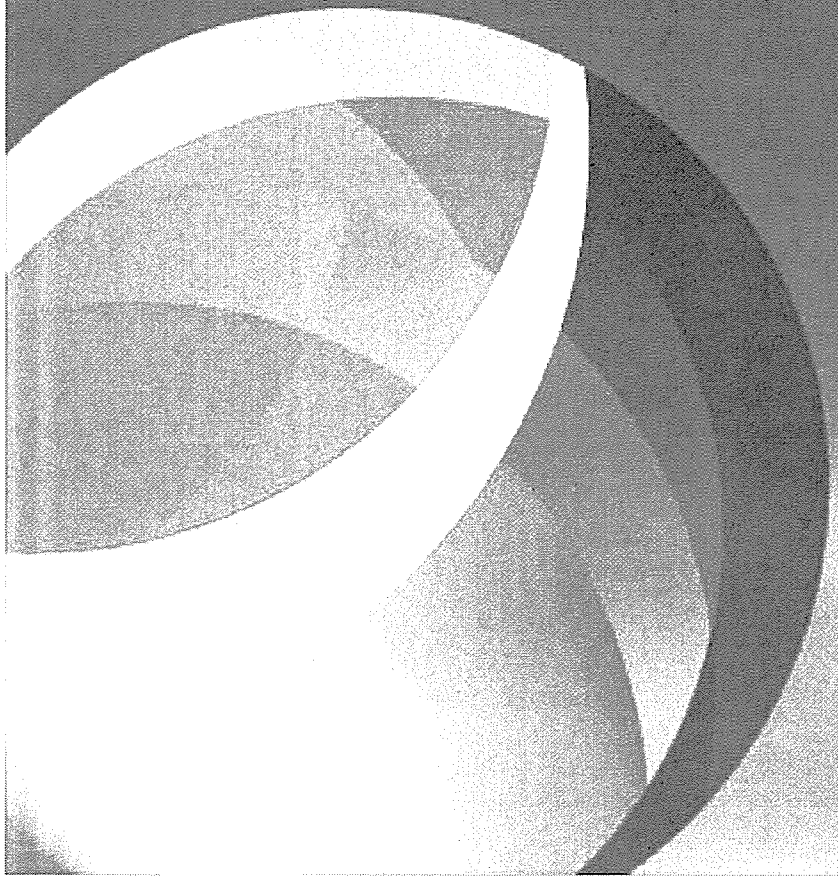
Jemena Gas Networks (NSW) Ltd

Initial response to the draft decision

19 March 2010



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5 Cost of Capital

- JGN proposes a nominal vanilla cost of capital of 10.86 per cent.
- JGN's cost of capital calculation incorporates many of the AER's amendments, including changing to a post-tax nominal WACC, revised market risk premiums and gearing ratios, and inflation forecasts based on reserve bank targets.
- JGN has retained use of the Fama-French model in its calculation of the cost of equity because it produces a demonstrably better estimate than the Capital Asset Pricing Model. The Fama-French model is a financial model that is well accepted by practitioners and academics. Use by regulators is not a necessary condition for it to be considered well accepted.
- JGN proposes a debt risk premium of 4.48 per cent that is 16 basis points higher than the premium provided in the AER's draft decision.133 This is because a BBB credit rating is more suitable for a benchmark efficient gas business than the BBB+ rating used by the AER, and because JGN proposes and applies a new three-step method for estimating the debt risk premium for a 10 year corporate bond.

5.1 Summary of JGN original proposal

In its original AA proposal, JGN set its cost of capital using a domestic version of the Fama-French three-factor model (**FF model**) to estimate the cost of equity component of its WACC. JGN proposed a pre-tax nominal WACC of 12.63 per cent. This estimate was a placeholder because it was not calculated with reference to the averaging period that will apply for the next AA period.

JGN considered that the use of the FF model to estimate the cost of equity ultimately provides a rate of return that better reflects the prevailing conditions in the market for funds than the Sharpe-Lintner Capital Asset Pricing Model (**CAPM**)[134] as currently applied. Providing a return commensurate with market conditions is required by the NGR and is also critically important to JGN in order for it to be able to fund its required capital program.

JGN's proposed cost of capital reflects the risks of an efficient gas distributor and the prevailing market conditions, as required by the NGR. Importantly, JGN considers that gas distributors are inherently more risky businesses than electricity distributors, with higher debt premia. This view has been supported by the AER in

[133] Draft decision, p. 143. The AER sets a debt risk premium of 4.32 per cent, even though p. 140 of the draft decision estimates a debt risk premium of 4.18 per cent.

[134] Future references to the CAPM refer to the Sharpe-Lintner version of the model.

previous decisions as well as by other regulators and academics as discussed in detail in section 9.5 of JGN's original AA proposal.

Table 5-1 summarises JGN's proposed WACC parameters (based on a proxy averaging period) and resulting WACC variants as provided in its original AA proposal.

Table 5-1: JGN's proposed WACC Parameters from August 2009 submission

Parameters	JGN Proposal
Inflation (i)	2.38%
Nominal risk-free rate (R_f^n)	5.60%
Real risk-free rate	3.15%
Debt margin (D^n)	5.04%
Nominal pre-tax cost of debt	10.64%
Real pre-tax cost of debt	8.08%
Market risk premium (MRP^n)	6.50%
Growth risk premium (HML^n)	6.24%
Size risk premium (SMB^n)	-1.23%
Equity beta (β_e)	Na
Market beta (β_m)	0.59
Growth beta (β_{HML})	0.48
Size beta (β_{SMB})	0.30
Post-tax nominal return on equity	12.06%
Gearing (D/V)	60%
Dividend imputation (γ)	0.20
Tax rate on equity (T_e)	28.35%
Corporate tax rate (T_c)	30%
Pre-tax real WACC ($WACC^r$)	10.01%

Parameters	JGN Proposal
Pre-tax nominal WACC ($WACC^n$)	**12.63%**
Nominal vanilla WACC	11.21%
Real vanilla WACC	8.63%

Notes:

1. Real costs of debt and equity and the risk-free rate are calculated from the nominal equivalents using the Fisher equation and forecast inflation.
2. Debt margin is based on an efficient gas business with a BBB credit rating.
3. JGN does not rely on a debt or asset beta to estimate its proposed WACC.

5.2 Summary of AER draft decision

The AER draft decision estimated a nominal vanilla WACC of 10.11 per cent for Jemena. The WACC is 2.52 per cent less than that proposed by JGN in its August 2009 submission. The reason for this difference is that the AER use the Shape-Lintner CAPM[135] for estimating the return of equity instead of the FF model proposed by JGN. The AER draft decision also provided that, in order to make the proposal acceptable to the AER, JGN would be required to amend the access arrangement proposal to incorporate the AER's determination for parameters such as the risk-free rate, equity beta and debt risk premium and these contributed to the lower WACC.

Table 5-2 sets out the amendments that the AER required in its draft decision of JGN's proposed access arrangement in relation to cost of capital.

Table 5-2: Amendments the AER required in its draft decision – cost of capital

AER required amendment		JGN revised AA revision	Explanation in this document
Amendment	**Description**		
5.1	Amend the AAI to delete tables 9-1 and 9-4 and replace them with table 5.7 provided in the draft decision	Partially incorporated	Section 5.3
5.2	Make all consequential amendments necessary in the AAI to take account of and reflect amendment 5.1	Partially incorporated	Section 5.3

The AER draft decision considered imputation credits (gamma) in its chapter on taxation. JGN has adopted this approach for the purposes of this section on cost of capital and discusses gamma in chapter 6.

[135] In future references to "CAPM" JGN means the Shape-Lintner model.

5.3 JGN response to AER draft decision

Table 5-3 summarises JGN's responses to the AER's draft decision.

Table 5-3: JGN's responses to the AER's draft decision – cost of capital

Change	Related AER amendments	JGN incorporation	Summary of explanation	Explanation in this document
WACC framework	5.1, 5.2	Has partially incorporated	Change to post-tax nominal WACC	Section 5.3.1
Cost of equity (Fama-French)	5.1, 5.2	Has not incorporated	Retained Fama-French model, not CAPM	Section 5.3.2
Risk-free rate	5.1, 5.2	Incorporated	Use an average of observed yields over 20 business days	Section 5.3.4
Equity beta	5.1, 5.2	Has not incorporated	Equity beta not relevant to Fama-French model	Section 5.3.5
Market risk premium	5.1, 5.2	Incorporated	Use market risk premium of 6.5 per cent	Section 5.3.6
Gearing ratio	5.1, 5.2	Incorporated	Use gearing of 0.5	Section 5.3.7
Debt risk premium	5.1, 5.2	Has not incorporated	BBB credit rating more appropriate for gas businesses and Bloomberg data provides better estimate of than CBASpectrum data	Section 5.3.8
Inflation forecast	5.1, 5.2	Incorporated	Use average of RBA target inflation	Section 5.3.9

JGN provides detail on its response to the AER's draft decision below.

5.3.1 Post-tax nominal vanilla WACC

JGN will use a post-tax nominal vanilla WACC to estimate the return on capital building block, rather than a pre-tax nominal WACC as proposed in JGN's original AA proposal. This incorporates the approach set out in the AER's draft decision.

JGN has not revised its proposal to incorporate a gamma estimate of 0.65 as set out in the AER's draft decision, but instead reaffirms its view that a gamma of 0.2 is the best estimate of this parameter in the circumstances for reasons set out in chapter 6 of this document.

