emphasise that the criterion for making capital investments should not be the accounting rate of return. There is a good reason for these phenomena. Accounting is not designed to measure the returns that investors actually earn (economic returns), or the returns that they expect.

We repeat here a statement from the Concurrent Evidence Session, which was based on a quote from Bowland (1965, Dedication):

[14] Consider a simple example, you want to work out how much it costs you to store stuff in your garage. Assume you rent the house, how much of the rent, rates, power bill, insurance etc. should be allocated to the garage and then how much of that cost should be allocated between storage, garaging your car and any other activities that take place in the garage? You would probably allocate costs based on square metres occupied, this is defensible but arbitrary. If you stopped storing stuff in your garage the costs of rent etc. would be the same, so clearly storage does not cause the costs. There is no observable causal link between the costs incurred and the stuff you store.

> *In the game of business accountants aspired to be players or at least umpires but were relegated to the humble office of scorekeepers. Their revenge for this unmerited ignominy was to keep the score in such a mysterious way that neither the players nor the umpires could determine the true state of the game.*

This is a little bit hard on the accountants, but it makes the point that accounting profit is based on the application of accounting principles and rules and as a result it differs from economic profit. Economic profit is simply net cash flow for the period plus the change in the market value of assets over the period. Accounting profit is accounting profit, it is a concept defined by the process used to measure it, as we now discuss.

Accountants have the surprisingly difficult task, when computing profit, of breaking up the continuous life of the firm into discrete periods for which profit is then reported. To do this they make use of the matching principle. Revenue for the period is determined, and then to determine profit the expenses incurred in earning that revenue are matched against the revenue, irrespective of what period the expenses occur in. Under this approach values for assets in the balance sheet do not represent the market value of the assets, but rather represent stores of unused expenses that will be charged against revenue in future periods.[15] Note that revenue is not the same as cash sales, revenue is recognised when earned. For example, sales on credit will normally be recognised at the time the sale is made, and where payment for goods is made in advance revenue may not be recognised until the goods are despatched to the purchaser. Similarly, expenses are not necessarily cash transactions in the current period but will include payments previously made or payments to be made in the future. As a result of the application of these principles and other accounting principles and rules, there can be a substantial difference between the return investors earn and the accounting rates of return and thus substantial pitfalls in using accounting rates of return as benchmarks.

For example, do pharmaceutical companies really have rates of return that are five times as great as chemical companies? According to Brealey Myers Partington and Robinson (2000) if you use the accounting return on investment as your performance measure, it is not difficult to find this sort of difference in practice. They also provide a simple example for a pharmaceutical company and a chemical company that have identical cash flow. Due to differences in methods of accounting the pharmaceutical company has three times the accounting rate of return on investment 18% relative to the chemical company 6%.

Brealey Myers Partington and Robinson (2000) also ask what do earnings (profits) per share mean? Their answer is (p.80):

[15] Assets are initially measured at cost and their value written down as they are expensed. However, in some cases some assets may be revalued to current market value.

They mean different things for different firms. For some firms they mean more than for others.

The problem is that the earnings that firms report are book, or accounting, figures, not sustainable cash flow. As accounting numbers they reflect a series of more or less arbitrary choices of accounting methods. Almost any firm's reported earnings can be changed substantially by adopting different accounting procedures. A switch in the depreciation method used for reporting purposes directly affects reported EPS, for example. Yet it has no effect on cash flow, since depreciation is a non-cash charge. (The depreciation method used for tax purposes does affect cash flow.) Other accounting choices that may affect reported earnings are the valuation of assets, the procedures by which the accounts of groups of related firms are combined, and the choice between expensing or capitalising research and development. The list could go on and on. In excess of one million alternative measurements of earnings are possible for the consolidated accounts of a moderately complex holding company.

The accounting rate of return and the internal rate of return (IRR)

We may think of the economic rate of return in two ways, first as the rate of return earned over the current period, which is just economic profit divided by the beginning of period market value of the assets. Alternatively, we may think of the economic rate of return as a return which is earned over the life of the assets. This is given by the internal rate of return (IRR).

Earnings and the internal rate of return on equity

Below we discuss the results of the literature that examines the link between accounting and the internal rate of return. To provide some context for the discussion we first provide a simple model of the relation between prices, accounting earnings and the IRR. For this purpose, we use the dividend growth model. We are often critical of the dividend growth model, but our criticism is directed at its implementation, as a conceptual/explanatory model it is very useful.

The discounted dividend model can be written as:

$$P_0 = \sum_{t=1}^{\infty} \frac{dps_t}{(1+r_E)^t}$$

Where dps_t is the expected dividend per share in period t, P_0 is the current ex-dividend price, and r_E is the required rate of return on equity. Since r_E is also the discount rate that equates the present value of dividends equal to the price it is by definition the internal rate of return expected from buying the stock.

Given the assumption of a constant growth rate in dividends g, starting next period and continuing for ever, the pricing equation may be rewritten as the Gordon growth model or DGM:

$$P_0 = \frac{dps_1}{r_E - g}$$

Rearranging gives:

$$r_E = \frac{dps_1}{P_0} + g$$

Using the relation that the dividend is equal to expected accounting earnings per share eps_1 multiplied by the dividend payout ratio *b* we can rewrite the return on equity or IRR as:

$$r_E = \frac{b \times eps_1}{P_0} + g$$

We can also write:

$$eps_1 = \frac{P_0(r_E - g)}{b}$$

The foregoing analysis shows that the relation between accounting earnings and the rate of return investors require (expected IRR) even in this simple model depends upon the growth rate and the payout ratio, which in turn is a function of investment financed by retained earnings.

Accounting and the IRR

There is an extensive accounting literature, that examines whether the internal rate of return being earned on a project, or by a business can be inferred from accounting data. The literature can conveniently be divided into two stands. One strand of the literature examines the relation between the accounting rate of return and the internal rate of return being earned by the assets, and the other strand of the literature attempts to estimate the internal rate of return that shareholders expect to earn (cost of equity) using accounting valuation models derived from the dividend discount model.

