Final Determination

2008 Weighted Average Cost of Capital for the Freight (WestNet Rail) and Urban (Public Transport Authority) Railway Networks

23 June 2008

Economic Regulation Authority
WESTERN AUSTRALIA

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1 FINAL DETERMINATION

1. Clause 3 of schedule 4 of the *Railways (Access) Code 2000* (**"Code"**) requires the Economic Regulation Authority (**"Authority"**) to make an annual determination of a weighted average cost of capital (**"WACC"**) to be applied in determination of floor and ceiling prices (**"WACC determination"**) for each of:

   - the railway infrastructure associated with the south west railway network described in schedule 1 of the Code, under items 1 to 19 (hereafter referred to as the "freight network"); and
   - the railway infrastructure associated with the urban railway network described in schedule 1 of the Code, under items 20 to 22 (hereafter referred to as the "urban network").

2. The freight network is operated by WestNet Rail, a subsidiary of Babcock and Brown Infrastructure, and the urban network is operated by the Public Transport Authority, an agency of the Western Australian Government.

3. Clause 3 of schedule 4 of the Code further requires that in every fifth year subsequent to 2003, the Authority undertake a public consultation program prior to determining the WACC values for that year. Consequently, the Authority is required to undertake a public consultation program prior to making its WACC determination for the regulatory year commencing 1 July 2008.

4. The process followed by the Authority in undertaking consultation and making its 2008 WACC determination is as follows.

   - The Authority commissioned a study by the Allen Consulting Group that provided recommendations for determination of the WACC for each of the urban and freight networks.[1]
   - On 30 October 2007, the Authority published the report of the Allen Consulting Group and invited submissions from interested parties, with a closing date for submissions of 14 December 2007.
   - On 4 April 2008, the Authority published a Draft Determination and invited interested parties to make further submissions, with a closing date for submissions of 2 May 2008.

5. Following consideration of the submissions received during the public consultation processes, the Final Determination of the Authority is that the real pre-tax 2008 WACC values are:

   - 9.77 per cent for the freight network; and
   - 7.19 per cent for the urban network.

6. The Authority calculated these values by the method of the Officer CAPM and WACC, applying values of parameters as shown in Table 1.

[1] Allen Consulting Group, October 2007, Railways (Access) Code 2000: Weighted Average Cost of Capital, report to the Economic Regulation Authority (received by the Authority on 17 October 2007).

Table 1: WACC values for the 2008 WACC Final Determination

CAPM or WACC parameter	Freight network 2008 value	Urban network 2008 value
Nominal risk free rate of return (%)	6.37	6.37
Inflation rate (%)	2.75	2.75
Real risk free rate of return (%)	3.52	3.52
Debt proportion (%)	35	35
Equity proportion (%)	65	65
Market risk premium (%)	6.0	6.0
Equity beta	1.00	0.46
Debt margin (%)	3.02	2.51
Debt issuance costs (%)	0.125	0.125
Taxation rate (%)	30	30
Franking credit value (gamma)	0.5	0.5
Nominal pre-tax cost of debt (%)	9.52	9.01
Nominal post-tax cost of equity (%)	12.37	9.14
Real post-tax cost of equity (%)	9.36	6.22
Nominal pre-tax cost of equity (%)	14.55	10.75
Real pre-tax cost of equity (%)	11.49	7.79
Nominal pre-tax ("Officer") WACC (%)	12.79	10.14
Real pre-tax ("Officer") WACC (%)	**9.77**	**7.19**
Nominal post-tax ("vanilla") WACC (%)	11.37	9.09
Real post-tax ("vanilla") WACC (%)	8.39	6.17

Notes: (a) The nominal risk free rate is determined as the average of implied yields on 10 year Commonwealth Government Securities over the 20 trading days to 30 May 2008. The debt margin is determined as the average of fair-value yields for 10-year BBB+ rated (freight network) and A rated (urban network) corporate bonds as stated by CBASpectrum over the same period.

(b) The equity beta is derived from consideration of empirically derived equity beta and asset beta values as described in section 2.7.5 of this determination.