The nominal vanilla WACC is calculated as a weighted average of the cost of equity and the cost of debt, with gearing ratios used to weight the calculation. Each element of this calculation is dealt with below.

5.3.2 *Rules assessment framework*

Rules 74 and 87 of the NGR provide the framework for assessing JGN's proposed parameter for the cost of capital for its proposed AA. Table 5-4 below summarises how these rules apply to the inputs, methodology, and outputs of the cost of capital calculations. We refer back to these rules throughout the body of this chapter.

Table 5-4: Summary of NGR rules that apply to cost of capital

Element	Rule requirements
Outputs	Must be commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services (87(1))
	Must represent the best forecast or estimate in the circumstances (74(2)(b))
Methodology	Must assume that the service provider meets benchmark levels of efficiency (87(2)(a)(i))
	Must assume that the service provider uses a financing structure that meets benchmark standards (87(2)(a)(ii))
	Must be a well accepted approach to calculating a rate of return (87(2)(b))
	Must use a well accepted financial model (87(2)(b))
Inputs	Must be supported by a statement of the basis of the forecast or estimate (74(1))
	Must be arrived at on a reasonable basis (74(2)(a))
	Must represent the best forecast or estimate in the circumstances (74(2)(b))
	To the extent that any inputs rely on a particular financial model, this must be a well accepted financial model (87(2)(b))

5.3.3 *Cost of equity (Fama-French model)*

JGN maintains its position that the Fama-French three factor model (**FF model**) produces the best estimate of the cost of equity possible in the circumstances. The

FF model is a well accepted financial model and it provides a better estimate for a benchmark efficient gas network than the CAPM.

By applying the Fama-French model, JGN proposes a cost of equity estimate of 12.04 per cent. This is based on a risk-free rate estimate of 5.58 per cent and the FF model parameters set out in Table 5-5.[136]

Table 5-5: Proposed parameters for domestic Fama-French three-factor model

Parameters	Market	HML	SMB
Risk Premium	6.50%	6.24%	-1.23%
Beta	0.59	0.48	0.30

Notes: The market risk premium is the value used by the AER for electricity businesses. The other parameters are estimated from data provided by Bloomberg and DFA.[137]

Source: NERA's August 2009 report.[138]

To be accepted as the method for calculating the cost of equity, the FF model must meet the requirements of rules 74 and 87, as shown earlier in this chapter. The rest of this section explains why JGN considers that the FF model satisfies these requirements and is laid out as follows:

- the FF model is a well accepted financial model (rule 87(2)(b))
- the inputs to the FF model are arrived at on a reasonable basis (rule 74(2)(a))

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[136] These parameters apply to the FF model which can be expressed by the following formula:

$$E(R_j) - R_f = b_j[E(R_m) - R_f] + h_j HML + s_j SMB,$$

where:

E(jj) is the expected return on asset j

R(m) is the expected return to the market portfolio of risky assets

Rf is the risk-free rate

bj, hj and *sj* are the slope coefficients from a multivariate regression of *Rj* on *Rm, HML* and *SMB* and *HMPL* and *SMBP* are the expected values of HML and SMB.

[137] FF model parameters are estimated using data sampled up to the end of May 2009. Where appropriate, NERA has populated the FF model with the same data and parameters as those employed by the AER in its recent review of the WACC parameters for electricity lines businesses. Those parameters not shared with the CAPM have been estimated from data provided by Bloomberg and DFA. DFA is an investment group affiliated with Fama and French that explicitly invests along the lines suggested by their research.

[138] NERA, 12 August 2009, *Cost of Equity – Fama-French Three Factor Model*, report for Jemena Gas Networks (NSW). Appendix 9.1 of JGN's original AA proposal.

- the outputs of the FF model are commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services (rule 87(1))

- the outputs of the FF model represent the best forecast or estimate in the circumstances (rule 74(2)(b))

JGN has critically assessed the AER's draft decision, NERA's August 2009 report and a subsequent March 2010 report from NERA to form its view—see appendices 5.1 and 5.2.[139] In its subsequent report, NERA explains how the inputs to and outputs of the FF model satisfy the requirements of rules 74 and 87.

Fama-French is a well accepted financial model

JGN considers that the FF model is a "well accepted financial model" because, in essence, JGN consider that acceptance by practitioners and academics is sufficient to make it well accepted. In contrast, the AER in its draft decision determined that the FF model is not well accepted because it is not used by regulators in Australia or overseas.

Rule 87(2)(b) requires that a well accepted financial model is used to estimate the cost of equity for a benchmark efficient gas network. JGN considers that this rule requires that the model be well accepted by either regulators, practitioners, academics or other experts. JGN bases its view on the following:

- *'Well accepted' less demanding than 'generally accepted'*—The requirement that a model is 'well accepted' is less demanding than the requirement that the model is universally or 'generally accepted'.

- *Acceptance not required by regulators*—There is no evidence indicating that the phase 'well accepted' requires that a financial model, besides being accepted by academics or practitioners, also be accepted by regulators. There is evidence to the contrary. For example, the Australian Legal Dictionary states that generally accepted accounting principles (**GAAP**) are principles that have "evolved over many years in the accounting profession"[140]. In other words, GAAP are principles and procedures that have gained currency among practitioners rather than regulators or courts. It is difficult to see that the less demanding phrase 'well accepted' used in rule 87(2)(b) would also require that a financial model, besides being accepted by academics or practitioners, also be accepted by regulators.

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[139] NERA, *Jemena Access Arrangement Proposal for the NSW Gas Networks: AER Draft Decision*, a report for Jemena. 19 March 2010, Appendix 5.1.

[140] Butterworths, *Butterworths Encyclopaedic Australian Legal Dictionary*, available on a subscription basis at: http://www.lexisnexis.com.au/aus/products/catalog/current_htm/beald%20onl.asp.

- *Inconsistent to require acceptance by regulators*—If, for a financial model to be well accepted, it has to be well accepted by regulators, then it is difficult to see how an alternative model could ever become well accepted. In other words, if a condition for a regulator to use a model were that a regulator use the model, then no model other than those currently in use could ever be adopted—no matter how well accepted by academics and practitioners. Moreover, if the intent of rule 87 was to require that a financial model be well accepted by regulators, then surely the drafters of the rule would have adding the phrase "by regulators" after the phrase "well accepted financial model";

- *More than one well accepted financial model*—The fact that rule 87(2)(b) refers to the CAPM as one example of a well accepted model suggests that other well accepted models exist. If the CAPM were the only well accepted financial model, one would expect that the NGR would prescribe its use. The NGR, though, unlike the national electricity rules[141], explicitly do not prescribe the use of the CAPM. This implies a conscious choice by the drafters of both sets of rules to allow other well accepted financial models under the gas regime.

The AER has taken a narrower view of 'well accepted financial model' than JGN. Moreover, the AER states:

> Since the [FF model] is not well accepted in a regulatory context, the AER considers that this indicates the model is not a well accepted model as required by r. 87 of the NGR. [142]

As noted above, JGN considers that a financial model can still be well accepted as required by rule 87 even if not well accepted by regulators. Moreover, JGN considers that the FF model is well accepted by academics and practitioners and therefore satisfies rule 87.

JGN considers that the FF model is well accepted by academics and practitioners for the following reasons:

- developed by well regarded academics, Eugene Fama and Ken French

- has had favourable media attention in the 'New York Times' and UK's 'The Guardian'

- is one of the most widely cited academic papers

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[141] Rule 6.5.2(b) of the national electricity rules: http://www.aemc.gov.au/Electricity/National-Electricity-Rules/Current-Rules.html.

[142] Draft decision, pp. 108–9.

- is support by papers raised in the AER draft decision, including Da, Guo and Jagannathan (2009) and Gharghori, Lee and Veeraghavan (2009)
- is taught at every major Australian university
- *is part of the CFA course* – the Chartered Financial Analyst (**CFA**) course requires all level two candidates to demonstrate the use of the FF model for estimating the required return on an equity investment.[143] The CFA designation is one of the most widely accepted professional qualification for finance practitioners worldwide.[144] The CFA Institute describes the FF model as one of the:[145]
  - "well-established methodologies of security analysis"
  - "major models for estimating the required return on equity"
  - "best known models based on multiple factors"
- has its inputs sold commercially by Morningstar
- is included in McKinsey's guide to valuation.

These and other reasons are explained with references and in more detail in NERA's March 2010 report in Appendix 5.1.

The inputs to the FF model are arrived at on a reasonable basis

The inputs to and outputs of the FF model meet the requirement of rule 74(2)(a) that they are arrived at on a reasonable basis. JGN considers that they meet this requirement for the following reasons:

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[143] CFA Institute, 2010, *Equity*, Volume 4 of the Level II CFA curriculum for 2010, p. 101.

[144] For example, see:

Investopedia, http://www.investopedia.com/articles/financialcareers/07/different_designations.asp

New York's 'The Sun', http://www.nysun.com/business/while-ivy-league-mbas-impress-hottest-three/42355/

Bloomberg, http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aIKWA1aqm.rs&refer=canada-redirectoldpage

Financial Times, http://www.cfainstitute.org/aboutus/press/mediahighlights/pdf/FT_final.pdf

Professional Exam Review, http://www.professionalexamreview.com/about.php

FTMS Global, http://www.ftmsglobal.com/courses/index.php?option=com_content&view=article&id=20&Itemid=53

[145] CFA Institute, 2010, *Equity*, Volume 4 of the Level II CFA curriculum for 2010, pp. 3, 102 & 130–137.