The literature on the relation between the accounting rate of return and the internal rate of return contains extensive debates that demonstrate the difficulty in theoretically analysing the relation. In a comprehensive review of the literature Feenstra and Wang (2000, p.4) state that:

> *The findings of analytical work have generally been pessimistic.*

We conclude from the theoretical analysis that the accounting rate of return, either as a single observation or as a weighted average, cannot in general be used as a reliable estimator of the internal rate of return. However, in some restrictive special cases correspondence between the two measures can be established. Given the theoretical difficulties it is not surprising that empirical investigations provide little or no support for use of the accounting rate of return. For Australian firms, the results of Kelly and Tippett (1991) and Kelly (1996) show that in the words of Kelly (1996, abstract)

Results confirm earlier work in the area in that the ARR was found to be an unreliable substitute for the IRR.

The accounting literature has also developed implied cost of equity models that are in the same set of models to which the dividend growth model belongs. In the dividend growth model, the cost of equity is given by the internal rate of return that equates the expected cash flows to the current share price. The accounting models operate in an analogous fashion. Indeed, the accounting models are derived from the discounted dividend model for price, assuming clean surplus accounting. In clean surplus accounting all gains and losses go through the income statement, such that net income is equal to the net dividend plus the change in the net book value of assets.

We have strongly argued in previous reports to the AER that the implied cost of equity derived from the dividend growth model provides an unreliable estimate. Unfortunately, and unsurprisingly, the estimates of the implied cost of equity from accounting models are also poor, see Easton and Monahan (2005) and Easton and Sommers (2007). Were this not the case we would previously have recommended their use to the AER.

Gaming

The third problem is that, depending on the accounting policies adopted, there can be significant variability in the accounting profit that will be reported in a given period. In other words, there is plenty of scope for gaming. For example, Cahan (1992) finds that monopolists under antitrust investigation in the USA adopt profit reducing methods of accounting. Thus, even if it were possible to reliably use accounting profitability as a cross-check to begin with it is very likely that the usefulness and reliability of the cross check would quickly disappear. Such gaming might be constrained by the RIN process, but how successful this would be is an open question.

Comparison across regulators

We include a discussion of comparison across regulators because it was strongly suggested in the AER Concurrent Evidence Sessions that the AER should, as a cross check, compare their return with the return of overseas regulators. This it seems to us is an issue that should concern the CRG, particularly as it involves an important matter that affects consumers, regulatory capture.

It is a reasonable proposition that regulators of networks have a similar task. Thus, comparisons across regulators may yield useful information. Such comparisons can be conveniently divided into two types. Comparison of methods and comparison of allowed rates of return. We will begin by considering the latter as this is the more contentious type of comparison.

Fundamental differences

Comparison of allowed rates of return implicitly assumes that there should be equality of returns across regulators. Such equality seems very unlikely, particularly for international comparisons. First there are differences in the nature of underlying assets, for example age of infrastructure, overhead or underground networks, intensity of maintenance, different cost

structures, and so forth. Second there are differences in markets, both for the services that networks provide and in the capital markets. Capital market differences bear directly on rates of return through differences in interest rates, the market risk premium, network betas, expected rates of inflation, corporate taxes and the taxation of debt and equity.

Impact of taxation

We note that differences in the taxation of debt and equity across different jurisdictions does not seem to have received much attention in relation to international comparisons of regulatory returns. Investors care about the returns they receive after all taxes, but the returns observed in capital markets and typically used by regulators are after corporate tax, but before personal tax, returns.[16]

Investors will gross up the returns they require before personal tax in order to obtain the return that they require after personal tax. For example, if investors require a 6% return after all taxes and the personal tax rate is 40% then they require an after corporate tax return of (0.06/(1 - 0.4)) = 0.10 or 10.0%. Thus, assuming investor required returns after all taxes were similar across the jurisdictions, then in high personal tax jurisdictions we would expect to see higher market (after corporate tax) rates of returns as compared to low personal tax jurisdictions.

The effect of taxation also goes to arguments about levels of return required to attract capital for networks from international investors. Capital can be attracted to countries with lower regulatory (after corporate tax) rates of return, if by investing in those countries investors can structure their investments to obtain tax advantages. For example, by the use of stapled securities, share plus trust, which seems to be an almost uniquely Australian method of obtaining tax advantages, having been banned in other jurisdictions such as Canada, see Davis (2016).

Impact of regulation

The nature of network regulation will also differ across jurisdictions, and this will feed back into the rates of return required in capital markets. This is a fairly obvious, but nonetheless important point. It was argued in the AER Concurrent Evidence Sessions that there may be differences in regulation, but that in setting the allowed rate of return all regulators are doing essentially the same thing: attempting to measure the network's required rate of return as determined in the capital market. This may be true, but the return required in capital markets is influenced by the regulatory framework and the actions of regulators. Thus, commonality in the objective of regulators, with respect to measuring capital markets' required rate of return,

[16] Under the Australian imputation system corporate and personal taxes are linked as corporate tax payments give rise to franking credits that can be used to offset personal taxes. Franking credits can be viewed as either reducing the effective corporate tax rate, or as reducing personal taxes. If franking credits are not fully valued (priced) by the market, then domestic investors get a personal tax benefit without having to pay for it in full. Consequently, they will accept a lower after corporate tax (market) rate of return. It would therefore be no surprise to find rates of return in the Australian market were lower than in markets considered comparable, but that had a classical tax system.

does not imply that those market returns are independent of differences in the system of regulation. To put it another way, just because the measurement objective is the same does not imply that the measurements will be equal.

