Jemena Gas Networks (NSW) Ltd

Revised Access Arrangement Information

19 March 2010

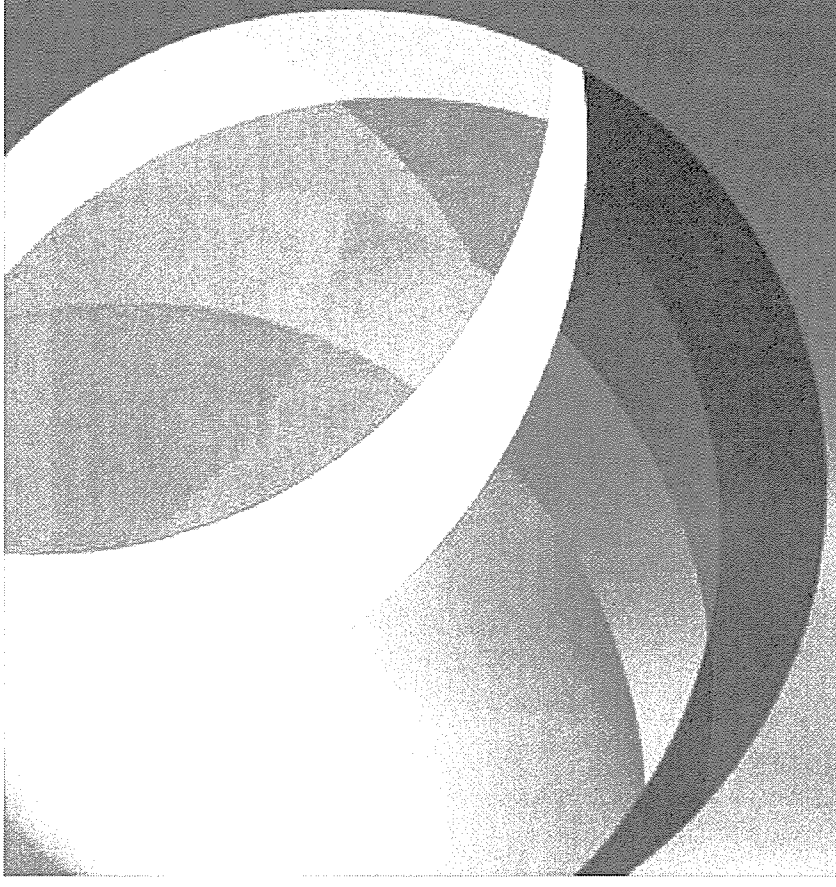

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Table of contents

8 Cost of capital

8.1 Summary

JGN has set its cost of capital using the domestic version of the Fama-French three-factor model **(FF model)** to estimate the cost of equity component of its WACC. JGN uses a nominal vanilla WACC of 10.86 per cent.

Table 8-1 summarises JGN's WACC parameters as well as resulting WACC variants.

Table 8-1: JGN's proposed WACC Parameters

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%
Gearing (D/V)	60%
Dividend imputation (γ)	0.20
Tax rate on equity (T_e)	22.46%

Parameters	JGN Proposal
Corporate tax rate (T_c)	30%
Pre-tax real WACC ($WACC^r$)	9.16%
Pre-tax nominal WACC ($WACC^n$)	11.91%
Nominal vanilla WACC	**10.86%**
Real vanilla WACC	8.13%

Notes: Real costs of debt and equity and the risk free rate are calculated from the nominal equivalents using the Fisher equation and forecast inflation.

Debt margin is based on an efficient gas business with a BBB credit rating.

JGN does not rely on a debt or asset beta to estimate its proposed WACC.

8.2 Treatment of tax

JGN calculate its revenue requirement on a post tax basis.

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 x r)*(1 – γ)

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).

8.3 Weighted average cost of capital model

JGN uses a nominal vanilla WACC incorporating:

- the Fama-French three-factor model to estimate the cost of equity
- observed domestic corporate bond performance to estimate the cost of debt.

8.3.1 WACC proposal

JGN proposes using a nominal vanilla WACC as follows:

$$WACC^n = R_e^n \frac{E}{V} + R_d^n \frac{D}{V},$$

where:

- R_e^n is the nominal return on equity
- R_d^n is the nominal return on debt
- $\frac{E}{V}$ is the level of equity
- $\frac{D}{V}$ is the level of gearing.