- a recognised process has been adopted to generate the forecasts and estimates. That process has been properly specified and applied
- the inputs to the model are relevant and current
- to the extent that decisions and choices have been made, there is a logical and cogent basis to support the decision or choice that has been made.

Details on the above reasons are provided in NERA's report in Appendix 5.1.

The outputs of the Fama-French model are commensurate with prevailing market conditions

JGN considers that the FF model's outputs are commensurate with prevailing market conditions because NERA uses recent Australian market data to estimate the FF model parameters in its August 2009 report.

As well as using recent market data, NERA also uses the AER's market risk premium estimate of 6.50 per cent and the AER's approved methodology for estimating the risk free-rate.[146] Therefore, JGN considers that NERA's cost of equity estimate is commensurate with prevailing market conditions.

Also, JGN considers that it would be inconsistent for the AER not to subject both the CAPM and the FF model to the same levels of review in respect to this requirement.

The Fama French model represents the best estimate in the circumstances

The estimate of the cost of equity from the FF model meets the requirements of rule 74(2)(b) as the best estimate in the circumstances. JGN considers that the FF model as applied by NERA provides a better estimate of the cost of equity in the circumstances than the CAPM as applied in the AER draft decision for the following reasons:

- A number of academic papers find that the FF model provides better estimates of the cost of equity than the CAPM in the Australia capital market, including all five of the papers raised by the AER in its draft decision that compare the two models.[147]

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[146] NERA, 12 August 2009, *Cost of Equity – Fama-French Three Factor Model*, report for Jemena Gas Networks (NSW). Appendix 9.1 of JGN's original AA proposal.

NERA, 19 March 2010, *Jemena Access Arrangement Proposal for the NSW Gas Networks: AER Draft Decision*, a report for Jemena.

[147] NERA, 19 March 2010, *Jemena Access Arrangement Proposal for the NSW Gas Networks: AER Draft Decision*, a report for Jemena, section 4.1.

- A number of academic papers also find that the FF model provides better estimates of the cost of equity than the CAPM in the US capital market, including some of the most widely cited papers. [148]

- The FF model and the CAPM both originate from the US capital market.

- The AER applies the theoretical CAPM with restrictions, such as ignoring the fact that large numbers of Australian investors hold foreign assets and hold assets that are not stocks.

- NERA find that the FF model provides a better estimate of the cost of equity for US energy businesses. [149]

These and other reasons are explained with references and in more detail in NERA's March 2010 report in Appendix 5.1.

5.3.4 Risk-free rate

JGN proposes a nominal risk free-rate of 5.58 per cent using the method adopted by the AER in the draft decision. The estimate is based on the 20-day historical average of the annualised yield on 10 year Commonwealth Government Securities (**CGS**) to 12 February 2010 using the indicative mid rates published by the RBA during a period approved by the AER.

JGN estimates the yield on a 10 year CGS maturing at the 20 business days to 12 February 2020 by interpolating on a straight-line basis the yields on the CGS bonds maturing at 15 March 2019 and 15 April 2020. This method is applied in JGN's WACC model (see Appendix 5.3).

JGN considers that this method provides the best estimate in the circumstances as per rule 74(2)(b) and that the resulting estimate—using recent market data—is commensurate with prevailing market conditions as per rule 87(1).

The averaging period used here is for presentational purposes only. JGN will use the averaging period determined in the AER draft decision to estimate the risk free rate using the method above.[150][151] This period differs from the presentational averaging period above. JGN supports the AER's view that this period should remain confidential until after it has passed.

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[148] NERA, 19 March 2010, *Jemena Access Arrangement Proposal for the NSW Gas Networks: AER Draft Decision*, a report for Jemena, section 4.2.

[149] NERA, 19 March 2010, *Jemena Access Arrangement Proposal for the NSW Gas Networks: AER Draft Decision*, a report for Jemena, section 4.3.

[150] Draft decision, Appendix A.

[151] JGN proposes to estimate the debt risk premium over this same period.

5.3.5 *Equity beta*

JGN notes the AER's equity beta estimate of 0.80, but does not incorporate it into the proposed cost of equity. JGN considers that the AER's equity beta estimate is specific to the CAPM used by the AER, which is not relevant to the FF model and JGN's proposed cost of equity.

5.3.6 *Market risk premium*

JGN incorporates the AER's market risk premium (**MRP**) estimate of 6.5 per cent as the best estimate in the circumstances as per rule 74(2)(b).

JGN considers that an MRP of 6.5 per cent reflects the minimum premium that an efficient gas business needs to compensate for the non-diversifiable risk that is influenced by the current financial and economic crises.

5.3.7 *Gearing ratio*

JGN incorporates the AER's gearing ratio of 0.60 as being consistent with rule 87(2)(a)(ii).

JGN considers that a gearing ratio of 0.60 is efficient for a stand-alone gas distribution business and is consistent with JGN's proposed cost of equity and debt risk premium estimates above.

5.3.8 *Debt risk premium*

JGN proposes a debt risk premium of 4.48 per cent for a BBB rated benchmark efficient gas business as the best estimate in the circumstances, satisfying rule 74(2)(b). This margin is added to the nominal risk free-rate estimate of 5.58 per cent to give JGN's proposed cost of debt of 10.06 per cent. JGN has not incorporated the method and assumptions used by the AER in its draft decision to estimate the debt risk premium.

JGN's proposed debt risk premium is a function of two key factors:

- *Credit rating*—JGN reaffirms its proposal that a BBB credit rating is more appropriate for a benchmark efficient gas network than the AER's proposed BBB+ credit rating. JGN does not agree with the AER that electricity and gas businesses are sufficiently close comparators.
- *Method for calculating debt risk premium based on credit rating*—JGN proposes a different method to estimating the debt risk premium based on the BBB credit rating. The method JGN uses is described by PwC in more detail in appendix 5.5.

The rest of this section explains these factors in more detail. It is laid out as follows:

- JGN explains how credit ratings are determined and shows that differences in risks (both systematic and unsystematic) are important.
- JGN shows that by considering electricity businesses a sufficiently close comparator to gas businesses, the AER has asserted that there are no material differences in their risks profiles, despite recognising differences in earlier decisions.
- JGN provides evidence that gas businesses are inherently riskier than electricity gas businesses, in particular by looking at the volatility of annual revenues and the credit ratings of similar businesses.
- JGN describes the key conceptual explanations for the observed differences in risk profiles and credit ratings.
- JGN outlines the method it proposes for calculating the debt risk premium, based on a credit rating, as recommended by PwC.
- JGN proposes a debt risk premium estimate of 4.48 percent using the PwC method that is the best available in the circumstances.

Credit ratings are based on systematic and unsystematic risks

Credit ratings are determined through specialised scoring methodologies employed by credit ratings agencies—such as Standard & Poor's (**S&P**), Moody's Investor Service and Fitch Ratings—to evaluate the systematic and unsystematic risks faced by a particular business. Businesses that have greater risk are generally assigned a lower credit score and therefore a lower credit rating than businesses with lower risk.

Even though many of the risks they evaluate may be considered diversifiable the rating agencies still consider them relevant.[152] For instance, S&P considers the following when assessing risk:[153]

- *Business profile*—a qualitative analysis of a business, including utility type, regulation, markets, operations, competitiveness, and management

[152] Here, JGN distinguishes between (a) systematic or non-diversifiable risk that is relevant for estimating a businesses equity beta and (b) unsystematic or diversifiable risk, which is not relevant. Credit rating agencies consider both (a) and (b) when assessing the credit rating of particular businesses.

[153] Standard and Poor's, September 1998, *Rating Methodology for Global Power Utilities*, Infrastructure Finance, pp 60–73. www2.standardandpoors.com/portal/site/sp/en/eu/page.article/3,2,2,0,1204836260146.html.

- *Financial profile*—a quantitative analysis of a business, including profitability, capital structure, cash flow, and financial flexibility.

Therefore any observed differences in the credit ratings of electricity and gas businesses cannot be attributed solely to different gearing ratios if there is evidence that the risks of the businesses differ. JGN agrees with the AER that "all things being equal, higher gearing ratios should be associated with lower credit ratings",[154] but considers that there are clear differences in the risks of the businesses that will also have an effect on credit rating.

AER has asserted without evidence that there are no material differences in the risks of gas and electricity businesses

The AER states in its draft decision that:

> electricity network businesses are sufficiently close comparators to ... estimate the credit rating of a benchmark efficient gas network service provider.[155]

By assuming the same credit ratings for gas and electricity businesses, the AER asserts that the risks of the businesses are not materially different.

The AER has not provided any evidence to support this proposition, despite earlier noting its concerns about using gas network businesses as comparators for electricity network businesses in its draft WACC decision:

> In selecting the sample of comparator [network] businesses the AER agrees ... that caution should be taken when including gas [network] businesses into the sample, as gas businesses may have some asset specific characteristics that may impact on the credit rating of gas businesses. [156]

JGN can see no reason why this concern should not apply when selecting comparators for gas network businesses. The AER has also stated in its recent WACC review that:

> [It] has previously acknowledged in its explanatory statement that gas businesses may have a higher business risk than electricity businesses due [to] greater volatility in cash-flows from relatively higher volume risk compared to electricity network businesses.[157]

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[154] Draft decision, p. 136.

[155] Draft decision, p. 136.

[156] AER, *Electricity Transmission and Distribution Network Service Providers Review of the Weighted Average Cost of Capital (WACC) Parameters, Explanatory Statement*, December 2008, Table 9.3, p. 264.