2 REASONS FOR THE FINAL DETERMINATION

2.1 Background to the Determination

2.1.1 Requirements of the Code

7. The requirement on the Authority to determine WACC values is established by section 3 of schedule 4 of the Code:

> 3. Regulator to determine weighted average cost of capital
>
> (1) For the purposes of clause 2(4)(b), the Regulator is to —
>
> (a) determine, as at 30 June in each year, the weighted average cost of capital for each of —
>
> (i) the railway infrastructure associated with the urban network described in items 49, 50 and 51 in Schedule 1; and
>
> (ii) the railway infrastructure associated with the railways network described in the other items in that Schedule;
>
> and
>
> (b) publish notice of each such determination in the Gazette as soon as is practicable after it is made.
>
> (2) Subclauses (3), (4) and (5) apply to the determinations under subclause (1) that are required to be made as at 30 June —
>
> (a) in the year 2003; and
>
> (b) in every 5th year after that year.
>
> (3) Before the Regulator makes a determination mentioned in subclause (2) he or she is to —
>
> (a) cause a notice describing the requirements of subclause (1) to be published in an issue of —
>
> (i) a daily newspaper circulating throughout the Commonwealth; and
>
> (ii) a daily newspaper circulating throughout the State;
>
> and
>
> (b) include in the notice the following information —
>
> (i) a statement that written submissions relating to the determination may be made to the Regulator by any person within a specified period;
>
> (ii) the address to which the submissions may be delivered or posted.
>
> (4) The period specified under subclause (3)(b)(i) is to be not less than 30 days after both of the notices under subclause (3)(a) have been published.
>
> (5) In making a determination under this clause the Regulator must have regard to any submission relating to the determination made in accordance with the notice.

8. Clause 3 of schedule 4 of the Code further requires that in every fifth year subsequent to 2003, the Authority undertake a public consultation program prior to determining the WACC values for that year. Consequently, the Authority is required to undertake a public consultation program prior to making its WACC determination for the regulatory year commencing 1 July 2008.

2.1.2 Report of the Allen Consulting Group

9. As part of the process of this WACC determination, the Authority commissioned a study by the Allen Consulting Group that provided recommendations for determination of the WACC for each of the urban and freight networks.[2]

10. The Allen Consulting Group recommended that the Authority continue to apply the same method as the Authority has done previously in its WACC determinations, with the exception of the methods applied for determination of the inflation rate and the real risk-free rate of return.

- The Allen Consulting Group recommended that the Authority continue with estimation of WACC values by use of the capital asset pricing model (**"CAPM"**) to estimate the cost of equity.
- The Allen Consulting Group indicated that the determination of WACC values on a pre-tax or post-tax basis is ultimately a matter for decision by the Authority, but stated that there are peculiarities of the Western Australian rail access regime that would favour continued use of pre-tax WACC values, consistent with past determinations of the Authority.
- The Allen Consulting Group recommended that the Authority apply a different method for determination of the inflation rate and real risk-free rate of return than in previous WACC determinations. Previously, the Authority has estimated the real risk free rate of return from implied rates of return on long-term inflation-indexed government bonds and estimated a rate of inflation from the difference in implied returns on the inflation indexed and nominal government bonds. The Allen Consulting Group recommended that the Authority make an assumption about the rate of inflation and determine the real-risk free rate of return by inflation adjustment of implied returns on nominal government bonds.

The Allen Consulting Group's recommended values of individual parameters of the WACC calculation and the resultant WACC values are indicated in Table 2 together with parameters values determined by the then Rail Access Regulator in 2003 (and maintained in subsequent WACC determinations by the Rail Access Regulator and the Authority, with the exception of revisions to values of the risk free rate and rate of inflation).

[2] Allen Consulting Group, October 2007, Railways (Access) Code 2000: Weighted Average Cost of Capital, report to the Economic Regulation Authority (received by the Authority on 17 October 2007).

