Assessment of the AER's proposed WACC Framework

A joint report for the
Energy Networks Association

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Project Team

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1. Introduction

This report has been jointly prepared by Jeff Balchin, Catherine Dermody and Greg Houston at the request of the Energy Networks Association (ENA), for submission to the Australian Energy Market Commission (AEMC). Its subject is the rate of return elements of the rule change proposal put forward in September 2011 by the Australian Energy Regulator (AER) for decision by the AEMC. It is one of three separate joint reports prepared for the ENA, each addressing particular aspects of AER's rule change proposal. In this report, the ENA has asked us to assess the proposed framework for determining the rate of return for electricity transmission and distribution network service providers as well as gas pipelines. Our specific terms of reference are as follows:

"Prepare a joint expert panel external report that:

1. describes the essential differences between the Chapter 6 and Chapter 6A WACC frameworks, and the role of the Chapter 6 'safety valve' in dealing with aberrant market conditions and error;
2. describes the effects of the GFC on capital markets (the flight to quality) and the implications for the performance of standard techniques for measuring the cost of capital and the appropriate response; and
3. will illustrate the importance of safety valves when WACC methodologies of values are otherwise 'locked in' and why a Chapter 6-style safety valve remains necessary; and
4. describes the role of the Tribunal process in bring closure to difficult and/or contentious matter, and the role of precedent in avoiding 'continual review'."

1.1. Authors and expertise

The authors of this report are: Jeff Balchin, Principal of PwC Australia; Catherine Dermody, Partner of Gilbert + Tobin; and Greg Houston, Director of NERA Economic Consulting. Greg and Jeff are both economists with substantial expertise in the economic regulation of network infrastructure services, while Catherine is a regulatory lawyer with deep expertise in the energy sector. This particular report has also been co-authored by Brendan Quach, Senior Consultant of NERA Economic Consulting, also an economist with substantial expertise in regulatory finance matters. A short biography for each of Jeff, Catherine, Greg and Brendan is attached as appendix B.

The authors also wish to acknowledge the substantial contributions of Sarah Turner, Research Officer, NERA Economic Consulting, in the preparation of this report.

1.2. Structure of this report

The remainder of this report is structured as follows:

- section 2 sets out the context for this report including the current frameworks for determining the cost of capital for electricity transmission network service providers (TNSPs), and distribution network service providers (DNSPs) and gas pipelines, and the issues with the current rules identified by the AER in its Rule Change Proposal;

- section 3 examines the effects of the global financial crisis on prevailing conditions in the financial markets;
- section 4 assesses how the AER's proposed framework would have operated had it been implemented from the time the current rules were put in place; and
- section 5 presents our conclusion that recent financial market conditions demonstrate the need for a mechanism that can be invoked by any party so that all available information can be considered at the time of any particular rate of return decision.

Appendix A provides a summary of the WACC/taxation issues that have been subject to merits review by the Australian Competition Tribunal, while appendix B provides a short biography for each of the authors of this report.

2. Context for this Report

This section provides an overview of:

- the current regulatory frameworks for setting the rate of return for electricity network service providers (NSPs) and gas pipelines; and
- a summary of the AER's proposal for a single cost of capital framework for all energy networks.

2.1. Three WACC frameworks

The current frameworks for setting the rate of return for electricity transmission, electricity distribution and gas pipeline businesses differ in terms of the level of prescription and flexibility to respond to current market conditions. The following sections describe the different characteristics of the current framework for each industry.

2.1.1. Electricity transmission

Chapter 6A of the National Electricity Rules (NER) prescribes that the rate of return be calculated as a nominal post-tax weighted average cost of capital (WACC) in accordance with the following formula.[1]

$$WACC = k_e \frac{E}{V} + k_d \frac{D}{V}$$

Where

k_e is the cost of equity (determined using the Capital Asset Pricing Model) ie:

$$k_e = r_f + b_e \times MRP$$

r_f is the nominal risk free rate

β_e is the equity beta

MRP is the Market Risk Premium

k_d is the cost of debt:

$$k_d = r_f + DRP$$

DRP is the Debt Risk Premium

$\frac{E}{V}$ & $\frac{D}{V}$ are the market value of equity (debt) as a proportion of the market value of equity and debt

Chapter 6A also provides for the AER to carry out a review every five years of various matters relevant to the determination of the above inputs.[2] The following matters (and the method of their calculation) may form the subject of a review:[3]

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1 Clause 6A.6.2(b) of the NER.

- the nominal risk free rate;
- the equity beta;
- the MRP;
- the maturity period and bond rates in relation to the calculation of the nominal risk free in the circumstances where there are no Commonwealth Government bonds with a maturity of 10 years on any day in the averaging period;
- the ratio of the value of debt to the value of equity and debt;
- the credit rating levels for the purposes of measuring the DRP;
- the assumed utilisation of imputation credits (gamma).

In undertaking the review the AER is required to comply with and/or have regard to a range of considerations. At the highest level, the AER must ensure that its review contributes to the achievement of the national electricity objective (NEO),[4] and must take into account the revenue and pricing principles.[5] The rate of return provisions in the NER also require the AER to have regard to:[6]

- the need for the rate of return to be a forward looking rate of return that is commensurate with prevailing conditions in the market for funds and the risk involved in providing prescribed transmission services;
- the need for the return on debt to reflect the current cost of borrowings for comparable debt;
- the need for the credit rating levels or values attributable to, or the methods of calculating the parameters to be based on a benchmark efficient provider; and
- that where the credit rating levels or the values attributable to, or the method of calculating, parameters cannot be determined with certainty:
  - the need to achieve an outcome that is consistent with the NEO; and
  - the need for persuasive evidence before adopting a credit rating level or a value for, or a method of calculating that parameter that differs from the credit rating level, value or the method of calculation that has previously been adopted for it.

Following the AER's review, pursuant to clause 6A.6.2(h), the AER may adopt values, methodologies or credit rating levels that are different from those specified in the Rules or from those adopted in a previous review. For the purposes of this report, we refer to the AER's review of the values, methodologies or credit rating levels used to determine the rate of return as the WACC Statement.

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2 Clause 6A.6.2(g) of the NER.

3 Clauses 6A.6.2(b) and 6A.6.4(b) of the NER.

4 National Electricity Law, Part 3, clause 16(1)

5 National Electricity Law, Part 3, clause 16(2)(a)

6 Clauses 6A.6.2(j) and 6A.6.4(e) of the NER.

The AER's decision to revise (or not) the WACC values, methodologies or credit rating levels to be adopted in the WACC Statement is not subject to merits review.[7]

Not all elements of the WACC are able to be reviewed by the AER in the WACC Statement. In particular, the only aspect of the DRP that can properly form the subject of the WACC Statement is the credit rating level and the term of debt for which the premium relates (the latter of which being given effect through the separate decision in relation to the term of the risk free rate).[8] This means that the DRP must otherwise be measured as set out in clause 6A.6.2(e), being:

> the premium determined for that regulatory control period by the AER as the margin between the annualised nominal risk free rate and the observed annualised Australian benchmark corporate bond rate for corporate bonds which have a BBB+ credit rating from Standard and Poors and a maturity equal to that used to derive the nominal risk free rate.