[157] AER, *Electricity Transmission and Distribution Network Service Providers Review of the Weighted Average Cost of Capital (WACC) Parameters, Explanatory Statement*, 1 May 2009, p. 108.

There is evidence that the risks are materially different

There are two key pieces of evidence that show that the risks of gas businesses are materially different from electricity businesses.

- the annual revenues of gas businesses tend to be more volatile than those of electricity businesses in Australia
- the credit ratings of gas businesses tend to be lower than comparable electricity businesses in Australia

Table 5-6 below summarises a high level analysis of the volatility of revenues, where volatility is calculated as the standard deviation in the growth of annual revenues. For a sample of 12 gas and electricity business, the average standard deviation of gas businesses is 0.8 per cent higher than that of electricity businesses. Full details of this analysis are provided in Appendix 5.4.

Table 5-6: Volatility of gas and electricity businesses in Australia

Business	Sector	Geographic Area	Mean of revenue growth	Standard deviation of revenue growth
EnergyAustralia	Electricity	New South Wales, ACT, Victoria and Queensland	6.18%	4.54%
UED	Electricity	Victoria	0.99%	4.46%
SPAusnet	Electricity	Victoria	5.61%	2.31%
CitiPower and Powercor	Electricity	Victoria	3.73%	8.11%
ETSA	Electricity	South Australia	4.91%	1.68%
ElectraNet SA	Electricity	South Australia	8.29%	8.44%
Average (electricity)			*4.95%*	*4.93%*
JGN	Gas	New South Wales	1.18%	4.02%
Multinet Gas	Gas	Victoria	3.94%	3.95%
SPAusnet	Gas	Victoria	7.28%	7.78%
Envestra	Gas	Victoria and New South Wales	3.29%	5.25%
Envestra	Gas	South Australia	5.99%	8.94%
Envestra	Gas	Queensland	9.01%	4.37%
Average (gas)			5.11%	5.72%

Business	Sector	Geographic Area	Mean of revenue growth	Standard deviation of revenue growth
Difference between averages (gas - electricity)			0.16%	0.80%

Source: Annual financial statements and annual reports of gas and electricity businesses.

JGN recognises the above analysis is high-level and is not based on a large data set, but alongside other evidence it presents a convincing argument that the market risks for gas businesses are materially higher than for electricity businesses because they can be less certain about incoming cash flows. In contrast, the AER has not provided any factual evidence to support its opposing assertion.

The credit ratings of two energy businesses in Australia—United Energy Distribution (**UED**) and Multinet—also provide evidence that gas businesses are inherently riskier and that this leads to lower credit ratings. These businesses are worth examining because they are both majority owned by the Diversified Utilities and Energy Trust (**DUET**) Group and therefore any difference in credit ratings is unlikely to be explained by ownership structure.

Table 5-7 shows the credit ratings of these two businesses.

Table 5-7: Credit ratings of DUET owned gas and electricity businesses

Business	Sector	Geographic market	Gearing[158]	Credit rating
UED	Electricity distribution	Victoria	104.92%	BBB
Multinet Gas	Gas distribution	Victoria	90.82%	BBB-

The table above shows that Multinet Gas has a credit rating of BBB- while UED has a credit rating of BBB. This is evidence that gas businesses are inherently riskier and that this difference is sufficient to warrant a lower credit rating. It is difficult to imagine any other factors affecting the credit rating because:

- both business have the very similar ownership and the same management
- both businesses operate in Victoria
- the gearing of UED is higher than that of Multinet Gas.

[158] JGN calculates gearing as total liabilities divided by total assets from UED and Multinet Gas's financial statements submitted to the Australia Securities and Investments Commission. UED's gearing is greater than 100 per cent due to a loss on reserves and therefore negative shareholder equity.

All else being equal, UED being more highly geared would typically lead to a lower credit rating. As its credit rating is actually higher, one can reasonably conclude that it is the nature of UED's business—electricity rather than gas distribution—that enables it to have a higher credit rating than Multinet Gas.

Data cited by the AER supports this conclusion. In its draft WACC decision, the AER states:

> The AER acknowledges that gas network businesses with similar financial credit metrics to electricity network businesses may have lower credit ratings.[159]

There are strong conceptual reasons why observed risks and credit ratings will differ for gas businesses

The evidence that gas businesses have higher risk and lower credit ratings than electricity businesses can be explained by the differences in the following factors:

- regulation
- market or volume volatility
- competitiveness.

JGN explains each of these factors in more detail below.

Regulation

Regulation is clearly one of the most important factors influencing the riskiness of network businesses. S&P notes that:[160]

> [E]valuation of regulation also encompasses the administrative, judicial, and legislative processes involved in local or national regulation. These can affect rate-setting activities and other aspects of the business, such as competitive entry, environmental and safety rules, facility siting, and securities sales.

JGN considers that it is crucial to consider any regulatory differences between gas and electricity networks when comparing riskiness. For instance, the type of revenue regulation, whether price cap or revenue cap, affects the risk exposure of regulated network businesses.

Regulation is particularly important given that the AER relies on the BBB+ credit rating of a single electricity network—ElectraNet SA —to determine the credit

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[159] AER, *Electricity Transmission and Distribution Network Service Providers Review of the Weighted Average Cost of Capital (WACC) Parameters, Final Decision,* May 2009, p. 371.

[160] Standard and Poor's, September 1998, *Rating Methodology for Global Power Utilities*, Infrastructure Finance, pp 66.

rating for benchmark electricity networks in the WACC review.[161] The AER then relies on the same electricity network to determine the BBB+ credit rating for a benchmark efficient gas network in its draft decision.[162] ElectraNet SA, as an electricity transmission business, is regulated under a revenue cap regime. In contrast, gas businesses are regulated under a price cap regime, which makes them more vulnerable to volume risk. JGN considers that the difference in regulatory regimes makes an electricity transmission business a poor benchmark for setting the benchmark credit rating of gas businesses.

Market or volume risk

When assessing distribution networks, S&P includes analysis of the risks associated with the market the network sells into. S&P state:[163]

> Assessing a distributor's markets begins with the economic and demographic evaluation of the area in which distribution services are provided. Strength of long-term demand is examined from a macroeconomic perspective, which enables Standard & Poor's to measure trends in investment, income, and employment as indicators of economic change within the service area. The sustainability of increasing demand also is analyzed. Many emerging economies go through periods of very rapid growth followed by severe contractions. This volatility can contribute to significant and unhealthy swings in a utility's revenues.

Market risk is faced acutely by gas networks because unlike electricity networks, gas networks have not saturated potential markets. As a consequence, gas networks have more options to expand their networks to enable new but uncertain demand to connect. For instance, JGN still has room to expand its network into large areas of Sydney and rural NSW, but whether or not it should is affected by uncertain long-term demand from those areas.

A further market factor affecting residential demand is the local climate, which in coastal NSW is relatively benign. Because gas is primarily used by residences for cooking and heating—either space or water—it is particularly susceptible to variation in the weather. Electricity on the other hand has many other uses, which means that a smaller proportion of residential demand is affected by weather. Further, when weather causes electricity networks to lose demand for heating in summer they tend to gain some offsetting demand for air conditioning in winter, and vice versa. In contrast, gas networks do not have offsetting demand in summer because gas does not have a viable cooling application.

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[161] Draft decision, p. 136.

[162] Draft decision, p. 136.

[163] Standard and Poor's, September 1998, *Rating Methodology for Global Power Utilities*, Infrastructure Finance, pp 67.

Hence, because credit rating agencies consider both business specific risk and systematic (or market wide) risk when assigning credit ratings, JGN considers that credit rating agencies will tend to assign lower credit ratings to gas networks—because of their higher volume risk—than electricity networks.

Competitiveness

Exposure to competition is also a major risk factor. S&P states:

> Transmission and distribution utilities face competitive pressures in the form of substitute energy sources and customer self-generation and bypass. Electricity competes with other fuels such as natural gas for certain segments of the market like space heating, water heating, and cooking. Thus, high electricity prices, which can be attributed to inefficient transmission or distribution service, or more likely caused by a high supply cost component, are cause for concern if customers have alternate energy sources. Self-generation has for many years been a significant risk, as large commercial and industrial customers have taken advantage of cogeneration technologies to reduce their reliance on and, in some cases, disconnect from transmission and distribution systems. [164]

Due to gas's rather limited residential application to cooking, and space and water heating it faces higher demand risk resulting from competition than electricity. This occurs because:

- *Gas competes with electricity for all of its applications*—Electricity can substitute for virtually all gas applications, but the reverse is not true. Consequently, demand for gas is likely to be more elastic.

- *Gas is more exposed to competition from self generation*—Self generation is a risk to all energy distributors. However, because several self generation technologies are aimed specifically at heating (e.g. solar water heating and insulation) gas distributors face an increased threat from self generation.

Method for calculating the debt risk premium

To estimate the debt risk premium for a benchmark efficient gas network business, JGN considers that:

- a benchmark cost of debt should be commensurate with prevailing market conditions and the best estimate in the circumstances, as per rules 87(1) and 74(2), by relying on observed marketing data

- all data sources should be properly tested before being relied upon to estimate a debt risk premium.

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[164] Standard and Poor's, September 1998, *Rating Methodology for Global Power Utilities*, Infrastructure Finance, pp 68.