Table 2: Recommendations of the Allen Consulting Group (October 2007) for the 2008 WACC Determination

CAPM or WACC parameter	Freight network		Urban network	
	2003 value	ACG 2008 value	2003 value	ACG 2008 value
Nominal risk free rate of return (%)	4.80	**5.99**	4.80	**5.99**
Inflation rate (%)	2.01	**3.00**	2.01	**3.00**
Real risk free rate of return (%)	2.74	**2.90**	2.74	**2.90**
Debt proportion (%)	55	**35**	55	**35**
Equity proportion (%)	45	**65**	45	**65**
Market risk premium (%)	6.0	**6.0**	6.0	**6.0**
Asset beta	0.45	**0.60**	0.30	**0.25**
Equity beta	1.00	**0.92**	0.66	**0.38**
Debt margin (%)	1.11	**1.55**	1.11	**1.40**
Debt issuance costs (%)	0.125	**0.125**	0.125	**0.125**
Taxation rate (%)	30	**30**	30	**30**
Franking credit value (gamma)	0.5	**0.5**	0.5	**0.5**
Nominal pre-tax cost of debt	6.04	**7.67**	6.04	**7.52**
Nominal post-tax cost of equity	10.80	**11.53**	8.76	**8.30**
Real post-tax cost of equity	8.62	**8.28**	6.62	**5.14**
Nominal pre-tax cost of equity	12.71	**13.56**	10.31	**9.76**
Real pre-tax cost of equity	10.49	**10.26**	8.13	**6.57**
Nominal pre-tax ("Officer") WACC	9.04	**11.50**	7.96	**8.98**
Real pre-tax ("Officer") WACC	6.87	**8.25**	5.83	**5.80**
Nominal post-tax ("vanilla") WACC	8.18	**10.18**	7.26	**8.02**
Real post-tax ("vanilla") WACC	6.05	**6.97**	5.15	**4.88**

2.1.3 Submissions on the Report from the Allen Consulting Group

11. On 30 October 2007, the Authority published the report of the Allen Consulting Group and invited submissions from interested parties, with a closing date for submissions of 14 December 2007.

12. The Authority received submissions from four parties. The content of each of these submissions is summarised as follows.

13. The Chamber of Commerce and Industry (**"CCI"**) submitted that the Authority should continue to apply the same principles and method in its WACC Determination as the Authority has done to date. CCI further addressed two matters arising from the report of the Allen Consulting Group, submitting that:

- the Authority should closely examine recommendations of the Allen Consulting Group on assumptions of financial gearing that differ from the assumptions previously adopted by the Authority; and
- the Authority should reject the recommendations of the Allen Consulting Group on assumptions of the systematic risk (beta) in favour of maintaining assumptions previously adopted by the Authority.

14. Alcoa World Alumina Australia (**"Alcoa"**) (a user of the freight network) submitted that it has particular concerns with the recommendations of the Allen Consulting Group for the higher value of the asset beta than applied in previous WACC determinations and submitted that the Authority should apply a lower value.

15. The Australian Pipeline Industry Association Ltd (**"APIA"**) submitted that it has an interest in the Authority's WACC determination as the determination may establish precedents for the Authority's consideration of rates of return under the National Third Party Access Code for Natural Gas Pipeline Systems.

16. On general matters relating to the WACC determination, APIA submitted that the Authority should:

- give attention to a "reasonable range" of WACC values and exercise regulatory judgement to select a point in this range rather than determining a point estimate directly from theoretical models without consideration of the "reasonableness" of the outcome;
- in exercising regulatory judgement, consider the uncertainty involved in determining the WACC and adverse consequences of underestimating the rate of return; and
- exercise caution before applying outcomes of a review of the WACC for railway businesses to other industries.

17. APIA also made submissions on particular parameters of the WACC calculation.

- APIA offered qualified support for the method recommended by the Allen Consulting Group for determination of the rate of inflation and the real risk-free rate, but submitted that there are additional matters that should be taken into account such as a potential "absolute bias" in implied yields of nominal government bonds and evidence pointing to a lower assumed value of inflation than has been applied in recent regulatory decisions.
- APIA submitted that assumptions on the debt margin should take into account recent instability in the market for corporate bonds that has reduced the predictive power of estimates of debt margins derived from historical data.
- APIA submitted that the Allen Consulting Group's recommended value for the market risk premium lies at the lower bound of a reasonable range of values, rather than at the upper bound as claimed.
- APIA submitted that, as many of the CAPM and WACC parameters rely on capital market data for "comparator" firms, care should be exercised in selecting comparator firms taking into account the limited number of true

comparator firms in the Australian economy and the appropriateness of using international firms as comparators.