Following completion of the AER's review, the revised values, methodologies or credit rating levels set out in the WACC Statement must be used in all future revenue proposals submitted to the AER. This applies until such time as the AER conducts a subsequent review. Since the AER has no discretion at the time of each revenue decision as to whether or not to adopt WACC statement, the specified values, methodologies or credit rating levels are not subject to merits review at the time of the TNSP's revenue determination.

2.1.2. Electricity distribution

The framework for setting the rate of return for DNSPs and set out in chapter 6 of the NER has a number of similarities, and one distinct difference, to the framework specified in chapter 6A. The common features of both chapter 6 and chapter 6A WACC frameworks are:

- the NEO and the revenue and pricing principles, as set out in the National Electricity Law;
- the specification of a nominal post-tax WACC and the CAPM;
- a periodic review of the same parameters values, methods or credit ratings, although the AER has some discretion on the timing of the review that must be undertaken at intervals not exceeding five years;
- that for the DRP only the credit rating is subject to change in the WACC Statement;
- the absence of any form of merits review of the AER's decision as to whether or not to revise the values, methods or credit ratings in the WACC statement; and
- the matters that to which the AER must have regard in preparing its WACC statement, including the need for persuasive evidence before changing from a previously adopted values or method in the WACC Statement.

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[7] The WACC statement is neither a network revenue nor price determination, nor reviewable regulatory decision prescribed by the National Electricity Regulation. See clause 71A of the *National Electricity (South Australia) Act 1996*, and clause 9 of the *National Electricity (South Australia) Regulations*.

[8] Clause 6A.6.2(i)(2) of the NER.

The principal and critical distinction between the two frameworks is that, at the time of each revenue or price determination, it is open to a DNSP to propose that a value in the WACC Statement not be adopted, any other relevant stakeholder to submit that such a value be or not be adopted, and for the AER, on the basis of the material before it, to decide whether or not to adopt WACC Statement values or some other value. A decision by the AER to adopt different values for particular WACC parameters is subject to criteria that are set down in the Rules.[9]

In developing chapter 6, the Ministerial Council on Energy Standing Committee of Officials (SCO) considered that the distribution rules should permit the WACC to be subject to merits review on a determination-by-determination basis. The SCO did not consider it appropriate to replicate the transmission rules, but that given the different parameters adopted by jurisdictions under the state-based approach, to allow distribution to converge, should the AER consider it appropriate, over time.[10]

The SCO noted:[11]

> The final decision on WACC will be part of each regulatory determination. However, the AER will still review WACC every five years and promulgate non-binding indicative guidelines [Statement of Regulatory Intent] on the industry wide WACC values. At the regulatory reset, DNSPs and other stakeholder [sic] will be able to seek variation from these guidelines. The proponent seeking variation will need to justify why the 5 year review parameters are not applicable and whether there has been a change in market circumstance. The AER will need to assess whether there has been a change in market circumstances to warrant a deviation from the parameter specified in its guidelines or whether sufficiently persuasive evidence has been provided for different values to be applied for the relevant DNSP. Linking the WACC to the regulatory determination means that the AER's consideration will be merits reviewable.

In other words, the SCO envisaged that the WACC Statement parameters would be varied when there was persuasive evidence:

- that change in the market circumstances warrant a deviation from a specified parameter value; or
- that the circumstances of the relevant DNSP justify that different value be applied.

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9 Clause 6.5.4(g), (h) and (i) of the NER, the AER is required to apply the Statement unless there is 'persuasive evidence justifying the departure'. When assessing whether such a departure is justified, the AER is required to apply the same method and/or principles that were applied when determining the Statement (the 'underlying criteria'), and inquire whether, applying those criteria, 'a material change in circumstances ... or any other factor' now makes the relevant aspect of the Statement inappropriate.

10 SCO, *Table 1: SCO Response to Stakeholder Comments on the Exposure Draft of the National Electricity Rules for Distribution Revenue and Pricing (Chapter 6)*, page 16 (item 49).

11 SCO, *Table 1: SCO Response to Stakeholder Comments on the Exposure Draft of the National Electricity Rules for Distribution Revenue and Pricing (Chapter 6)*, page 17 (item 50).

2.1.3. Gas pipelines

The gas pipeline framework for determining the rate of return is substantially different from that applying to electricity NSPs. While the NER specify the financial models and parameters for the rate of return, the National Gas Rules (NGR) establish an overarching cost of capital principle. Rule 87(1) states that:

> The rate of return on capital is to be commensurate with prevailing conditions in the market for funds and the risk involved in providing reference services.

Rule 87(2) provides some guidance on how that overarching principle is to be applied by the AER in determining a rate of return on capital, ie:

- it will be assumed that the service provider meets benchmark levels of efficiency and uses a financing structure that meets benchmark standards as to gearing and other financial parameters for a going concern and reflects in other respects best practice; and
- a well accepted approach that incorporates the cost of equity and debt, such as the Weighted Average Cost of Capital, is to be used; and a well accepted financial model, such as the Capital Asset Pricing Model, is to be used.

One consequence of this framework is that all elements of AER rate of return decisions made in the context of gas access arrangements are subject to merits appeal.

Under the NGR, there is no periodic, AER review of generic WACC parameters, and the WACC Statement made under the NER does not formally apply to gas networks. Notwithstanding, in its 2009 WACC Statement for electricity NSPs, the AER stated that, "given the similarity of the issues, the AER may use the outcomes of this review in the consideration of WACC issues in future gas access arrangement reviews".[12]

2.2. AER rule change proposal

The AER has proposed that the NER and NGR be amended:

- to establish a single WACC framework that largely reflects the current approach for electricity transmission of fixing WACC parameter values or methods by way of a periodic Statement on the Cost of Capital (SoCC);
- to adjust chapters 6 and 6A so that the DRP method is subsumed within SoCC process (rather than being fixed by rules sitting outside the scope of a SoCC);
- to remove the 'persuasive evidence' criteria before changing a value, method or credit rating in the SoCC; and
- to allow the AER the flexibility to deal with change in financial market or other circumstances through bringing forward the review, since the SoCC is to be undertaken at intervals determined by the AER, but which are not to be more than 5 years.

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[12] AER, *Electricity Transmission and Distribution Network Service Providers: Review of the Weighted Average Cost of Capital (WACC) Parameters – Final Decision*, May 2009, page 6.

The AER cites the following reasons for its proposed rule change:

- convergence to a periodic SoCC has administrative efficiency benefits;[13]
- it would avoid the AER and networks operating in a continual 'WACC review' mode that has characterised recent distribution and gas decisions;[14]
- new information or theory evolves slowly, and so there is little reason for decisions to continually review the WACC parameter values, methods or credit ratings;[15]
- the persuasive evidence requirement is asymmetric and is a cause of bias since firms can "cherry pick" WACC parameters;[16] and
- the benchmark DRP has recently been set at a rate significantly above the cost of newly issued NSP debt.[17]

We note that the AER cite as supports for change the ongoing debate on the MRP. The AER characterises the MRP debate as one where DNSPs and gas pipelines have been:[18]

> attempting to cherry pick certain parameters and engage in arguments even where evidence is not persuasive, or to repeat and repackage data and theoretical arguments at each distribution determination

Notably, the AER's characterisation of recent history as one of being 'continual WACC review' involves no acknowledgement of the effect that the 'global financial crisis' (GFC) may have had on the WACC determination process. The effect of the GFC on the financial markets, and its particular implications for the regulated WACC and MRP, is discussed in greater detail in the following sections of this report.