The two main data sources available in Australia come from two information services—Bloomberg and CBASpectrum.[165]

In its draft decision, the AER found that CBA Spectrum's BBB+ fair value curve results in the best estimate possible in the circumstances and used this curve to estimate the debt risk premium of 4.18 for a 10 year BBB+ corporate bond over the 20 business days to 23 December 2009.[166] To support this finding, the AER relied on analysis undertaken for the ActewAGL draft decision that compared the Bloomberg and CBASpectrum services.[167]

But, JGN considers that the AER's analysis does not provided sufficient evidence to support this finding because the analysis.

- only tested the accuracy of the CBASpectrum and Bloomberg fair value curves over the 20 business days to 23 October 2009 (the ActewAGL proxy averaging period), [168] so cannot, without further analysis, support the finding that CBASpectrum fair value curve provides a better estimate over the 20 business days to 23 December 2009 (the JGN proxy averaging period)

- only tested BBB+ bonds with a maximum maturity of 5.6 years against the CBASpectrum BBB+ fair value curve, [169] so cannot, without further analysis, support the finding that this curve provides the best estimate for bonds with a maturity of 10 years.

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[165] In its draft decision, the AER rejected JGN's original proposal to use the Tabcorp bond to estimate the debt risk premium because it is only a single bond, which requires several adjustments to make it comparable to the benchmark corporate bond.

See Draft Decision, p. 137–140.

In principle, JGN agrees that the benchmark debt risk premium should reflect the characteristics of a benchmark gas network business and not the characteristics of a single bond issue. At the time of its August 2009 proposal, JGN considered that Bloomberg and CBASpectrum services did not reflect the prevailing conditions in the market for funds because of uncertainty in the debt markets, but considered that most recent bond issue—the Tabcorp April 2009 issue—did reflect these conditions. Since August 2009, this uncertainty has reduced and so JGN considers that Bloomberg and CBASpectrum services better reflect the prevailing conditions in the market for funds.

[166] Draft decision, p. 140.

[167] Draft decision, p.139.

[168] Draft decision, pp.139–140.

AER, *November 2009,* Draft decision: ActewAGL distr bution access arrangement proposal, November 2009 and AER, Draft decision: County Energy access arrangement proposal, section B.4.

[169] AER, *November 2009,* Draft decision: ActewAGL distr bution access arrangement proposal, November 2009 and AER, Draft decision: County Energy access arrangement proposal, section B.4. The AER excludes the BBI bond from its sample, which has a 6.5 year maturity.

JGN engaged PwC to review the AER's draft decision on debt margin and propose a method for estimating the debt risk premium for a benchmark efficient gas network business—see Appendix 5.5.[170]

PwC find that the method used by the AER for the JGN draft decision and applied to the JGN proxy averaging period contained many flaws. In particular, PwC find that the AER did not: [171]

- undertake a sensitivity analysis of the estimation errors produced by adopting CBASpectrum or Bloomberg's fair value curve
- test the representativeness of the data that was used by CBA Spectrum to extrapolate its fair value (and debt margin) curves to 10 years
- assess whether the results of CBASpectrum's extrapolation methodology (i.e. the slope of the debt margin curves by credit rating) are consistent with economic theory.

PwC conclude that the AER's estimated 10 year BBB+ debt margin of 4.18 per cent was not the best forecast possible at the time of the JGN draft decision because CBASpectrum's:[172]

- yield estimates were not representative of general financial market opinion in most off the credit rating categories, except for BBB+
- fair value yield curves are uniformly concave across all credit ratings, which contravenes the predictions of economic theory that indicate a linear functional form;
- yield margin curves all have similar slopes, which is not consistent with the predictions of economic theory that the slope withy term should higher for lower rated bonds.

JGN considers that any analysis of the services should (a) be relevant to the period in question and (b) consider the best estimate for 10 year bonds.

So, based on the PwC advice, JGN proposes a three-step method for estimating the debt risk premium for a benchmark efficient gas network business that addresses the flaws identified with the AER's analysis.

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[170] PriceWaterhouseCoopers, March 2010, *Jemena Gas Networks (NSW), The cost of debt for a gas distributor.*

[171] PriceWaterhouseCoopers, March 2010, *Jemena Gas Networks (NSW), The cost of debt for a gas distributor*, section 4.4.

[172] PriceWaterhouseCoopers, March 2010, *Jemena Gas Networks (NSW), The cost of debt for a gas distributor*, section 4.3.

- *Step one: test the Bloomberg and CBASpectrum services in isolation*—test whether the bond yield estimates that are produced by these services are likely to represent prevailing conditions in the market for funds.

- *Step two: assess the relative merits of Bloomberg and CBASpectrum services*—assess which service provides the best estimate of the debt risk premium for a 10 year BBB bond possible in the circumstances by answering the following two questions:

  - which service provides the better explanation of the yields on the bonds that are on issue?

  - what is the most appropriate method for extrapolating yield estimates for bonds with maturities longer than the bonds that are on issue?

- *Step three: estimate the debt risk premium using the preferred service*—estimate the yield on 10 year BBB rated bonds by:

  - *if CBASpectrum is preferred*, using the fair value yield for 10 year BBB corporate bonds

  - *if Bloomberg is preferred*, extrapolating on a linear basis the fair value yields on five and seven year BBB rated bonds.[173]

Under step one, JGN proposes three tests of the Bloomberg and CBASpectrum services:

1. *Divergence in bank opinions*—does the coefficient of variation of bank feeds into Bloomberg for the Australian corporate bonds of greater than three years duration that are considered for Bloomberg's fair value curve exceed 0.05?

2. *Divergence of fair value yield from the bank opinions*—does the average value of the difference between Bloomberg or CBA Spectrum yield estimate and the mean of bank feeds for the Australian corporate bonds, expressed as a percentage of the yield, exceed +/- 2.50 percent?

3. *Divergence of fair value curve from yield estimates*—does the average value of the difference between Bloomberg's (CBA Spectrum's) fair value

[173] Here, the debt margin on 10 year bonds is calculated as follows:

$$\text{DebtMargin}_{10yr} = \frac{\text{DebtMargin}_{7yr} - \text{DebtMargin}_{5yr}}{2/3} + \text{DebtMargin}_{7yr}.$$

curve and the Bloomberg (CBA Spectrum) bond yield estimate, expressed as a percentage of the bond yield estimate exceed +/- 4.00 percent?

Under step two, JGN proposes to compare the (simple) average error associated with each service, consistent with the practice of regulators and advisor's prior to the global financial crisis.[174] Also, JGN agrees with PwC's conclusions that: [175]

- theory predicts that the relationship between the debt margin and term should be approximately linear, at least once short dated bonds are eliminated from the sample of bonds used to estimate fair value yields
- the slope of this relationship should rise as the credit rating declines.

Appendix 5.5 provides further description of the PwC methodology and analysis of the AER draft decision.

The best estimate of the debt risk premium in the circumstances is 4.48 per cent

JGN proposes to apply the three-step method to the 20 business days to 12 February 2010 to determine the best estimate of the debt risk premium in the circumstances, for presentational purposes. This is the same period used to estimate the risk free rate above.

PwC applied the three-step method to the period and concluded that the Bloomberg service provides the best estimate in the circumstances.[176] In particular, PwC find that at longer terms the Bloomberg fair value curve has a better alignment with the data than the CBASpectrum curve.[177] PwC find that:

> CBASpectrum's fair value curves produce debt margins that are materially concave (in contrast to the predictions of economic theory) and rely upon inputs that are not representative of the views across financial institutions. Accordingly, even if CBASpectrum predicted the current bond yields accurately, we consider that the extrapolation that it performs means that its estimate of the margin on 10 year BBB+ debt would not be the best estimate of that margin in the market for funds.[178]

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[174] PriceWaterhouseCoopers, March 2010, *Jemena Gas Networks (NSW), The cost of debt for a gas distributor*, p. 10.

[175] PriceWaterhouseCoopers, March 2010, *Jemena Gas Networks (NSW), The cost of debt for a gas distributor*, section 3.4.2.

[176] PriceWaterhouseCoopers, March 2010, *Jemena Gas Networks (NSW), The cost of debt for a gas distributor*, p. 47.

[177] PriceWaterhouseCoopers, March 2010, *Jemena Gas Networks (NSW), The cost of debt for a gas distributor*, p. 51.

[178] PriceWaterhouseCoopers, March 2010, *Jemena Gas Networks (NSW), The cost of debt for a gas distributor*, p. 50.

Moreover, PwC find that Bloomberg's fair value curves passed all of the tests of representativeness of the current market for funds.

Over the 20 business days to 12 February 2010, PwC estimate a debt premium of 4.48 per cent on BBB and BBB+ rated bonds using the Bloomberg service as follows:

Table 5-8: JGN's proposed debt premium

Details	Average yield / margin
Yield on five year BBB rated bonds	8.75%
Yield on five year CGS	5.24%
Debt margin on five year BBB rated bonds	3.52%
Yield on seven year BBB rated bonds	9.33%
Yield on seven year CGS	5.43%
Debt margin on seven year BBB rated bonds	3.90%
Proposed debt margin on 10 year BBB rated bonds	4.48%

JGN recognises that its proposed debt margin will require updating for the final averaging period. On this basis, JGN submits the method contained in Appendix 5.5 for approval.

5.3.9 Forecast inflation

Following its review of the AER's draft decision, JGN proposes an inflation forecast of 2.52 per cent, incorporating the method used by the AER in its draft decision as the best estimate in the circumstances, as per rule 74(2)(b).

Accordingly, JGN estimates forecast inflation as the geometric average of the forecast annual inflation for each of the ten years from 2011 to 2020 as follows:

Table 5-9: Forecast Inflation

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Inflation Forecast	2.50%	2.75%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Geometric Average										**2.52%**

Note: Inflation forecasts are for the year to June.