- APIA submitted that there are significant differences of view on appropriate beta values to apply in a regulatory determination and the Authority should consider a broader range of evidence than that provided by the Allen Consulting Group.

18. WestNet Rail (the operator of the freight network) presented a submission prepared on its behalf by Synergies Economic Consulting (**"Synergies"**). Synergies made submissions on particular elements of the WACC calculation for the freight network, as follows.

- A bias in implied yields of nominal government bonds as an indicator of the nominal risk free rate should be taken into account in determining a value of the nominal risk free rate, with the resultant assumed value being greater than the implied yield on nominal government bonds.
- A lower rate of inflation should be assumed than applied by the Allen Consulting Group.
- A lower value financial gearing (debt to assets ratio) should be assumed than the value recommended by the Allen Consulting Group (30 per cent rather than 35 per cent applied by the Allen Consulting Group).
- A substantially higher asset beta should be assumed than applied by the Allen Consulting Group (0.8 rather than 0.6 applied by the Allen Consulting Group).
- In deriving a value for the market risk premium, sole reliance should be placed on historical evidence of equity premia, which indicates that there is "only one appropriate [market risk premium] and it has value of 6.76" and there is no basis for the Allen Consulting Group's assertion that a market risk premium of 6 per cent is at the upper bound of the range of reasonable estimates.
- In deriving a value for the debt margin, sole reliance should be placed on reported yields from the Bloomberg financial data service, with the margin calculated from Bloomberg data over the 20 trading days prior to the Authority's determination.
- There should be no value assigned to dividend imputation (franking credits).
- An appropriate cost of raising equity funds is 5.6 per cent of equity funds raised.

2.1.4 Draft Determination

19. The Authority published a Draft Determination on 4 April 2008. The Draft Determination of the Authority was that the WACC values should continue to be determined on a real pre-tax basis, with the WACC values to be applied in determining floor and ceiling prices in the 2008/09 year being:

- 9.30 per cent for the freight network; and.
- 7.17 per cent for the urban network.

20. These WACC values were calculated on the basis of a nominal risk free rate determined as at 29 February 2008 and estimates of debt margins determined as at December 2007. The Authority indicated in its draft determination that it would update these values prior to making its final determination, with consequent revisions to the WACC values.

21. The full set of parameter values applied by the Authority in its draft determination on WACC values is shown in Table 3.

Table 3: WACC values for the 2008 WACC Draft Determination

CAPM or WACC parameter	Freight network 2008 value	Urban network 2008 value
Nominal risk free rate of return (%)	6.30	6.30
Inflation rate (%)	2.5	2.5
Real risk free rate of return (%)	3.71	3.71
Debt proportion (%)	35	35
Equity proportion (%)	65	65
Market risk premium (%)	6.0	6.0
Asset beta	0.60	0.30
Equity beta	0.92	0.46
Debt margin (%)	2.10	1.90
Debt issuance costs (%)	0.125	0.125
Taxation rate (%)	30	30
Franking credit value (gamma)	0.5	0.5
Nominal pre-tax cost of debt (%)	8.53	8.33
Nominal post-tax cost of equity (%)	11.84	9.07
Real post-tax cost of equity (%)	9.11	6.41
Nominal pre-tax cost of equity (%)	13.93	10.67
Real pre-tax cost of equity (%)	11.15	7.97
Nominal pre-tax ("Officer") WACC (%)	12.04	9.85
Real pre-tax ("Officer") WACC (%)	**9.30**	**7.17**
Nominal post-tax ("vanilla") WACC (%)	10.68	8.81
Real post-tax ("vanilla") WACC (%)	7.98	6.15

2.1.5 Submissions on the Draft Determination

22. The Authority has received submissions on the draft determination from four parties. The content of each of these submissions is summarised as follows.

23. The Department of Industry and Resources indicates general support for the Authority's determination on the WACC for the freight network, although indicating concern over a number of matters, and submitting that the Authority should give further consideration to:

- the debt margin and cost of debt, in light of current conditions in capital markets;

- the value of the asset and equity betas;
- the value of the market risk premium.