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[13] AER, *Economic regulation of gas distribution and transmission services: AER's proposed changes to the National Gas Rules, September* 2011, page 3.

[14] AER, *Economic regulation of transmission and distribution network service providers: AER's proposed changes to the National Electricity Rules, September* 2011, page 69.

[15] *Ibid.*

[16] *Ibid.*

[17] AER, *Economic regulation of transmission and distribution network service providers: AER's proposed changes to the National Electricity Rules, September* 2011, p 79.

[18] AER, *Economic regulation of transmission and distribution network service providers: AER's proposed changes to the National Electricity Rules, September* 2011, p 68.

3. Implications of GFC for Financial Markets

3.1. The Global Financial Crisis

This section describes the events that are colloquially known as the global financial crisis or GFC. There is no single event that defines the GFC. Rather, it refers to a period during which the value of financial assets were subject to cataclysmic change as perceptions of risk and the creditworthiness of both major financial institutions and sovereign borrowers were subject to rapid change. In consequence the market value of virtually all financial assets was subject to unprecedented volatility. These developments were occasioned by a series of detrimental occurrences, including:

- the collapse of the US subprime mortgage market;
- the bankruptcy of Lehman Brothers in September 2008; and
- more recently, the European government debt crisis.

3.1.1. US subprime mortgages

The GFC stems from what was originally known as the subprime crisis in June to mid-July 2007.[19] The subprime crisis was a problem initially assumed to be contained in the US subprime mortgage sector and relates to the subprime lending.

In the US, mortgages that do not meet the underwriting standards for entry into mortgages pools guaranteed by the government-sponsored enterprises Freddie Mac and Fannie Mae are known as sub-prime.[20] Such mortgages are associated with borrowers that have a relatively higher risk of default. Over a period of some years, the fact that sub-prime mortgages are not able to be backed by the government-sponsored enterprises led to the emergence of private mortgage-backed securities.[21]

The sub-prime crisis began in mid June 2007 following the losses suffered by two hedge funds managed by Bear Stearns, which had invested in securities backed by sub-prime mortgage loans.[22] This event highlighted the rise in sub-prime mortgage default rates (following an adverse change in the housing market, leading to an increase in the number of mortgagors that were in negative equity) and, as such, credit rating agencies downgraded a large number of collateralised debt obligations (CDOs) that used mortgages as collateral.[23]

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19 Bank for International Settlements, BIS 78th Annual Report, 30 June 2008, page 92.

20 Reserve Bank of Australia, A Comparison of the US and Australian Housing Markets: Address to the Sub-prime Mortgage Meltdown Symposium, 16 May 2008.

21 Reserve Bank of Australia, A Comparison of the US and Australian Housing Markets: Address to the Sub-prime Mortgage Meltdown Symposium, 16 May 2008.

22 Bank for International Settlements, BIS 78th Annual Report, 30 June 2008, page 95.

23 Reserve Bank of Australia, Lessons from the Financial Turmoil of 2007 and 2008, October 2008, Cohen and Eli Remolona, The Unfolding Turmoil of 2007–2008: Lessons and Responses, page 9.

The crisis spread to the interbank money markets because banks did not know the level of exposure of other entities, resulting in banks hoarding liquidity.[24] This saw the asset-backed commercial paper market freeze in several countries and the London Interbank Offered Rate (LIBOR) overnight index swap (OIS) spreads rising sharply.[25] As a result, there was a decrease in credit available for borrowing and a general loss of confidence in financial markets, culminating it what became known as the GFC.

3.1.2. Collapse of Lehman Brothers

Following the effects of the subprime crisis on funding liquidity, a number of banks experienced losses and write downs as asset prices weakened.[26] From March to mid-September 2008, these funding problems raised concerns about solvency and the risk of bank failures. On 15 September 2008 the investment bank Lehman Brothers collapsed, leading to a global loss of confidence.[27] The OECD note that "[f]ollowing the collapse of Lehman Brothers in mid-September, a generalised loss of confidence between financial institutions triggered reactions akin to a 'blackout' in global financial markets".[28]

September 2008 also saw both Fannie Mae and Freddie Mac placed in conservatorship, as well as the sale of Merrill Lynch to Bank of America and the US government taking over 80 per cent of the equity in AIG.[29] The events that occurred in September 2008 highlight the progression of the GFC, with these effects being felt throughout global financial markets. Indeed the IMF states in its October 2008 World Economic Outlook that:[30]

> The financial crisis that first erupted with the U.S. subprime mortgage collapse in August 2007 has deepened further in the past six months and entered a tumultuous new phase in September. The impact has been felt across the global financial system, including in emerging markets to an increasing extent. Intensifying solvency concerns have led to emergency resolutions of major U.S. and European financial institutions and have badly shaken confidence.

In a speech on 31 March 2009, the RBA Assistant Governor (Financial Markets) Guy Debelle stated that:

> …funding markets shut completely following the collapse of Lehman Brothers. All global financial markets were dislocated by this event, but not surprisingly term debt

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[24] Reserve Bank of Australia, *The Global Financial Crisis: Causes, Consequences and Countermeasures: Remarks to the conference: 'Australia in the global storm: A conference on the implications of the global financial crisis for Australia and its region' Victoria University*, 15 April 2009.

[25] Reserve Bank of Australia, Lessons from the Financial Turmoil of 2007 and 2008, October 2008, Cohen and Eli Remolona, The Unfolding Turmoil of 2007–2008: Lessons and Responses, page 9.

[26] Bank for International Settlements, *BIS 79th Annual Report*, 29 June 2009, page 16.

[27] Bank for International Settlements, *BIS 79th Annual Report*, 29 June 2009, page 16.

[28] Competition Economists Group, *Rate of Return and the Averaging Period Under the National Electricity Rules and Law*, January 2008, page 31.

[29] Competition Economists Group, *Rate of Return and the Averaging Period Under the National Electricity Rules and Law*, January 2008, page 31.

[30] Competition Economists Group, *Rate of Return and the Averaging Period Under the National Electricity Rules and Law*, January 2008, page 31.

> markets were about the most affected… In many money markets around the world, maturities shortened dramatically so that only the overnight market was (barely) functioning and a number of central banks became effectively the intermediator of last resort.
>
> …in the wake of the dislocation induced by Lehman's, many countries, including Australia, moved to guarantee bank debt issuance.
>
> Soon after the introduction of the guarantee, Australian banks were able to once again access term debt markets… There has, however, been little investor appetite for unguaranteed debt, despite other indications of an improvement in credit market conditions."

3.1.3. European government debt crisis

The most recent incarnation of the GFC has been the deterioration of government finances in a number of European countries. The declining fiscal situation of European governments has led to heightened concerns of the sustainability of sovereign debt.[31] The levels of debt in Greece, Ireland and Portugal escalated to the point that international bailout packages were devised for these countries in 2010 and 2011.[32] However, sovereign debt risks have continued to spread, which has recently affected Italy and Spain.[33] Moreover, the recent failure of the German government to sell its €6 billion worth of loans "effectively" froze the global markets in November 2011.[34] Ralph Norris (CEO of Commonwealth Bank) stated that:[35]

> "This [European debt crisis] has potential to be significantly worse than the Lehman Brothers collapse and the subprime crisis because now we are talking about nation states"

The ongoing European debt crisis and the inability of governments to resolve the sovereign debt problems, raises the prospect that this crisis may not be a temporary period of market uncertainty and could be the start of a severe market dislocation.[36]

3.2. Impact on Australian financial markets

Australian financial markets have avoided directly contributing to these crises. However, Australia is highly integrated with world financial markets and so the effects of the GFC have had a profound impact on Australian markets.