8.3.2 *Cost of equity proposal*

Summary

Nominal cost of equity is estimated using the FF model as follows:

$$R_e^n = R_f + MRP^n \times \beta_m + SMB^n \times \beta_{SMB} + HML^n \times \beta_{HML},$$

where:

- R_f^n is the nominal risk free rate
- MRP^n is the nominal market risk premium
- HML^n is the risk premium for high book-to-market firms compared to low book-to-market firms.
- SMB^n is the risk premium for small firms compared to big firms
- β_m is the market beta
- β_{HML} is the beta on the high minus low firm factor
- β_{SMB} is the beta on the small minus big firm factor.

Table 8-2 sets out the FF model parameters that JGN relies upon for its proposed cost of equity.

Table 8-2: 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

Note. Estimated using data sampled up to the end of May 2009.

Applying these parameters to a domestic version of the FF model leads to a return on equity that is 6.46 percentage points above the risk-free rate. A risk-free rate of 5.58 per cent was observed over the 20 days up to and including the 12 February 2010, which results in an estimated cost of equity of 12.04 per cent for a gas distributor.

8.3.3 Cost of debt proposal

Nominal cost of debt:

$$R_d^n = R_f^n + D^n,$$

where:

- R_f^n is the nominal risk free rate
- D^n is the nominal debt margin.

JGN uses a debt margin of 4.48 per cent. This margin is added to the nominal risk free rate of 5.60 per cent to give JGN's proposed cost of debt of 10.06 per cent.

8.4 Weighted average cost of capital parameters

Based on the above, JGN calculates a pre tax WACC of 12.63 per cent in accordance with the NGR.

Table 8-3 provides a summary of the parameter values that JGN proposes for its WACC calculation and resulting WACC estimates.

Table 8-3: JGN's proposed WACC parameters for the next AA period

Parameters	Current AA period	Next AA period
Inflation (i)	2.80%	2.52%
Nominal risk free rate (R_f^n)	5.70%	5.58%
Real risk free rate	2.82%	2.98%
Debt margin (D^n)	1.13%–1.22%	4.48%
Normal pre-tax cost of debt	6.83%–6.92%	10.06%

Parameters	Current AA period	Next AA period
Real pre-tax cost of debt	3.92%–4.01%	7.36%
Market risk premium (MRP^n)	5.5%–6.5%	6.50%
Growth risk premium (HML^n)	Na	6.24%
Size risk premium (SMB^n)	Na	-1.23%
Equity beta (β_e)	0.8–1.0	Na
Market beta (β_m)	Na	59.00%
Growth beta (β_{HML})	Na	48.00%
Size beta (β_{SMB})	Na	30.00%
Post-tax nominal return on equity	10.10%–12.20%	12.04%
Gearing (D/V)	60.00%	60.00%
Dividend imputation (γ)	0.5–0.3	20.00%
Tax rate on equity (T_e)	30.00%	22.46%
Corporate tax rate	30.00%	30.00%
Pre-tax real WACC ($WACC^r$)	5.9–7.3%	9.16%
Selected Pre-tax WACC ($WACC^r$)	7.00%	9.16%
Pre-tax nominal WACC ($WACC^n$)	10.00%	11.91%
Nominal vanilla WACC	**8.14%–9.03%**	**10.86%**
Real vanilla WACC	5.19%–6.06%	8.13%

Source: Current AA period parameters from Table 8.6 of IPART (2005). [7]

[7] IPART, *Final Decision, Revised Access Arrangement for AGL Gas Networks*, April 2005, p. 104.

8.4.1 *Inflation*

JGN proposes an inflation forecast of 2.52 per cent. Here, forecast inflation is the geometric average of the forecast annual inflation for each of the ten years from 2010 to 2019 as follows:

Table 8-4: Forecast Inflation

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
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.

8.4.2 *Gearing*

JGN uses a gearing ratio of 60 per cent, consistent with the assumed efficient level of debt chosen by the AER in its final WACC decision and in the current IPART decision.

8.4.3 *Nominal risk free rate*

The nominal risk free rate is 5.58 per cent, 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.

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.

8.4.4 *Market risk premium*

JGN uses a market risk premium (**MRP**) of 6.5 per cent, based on the AER's final WACC decision.

8.4.5 *Fama-French factors and betas*

JGN relies upon NERA's report for the parameters of the FF model. Appendix 5.1 provides NERA's full computations, which are summarised in Table 8-2 above.

8.4.6 *Debt margin*

JGN proposes a debt margin of 4.48 per cent. This margin is added to the nominal risk free rate of 5.58 per cent to give JGN's proposed cost of debt of 10.06 per cent as set out in section 8.3.3.

8.4.7 *Dividend imputation*

JGN uses a value of imputation credits (or gamma) of 0.2 as the best estimate in the circumstances