24. The Australian Pipeline Industry Association ("**APIA**") reiterates its earlier submission that the Authority should give attention to submissions made to the Victorian Essential Services Commission ("**ESC**") in relation to proposed revisions to access arrangements for the Victorian gas distribution networks. In particular, APIA submits that the Authority should give further attention to the ESC submissions and expert reports dealing with beta values and the valuation of taxation imputation credits and to its position on the debt margin and market risk premium.

25. Synergies Economic Consulting (**"Synergies"**), on behalf of WestNet Rail, submits that the Authority should give further consideration to particular parameters of the WACC calculation including beta values, an allowance for equity-raising costs and determination of the debt margin.

26. Babcock and Brown Infrastructure ("**BBI**", the majority owner of WestNet Rail) submits that the Authority should give further consideration to the particular form of the CAPM used to estimate the cost of equity and the prospect that this form of the CAPM will result in systematic underestimation of the cost of equity for a business such as the freight network; the beta values for the freight network; and the value of allowances for debt and equity raising costs.

27. These submissions are addressed in more detail in the following sections of this determination.

2.2 General Method and Financial Model

2.2.1 Background and the Allen Consulting Group's October 2007 Recommendations

28. There are three matters of general method in estimating a WACC:

- the choice of method and financial model applied in estimation of costs of equity and debt;
- the treatment of inflation; and
- the treatment of taxation.

29. On the choice of financial model, the Authority has in previous WACC determinations under the Code applied the CAPM in estimating the cost of equity and has determined the cost of debt by adding a debt-risk premium (or "debt margin") to a risk free cost of capital to estimate a cost of debt. The Allen Consulting Group recommended that the Authority continue to apply this method, for reason that it is uniformly applied by Australian economic regulators and is broadly accepted by regulated businesses.

30. On the treatment of inflation, the Authority has in previous WACC determinations under the Code specified WACC values as real values, consistent with determining floor and ceiling prices in real terms and subsequently indexing these prices for actual inflation. This treatment of inflation is broadly consistent with the practice of the Authority in determinations on regulated prices for other infrastructure services and with the practice of other Australian economic regulators. This treatment of

inflation also simplifies financial modelling and is consistent with accepted regulatory practice in Australia that shelters regulated businesses from inflation risk in regulated prices.

31. On the treatment of taxation, the Authority has in previous WACC determinations under the Code determined and applied pre-tax rates of return using the "Officer WACC" model with an assumption of the effective taxation rate of the rail businesses being equal to the statutory rate of corporate income tax.

32. The Allen Consulting Group stated that a post-tax rate of return is generally to be preferred in economic regulation for reason that this approach would determine regulated revenues and prices with recognition of an estimated cost of taxation that is closer to the cost of taxation that would actually be incurred by an efficient provider of an infrastructure service.[3] However, the Allen Consulting Group also stated that there are reasons why a pre-tax rate of return may be preferred for the current WACC determination including:

- consistency with past practice of the Authority;
- relative simplicity of financial modelling; and
- avoiding complications in regulatory accounting that would arise under a post-tax approach as a result of the Western Australian rail access regime taking a peculiar approach to the valuation of assets (with periodic revaluation on a replacement cost basis) and accounting for capital expenditures and depreciation.

2.2.2 Submissions on the Allen Consulting Group's October 2007 Recommendations

33. Parties that made submissions to the Authority on the Allen Consulting Group's report of October 2007 either supported the general method previously applied by the Authority (CCI and APIA), or were silent on issues of general method (Alcoa and Synergies).

34. APIA made an additional submission relating to general method, submitting that the Authority, in making its determination:

- should give attention to a "reasonable range" of WACC values and exercise regulatory judgement to select a point in this range rather than determining a point estimate directly from theoretical models without consideration of the "reasonableness" of the outcome; and
- in exercising regulatory judgement, consider the uncertainty involved in determining the WACC and adverse consequences of underestimating the rate of return.

2.2.3 Draft Determination

35. In its draft determination, the Authority took the view that it is appropriate to maintain the same general method for estimation of the WACC. The Authority

[3] Allen Consulting Group, p. 10.

accordingly estimated WACC values using the Officer form of the CAPM and has specified the WACC values in real, pre-tax terms.