The effects of the GFC on Australia became apparent between July and August 2007 with the failure of two Australian Hedge Funds – Basis Capital and Absolute Capital – as well as the announcement of financing of problems of a mortgage securitiser – RAMS Home Loans.[37]

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31 Reserve Bank of Australia, *Financial Stability Review*, September 2011, page 5.

32 Reserve Bank of Australia, *Financial Stability Review*, September 2011, page 5.

33 Reserve Bank of Australia, *Financial Stability Review*, September 2011, page 5.

34 Sydney Morning Herald, *GFC II on its Way: Norris*, 25 November 2011.

35 Sydney Morning Herald, *GFC II on its Way: Norris*, 25 November 2011.

36 Reserve Bank of Australia, *Financial Stability Review*, September 2011, page 1.

Further, the closure of international securitisation markets led to a halt in the domestic markets.[38] The Australian banks had previously relied on international wholesale financing and, due to the increased price of risk, the banks' cost of funding increased, with these increases passed onto borrowers.[39] As such, these higher borrowing costs, as well as depressed equity and asset prices, drove many of the negative outcomes associated with the GFC.[40]

Australia, like the US, also experienced a rise in spreads in short-term money markets in mid-2007.[41] In response to this decline in interbank lending, the RBA increased the supply of cash in the system – as measured by exchange settlement balances – in order to maintain the cash rate.[42]

The Australian stock market fell soon after the global stock market crash, itself a result of the economic downturn and a reduced appetite for risk.[43] Both the Australian household and business sectors appear to have become significantly more risk-averse following the onset of the GFC, as indicated by a substantial increase in household saving and higher equity funding by a number of businesses.[44]

Directly observable effects of the GFC on Australian financial markets have included:

- major falls in equity markets due to a combination of reduced outlook for earnings and/or earnings growth and a reduced appetite for risk;
- a fall in yields for Commonwealth Government Securities (CGS) due to increased demand for 'safe' securities combined with progressing easing of monetary policy by the Reserve Bank of Australia (RBA); and
- an increase in the corporate DRP and the subsequent preference to issue bonds at shorter than historic maturities.

Evidence of these effects can be seen in the following three figures on:

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37 Kevin Davis, *The Australian Financial System in the 2000s*, Prepared for Reserve Bank of Australia, 28 July 2011, page 32.

38 Kevin Davis, *The Australian Financial System in the 2000s*, Prepared for Reserve Bank of Australia, 28 July 2011, page 32.

39 Kevin Davis, *The Australian Financial System in the 2000s*, Prepared for Reserve Bank of Australia, 28 July 2011, page 32; and Reserve Bank of Australia, A Comparison of the US and Australian Housing Markets: Address to the Sub-prime Mortgage Meltdown Symposium, 16 May 2008.

40 Kevin Davis, *The Australian Financial System in the 2000s*, Prepared for Reserve Bank of Australia, 28 July 2011, pages 32-33.

41 Reserve Bank of Australia, Some Effects of the Global Financial Crisis on Australian Financial Markets: Finance Professionals Forum, 31 March 2009.

42 Reserve Bank of Australia, Some Effects of the Global Financial Crisis on Australian Financial Markets: Finance Professionals Forum, 31 March 2009.

43 Kevin Davis, *The Australian Financial System in the 2000s*, Prepared for Reserve Bank of Australia, 28 July 2011, page 32.

44 Reserve Bank of Australia, *The Global Financial Crisis: Causes, Consequences and Countermeasures: Remarks to the conference: 'Australia in the global storm: A conference on the implications of the global financial crisis for Australia and its region' Victoria University*, 15 April 2009.

- Figure 3.1, that shows the closing price of the All Ordinaries, the broad Australian equities index;
- Figure 3.2, depicting the yield on ten year CGS; and
- Figure 3.3, showing the 7 year BBB corporate debt risk premium.

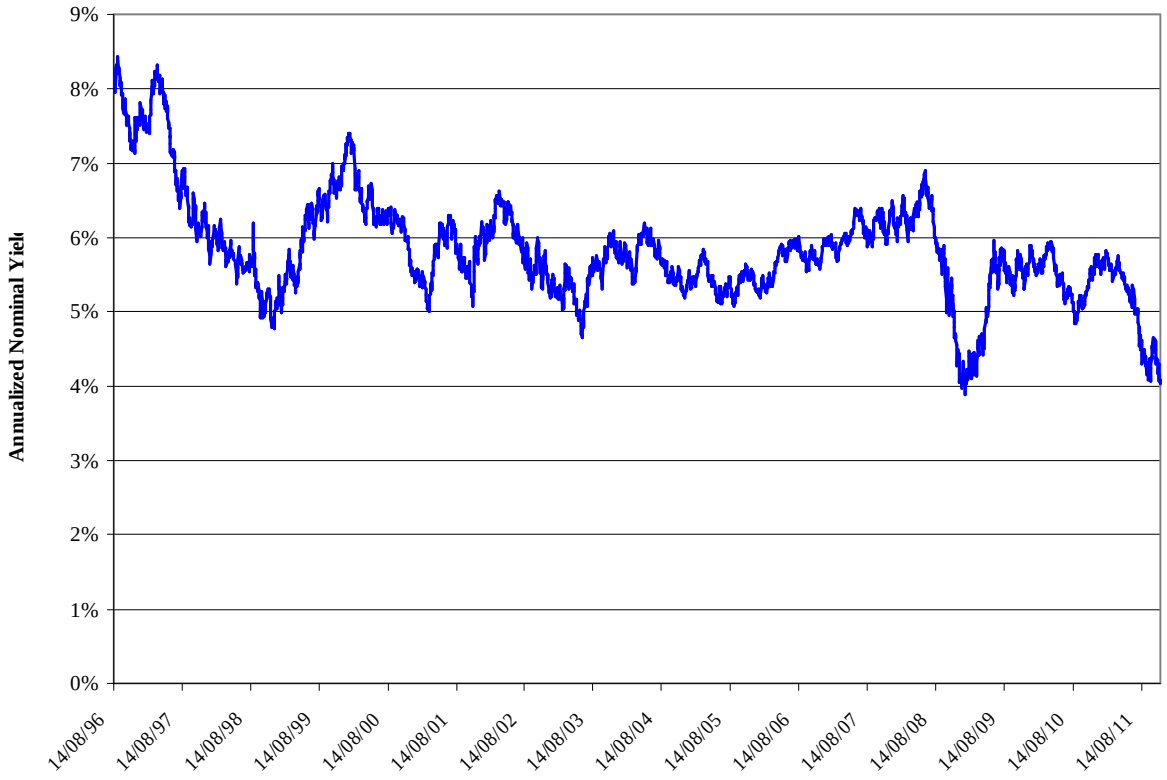
Figure 3.1
Daily Closing Price of the ASX All Ordinaries

Source: Factiva

Figure 3.1, shows the dramatic fall in the value of Australian equities from the second half of 2007. At its peak the All Ordinaries touched 6,873 in October 2007, before falling to 3,092 in March 2009, a fall of 55 per cent.