Source: Reserve Bank of Australia, Statement on Monetary Policy, 4 February 2010, page 58, table 12.

Our explanation of the ten annual inflation forecasts above are as follows:

- *first two years* – the forecasts are the expected inflation outcomes stated in the Reserve Bank of Australia's (RBA's) most recent Statement on Monetary Policy

- *subsequent eight years* – the forecasts are the midpoint of the RBA's long term inflation target range. The forecast range is 2 to 3 per cent, so the midpoint is 2.50 per cent.

This approach is consistent with the AER's approach in the draft decision and the recent price determinations for NSW and ACT electricity distributors.

5.4 Amendments to the access arrangement proposal and information

JGN proposes to amend its access arrangement information to delete Tables 9-1 and 9-4 and replace both of them with the following table:

Table 5-10: JGN's proposed WACC Parameters for revised submission

Parameters	JGN Proposal
Inflation (i)	2.52%
Nominal risk-free rate (R_f^n)	5.58%
Real risk –free rate	2.98%
Debt margin (D^n)	4.48%
Nominal pre-tax cost of debt	10.06%
Real pre-tax cost of debt	7.36%
Market risk premium (MRP^n)	6.50%
Growth risk premium (HML^n)	6.24%
Size risk premium (SMB^n)	-1.23%
Equity beta (β_e)	Na
Market beta (β_m)	0.59
Growth beta (β_{HML})	0.48
Size beta (β_{SMB})	0.30
Post-tax nominal return on equity	12.04%

Parameters	JGN Proposal
Gearing (D/V)	60%
Nominal vanilla WACC	**10.86%**
Real vanilla WACC	8.13%

Notes:

1. Real costs of debt and equity and the risk free rate are calculated from the nominal equivalents using the Fisher equation and forecast inflation.
2. Debt margin is based on an efficient gas business with a BBB credit rating.
3. JGN does not rely on a debt or asset beta to estimate its proposed WACC.

6 Taxation

- JGN has incorporated the AER's decision and applied a post-tax approach to calculating required revenues.
- JGN applies the diminishing value depreciation method to calculate its tax asset base because it is the approach JGN has elected (with the ATO) to use to calculate its actual tax liability and is consistent with other regulatory decisions and the requirements of the NGL and NGR.
- JGN uses an assumed utilisation of imputation credits (gamma) of 0.2 because it is a better estimate than the AER's for two reasons—the AER's payout ratio of 1 is not backed by empirical evidence and JGN's 0.23 estimate of theta is the best available estimate based on recent data.

6.1 Summary of JGN original proposal

JGN elected to determine its building block revenue using a pre-tax approach as provided for under rule 72(1)(h) of the NGR in its August 2009 proposal. This is consistent with IPART's method for compensating for taxation costs used in JGN's last three AA periods by applying a pre-tax rate of return to the value of assets when determining JGN's revenue requirement.

JGN's proposed pre-tax approach means that the rate of return used to determine the return on capital is a pre-tax rate of return. This meant that it was not necessary for JGN to itemise the estimated annual cost of corporate income tax as a separate building block as required by rule 76(c). Instead, JGN converted its proposed nominal vanilla rate of return to a pre-tax rate of return using an estimate effective tax rate of 28.35 per cent as discussed in section 9.7.8 of JGN's August 2009 submission.

JGN calculated an effective tax rate in line with the AER's AA guideline.[179]

In its original AA proposal, JGN proposed a value of imputation credits (or gamma) of 0.2[180].

[179] AER, *Access arrangement guideline, Final*, March 2009, p. 62.

[180] The draft decision considered imputation credits (gamma) in the taxation chapter. Accordingly, gamma is addressed in this chapter of the submission.

6.2 Summary of AER draft decision

The AER draft decision considered that, in order to make JGN's proposal acceptable to the AER, JGN should amend its proposal to include a post-tax approach for taxation.

Accordingly, the draft decision did not propose to approve the approach to establishing compensation for taxation and opening taxation asset base proposed by JGN[181]. The draft decision considered that in moving to a post-tax approach, JGN should incorporate a value for gamma in calculating a taxation building block. The draft decision required JGN to amend gamma to 0.65[182].

Table 6-1 sets out the amendments that the AER required in its draft decision of JGN's proposed access arrangement in relation to taxation.

Table 6-1: Amendments the AER required in its draft decision – taxation

AER required amendment		JGN revised AA revision	Explanation in this document
Amendment	**Description**		
6.1	Amend the AAI to delete the sections of 9.4 relating to a pre-tax approach and replace them with the following: JGN determines its building block requirement using a post-taxation approach. It is therefore necessary to itemise "the estimated cost of corporate income taxation for [each] year" as a separate revenue building block consistent with rule 76(c)	Incorporated	Section 6.3.1
6.2	Amend section 9.4 in the AAI to include a discussion of the estimation of the taxation building block, i.e. using a post-taxation framework, including a reference to appendix 9.3 of the AAI	Incorporated	Section 6.3.1
6.3	Amend the AAI to delete section 9.6.1 (WACC proposal) and replace it with the WACC proposal provided in the draft decision	Not incorporated	Section 6.3.1
6.4	Amend the AAI to delete section 9.7.8 (tax rate on equity)	Incorporated	Section 6.3.1

[181] Draft decision, p. 160.

[182] ibid.

AER required amendment		JGN revised AA revision	Explanation in this document
Amendment	Description		
6.5	Amend the AAI to change the title of appendix 9.3 to "taxation asset base"	Incorporated	Section 6.3.1
6.6	Amend the AAI to delete section 1 and the introduction to section 2 in appendix 9.3 (Effective tax rate)	Incorporated	Section 6.3.1
6.7	Amend the AAI to delete the third dot point in section 2.2 in appendix 9.3 (Effective tax rate) and replace it with the following: To determine the taxation written down value of each asset and hence the opening tax asset base for the regulatory capital base assets as at 1 July 1999. Where the taxation regime offered the option of prime cost (historic straight line) or diminishing value depreciation. JGN has used the prime cost method. The prime cost method was used to ensure consistency with approaches to taxation in past access arrangement periods.	Not incorporated	Section 6.3.2
6.8	Amend the AAI to delete table 2-1 (JGN opening TAB) in appendix 9.3 (Effective tax rate) and replace it with the provided table, after calculating the initial taxation life and remaining taxation life.	Incorporated	Section 6.3.2
6.9	Amend the AAI to delete table 2-2 (TAB roll forward from 1999-2010) in appendix 9.3 (Effective tax rate) and replace it with the provided table	Not incorporated	Section 6.3.2
6.10	Amend the AAI to delete table 2-3 (TAB roll forward from 2011-2015) in appendix 9.3 (Effective tax rate) and replace it with the provided table	Not incorporated	Section 6.3.2
6.11	Amend the AAI to delete table 2-4 (Roll forward of TAB from 2011-2015) in appendix 9.3 (Effective tax rate) and replace it with the provided table	Not incorporated	Section 6.3.2
6.12	Amend the AAI to delete all references to a gamma value of 0.2 and replace them with 0.65	Not incorporated	Section 6.3.4

AER required amendment		JGN revised AA revision	Explanation in this document
Amendment	Description		
6.13	Make all consequential amendments necessary to take account of and reflect amendments 6.1 to 6.12 including updating modelling inputs and calculations	Partially incorporated	Section 6.3.1, Section 6.3.2, Section 6.3.4

6.3 JGN response to AER draft decision

Table 6-2 summarises JGN's responses to the AER's draft decision.

Table 6-2: JGN's responses to the AER's draft decision – taxation

Change	Related AER amendments	JGN revised AA revision	Summary of explanation	Explanation in this document
Pre tax and post tax frameworks	6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.13	Incorporated	Changed to post tax approach to calculating required revenue	Section 6.3.1
Depreciation to determine the tax asset base	6.7, 6.8, 6.9, 6.10, 6.11, 6.13	Not incorporated	Use diminishing value depreciation to calculate the opening 2011 tax asset base	Section 6.3.2
Assumed utilisation of imputation credits (gamma)	6.12, 6.13	Not incorporated	Gamma of 0.2 is a better estimate because (a) the AER's payout ratio of 1 is not backed by empirical evidence and (b) a 0.23 estimate of theta is the best available estimate based on recent data	Section 6.3.4

JGN provides detail on its response to the AER's draft decision below.

6.3.1 *Pre tax and post tax frameworks*

JGN proposes to calculate its revenue requirement on a post tax basis. This incorporates the approach set out in the AER's draft decision, although JGN does not necessarily accept the reasons given by the AER for requiring this amendment.

The post-tax approach involves incorporating a separate taxation building block—the estimated cost of corporate income tax (ETC)—which is calculated for each year as:

$$ETC = (ETI \times r)*(1 - \gamma)$$

where:

ETI is the estimate of taxable income for that year

r is the tax rate; and

γ is the assumed utilisation of imputation credits, which is the product of the payout ratio and the utilisation rate (θ).

6.3.2 *Rules assessment framework*

Rule 74 of the NGR requires that forecasts and estimates be arrived at on a reasonable basis and represent the best forecast or estimate possible in the circumstances. Any estimate of the cost of corporate income tax must conform with this rule requirement and must also be supported by a statement of the basis of that forecast or estimate (NGR, rule 74(1)). In the remainder of this section, we explain how the JGN approach to estimating the cost of corporate income tax conforms with these rule requirements.