36. In addressing APIA's submission that regulatory judgement should be exercised in considering a range of WACC values, the Authority indicated that, in some past determinations on regulated rates of return for energy infrastructure, the Authority has give consideration to determining a "reasonable range" of rates of return. This has been undertaken in the context of assessing proposals by regulated businesses for the regulated rate of return where the role of the Authority is to determine whether a proposal meets the requirements of the relevant regulatory code rather than for the Authority itself determining a rate of return. This is the general approach taken by the Authority in making determinations on proposed access arrangements under the *Electricity Networks Access Code 2004* and the *National Third Party Access Code for Natural Gas Pipeline Systems*. However, in the WACC determination for the rail networks, the role of the Authority is to determine the rate of return rather than assess proposals from the network operators. As such, there is no particular need for the Authority to consider a reasonable range as opposed to exercising judgement to make point estimates of WACC values from consideration of the values of individual parameters of the CAPM and the WACC formula.

37. Taking these matters into account, the Authority took the view that the requirements of the Code are best met by making points estimates of the WACC values for the rail networks.

2.2.4 Submissions on the Draft Determination

38. The Department of Industry and Resources made a submission indicating that it supports the general approach and financial model adopted by the Authority in its draft determination.

2.2.5 Final Determination

39. The Authority maintains the view that it is appropriate to use the same general method for estimation of the WACC as applied in the 2003 determination. Accordingly, the Authority has estimated WACC values using the Officer form of the CAPM and has specified the WACC values in real, pre-tax terms.

2.3 The Risk Free Rate of Return and Inflation

2.3.1 Background and the Allen Consulting Group's October 2007 Recommendations

40. Australian regulators have typically derived values of real and nominal risk free rates from capital-market observations of implied yields on long-term inflation-indexed (real) and non-indexed (nominal) Commonwealth Government securities (government bonds). A forecast of inflation has been derived from the difference in implied yields of the two types of bonds. The Rail Access Regulator and the Authority have adopted this approach in WACC determinations to date, and both the Authority and other Australian regulators have, until very recently, adopted this approach in determinations of rates of return for other regulated infrastructure.

41. The Allen Consulting Group examined problems that have recently emerged with this approach and a change in practice of other Australian regulators, indicating that the problem with the conventional method for determining risk free rates of return and a forecast of inflation has arisen from claims by (or on behalf of) regulated businesses that features of the market for government bonds – in particular an excess demand for government bonds – result in the implied returns being "downward biased" and under-representing the value of the risk free rate that should be applied in estimation of WACC values.

42. Acting on advice from the Commonwealth Treasury, the Reserve Bank of Australia and consultants, the Australian Energy Regulator ("AER") and the Essential Services Commission of Victoria ("ESC") have both accepted the existence of bias in observations of implied yields on real government bonds, but rejected claims of the existence of bias in observations of implied yields on nominal government bonds. The Allen Consulting Group recognised that there have been claims of bias in implied yields on nominal government bonds, but it was beyond the scope of the Allen Consulting Group's brief to examine these claims other than to review work undertaken for other price determinations.[4]

43. Both the AER and ESC have adopted an approach for estimating the real risk free rate and deriving a forecast of inflation of:

- estimating a nominal risk free rate from observations of implied yields on nominal government bonds (consistent with past practice);
- making a forecast of the rate of inflation based on a range of published short-term and long-term inflation forecasts; and
- estimating a value of the real risk free rate by de-escalation of the estimated nominal risk free rate by the forecast rate of inflation.[5]

44. The Allen Consulting Group recommended that the Authority adopt this approach in its WACC Determination. The Allen Consulting Group did not make a recommendation on the forecast of the inflation rate that should be applied, but rather indicated that the AER and ESC have previously applied a rate of three per cent and calculated the indicative WACC values on this basis.

2.3.2 Submissions on the Allen Consulting Group's October 2007 Recommendations

45. Parties that made submissions to the Authority either supported the recommendations of the Allen Consulting Group's report of October 2007 in the approach to estimating the real risk free rate and deriving a forecast of inflation (APIA and Synergies) or were silent on this matter (Alcoa and CCI).