Figure 3.2, shows that since the RBA was given independence to pursue an inflation target of between two and three percent the annualised ten year CGS yield has averaged 6.5 per cent. However, following the collapse of Lehman Brothers (mid September 2008) ten year yields fell from 5.8 per cent to 3.9 per cent in mid-January 2009 (the lowest observed yield since the RBA gained monetary policy independence).

Figure 3.2
Ten Year Nominal Yield (Annualised)



Source: RBA, and NERA analysis

Figure 3.3, shows that the DRP for 7 year BBB rated Australian corporate debt increased rapidly in the second half of 2007 from a little over 100 basis points to around 350 basis points in early 2008.[45]

[45] Figure 3.3, charts the seven years BBB Australian corporate yields as published by Bloomberg. This series has been selected as it is the longest BBB bond yield that is still published by Bloomberg.

Figure 3.3
Debt Risk Premium
Australia Domestic BBB (7yr)

Source: Bloomberg L.P., RBA and NERA

4. Assessment of the AER's Proposed WACC Framework

This section assesses how the AER's proposed framework for determining the rate of return to apply to all network service providers would have operated had it been implemented from the time the current rules were put in place – being November 2006 in respect of Chapter 6A and January 2008 for Chapter 6.

4.1. Critical features of the AER's proposal

The AER's rule change proposal is that the framework for determining the rate of return for electricity transmission and distribution networks as well as gas pipelines should converge to a single regime that closely resembles that set out in chapter 6A of the NER. The key features of that framework are that:

- the rules require that the rate of return be calculated on the basis of a specified WACC formula that includes using the CAPM to determine the cost of equity;
- the values and/or methodologies for determining each of the WACC parameters would be reviewed periodically (at least every five years);
- following the review a Statement on the Cost of Capital (SoCC) would be published specifying the values, methods, and/or credit ratings to be applied in all subsequent revenue/price decisions (until superseded by a subsequent review and SoCC); and
- there would no ability on the part of either the network service providers to propose a departure from the prescribed SoCC values or methods, or for other stakeholders to submit that a departure be or not be made, or the AER allow departures from the prescribed SoCC values or methods for each WACC parameter at individual revenue/price determinations.

In assessing the strengths, weaknesses and risks of this framework it is instructive to consider how it would have operated over the last six years, being a period characterised by significant changes in financial markets. We conclude that the AER's proposed rate of return framework contains a number of fundamental weaknesses, ie:

- the framework cannot accommodate rapid changes in market conditions, such as those experienced in recent years, with the effect that the locking-in of WACC parameters once every five years would create the risk that the rate of return decisions for some NSPs would not be commensurate with the regulatory and commercial risks involved[46] and/or with the prevailing conditions in the market for funds;[47]
- unforeseen changes in the availability of data may result in prescribed methods becoming obsolete and so not practicable for application in revenue/price decisions;
- the framework contains no mechanism to enable errors to be identified and corrected, and for contentious issues to be resolved by a process of merits review; and

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[46] National Electricity Law, Part 2, clause 7A(5)

[47] Clauses 6A.6.2(j)(1)

§ the ability of the AER to bring forward the timing of the SoCC is not a practicable solution to the above issues.

The remainder of this section discusses each of these weaknesses in greater detail.

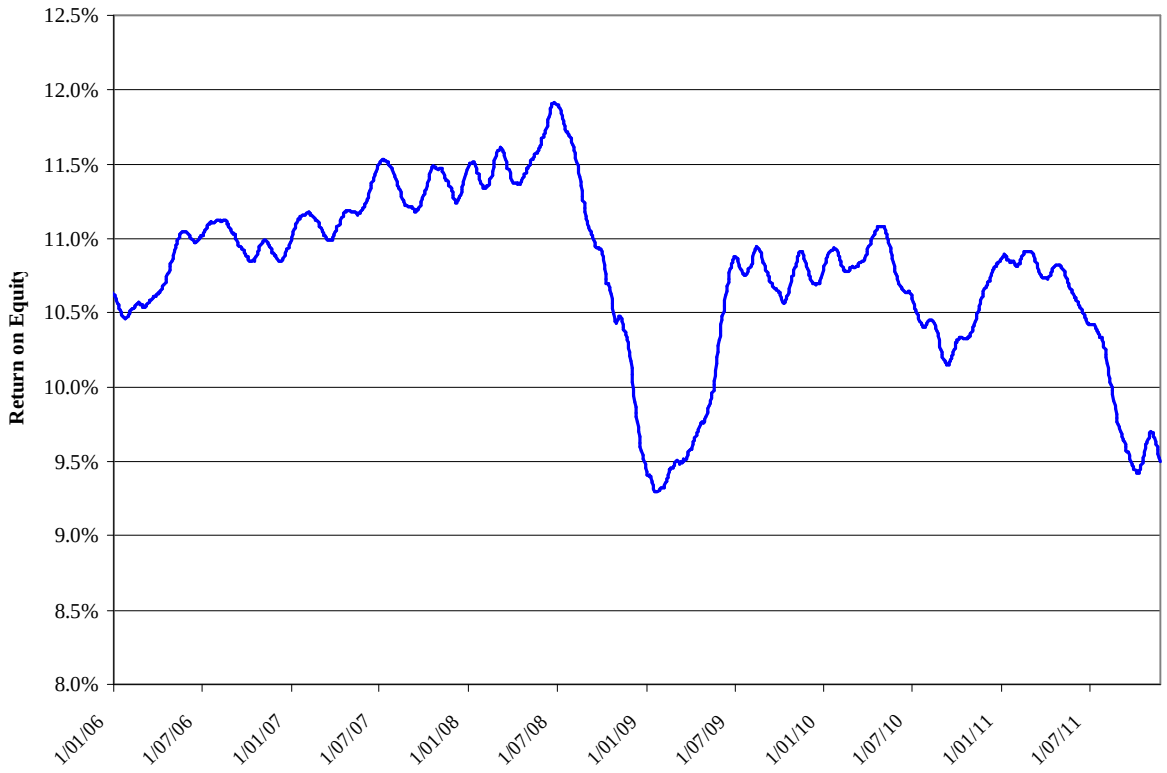
4.2. Inability to accommodate rapid changing markets

Under the AER's proposed WACC framework the estimate of the cost of equity would be set by reference to a fixed margin above the risk free rate. Using the parameter values determined in the 2009 WACC Statement that margin would be 5.2 per cent, ie:

$$k_e = r_f + b_e \times MRP$$
$$= r_f + 0.8 \times 6.5\%$$
$$= r_f + 5.2\%$$

Figure 4.1 illustrates how the nominal regulatory cost of equity estimate would have fluctuated over the past five years if it were set as a fixed margin above the risk free rate.

Figure 4.1
Return on Equity 2006-present



These data shows that prior to the collapse of the Lehman brothers in September 2008 the estimate of the cost of equity would have been over 11.5 per cent, but with this having fallen to 9.2 per cent by January 2009. In other words, at the deepest point in the first phase of the

GFC, the AER's proposed rate of return framework would have enforced a fall in the estimate of the cost of equity of over 2.3 per cent.