6.3.3 *The depreciation method used to determine the tax asset base – amendment 6.7*

JGN proposes to use diminishing value tax depreciation to estimate the opening tax asset base (**TAB**) because this method aligns with JGN's election to use diminishing value tax depreciation when determining its tax liability with the Australian Tax Office (**ATO**).

JGN has not incorporated the AER's requirement to use the prime cost (historic cost straight line) depreciation method (amendment 6.7). JGN's reasons for taking this position are set out below under the following headings:

- tax depreciation should be based on the efficient costs of providing reference services

- tax depreciation should be based on the approach used to calculate JGN's actual tax liability
- the AER has concluded, based on an earlier IPART decision, that a uniform tax rate implies straight line depreciation method
- IPART's reasoning does not support the AER's conclusion
- the AER's reasoning appears to be incorrect and is not supported by any analysis
- depreciation methods should be consistent across regulatory periods.

Tax depreciation should be based on the efficient costs of providing reference services

Tax is a cost for a benchmark efficient gas business and tax depreciation affects this cost. JGN considers that Rule 74(2) requires that compensation for tax be the best estimate, in the circumstances, of the efficient cost of providing reference services.

Therefore, to estimate this efficient cost, the TAB should be a realistic estimate of the tax position of an efficient gas business in the circumstances. JGN considers that these circumstances include:

- JGN's historic nominal capital expenditure
- the tax law existing at the time of this expenditure
- the assumed tax depreciation method that an efficient gas business would have elected to use if it operated JGN's network historically.

JGN proposes to use its actual historic capital expenditure, the tax rates applying when this expenditure was incurred and, as an assumption, diminishing value tax depreciation to calculate its opening 2010-11 TAB.

JGN considers that its actual tax depreciation method—diminishing value, as discussed below—provides the best indication of the method that an efficient gas business would take in the circumstances.

Other regulatory decisions have also adopted diminishing value tax depreciation. For instance, the ESC in its 2008 GAAR final decision adopted this method,[183] while considering that:

[183] ESC, 7 March 2008, *Gas Access Arrangement Review 2008-2012*, Final Decision, p. 498. Noting that the ESC adopted the tax depreciation method consistent with the 2003 Gas Access Arrangement review, which was to use diminishing value tax depreciation.

> the process of deriving an allowance for the cost of tax is not a matter for discretion, but rather that the Code requires that the Commission establish the best estimate of the cost, arrived at on a reasonable basis in accordance with section 8.2(e). To derive such an estimate, account must be taken of the implications of the tax law for the distributors' tax depreciation allowances.[184]

Although this decision was made in the context of the Gas Code, section 8.2(e) of the Code corresponds directly with Rule 74(2). Section 8.2(e) requires that "any forecasts required in setting the Reference Tariff represent the best estimates arrived at on a reasonable basis".[185] JGN agrees with the ESC's interpretation of section 8.2(e) and considers that this interpretation applies equally to Rule 74(2).

Further, in an electricity context, the ESC also approved diminishing value tax depreciation in the 2006 EDPR final decision.[186]

Tax depreciation should be based on the approach used to calculate JGN's actual tax liability

JGN has elected diminishing value depreciation for the bulk of its assets in determining its tax liability with the ATO. This provides a compelling basis for assuming diminishing value tax depreciation in determining JGN's opening tax asset base for the 2010-11 regulatory year for an efficient gas network business in the circumstances.

The AER has concluded that a uniform tax rate implies straight line tax depreciation

The AER's requirement that JGN should use nominal straight line tax depreciation in calculating the 1999 opening tax asset base and in rolling that value forward to the start of the 2010-11 regulatory year is based on its interpretation of previous IPART decisions.

In grossing up from a post-tax WACC to a pre-tax WACC in its 2000 and 2005 decisions, IPART assumed the statutory tax rate of 30 per cent in both decisions. The AER has interpreted these decisions as follows:

> [the assumption, by IPART, of] a uniform taxation rate over different access arrangement periods necessarily implies the use of straight line [tax] depreciation method.[187]

See ESC, October 2002, *Gas Access Arrangement Review 2003-2008*, Final Decision, pp. 379–390.

184 ESC, 7 March 2008, *Gas Access Arrangement Review 2008-2012*, Final Decision, p. 498.

185 *National Third Party Access Code for Natural Gas Pipeline Systems*, section 8.2(e).

186 ESC, October 2005, *Electricity Distribution Price Review 2006-10*, Final Decision Volume 1, pp. 551–554. Here, the ESC refers to 'diminishing value' tax depreciation as 'declining balance' tax depreciation.

IPART's reasoning does not support the AER's conclusion

IPART's reasoning does not support any inference about the form of tax depreciation that should be used in establishing the tax asset base.

In its 2000 Final Decision, IPART adopted the statutory rate of 30 per cent stating that "In the draft decision the Tribunal decided that the statutory tax rate would be applied due to difficulties in estimating the effective tax rate for the industry as a whole. The Tribunal maintains this view".[188]

In adopting the statutory rate of 30 per cent in its 2005 Final Decision, IPART's reason was simply that "The Tribunal is satisfied that the use of the statutory tax rate of 30 per cent proposed by AGLGN meets the requirements of section 8.30 of the Code".[189]

The AER's reasoning appears to be incorrect and is not supported by any analysis

The AER suggests that IPART's assumption of the same 30 per cent tax rate for two consecutive regulatory periods implies straight line tax depreciation.[190] This reasoning appears incorrect and the AER does not provide any analysis to support it.

The effective tax rates in different periods will only be the same if regulatory depreciation (the depreciation amount used to set revenues) is equal to tax depreciation (the depreciation amount used to calculate taxes) in each year of each period.[191] This condition is demonstrated in Appendix 6.2. This condition has not and will not be met for JGN because:

- *regulatory versus tax depreciation method* – Regulatory depreciation is based on *real* straight line depreciation whereas the prime cost option for tax depreciation uses *nominal/historic cost* straight line depreciation. Even if the prime cost method was used for tax depreciation, the annual regulatory and tax depreciation amounts will be materially different.

- *regulatory versus tax depreciation lives* – Standard regulatory asset lives (used to calculate regulatory depreciation) and effective lives (used to

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187 Draft decision, p. 149.

188 IPART, *Final Decision, Access Arrangement For AGL Gas Networks Limited Natural Gas System In NSW*, July 2000, p. 66.

189 IPART, *Revised Access Arrangement for AGL Gas Networks, Final Decision*, April 2005, p. 82.

190 Draft decision, p. 149, and confirmed by the AER in AER, 2010 03 11 – Letter AER to JGN – Errors in draft decision, 11 March, 2010, Item 15 under the heading 'Clarification of AER's reasons for draft decision: (8 March 2010, 3 page letter).

191 There may be cases where the combination of post tax returns on equity and different depreciation schedules is such that different periods have the same effective tax rates, but those cases will be rare in practice.

calculate tax depreciation) are not necessarily the same. For example, the effective life of pipeline infrastructure for tax purposes is 30 or 50 years depending on material[192] whereas the regulatory life is normally 50 or 80 years depending on material. In fact the actual amount of tax depreciation allowed under the diminishing value method is calculated as if the effective life was two thirds or half of the "headline" effective life by virtue of sections 40.70 and 40.72 of the Income Tax Assessment Act 1997.[193] Again, the annual regulatory and tax depreciation amounts will be materially different even if the methods were the same.

Depreciation methods should be consistent between regulatory periods

JGN considers that the tax depreciation method used to roll-forward the 2010-11 opening tax asset base in the next regulatory period should be the same as the method used to establish the opening TAB for the 2010-11 regulatory year. Accordingly, JGN also proposes to use the diminishing value tax depreciation method for the next regulatory period. JGN calculates the opening TAB for the 2010-11 regulatory year in Appendix 6.1 and calculates tax depreciation for the next regulatory period in Appendix 10.

If the AER determines to use nominal straight line tax depreciation to establish the opening taxation asset base for the 2011 regulatory year, then JGN proposes to use nominal straight line tax depreciation for the next regulatory period also.

6.3.4 Value of imputation or franking credits (gamma)

JGN has not incorporated the AER's gamma estimate of 0.65. JGN proposes a gamma estimate of 0.2 because it the best estimate in the circumstances, relying on evidence presented in Appendix 6.3.

The rest of this section explains why JGN considers a gamma of 0.2 a better estimate than 0.65 and is laid out as follows:

- JGN and AER agree on a definition of gamma
- the AER's imputation credit payout ratio of 1 is not backed by empirical evidence; JGN proposes 0.68 as the best estimate
- the best estimate of the utilisation rate (theta) is 0.23 because it relies on more recent data and because dividend drop-off studies provide a much better estimate than taxation statistics

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[192] Commissioner of Taxation, *Tax Ruling 2009/04, Income tax: effective life of depreciating assets (applicable from 1 July 2009)*, 29 June 2009, p. 93.

[193] Section 40.70 applies to assets held before 10 May 2006 and section 40.72 applies to assets held on or after that date.

- combining the payout ratio and theta estimates, the best estimate of gamma is 0.2.

JGN and AER agree on a the definition of gamma

JGN considers that gamma should be estimated as a market wide parameter for the Australian economy and defined (using the Monkhouse definition[194]) as the product of:

- the imputation credit payout ratio—the face value of imputation credits distributed by the firm as a proportion of the face value of imputation credits generated by the firm in the period
- the utilisation rate (theta)—the value of distributed credits to investors as a proportion of their face value.