Clearly regulation can differ with respect to the objectives, the design of compensation systems, the methods of estimating the allowed rate of return, and the stability of the regulatory framework. For example, New Zealand regulators have deliberately chosen to have an upward biased estimate of the allowed return as they believe the consequences of underestimation are worse than the consequences of overestimation. Consequently, they use an estimate for the allowed rate of return based on the 75th percentile of their estimates. Given such differences in systems of regulation we should expect differences in allowed returns across regulators.

Attracting international capital

It has been argued that capital markets around the world have become more integrated and also that there is global competition for capital. This in turn it is argued, means that the AER needs to offer rates of return that match those offered by overseas regulators.[17] There are several problems with this argument.

The forces of capital market integration will tend to reduce, but not eliminate differences in rates of return across different countries. It is clearly evident that capital markets in different countries still have different interest rates, different levels of market volatility, different realised market risk premiums and differences in utility betas. Furthermore, even assuming capital markets were fully integrated, this would not guarantee equality in required returns across networks in different countries. Differences in underlying assets, differences in markets for network services and differences in systems of regulation, mean that networks would not be homogeneous investments, even in a fully integrated global capital market. Thus, differences in rates of return would likely persist, although they would probably be smaller.

With respect to the ability of Australian networks to attract international capital, there has been no shortage of willing international bidders for Australian networks. In the competition to acquire networks, bidders have been prepared to pay substantial premiums over the value of the regulated asset base.[18] As recent takeovers have demonstrated; this demand persists even after reductions in allowed rates of return. The evidence therefore suggests that differences across countries in current allowed rates of return and expected future allowed rates of return are not a significant deterrent to attracting international capital to Australian networks. [19] Thus, the evidence to date does not support the argument that the AER needs to match returns set by overseas regulators. Also, since there are differences in allowed rates of return across international regulatory jurisdictions, this rather suggests that regulators internationally have

[17] This leaves open the question of which comparator rates need to be matched.
[18] See Figure 3.
[19] These outcomes also imply that if the AER had set higher allowed rates of return, then even bigger premiums would have been paid.

not needed to match returns of other regulators in order to ensure a supply of capital to the networks that they regulate.

The effect of international capital market integration is likely to both reduce differences in required returns across markets, and to reduce domestic market risk premiums. Thus, when making arguments based on capital market integration both effects should be recognised.[20]

Regulatory capture

Even if all the differences across assets, markets, and systems of regulation were not important, we would still expect there to be differences in regulated rates of return, due to differences in the degree of regulatory capture.[21] Seen in this light, a relatively low regulated rate of return, as in the AER's case, signals a low level of regulatory capture and vice versa for relatively high regulated returns.

In reality, differences across assets, markets, and systems of regulation are important and thus confound the use of differences in regulated returns as an index of regulatory capture. This is not an argument that regulatory capture is not significant, just that it may be difficult to reliably measure. However, where assets, markets, and systems of regulation are similar then we think it very likely that differences in the extent of regulatory capture would explain a significant part of the observed differences in regulated returns.

We wish to emphasise the role of regulatory capture because it is important and yet, in the discussion of comparison of allowed rates of return across regulators, we have seen no discussion of regulatory capture. It is absolutely clear that there is substantial lobbying in relation to the methods and parameters to be used in estimating the rate of return that regulators allow. It would be truly remarkable if this was entirely without self-interest and equally remarkable if it did not have some effect.

It would also be remarkable if the effects of lobbying were the same across all regulators. Thus, at least part of the difference in allowed rates of return across regulators is almost certainly due to differences in the nature and extent of regulatory capture and consequent differences in the methods and parameters used in the regulatory process.

Given our foregoing analysis, we consider that comparison with the rates of return of international regulators does not provide a suitable cross check for the magnitude of the AER's allowed rate of return. It is possible that domestic comparators like the ERA could be a suitable

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[20] A counter argument about the effect of integration on the market risk premium was made during the Concurrent Evidence Sessions. That argument was that the integration of developing economies may increase the influence of investors with higher levels of risk aversion. Presumably these higher levels of risk aversion arise from less wealth. However, less wealth reflects the fact that capital markets in developing countries represent a small fraction of the global equity market and thus investors from such markets are very unlikely to have a significant impact on risk premiums across markets. Thus, we give this argument little or no weight.

[21] It can also be the case that there is legislative capture, where lobbying of politicians leads to a legislative framework for regulation that favours the regulated.

basis for comparison, but even then some of the problems we have discussed above could still arise. Another problem that arises in domestic comparisons is circularity. If the AER benchmarks against the ERA and the ERA benchmarks against the AER, then the comparison is not between independent estimates.

Comparison of methods

Given the argument that all regulators are doing essentially the same thing: attempting to measure the network's required rate of return as determined in the capital market, there is merit in looking at what other regulators do. This is because there is the possibility of discovering useful ideas and methods of analysis. It can also help explain differences between the AER's allowed rate of return and that allowed by other regulators.

In assessing differences in methods across regulators, this should be a case of exercising judgement, not just be a case of majority rules. Remember, our earlier comments about regulatory capture. Choice of methods for determining allowed returns will come down to the interaction of regulatory judgement and successful lobbying. A great deal of lobbying expenditure will be directed to the adoption of methods that increase current regulated returns. Methods that achieve this are therefore more likely to be adopted than those that do not.

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Expert Witness Compliance Declaration

We have read “Expert witnesses in proceedings in the Federal Court of Australia” which are attached as Appendix B. This report has been prepared in accordance with those guidelines. As required by the guidelines, we have made all the inquiries that we believe are desirable and appropriate and no matters of significance that we regard as relevant have, to our knowledge, been withheld from the Court.

Signed

Graham. H. Partington

Steven. E. Satchell

Appendix A

Terms of Reference

Background

The RoRI is a 'binding" instrument and will apply to all the AER's decisions on the networks' allowed rate of return for a four year period commencing January 2023. The AER will make its final determination in December 2022 following some 18 months of extensive consultation on key elements of the RoRI.