Applying the fixed margins of 5.2 per cent to the risk free rates prevailing in the 20 days prior to all the energy network decisions since 2006 (as a convenient proxy period) the estimate of the cost of equity would be:

- 10.89 per cent for the Roma to Brisbane Pipeline (20 December 2006);
- 11.25 per cent for the Dawson Valley Pipeline (22 August 2007);
- 11.35 per cent for SP AusNet (Transmission) (31 January 2008)
- 11.36 per cent for ElectraNet (11 April 2008);
- 11.70 per cent for GasNet (25 June 2008);
- 9.76 per cent for the NSW DNSPs, TransGrid, Transend and ActewAGL (28 April 2009);
- 11.08 per cent for the Queensland DNSPs and ETSA Utilities (4 May 2010),
- 10.66 per cent for Jemena (NSW) gas networks (11 June 2010)
- 10.36 per cent for the Victorian DNSPs (29 October 2010);
- 10.51 per cent for the APT Allgas and Envestra (Qld) and (SA) gas networks (17 June 2011); and
- 9.38 per cent for Aurora Energy and Powerlink (draft decision 29 November 2011)

This list indicates that the estimate of the cost of equity under this method would generally fall between just under 10.5 per cent and just over 11.5 per cent. The exceptions to this would have been the decisions in April 2009 and the recent draft decisions for Aurora and Powerlink. In both cases financial markets were experiencing extreme stress, in late 2008 the market was dealing with the aftermath of the collapse of Lehman Brothers and, more recently, financial markets are significantly affected by concerns associated with European sovereign debt.

In our opinion, when applied during periods of extreme uncertainty, the combination of a market risk premium determined by reference to long term historical data and a risk free rate determined by reference to present day market conditions results in a return on equity value that does not meet the overarching principle of being commensurate with the current market conditions. Rather, in such circumstances, a material increase in the present date market risk premium would be predicted. This conclusion is consistent with the observations of the RBA in its March 2009 Financial Stability Review:[48]

> The global financial system has continued to experience significant stress. … A notable feature of the current crisis has been a marked increase in the price of risk, after risk had been underpriced in many markets for a number of years. This repricing of risk has resulted in large falls in the price of many financial assets, often by considerably more than can be explained by changes in the expected underlying cash flows.

[48] RBA, Financial Stability Review, March 2009, page 1.

Similar sentiments were expressed by Professors Franks and Myers in their advice to the New Zealand Commerce Commission on whether it should change its estimate of the MRP as a result of the GFC:[49]

> Professor Myers recommends that the Commission sets a range for the MRP. The bottom of the range for the MRP should be 5%. The top of the range should be a long-term historical arithmetic average MRP over long-term government bond returns. This range for the MRP implies a range for the TAMRP. The Commission should use the top of the range for the TAMRP until the world economy returns to normalcy and stable growth… Professor Franks recommends that the Commission consider a small increase of ½% to 1% to the TAMRP estimate but it would take the form of a temporary surcharge.

We note that, as a practical matter, an alternative means of estimating the cost of equity during times of extreme market uncertainty is to set aside the current date risk free rate and instead to adopt a figure that better reflects the market conditions that gave rise to the historical average market risk premium. This was the recommendation of Professor Officer in 2009:[50]

> Ideally, as I have already indicated, one would estimate the relevant parameters of the CAPM to reflect the expected or required return on equity for the period that the regulatory rate is set. If one is prevented from doing this, either because of a constraint that an average MRP must be used or through estimation problems, then a second beset approach is to use a period that is unaffected by "aberrant market conditions". In effect, the R_f should be estimated from a period that is consistent with the MRP estimate – an 'averaging period' or period of 'equilibrium'.

The fact that the GFC caused an increase in the Australian MRP is consistent with the AER's own assessment that over the last three years the MRP has varied from:

- 6 per cent prior to 1 May 2009, which according to the AER represents the historical average MRP; to
- 6.5 per cent between the 1 May 2009 and February 2011 when, on account of the effects of the GFC as they were then interpreted, the AER raised the MRP value by 0.5 per cent in its 2009 WACC Statement; and then back to
- 6 per cent from the February 2011, when the AER concluded that the effects of the GFC had dissipated.[51]

This summary of AER decisions in relation to the MRP confirm that its own analysis of changes in that parameter over time is at odds with its statement in the context of its rule change proposal that new financial information or theory is slow to evolve. By the statements and decisions it has made during this period, the AER itself appears to accept that WACC

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[49] J. R. Franks, M. Lally and S. C. Myers, 2010, *Recommendation to the New Zealand Commerce Commission on whether or not it should change its previous estimate of the tax adjusted market risk premium as a result of the recent global financial crisis*, pages 4 and 8.

[50] Professor R. Officer, *Expert Report prepared in respect of certain matters arising from the AER's New South Wales Draft Distribution Determination 2009-10 to 2013-14*, 16 February 2009, paragraph 46.

[51] AER, Envestra Ltd Access arrangement proposal for the Qld gas network 1 July 2011- 30 June 2016: Draft decision, February 2011, page 85.

parameters can alter over relatively short periods of time in response to changing market conditions.

Notwithstanding these developments, the chapter 6A framework that the AER now proposes be adopted for network service providers generally cannot accommodate changes in market conditions of the nature and timing that have recently been experienced. In our opinion, the only mechanism that is capable of addressing such circumstances is a provision that, at each revenue or price determination, allows an assessment as to whether the SoCC values, methods and credit rates are still appropriate. That assessment must be undertaken by reference to prevailing conditions in the market for funds at the time of the determination and their effect on the rate of return required to provide the services to which the prices or charges relate.

4.3. Inability to cope with changes in available market data

The AER's proposed framework would also inhibit the adoption of alternative or augmented approaches to the measurement of WACC parameters in circumstances where there are changes to the availability of information necessary to implement a method specified in the rules/SoCC. By way of recent and relevant example, such a situation has arisen in relation to the data necessary to determine the DRP.

Chapters 6 and 6A of the NER require the DRP to be estimated on the basis of Australian corporate bond with a BBB+ credit rating and a maturity equal to that used to derive the nominal risk free rate (ie, ten years). The AER may review and alter the credit rating (ie, BBB+) or the term of the risk free rate in its WACC Statement, although it chose not to do so in its 2009 WACC Statement.

At the time the existing rules were put in place, both networks service providers and the AER could rely on two independent data sources for the specified DRP, ie, CBASpectrum and Bloomberg. However, Bloomberg ceased to publish an estimate of the Australian 10 year BBB+ rated bonds in October 2007, while CBASpectrum ceased providing estimates in 2010.[52]

Market developments during this period were themselves a contributing factor to these two independent data sources deciding to cease publication of their estimates of the current yield on Australian 10 year BBB+ rated bonds. Irrespective, the consequence has been that network service providers and the AER have had to develop new statistical techniques to estimate the DRP in the manner prescribed by the rules.