The AER adopts this same definition in its draft decision.[195]

Payout ratio of one is not backed by empirical evidence

JGN considers that it is inappropriate to adopt the AER's assumed dividend payout ratio of one. Empirical evidence strongly suggests a payout of significantly less than one and therefore JGN considers that 0.68 per cent is the best estimate in the circumstances.[196] The AER provided no new empirical evidence to the contrary in its draft decision.

JGN supports the view of Professor Officer that the Officer framework says nothing about the payout ratio.[197] The Officer CAPM is one of a class of robustly derived tax-adjusted CAPM's where the dividend payout is variable, not something that needs to be assumed.[198] Instead, empirical data provides better estimates of the payout ratio than theoretical assumptions, such as that made by the AER.[199]

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194 P. Monkhouse, 1997, *Adopting the APV Valuation Methodology and the Beta Gearing Formula to the Dividend Imputation Tax System*, Accounting and Finance, 37, vol. 1, 1997, pp. 69–88.

195 Draft decision, p. 149.

196 As noted recently by ETSA. ETSA Utilities, 14 January 2010, *Revised Regulatory Proposal 2010–2015*, p. 191.

197 R. Officer, 23 June 2009, *Estimating the Distribution Rate of Imputation Tax Credits: Questions Raised by ETSA's Advisers*.

198 M. Lally, 2000, *Valuation of companies and projects under differential personal taxation*, Pacific-Basin Financial Journal, vol. 8, pp. 115–133.

For instance, Lally notes on page 117 that: the Officer CAPM assumes that empirical approaches will determine the extent of the utilisation of imputation credits, including the payout ratio variable.

199 Draft decision, p. 150. The AER assumes a 100 per cent payout ratio.

NERA has conducted new empirical analysis—provided in Appendix 6.3—of ATO statistics that clearly shows that the assumption of a 100 per cent payout ratio is inconsistent with the actual behaviour of firms.[200] NERA's analysis finds that on average 68 per cent of imputation credits were paid out between 1996-97 and 2006-07.[201] This result is consistent with the results of Hathaway and Officer[202] and Synergies[203] that JGN relied on in its original AA proposal.

Assuming a payout ratio of one is not only inconsistent with the empirical evidence, but also ignores the practical constraints on the ability of firms to pay out retained credits. In general, a firm will only be able to distribute retained imputation credits in years where it distributes more credits than it creates (that is, in years when the payout ratio is greater than one). This might be possible for some companies with substantial foreign income or a desire to lower equity levels, but it is unlikely to be the case for regulated energy businesses such as JGN. JGN's ability to pay out retained credits in any given year is restricted by both its assumed financing structure (particularly gearing) and the nature of its income streams.

JGN also notes that the pool of retained credits is growing over time,[204] which suggests that firms are struggling to pay out these credits and that investors are not able to access this value. So, even if these credits were eventually paid out, JGN considers that they would not be paid out within five years of being earned, as suggested by the AER.[205]

A better estimate of the utilisation rate (theta) is 0.23

JGN considers that the May 2009 SFG study (**the SFG study**) which estimates theta at 0.23 is the most reliable and current estimate.[206]

The SFG study is more comprehensive than the 2006 Beggs and Skeels study[207] that the AER relies on in its draft decision because it uses a much larger cross-section of businesses and a longer, more recent data period. This view is confirmed by Skeels—a co-author of the 2006 Beggs and Skeels study—who

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200 NERA, 5 January 2010, *Payout Ratio of Regulated Firms.*

201 NERA, 5 January 2010, *Payout Ratio of Regulated Firms*, p. 6.

202 N. Hathaway and B. Officer, November 2004, *The Value of Imputation Tax Credits – Update 2004*, Capital Research Pty Ltd, pp. 13 and 24.

203 Synergies Economic Consulting, 28 May 2009, *Gamma: New Analysis Using Tax Statistics*, p. 6.

204 NERA, 5 January 2010, *Payout Ratio of Regulated Firms*, p. 6.

205 Draft decision, p. 150.

206 SFG, *The value of imputation credits as implied by the methodology of Beggs and Skeels (2006)*, referenced in:

C. Skeels, 28 August 2009, *A Review of the SFG Dividend Drop-Off Study*, p. 3.

207 C. Skeels and Beggs, 2006, *Market Arbitrage of Cash Dividends and Franking Credits*, The Economic Record in 2006, Vol. 82, pp. 239–252.

considers that the SFG study provides the most accurate estimate of the value of theta.[208]

The AER's following criticisms of the SFG study are either overstated or do not apply:

- *Multi-collinearity* – JGN agrees with the AER that dividend drop-off studies are likely to suffer from some multi-collinearity.[209] However this issue will apply not only to the SFG study, but also the Beggs and Skeels study relied on by the AER.[210] The AER is inconsistent in expressing concerns about the SFG study but not applying those same criticisms to the Beggs and Skeels study.

  JGN also considers that the AER's concerns about multi-collinearity in the SFG study are overstated. The standard errors of the estimate do not suggest that multi-collinearity represents any material concern, as analysed in both the Skeels report[211] and the SFG report[212].

- *Filtering and data quality* – JGN considers that the SFG study does properly filter its data set to exclude observations based on shortcomings in the data or where the observations were unreliable on economic grounds. SFG has recently conducted a rigorous sample exercise that shows, after a review of some 236 ASX announcements in relation to 150 observations, there are negligible changes to the results previously reported by SFG.[213] This sample exercise was conducted in response to Dr John Field, an independent statistician, who prepared a statistically robust sampling methodology to be used to interrogate the SFG data set.[214]

- *Economically implausible results* – the AER criticises one set of SFG results where "the coefficient of cash dividends exceeds one dollar are economically

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208 C. Skeels, 28 August 2009, *A Review of the SFG Dividend Drop-Off Study*, p. 5

C. Skeels, 13 January 2010, *Response to Australian Energy Regulatory Draft Determination*, section 3.

209 Draft decision, p. 154.

210 Draft decision, p. 158.

211 C. Skeels, 13 January 2010, *Response to Australian Energy Regulatory Draft Determination*, section 3.1.

212 SFG Consulting, 8 January 2010, *Response to AER Draft Determination in relation to gamma*, paragraphs 19–34.

213 SFG Consulting, 13 January 2010, *Response to AER Draft Determination in relation to gamma.*

214 SFG Consulting, 13 January 2010, *Response to AER Draft Determination in relation to gamma*, p.17.

implausible and therefore cannot be relied upon".[215] JGN notes the AER's concern but reiterates the view of Associate Professor Skeels that:[216]

> [i]f the point estimate is economically implausible but the confidence interval includes economically plausible values, as the preferred SFG results do, then the correct interpretation of the estimates is that they suggest that the true parameter is near to the boundary of economically plausible values. They do not suggest that the true parameter value is an economically implausible value. To attach an implausible interpretation to something when a plausible interpretation is equally probable does not constitute a fair assessment of the statistical evidence.

The above reasons why the AER's criticisms of SFG's report are unfounded are supported by the reports in Appendix 6.3.[217] These reports address concerns about the SFG study that the AER originally raised in the South Australian draft decision and raised again in its draft decision for JGN. Furthermore, Skeels suggests that the concerns raised by the AER are of little practical importance and that the SFG estimate is the most accurate estimate currently available.[218]

Also, JGN reaffirms its view that dividend drop-off studies provide the most reliable and accurate method for estimating theta. JGN considers that these studies better satisfy the requirements of rules 74 and 87 than do tax statistics because they better reflect the true market or economic value of imputation credits.[219] Hence, JGN considers it inappropriate to use tax statistics as part of determining the best estimate of theta that is commensurate with prevailing conditions in the market for funds.

Combining the best payout ratio and theta estimates, the best estimate of gamma is 0.2

JGN proposes a gamma estimate of 0.2. Multiplying the payout ratio estimate of 0.68 and the theta estimate of 0.23, as per the Monkhouse definition, gives a gamma estimate of 0.16, which is consistent with JGN's proposal. Even using an

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215 Draft decision, p.157.

216 C. Skeels, 13 January 2010, *Response to Australian Energy Regulatory Draft Determination*, p. 28.

217 SFG Consulting, 13 January 2010, *Response to AER Draft Determination in relation to gamma.*

SFG Consulting, 4 January 2010, *Further analysis in response to AER Draft Determination in relation to gamma.*

C. Skeels, 13 January 2010, *Response to Australian Energy Regulatory Draft Determination.*

218 C. Skeels, 28 August 2009, *A Review of the SFG Dividend Drop-Off Study*, p. 5.

C. Skeels, 13 January 2010, *Response to Australian Energy Regulatory Draft Determination*, section 3.

219 This is support by: C Skeels, 12 January, *Response to Australian Energy Regulator Draft Determination*, section 2. On page 10, Associate Professor Skeels states that "the face value of the franking credit overstates its value to the investor relative to that of the corresponding cash dividend".

assumed payout ratio of one implies a gamma estimate of 0.23, which is also consistent with JGN's proposal.

Further, JGN does not agree that an average of theta estimates from tax statistics and dividend drop-off studies—the method used by the AER[220]—is appropriate in the circumstances. As noted above, JGN considers that tax statistics do not represent economic values so should not be used to estimate gamma.

6.4 Amendments to the access arrangement proposal and information

JGN has amended its AAI to apply a post-tax approach to calculating required revenues. JGN has not incorporated any other required amendments. Appendix 10 calculates JGN's tax allowance for the next regulatory period.

[220] Draft decision, pp. 158–160.