The CRG is seeking expert advice on the potential use of 'cross checks' to assess whether the AER's estimate of an efficient rate of return is appropriate for a regulated electricity or gas network company operating in the national energy market (NEM) and consistent with the relevant national energy objectives, laws and rules. (see: https://www.aemc.gov.au/regulation/legislation)

The AER has considered what cross checks would be relevant and how they might be used by the AER in making its rate of return decision. Both the 2018 RoRI and the draft 2022 RoRI review potential cross checks. The AER has also published annual reports that provide an ongoing assessment of a number of the potential cross checks.

In its most recent final working paper the AER reviewed some 6 potential cross checks on the overall rate of return estimate. The AER considered whether each of the cross checks could be used and if so, in what role. The AER's preliminary position is set out in the Final Omnibus paper published in December 2021 and summarised in the table below from the paper (p 124)

Overall cross check	Preliminary position
Financeability tests	Open to using financeability tests in a contextual role
RAB multiples	May be useful as a sense check and trigger for further investigation into the regulatory framework
Historical profitability	No role in informing the overall rate of return
Investment trends	No role in informing the overall rate of return
Other regulators' rate of return	No role in informing the overall rate of return
Scenario testing	Open to using scenario tests in a contextual role

Requirements

The Supplier is required to address the matters listed below.

In doing so, the Supplier should take account of the AER's eight "assessment criteria" and the CRG's five "consumer principles" which have been used by the AER and by the CRG to assess the AER's position on the rate of return parameters. Details of these criteria and principles can be found in the AER's "*Rate of return –Final omnibus paper*", December 2021 pp 11-12, [https://www.aer.gov.au/node/79503]

1. General review of the AER's approach and conclusions in the context of the AER's statement that it is considering the use of overall cross checks for (a) informing the rate of return, (b) the information they can provide and (c) the best approach to incorporate this information into its rate of return decision. (See page 119 of the above linked document).

2. Specifically, with reference to the 6 cross checks considered by the AER (see Table above):

- Do the AER's conclusions represent a balanced assessment that promotes the National Electricity and National Gas Objectives (the NEO and the NGO)
- Are there other relevant cross checks that the AER has not identified that might promote a balanced assessment that promotes the NEO and NGO.

(2) With respect to the three cross checks that the AER is considering further (as per the Table above), the CRG is specifically interested in the following issues:

(2.1) Financeability

What are the risks that financeability testing as a cross check on the total rate of return will result in an asymmetry that favours networks over consumers? The analysis should cover, but is not be limited to, the following factors:

a. Networks and their owners have advocated for the application of narrow financeability tests such as a single FFO/debt test that is not reflective of the broader quantitative and qualitative tests carried out by ratings agencies, for example. This runs the risk of creating a case for financeability adjustments when they are not required.

b. The RoRI is set as a binding instrument for all networks without reference to other elements of a regulatory determination that impact financeability, such as depreciation rates, and capex profiles and regulatory taxation allowance. Thus, linking financeability outcomes purely to a rate of return decision (or even to a notional "average" network) may result in creating a case for financeability adjustments that are not required for *specific* networks.

c. Financeability testing risks an inherent asymmetry if the only possible adjustment to the rate of return is upwards. Logically, if upward adjustments to the rate of return are legitimate, then so too are adjustments down where financeability testing indicates

significant headroom or a higher credit rating than the AER's benchmark. How could financeability testing be made formally symmetric?

(2.2) RAB multiples

What do current RAB multiples indicate in terms of: the attractiveness of the regulated assets to which the 2022 RoRI applies and claims by networks and their shareholders that the current Return on Equity is insufficient?

Analysis may be required to break down potential rationales for RAB multiples. These should include but not be limited to: the quantum of unregulated cashflows and the ability of the regulated network to out-earn its allowed cost of capital. While these rationales would be based on expected future cashflows, the CRG considers that historical data and current regulatory settings (such as the 2018 RoRI, which is currently in force) is likely to guide such expectations and thus is relevant

A relevant analytical reference source is this paper by Daryll Biggar.

Data relevant to RAB multiples and historical profitability can be found in the AER's Network Performance reports. The Supplier will also need to obtain RAB multiple data on recent transactions not included in the latest performance reports, including:

- Purchase of Spark Infrastructure by KKR/OTPP
- Purchase of AusNet Services by Brookfield Infrastructure
- Purchase of a 16.8% stake in Ausgrid by APG

(2.3) Scenario testing.

The CRG is supportive in principle of scenario testing. However, there are two key issues we have identified:

a. Scenario testing runs the risk of being asymmetric – that it only prompts adjustments to the AER's decisions where there is potential harm to network investors. A balanced use of scenarios should also guide the AER's decision when there are unacceptable impacts on consumers and consumer investment decisions.

b. Scenario testing opens up a whole new area of debate within the process – what scenarios should be run, how can probabilities be assigned to them, what other inputs are relevant to the model, what response is appropriate to extreme scenarios that cast doubt on the appropriateness of the rate of return, etc? This debate inherently favours stakeholders with greater resources, i..e. networks and their shareholders.

In the light of these issues and any others identified by the Supplier, how should the AER construct its scenario testing process to aid transparency and to assist the AER to provide a balanced assessment of the rate of return that promotes the NEO and the NGO?

An example of scenario testing prepared by the Energy Networks Association (ENA) can be found on the AER's website https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/rate-of-return-omnibus-papers/initiation (under "Supporting Information"). The Supplier may wish to comment on this model in the context of the issues raised above.

(3) Historical Profitability

The CRG's consumer research indicates that consumers consider that the 'historical profitability' of the networks should be a key check on the AER's decisions. The AER has now adopted a position that it does not consider historical profitability has a role to play in the assessment of the allowed rate of return in the 2022 RoRI (see Table above).

In light of consumers' concerns with this, the CRG requests the Supplier to review the AER's preliminary position and to indicate if historical profitability can be useful guide to the 2022 rate of return decision and if so, how might it be implemented in the context of the RoRI.