A related complexity is that very few Australian long term/low rated bonds were issued from the start of the GFC (mid 2007) until about 18 months ago (mid 2010), although a number of new, longer dated domestic corporate bond issues have occurred more recently. This seems likely to be a consequence of the increased risk aversion of investors and so a reduced appetite for investment in long dated corporate bonds. Similarly, corporate borrowers have

[52] This was communicated to the AER on 19 August 2010, see AER, *Victorian electricity distribution network service providers: Distribution determination 2011- 2015: Final decision*, October 2010, p. XXXVIII.

(understandably) responded to the increased investor risk aversion by opting for shorter dated maturity borrowings.

Importantly, one consequence of the declining amount of information and data on the DRP has been that the process of estimation using proxy data has given rise to dispute as to precisely how this should be undertaken. Such disputes have been the cause of half the WACC/tax appeals amongst the ten electricity and gas businesses that have appealed the AER's DRP decisions.[53]

4.4. Lack of a mechanism to identify and correct errors

Under the AER's proposed WACC framework, the parameter values, methods and credit ratings would be fixed by means of the SoCC, and the AER would then be prevented from being able to modify or accept any proposed modification to these parameters at the time of a revenue/price decision. Relative to the current arrangements under chapter 6 of the NER, the WACC parameters would not be a constituent decision of a revenue/price decision and so would not be subject to merits review by the Tribunal.

Without any mechanism to trigger an expert and independent review, errors in a WACC Statement would not be able to be identified and corrected. Applying this to the experience to date under the current regime, this means that the merits review proceedings brought by ETSA Utilities, Ergon Energy, and Energex on the decision by the AER to apply the WACC Statement value for the assumed utilisation of imputation credits (gamma) uncovered a number of errors in the AER's 2009 statement would not have been possible.[54]

By way of background gamma is the product of two components:

- the fraction of imputation credits created through the payment of company income tax that are assumed to be distributed to shareholders by way of franked dividends; and
- the value to shareholders from receiving one dollar of imputation credits (theta).

In its 2009 WACC Statement the AER established a value for gamma of 0.65. This was calculated as the product of a distribution rate of 100 per cent and a value for distributed credits of 0.65.

In subsequent proceedings before the Tribunal, the AER conceded that there was no empirical data capable of supporting a distribution rate higher than 70 per cent. This was the distribution rate argued by the NSPs in the appeal and was also the rate put forward in joint industry submissions during the 2009 WACC review.

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[53] See Appendix A to this report.

[54] The value of 'gamma' is used to determine the proportion of benchmark company income tax that should not be included in a regulated firm's annual revenue requirement. Compensation for company income tax does not need to be provided because under the Australian imputation tax system, a franking credit is provided to companies for tax paid at the corporate level. Companies can then distribute franked dividends to its shareholders. Shareholders receiving franked dividends are able to use the franking credit to offset Australian tax due on the dividend to which the credit is attached or tax due on other income or, since 1 July 2000, credits can be used to produce a rebate from the Australian Tax Office (ATO).

The Tribunal also found further error in the AER's determination of theta. The AER's estimate of theta of 0.65 was the mid point of two estimates:

- 0.57, inferred from 2006 dividend drop-off study by Beggs and Skeels;[55] and
- 0.74, inferred from a 2008 paper by Handley and Maheswaran using from tax statistics.[56]

A matter of significant contention between the AER and network service providers in the course of preparing the WACC Statement was the relevance and weight that should be put on the use of tax statistics. Advisors to the energy networks argued that no weight should be put on tax statistics because:[57]

> In summary, three expert reports have reached the same conclusion on this point – that Associate Professor Handley is mistaken to suggest that redemption rates [sourced from tax statistics] provide point estimates or even "upper bounds" for theta and that the AER was wrong to rely on that advice.

The Tribunal found that the AER had made an error of logic in its use of the Handley and Maheswaran paper, stating that:[58]

> The AER accepted that utilisation rates derived from tax statistics provide an upper bound on possible values of theta. …. However, its relevance could only be related to the fact that it was an upper bound. No estimate that exceeded a genuine upper bound could be correct. Thus the appropriate way to use the tax statistics figure was as a check.

In other words, the Tribunal found that tax statistics should not be used to estimate theta but should only be used to check whether the estimated value was too high.

Furthermore, the Tribunal also directed the AER to commission a 'state of the art' dividend drop-off study from Strategic Finance Group (SFG). This direction followed the AER's continued insistence that no weight should be placed on any study other than that by Beggs and Skeels in 2006.

The Tribunal accepted the results of the new study:[59]

> The Tribunal is satisfied that SFG's March 2011 report is the best dividend drop-off study currently available for the purpose of estimating gamma in terms of the Rules. Its estimate of a value of 0.35 for theta should be accepted as the best estimate using this approach. In particular, the Tribunal cannot accept the submission of the AER that either minor issues in the construction of the database or multicollinearity argue

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55 D. Beggs and C. L. Skeels, 'Market arbitrage of cash dividends and franking credits', *The Economic Record,* vol.82, no.258, September 2006.

56 J. C. Handley and K. Maheswaran, 'A measure of the efficacy of the Australian imputation tax system', *The Economic Record*, vol.84, no.264, March 2008.

57 Network Industry Submission, *AER Proposed Determination – Review of the Weighted Average Cost of Capital (WACC) parameters for electricity transmission and distribution*, February 2009, page 145.

58 Application by Energex Limited (No 2) [2010] ACompT 7, paragraph 91.

59 Application by Energex Limited (Gamma) (No 5) [2011] ACompT 9, paragraphs 29-30

> for giving the SFG study less weight and the Beggs and Skeels study some weight. The Beggs and Skeels study, despite not being subjected to anything like the same level scrutiny, is known to suffer by comparison with the SFG study on those and other grounds.
>
> Moreover, the fact that in its earlier reasons the Tribunal found no error in the AER having relied on the Beggs and Skeels study is not to the point. The proceedings since then have been largely designed to render that study, along with the earlier SFG study, obsolete for the purpose of setting a value for gamma – and have done so.

The outcome of the appeals before the Tribunal on gamma was to identify a number of errors in the gamma value contained in the 2009 WACC Statement, ie:

- in the assumption of 100 per cent distribution rate, when instead a 70 per cent rate was substituted by the Tribunal;
- in the AER's reliance on tax statistics as an estimate of theta, when this source should only be used a check of the estimated theta value; and
- in the AER's rejection of other dividend drop-off studies and its sole reliance on the estimated from the Beggs and Skeels 2006 study.

The AER has since adopted the corrected gamma value in its gas pipeline decisions, and has the ability to adopt the correct rate in future chapter 6 (DNSP) decisions (and has indeed done so in its recent draft decision for Aurora[60]). For DNSP's, this ability arises through the decision open to the AER not to apply the WACC Statement gamma value. However, the AER has no ability to correct the gamma value for chapter 6A (TNSP) decisions, since the rules do not provide for a 'safety valve' mechanism by which errors can be corrected.[61]

Without review by the Tribunal it is not clear that the errors in the gamma value in the WACC Statement would have been properly investigated and corrected.