46. Notwithstanding general support for the approach recommended by the Allen Consulting Group, APIA and Synergies submitted that the Authority should also recognise bias in implied yields on nominal government bonds. Both of these

[4] Synergies incorrectly asserts that the Allen Consulting Group identifies a bias for nominal bonds to the extent of 42 to 44 basis points; p. 8 citing Allen Consulting Group p. 12)

[5] Australian Energy Regulator, January 2008, Final Decision: SP AusNet Transmission Determination 2008-09 to 2013-14, p 105. Essential Services Commission, 7 March 2008, Gas Access Arrangement Review 2008–2012 Final Decision – Public Version, p 460.

parties referred to submissions and supporting studies from regulated businesses in relation to other regulatory price determinations that have claimed a bias also exists in deriving an estimate of a nominal risk free rate from observations on implied yields on nominal government bonds. Synergies presented further analysis of its own that examines differences (spreads) in implied yields between government bonds and high-rated (AA and A) corporate bonds. The claimed bias is in the order of 40 to 55 basis points.

47. Synergies submitted that the Authority should adopt a forecast inflation rate of 2.5 per cent rather than 3.0 per cent, indicating that the value of 2.5 per cent is substantiated by:

- inflation expectations of the Commonwealth Treasury as indicated in the *Mid Year Economic and Fiscal Outlook 2007-08* and *Pre-Election Economic and Fiscal Outlook 2007*, indicating an expected easing of inflation pressures in the "medium term" beyond 2008 and a forecast inflation rate in 2009-10 and 2010-11 of 2.5 per cent;
- the Reserve Bank maintaining a target range for the inflation rate of two to three per cent, and published expectations in its *Statement on Monetary Policy 2007* of easing inflation pressures;
- published expectations of the Commonwealth Bank (in *Economic Perspective*) and ANZ Bank (in *ANZ Australian Economics Weekly*) of a decrease in the inflation rate to 2.6 per cent in 2008-09; and
- a long-term historical average rate of inflation of just over 2.6 per cent.

48. APIA submitted that the Authority should adopt a forecast inflation rate of 2.5 to 2.6 per cent, citing expert statements by NERA and Competition Economics Consulting Group that have been included as part of submissions made to the ESC in relation to the ESC's Draft Decision on proposed revisions to the access arrangements for the Victorian gas distribution networks.[6] APIA claimed that these statements indicate:

- that in applying a forecast rate of inflation of 3.0 percent, the ESC gave undue weight to short term forecasts of inflation and to the upper bound of the Reserve Bank's target range for inflation; and
- that medium to long term forecasts of inflation and the views of the Reserve Bank and Commonwealth Treasury support a forecast inflate rate of 2.5 to 2.6 per cent.

2.3.3 Draft Determination

49. In its draft determination, the Authority took the view, consistent with the determinations of the AER and ESC, that:

- there is sound evidence for bias in estimates of real risk free rates derived from implied returns on inflation-indexed government bonds; but

[6] NERA Economic Consulting, 29 October 2007, ESC Draft Decision: Inflation Expectations; Statutory Declaration of Thomas Nicholas Hird of Competition Economics Consulting Group, 26 October 2007.

- there has not been a sustainable case put to Australian regulators for the existence of bias in estimates of nominal risk free rates derived from implied yields on nominal government bonds.

50. On this basis, the Authority determined a real risk free rate by:

- determining a nominal risk free rate as the average of implied returns on nominal government bonds over a 20 day trading period;
- determining a forecast value of inflation; and
- calculating the real risk free rate by use of the Fisher equation.

51. The Authority observed that, in recent regulatory determinations where the rate of inflation is determined by means other than the difference between yields on nominal and real government bonds, both the AER and ESC have applied values of forecast inflation set at 2.6 or 2.7 per cent. The AER applied a ten-year inflation forecast of 2.59 per cent, calculated as an average over ten years of short term (two year) inflation forecasts of three per cent and a long term forecast of 2.5 per cent.[7] The ESC applied a ten year inflation forecast of 2.7 percent, based on a range of considerations including market practice in making assumptions on long-term inflation, levels of historical inflation, and the Reserve Bank's target range for the rate of inflation.[8]

52. Taking account of the submissions received from interested parties and the analyses and conclusions of the AER and ESC, the Authority took the view that the best estimate of the forecast rate of inflation is 2.5 per cent. Implied yields on nominal government bonds over the 20 trading days to 29 February 2008 indicated a nominal risk free rate of 6.30 per cent. Together with the assumed inflation rate of 2.5 per cent, this nominal risk free rate implied a real risk free rate of 3.71 per cent.