Further information on the AER's annual assessment of network performance and returns on regulated equity can be found in the following annual reports:

(a) Rate of Return Annual Update (December 2021) https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/rate-of-return-annual-updates-2019–2022

(b) Electricity Network Performance Report (September 2021) https://www.aer.gov.au/networks-pipelines/performance-reporting/electricity-network-performance-report-2021

Appendix B

FEDERAL COURT OF AUSTRALIA

EXPERT EVIDENCE PRACTICE NOTES (GPN-EXPT)

General Practice Note

1. INTRODUCTION

1.1 This practice note, including the *Harmonised Expert Witness Code of Conduct* ("**Code**") (see **Annexure A**) and the *Concurrent Expert Evidence Guidelines* ("**Concurrent Evidence Guidelines**") (see **Annexure B**), applies to any proceeding involving the use of expert evidence and must be read together with:

(a) the Central Practice Note (CPN-1), which sets out the fundamental principles concerning the National Court Framework ("**NCF**") of the Federal Court and key principles of case management procedure;

(b) the Federal Court of Australia Act 1976 (Cth) ("**Federal Court Act**");

(c) the *Evidence Act 1995* (Cth) ("**Evidence Act**"**),** including Part 3.3 of the Evidence Act;

(d) Part 23 of the *Federal Court Rules 2011* (Cth) ("**Federal Court Rules**"**)**; and

(e) where applicable, the Survey Evidence Practice Note (GPN-SURV).

1.2 This practice note takes effect from the date it is issued and, to the extent practicable, applies to proceedings whether filed before, or after, the date of issuing.

2. APPROACH TO EXPERT EVIDENCE

2.1 An expert witness may be retained to give opinion evidence in the proceeding, or, in certain circumstances, to express an opinion that may be relied upon in alternative dispute resolution procedures such as mediation or a conference of experts. In some circumstances an expert may be appointed as an independent adviser to the Court.

2.2 The purpose of the use of expert evidence in proceedings, often in relation to complex subject matter, is for the Court to receive the benefit of the objective and impartial assessment of an issue from a witness with specialised knowledge (based on training, study or experience - see generally s 79 of the Evidence Act).

2.3 However, the use or admissibility of expert evidence remains subject to the overriding requirements that:

(a) to be admissible in a proceeding, any such evidence must be relevant (s 56 of the Evidence Act); and

(b) even if relevant, any such evidence, may be refused to be admitted by the Court if its probative value is outweighed by other considerations such as the evidence being unfairly prejudicial, misleading or will result in an undue waste of time (s 135 of the Evidence Act).

2.4 An expert witness' opinion evidence may have little or no value unless the assumptions adopted by the expert (ie. the facts or grounds relied upon) and his or her reasoning are expressly stated in any written report or oral evidence given.

2.5 The Court will ensure that, in the interests of justice, parties are given a reasonable opportunity to adduce and test relevant expert opinion evidence. However, the Court expects parties and any legal representatives acting on their behalf, when dealing with

expert witnesses and expert evidence, to at all times comply with their duties associated with the overarching purpose in the Federal Court Act (see ss 37M and 37N).

3. INTERACTION WITH EXPERT WITNESSES

3.1 Parties and their legal representatives should never view an expert witness retained (or partly retained) by them as that party's advocate or "hired gun". Equally, they should never attempt to pressure or influence an expert into conforming his or her views with the party's interests.

3.2 A party or legal representative should be cautious not to have inappropriate communications when retaining or instructing an independent expert, or assisting an independent expert in the preparation of his or her evidence. However, it is important to note that there is no principle of law or practice and there is nothing in this practice note that obliges a party to embark on the costly task of engaging a "consulting expert" in order to avoid "contamination" of the expert who will give evidence. Indeed the Court would generally discourage such costly duplication.

3.3 Any witness retained by a party for the purpose of preparing a report or giving evidence in a proceeding as to an opinion held by the witness that is wholly or substantially based in the specialised knowledge of the witness[22] should, at the earliest opportunity, be provided with:

(a) a copy of this practice note, including the Code (see Annexure A); and

(b) all relevant information (whether helpful or harmful to that party's case) so as to enable the expert to prepare a report of a truly independent nature.

3.4 Any questions or assumptions provided to an expert should be provided in an unbiased manner and in such a way that the expert is not confined to addressing selective, irrelevant or immaterial issues.

4. ROLE AND DUTIES OF THE EXPERT WITNESS

4.1 The role of the expert witness is to provide relevant and impartial evidence in his or her area of expertise. An expert should never mislead the Court or become an advocate for the cause of the party that has retained the expert.

4.2 It should be emphasised that there is nothing inherently wrong with experts disagreeing or failing to reach the same conclusion. The Court will, with the assistance of the evidence of the experts, reach its own conclusion.

4.3 However, experts should willingly be prepared to change their opinion or make concessions when it is necessary or appropriate to do so, even if doing so would be contrary to any previously held or expressed view of that expert.

Harmonised Expert Witness Code of Conduct

4.4 Every expert witness giving evidence in this Court must read the *Harmonised Expert Witness Code of Conduct* (attached in Annexure A) and agree to be bound by it.

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[22] Such a witness includes a "Court expert" as defined in r 23.01 of the Federal Court Rules. For the definition of "expert", "expert evidence" and "expert report" see the Dictionary, in Schedule 1 of the Federal Court Rules.

4.5 The Code is not intended to address all aspects of an expert witness' duties, but is intended to facilitate the admission of opinion evidence, and to assist experts to understand in general terms what the Court expects of them. Additionally, it is expected that compliance with the Code will assist individual expert witnesses to avoid criticism (rightly or wrongly) that they lack objectivity or are partisan.

5. CONTENTS OF AN EXPERT'S REPORT AND RELATED MATERIAL

5.1 The contents of an expert's report must conform with the requirements set out in the Code (including clauses 3 to 5 of the Code).