The WACC framework that the AER is now proposing to apply to all electricity and gas network service providers has the effect of removing the ability for an NSP to seek merits review of any WACC parameter values, methods and credit ratings. It thereby omits an important feature of the current arrangements that has been able to identify and correct errors made by the AER. It is difficult to see how the removal of an error correction mechanism, particularly in the context of errors having been known to be made, could be consistent with contributing to the achievement of either the NEO or the national gas objective.[62]

4.5. Practicability of bringing the SoCC forward

In explaining the basis for its rate of return rule change proposals the AER contends that the option of bringing forward the timing of a future SoCC amounts to a process that would be

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60 AER, *Aurora Energy Pty Ltd 2012-13 to 2016-17: Draft decision*, 29 November 2011, page 27.

61 A gamma value of 0.65 has recently been applied in Powerlink's draft decision, see, AER, *Powerlink Transmission determination 2012-13 to 2016-17: Draft decision*, 29 November 2011, page 33.

62 National Gas Law, section 23.

capable of dealing with unanticipated changes in financial market conditions. In our opinion, such a process is not capable of effectively addressing this need.

The SoCC process takes the best part of two years from the point in time at which significant changes in market conditions were recognised through to their potential application in network pricing decisions. This is because time is needed for:

- the problem to be recognised and for the AER to develop and publish an issues paper;
- the SoCC review to be completed, noting that the 2009 review took approximately 9 months;[63] and
- the new WACC values, methods and credit ratings to be applied to a electricity network or pipeline decision.[64]

A delay of close to two years between a problem being identified and the application of a new WACC value, method and credit rating is not capable of dealing effectively with the rapidity and severity of changes in financial market conditions experienced over the last few years. For example, the failure of Lehman Brothers occurred just prior to the publication of the draft decisions for the NSW DNSPs, TransGrid, Transend and ActewAGL, and six months before the final decision.

In any case, the option of bringing forward an AER review and so the publication of a new SoCC is not a practicable solution for identifying and correcting errors made by the AER.

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[63] We note that the AER's rule change proposal also seeks to increase the timeframe for conducting the WACC review from 80 to 100 business days.

[64] We note that the SoCC parameters will only apply to revenue/price proposals submitted after the SoCC is published. Furthermore, the revenue/price proposal is submitted at least 12 months before the start of the regulatory period.

5. Conclusion

The AER's proposal to move TNSPs, DNSPs and gas pipelines to a common framework for determining the rate of return that, in essence, reflects that already established in chapter 6A of the NER involves a substantial risk of setting a WACC that is not commensurate with prevailing conditions in the market for funds and/or involves known error. Locking-in the WACC parameter values, methods and credit ratings gives rise to the risks that:

- the pre-specified WACC parameters are no longer appropriate due to changes in financial market conditions subsequent to the SoCC;
- the SoCC will specify methods dependent on data or information that subsequently ceases to exist; and
- the SoCC contains errors that cannot be adequately addressed without merits review.

In our opinion, the experience since the current rules were put in place demonstrates that any WACC framework must contain a mechanism that is able to be invoked by any party in relation to any individual decision in order to ensure that rate of return is be commensurate with the prevailing conditions in the market for funds and any effect those conditions may have on the returns required to provide the services to which the prices or charges relate.

With the benefit in hindsight of financial market developments over the past five years, the absence of any credible safety valve mechanisms amounts to a fundamental design flaw in both the chapter 6A provisions of the current NER and the framework that is now proposed by the AER. That design flaw would appear to put the chapter 6A arrangements at odds with both the revenue and pricing principles as well as with the requirement that the SoCC process delivers outcomes that are consistent with prevailing conditions in the market for funds.

The AER's proposal also removes an important feature of the current arrangements applying to distributors and gas pipelines that has been able to identify and correct errors made by the AER. It is difficult to see how the removal of an error correction mechanism, particularly in the context of errors having been known to be made, could be consistent with contributing to the achievement of either the national electricity or gas objectives.

The AER's contention that a process involving periodic review of rate of return parameter values or methodologies and so the establishment of an updated SoCC could be brought forward from its 5-year cycle is not adequate to deal with changing market circumstances.

Appendix A – WACC/Tax Related Appeals

Table A.1 lists the WACC and tax related matters that have been appealed to the Australian Competition Tribunal.

Table A.1
Recent AER WACC Decisions

Decision	Company	Issue	Outcome
NSW/ACT Distribution (2009)	Country Energy	Averaging period	Varied
		Debt risk premium	Rejected
NSW/ACT Distribution (2009)	EnergyAustralia	Averaging period	Varied
		Debt risk premium	Rejected
NSW/ACT Distribution (2009)	Integral Energy	Averaging period	Varied
NSW/ACT Transmission (2009)	TransGrid	Averaging period	Varied
		Debt risk premium	Rejected
TAS Transmission (2009)	Transend	Averaging period	Varied
		Debt risk premium	Rejected
Gas Access Arrangement (2010)	ActewAGL	Debt risk premium	Varied
QLD Distribution (2011)	Energex	Gamma	Varied
QLD Distribution (2011)	Ergon	Gamma	Varied
SA Distribution (2011)	ETSA Utilities	Gamma	Varied
Gas Access Arrangement (2011)	Jemena (NSW) Gas	Gamma	Varied
		Debt risk premium	Varied
Gas Access Arrangement (2012)	APT Allgas	Debt risk premium	Pending
Gas Access Arrangement (2012)	Envestra (QLD)	Debt risk premium	Pending
		Market risk premium	Pending
Gas Access Arrangement (2012)	Envestra (SA)	Debt risk premium	Pending
		Market risk premium	Pending

Appendix B – Authors

Jeff Balchin is a Principal in the PwC Economics and Policy team, previously being a director of the Allen Consulting Group and prior to that in various positions in the Commonwealth Government. Jeff has over 17 years of experience in relation to economic regulation issues across the electricity, gas, airports, ports and water industries in Australia and New Zealand. He has been an adviser to governments, regulators, customers and infrastructure providers on the design, economic interpretation and application of economic regulation, which has included key roles in many of the landmark matters.

Catherine Dermody is a Partner in Gilbert + Tobin's Competition & Regulation group. Catherine provides advice in relation to electricity, gas and telecommunications regulation, and has advised both regulators and regulated entities in regulatory determination processes and merits reviews of those processes. Prior to working at Gilbert + Tobin, Catherine spent six years at the Australian Competition and Consumer Commission involved in infrastructure regulation and two years as a legal advisor at the Office of Gas and Electricity Markets in the United Kingdom.

Greg Houston is a Director of NERA Economic Consulting, based in Sydney. Greg has twenty five years' experience in the economic analysis of markets and the provision of expert advice in litigation, business strategy, and policy contexts. Greg's work in the Asia Pacific region principally revolves around the activities of the enforcement and regulatory agencies responsible for competition, economic regulation and securities market matters, many of whom also number amongst his clients. In December 2005 Greg was appointed by the Hon Ian Macfarlane, then Minister for Industry, Tourism and Resources, to an Expert Panel to advise the Ministerial Council on Energy on achieving harmonisation of the approach to regulation of electricity and gas transmission and distribution infrastructure in Australia. During the 2005-06 period Greg also advised both the AEMC and the Ministerial Council on Energy on the development of the rules now applying to both the transmission and distribution network service providers.

Brendan Quach has eleven years experience as an economist, specialising in network economics, and competition policy in Australia, New Zealand and Asia Pacific. Brendan specialises in regulatory and financial modelling and the cost of capital for network businesses. Brendan was involved with the initial development of the chapter 6A provisions of the national electricity rules.

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