5.2 In addition, the contents of such a report must also comply with r 23.13 of the Federal Court Rules. Given that the requirements of that rule significantly overlap with the requirements in the Code, an expert, unless otherwise directed by the Court, will be taken to have complied with the requirements of r 23.13 if that expert has complied with the requirements in the Code and has complied with the additional following requirements. The expert shall:

(a) acknowledge in the report that:
  (i) the expert has read and complied with this practice note and agrees to be bound by it; and
  (ii) the expert's opinions are based wholly or substantially on specialised knowledge arising from the expert's training, study or experience;
(b) identify in the report the questions that the expert was asked to address;
(c) sign the report and attach or exhibit to it copies of:
  (i) documents that record any instructions given to the expert; and
  (ii) documents and other materials that the expert has been instructed to consider.

5.3 Where an expert's report refers to photographs, plans, calculations, analyses, measurements, survey reports or other extrinsic matter, these must be provided to the other parties at the same time as the expert's report.

6. CASE MANAGEMENT CONSIDERATIONS

6.1 Parties intending to rely on expert evidence at trial are expected to consider between them and inform the Court at the earliest opportunity of their views on the following:

(a) whether a party should adduce evidence from more than one expert in any single discipline;
(b) whether a common expert is appropriate for all or any part of the evidence;
(c) the nature and extent of expert reports, including any in reply;
(d) the identity of each expert witness that a party intends to call, their area(s) of expertise and availability during the proposed hearing;
(e) the issues that it is proposed each expert will address;
(f) the arrangements for a conference of experts to prepare a joint-report (see Part 7 of this practice note);
(g) whether the evidence is to be given concurrently and, if so, how (see Part 8 of this practice note); and
(h) whether any of the evidence in chief can be given orally.

6.2 It will often be desirable, before any expert is retained, for the parties to attempt to agree on the question or questions proposed to be the subject of expert evidence as well as the relevant facts and assumptions. The Court may make orders to that effect where it considers it appropriate to do so.

7. CONFERENCE OF EXPERTS AND JOINT-REPORT

7.1 Parties, their legal representatives and experts should be familiar with aspects of the Code relating to conferences of experts and joint-reports (see clauses 6 and 7 of the Code attached in Annexure A).

7.2 In order to facilitate the proper understanding of issues arising in expert evidence and to manage expert evidence in accordance with the overarching purpose, the Court may require experts who are to give evidence or who have produced reports to meet for the purpose of identifying and addressing the issues not agreed between them with a view to reaching agreement where this is possible ("**conference of experts**"). In an appropriate case, the Court may appoint a registrar of the Court or some other suitably qualified person ("**Conference Facilitator**") to act as a facilitator at the conference of experts.

7.3 It is expected that where expert evidence may be relied on in any proceeding, at the earliest opportunity, parties will discuss and then inform the Court whether a conference of experts and/or a joint-report by the experts may be desirable to assist with or simplify the giving of expert evidence in the proceeding. The parties should discuss the necessary arrangements for any conference and/or joint-report. The arrangements discussed between the parties should address:

(a) who should prepare any joint-report;

(b) whether a list of issues is needed to assist the experts in the conference and, if so, whether the Court, the parties o r the experts should assist in preparing such a list;

(c) **t**he agenda for the conference of experts; and

(d) arrangements for the provision, to the parties and the Court, of any joint-report or any other report as to the outcomes of the conference ("**conference report**").

Conference of Experts

7.4 The purpose of the conference of experts is for the experts to have a comprehensive discussion of issues relating to their field of expertise, with a view to identifying matters and issues in a proceeding about which the experts agree, partly agree or disagree and why. For this reason the conference is attended only by the experts and any Conference Facilitator. Unless the Court orders otherwise, the parties' lawyers will not attend the conference but will be provided with a copy of any conference report.

7.5 The Court may order that a conference of experts occur in a variety of circumstances, depending on the views of the judge and the parties and the needs of the case, including:

(a) while a case is in mediation. When this occurs the Court may also order that the outcome of the conference or any document disclosing or summarising the experts' opinions be confidential to the parties while the mediation is occurring;

(b) before the experts have reached a final opinion on a relevant question or the facts involved in a case. When this occurs the Court may order that the parties exchange draft expert reports and that a conference report be prepared for the use of the experts in finalising their reports;

(c) after the experts' reports have been provided to the Court but before the hearing of the experts' evidence. When this occurs the Court may also order that a conference report be prepared (jointly or otherwise) to ensure the efficient hearing of the experts' evidence.

7.6 Subject to any other order or direction of the Court, the parties and their lawyers must not involve themselves in the conference of experts process. In particular, they must not seek to encourage an expert not to agree with another expert or otherwise seek to influence the outcome of the conference of experts. The experts should raise any queries they may have

in relation to the process with the Conference Facilitator (if one has been appointed) or in accordance with a protocol agreed between the lawyers prior to the conference of experts taking place (if no Conference Facilitator has been appointed).

7.7 Any list of issues prepared for the consideration of the experts as part of the conference of experts process should be prepared using non-tendentious language.

7.8 The timing and location of the conference of experts will be decided by the judge or a registrar who will take into account the location and availability of the experts and the Court's case management timetable. The conference may take place at the Court and will usually be conducted in-person. However, if not considered a hindrance to the process, the conference may also be conducted with the assistance of visual or audio technology (such as via the internet, video link and/or by telephone).

7.9 Experts should prepare for a conference of experts by ensuring that they are familiar with all of the material upon which they base their opinions. Where expert reports in draft or final form have been exchanged prior to the conference, experts should attend the conference familiar with the reports of the other experts. Prior to the conference, experts should also consider where they believe the differences of opinion lie between them and what processes and discussions may assist to identify and refine those areas of difference.

Joint-report

7.10 At the conclusion of the conference of experts, unless the Court considers it unnecessary to do so, it is expected that the experts will have narrowed the issues in respect of which they agree, partly agree or disagree in a joint-report. The joint-report should be clear, plain and concise and should summarise the views of the experts on the identified issues, including a succinct explanation for any differences of opinion, and otherwise be structured in the manner requested by the judge or registrar.

7.11 In some cases (and most particularly in some native title cases), depending on the nature, volume and complexity of the expert evidence a judge may direct a registrar to draft part, or all, of a conference report. If so, the registrar will usually provide the draft conference report to the relevant experts and seek their confirmation that the conference report accurately reflects the opinions of the experts expressed at the conference. Once that confirmation has been received the registrar will finalise the conference report and provide it to the intended recipient(s).

8. CONCURRENT EXPERT EVIDENCE

8.1 The Court may determine that it is appropriate, depending on the nature of the expert evidence and the proceeding generally, for experts to give some or all of their evidence concurrently at the final (or other) hearing.

8.2 Parties should familiarise themselves with the *Concurrent Expert Evidence Guidelines* (attached in Annexure B). The Concurrent Evidence Guidelines are not intended to be exhaustive but indicate the circumstances when the Court might consider it appropriate for concurrent expert evidence to take place, outline how that process may be undertaken, and assist experts to understand in general terms what the Court expects of them.

8.3 If an order is made for concurrent expert evidence to be given at a hearing, any expert to give such evidence should be provided with the Concurrent Evidence Guidelines well in advance of the hearing and should be familiar with those guidelines before giving evidence.

9. FURTHER PRACTICE INFORMATION AND RESOURCES

9.1 Further information regarding Expert Evidence and Expert Witnesses is available on the Court's website.

9.2 Further information to assist litigants, including a range of helpful guides, is also available on the Court's website. This information may be particularly helpful for litigants who are representing themselves.

J L B ALLSOP
Chief Justice

25 October 2016

Annexure A

HARMONISED EXPERT WITNESS CODE OF CONDUCT[23]

APPLICATION OF CODE

1. This Code of Conduct applies to any expert witness engaged or appointed:

   (a) to provide an expert's report for use as evidence in proceedings or proposed proceedings; or

   (b) to give opinion evidence in proceedings or proposed proceedings.

GENERAL DUTIES TO THE COURT

2. An expert witness is not an advocate for a party and has a paramount duty, overriding any duty to the party to the proceedings or other person retaining the expert witness, to assist the Court impartially on matters relevant to the area of expertise of the witness.

CONTENT OF REPORT

3. Every report prepared by an expert witness for use in Court shall clearly state the opinion or opinions of the expert and shall state, specify or provide:

   (a) the name and address of the expert;

   (b) an acknowledgment that the expert has read this code and agrees to be bound by it;

   (c) the qualifications of the expert to prepare the report;

   (d) the assumptions and material facts on which each opinion expressed in the report is based [a letter of instructions may be annexed];

   (e) the reasons for and any literature or other materials utilised in support of such opinion;

   (f) (if applicable) that a particular question, issue or matter falls outside the expert's field of expertise;

   (g) any examinations, tests or other investigations on which the expert has relied, identifying the person who carried them out and that person's qualifications;

   (h) the extent to which any opinion which the expert has expressed involves the acceptance of another person's opinion, the identification of that other person and the opinion expressed by that other person;

   (i) a declaration that the expert has made all the inquiries which the expert believes are desirable and appropriate (save for any matters identified explicitly in the report), and that no matters of significance which the expert regards as relevant have, to the knowledge of the expert, been withheld from the Court;

[23] Approved by the Council of Chief Justices' Rules Harmonisation Committee

(j) any qualifications on an opinion expressed in the report without which the report is or may be incomplete or inaccurate;

(k) whether any opinion expressed in the report is not a concluded opinion because of insufficient research or insufficient data or for any other reason; and

(l) where the report is lengthy or complex, a brief summary of the report at the beginning of the report.

SUPPLEMENTARY REPORT FOLLOWING CHANGE OF OPINION

4. Where an expert witness has provided to a party (or that party's legal representative) a report for use in Court, and the expert thereafter changes his or her opinion on a material matter, the expert shall forthwith provide to the party (or that party's legal representative) a supplementary report which shall state, specify or provide the information referred to in paragraphs (a), (d), (e), (g), (h), (i), (j), (k) and (I) of clause 3 of this code and, if applicable, paragraph (f) of that clause.

5. In any subsequent report (whether prepared in accordance with clause 4 or not) the expert may refer to material contained in the earlier report without repeating it.

DUTY TO COMPLY WITH THE COURT'S DIRECTIONS

6. If directed to do so by the Court, an expert witness shall:

(a) confer with any other expert witness;

(b) provide the Court with a joint-report specifying (as the case requires) matters agreed and matters not agreed and the reasons for the experts not agreeing; and

(c) abide in a timely way by any direction of the Court.

CONFERENCE OF EXPERTS

7. Each expert witness shall:

(a) exercise his or her independent judgment in relation to every conference in which the expert participates pursuant to a direction of the Court and in relation to each report thereafter provided, and shall not act on any instruction or request to withhold or avoid agreement; and

(b) endeavour to reach agreement with the other expert witness (or witnesses) on any issue in dispute between them, or failing agreement, endeavour to identify and clarify the basis of disagreement on the issues which are in dispute.

ANNEXURE B

CONCURRENT EXPERT EVIDENCE GUIDELINES

APPLICATION OF THE COURT'S GUIDELINES

1. The Court's Concurrent Expert Evidence Guidelines ("**Concurrent Evidence Guidelines**") are intended to inform parties, practitioners and experts of the Court's general approach to concurrent expert evidence, the circumstances in which the Court might consider expert witnesses giving evidence concurrently and, if so, the procedures by which their evidence may be taken.

OBJECTIVES OF CONCURRENT EXPERT EVIDENCE TECHNIQUE

2. The use of concurrent evidence for the giving of expert evidence at hearings as a case management technique[24] will be utilised by the Court in appropriate circumstances (see r 23.15 of the *Federal Court Rules 2011* (Cth)). Not all cases will suit the process. For instance, in some patent cases, where the entire case revolves around conflicts within fields of expertise, concurrent evidence may not assist a judge. However, patent cases should not be excluded from concurrent expert evidence processes.

3. In many cases the use of concurrent expert evidence is a technique that can reduce the partisan or confrontational nature of conventional hearing processes and minimises the risk that experts become "opposing experts" rather than independent experts assisting the Court. It can elicit more precise and accurate expert evidence with greater input and assistance from the experts themselves.

4. When properly and flexibly applied, with efficiency and discipline during the hearing process, the technique may also allow the experts to more effectively focus on the critical points of disagreement between them, identify or resolve those issues more quickly, and narrow the issues in dispute. This can also allow for the key evidence to be given at the same time (rather than being spread across many days of hearing); permit the judge to assess an expert more readily, whilst allowing each party a genuine opportunity to put and test expert evidence. This can reduce the chance of the experts, lawyers and the judge misunderstanding the opinions being expressed by the experts.

5. It is essential that such a process has the full cooperation and support of all of the individuals involved, including the experts and counsel involved in the questioning process. Without that cooperation and support the process may fail in its objectives and even hinder the case management process.

CASE MANAGEMENT

6. Parties should expect that, the Court will give careful consideration to whether concurrent evidence is appropriate in circumstances where there is more than one expert witness having the same expertise who is to give evidence on the same or related topics. Whether experts should give evidence concurrently is a matter for the Court, and will depend on the circumstances of each individual case, including the

[24] Also known as the "hot tub" or as "expert panels".

character of the proceeding, the nature of the expert evidence, and the views of the parties.

7. Although this consideration may take place at any time, including the commencement of the hearing, if not raised earlier, parties should raise the issue of concurrent evidence at the first appropriate case management hearing, and no later than any pre-trial case management hearing, so that orders can be made in advance, if necessary. To that end, prior to the hearing at which expert evidence may be given concurrently, parties and their lawyers should confer and give general consideration as to:

   (a) the agenda;

   (b) the order and manner in which questions will be asked; and

   (c) whether cross-examination will take place within the context of the concurrent evidence or after its conclusion.

8. At the same time, and before any hearing date is fixed, the identity of all experts proposed to be called and their areas of expertise is to be notified to the Court by all parties.

9. The lack of any concurrent evidence orders does not mean that the Court will not consider using concurrent evidence without prior notice to the parties, if appropriate.

CONFERENCE OF EXPERTS & JOINT-REPORT OR LIST OF ISSUES

10. The process of giving concurrent evidence at hearings may be assisted by the preparation of a joint-report or list of issues prepared as part of a conference of experts.

11. Parties should expect that, where concurrent evidence is appropriate, the Court may make orders requiring a conference of experts to take place or for documents such as a joint-report to be prepared to facilitate the concurrent expert evidence process at a hearing (see Part 7 of the Expert Evidence Practice Note).

PROCEDURE AT HEARING

12. Concurrent expert evidence may be taken at any convenient time during the hearing, although it will often occur at the conclusion of both parties' lay evidence.

13. At the hearing itself, the way in which concurrent expert evidence is taken must be applied flexibly and having regard to the characteristics of the case and the nature of the evidence to be given.

14. Without intending to be prescriptive of the procedure, parties should expect that, when evidence is given by experts in concurrent session:

   (a) the judge will explain to the experts the procedure that will be followed and that the nature of the process may be different to their previous experiences of giving expert evidence;

   (b) the experts will be grouped and called to give evidence together in their respective fields of expertise;

(c) the experts will take the oath or affirmation together, as appropriate;

(d) the experts will sit together with convenient access to their materials for their ease of reference, either in the witness box or in some other location in the courtroom, including (if necessary) at the bar table;

(e) each expert may be given the opportunity to provide a summary overview of their current opinions and explain what they consider to be the principal issues of disagreement between the experts, as they see them, in their own words;

(f) the judge will guide the process by which evidence is given, including, where appropriate:

(i) using any joint-report or list of issues as a guide for all the experts to be asked questions by the judge and counsel, about each issue on an issue-by-issue basis;

(ii) ensuring that each expert is given an adequate opportunity to deal with each issue and the exposition given by other experts including, where considered appropriate, each expert asking questions of other experts or supplementing the evidence given by other experts;

(iii) inviting legal representatives to identify the topics upon which they will cross-examine;

(iv) ensuring that legal representatives have an adequate opportunity to ask all experts questions about each issue. Legal representatives may also seek responses or contributions from one or more experts in response to the evidence given by a different expert; and

(v) allowing the experts an opportunity to summarise their views at the end of the process where opinions may have been changed or clarifications are needed.

15. The fact that the experts may have been provided with a list of issues for consideration does not confine the scope of any cross-examination of any expert. The process of cross-examination remains subject to the overall control of the judge.

16. The concurrent session should allow for a sensible and orderly series of exchanges between expert and expert, and between expert and lawyer. Where appropriate, the judge may allow for more traditional cross-examination to be pursued by a legal representative on a particular issue exclusively with one expert. Where that occurs, other experts may be asked to comment on the evidence given.

17. Where any issue involves only one expert, the party wishing to ask questions about that issue should let the judge know in advance so that consideration can be given to whether arrangements should be made for that issue to be dealt with after the completion of the concurrent session. Otherwise, as far as practicable, questions (including in the form of cross-examination) will usually be dealt with in the concurrent session.

18. Throughout the concurrent evidence process the judge will ensure that the process is fair and effective (for the parties and the experts), balanced (including not permitting one expert to overwhelm or overshadow any other expert), and does not become a protracted or inefficient process.