2.3.4 Submissions on the Draft Determination

53. The methods applied by the Authority to determine the risk free rates of return and a forecast of inflation was addressed only in the submission of APIA

54. APIA indicates support for the methods applied by the Authority and reiterates its earlier submission and support for a forecast inflation rate of close to 2.5 per cent.

2.3.5 Final Determination

55. The Authority has given further consideration to the forecast of inflation applied in determination of the real risk free rate.

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[7] Australian Energy Regulator, January 2008, Final Decision: SP AusNet Transmission Determination 2008-09 to 2013-14, pp 105, 106.

[8] Essential Services Commission, 7 March 2008, Gas Access Arrangement Review 2008–2012 Final Decision – Public Version. The ESC has subsequently issued its further final decision approving access arrangements that incorporate rates of return determined with an assumed inflation rate of 2.6 per cent (Essential Services Commission, 19 May 2008, Review of Gas Access Arrangements 2008-2012, Further Final Decision and Approval of Commission's Amended Revisions to Access Arrangement Envestra (Victoria), p 26).

56. Medium to long-term projections of inflation made in the first half of 2008 have consistently incorporated relatively high rates of inflation for the next three to four years. These projections include:

- a statement in February 2008 by the Reserve Bank of Australia indicating expectations of inflation of 3.5 per cent to the end of 2008,[9] revised upwards from earlier stated expectations of inflation of "around 3 per cent" (August 2007[10]) and "exceed[ing] 3 per cent" (November 2007[11]);
- a statement by the Reserve Bank of medium term projections of inflation of "fall[ing] gradually in 2009 and beyond, to around 3 per cent at the end of the forecast period in mid 2010" and that the "risk of inflation remaining uncomfortably high for some time is considerable";[12] and
- a Western Australian Treasury forecast of inflation in Western Australia of 3.25 per cent in 2008/09 and 3.0 per cent in 2009/10, and a long-term projection of inflation of 2.75 per cent.[13]

57. Taking these forecasts and projections into account, the Authority considers that maintaining an inflation value of 2.5 per cent in the WACC calculation is not supported by the evidence. The Authority instead considers that available evidence is consistent with a long-term average rate of inflation of 2.75 per cent.

58. The Authority has maintained the methods for determining the risk free rates of return as applied for the Draft Determination, together with a forecast of inflation of 2.75 per cent.

59. The Authority has updated the estimate of the nominal risk free rate from implied yields on nominal government bonds over the 20 trading days to 30 May 2008, indicating a nominal risk free rate of 6.37 per cent. Together with the assumed inflation rate of 2.75 per cent, this nominal risk free rate implies a real risk free rate of 3.52 per cent.

2.4 Financial Structure

2.4.1 Background and the Allen Consulting Group's October 2007 Recommendations

60. In the 2003 Determination, the Rail Access Regulator determined a benchmark financial structure of 55 per cent debt to assets for both the freight and urban networks. The value was based on the mid point of a range of assumptions of financial structures in other Australian regulatory decisions for rail access.

[9] Reserve Bank of Australia, 2008, Statement on Monetary Policy, February, p. 55.

[10] Reserve Bank of Australia, 2007, Statement on Monetary Policy, August, p. 4.

[11] Reserve Bank of Australia, 2007, Statement on Monetary Policy, November, p. 4.

[12] Reserve Bank of Australia, 2008, Statement on Monetary Policy, February, pp. 4, 55.

[13] Government of Western Australia, 8 May 2008, 2008-09 Budget Economic and Fiscal Outlook, Budget Paper No. 3, p. 9.

61. The Allen Consulting Group considered capital market evidence for gearing assumptions, with this evidence comprising observed capital structures of a set of "comparable" listed businesses comprising:

- listed rail infrastructure businesses in the USA and Canada;
- listed transport infrastructure and services firms in Australia and New Zealand; and
- listed global toll-road operators.

62. With only a couple of exceptions, the financial structures of the comparable firms indicated gearing levels of 20 to 40 per cent. On the basis of this evidence, and with particular consideration of the observed gearing levels of rail infrastructure businesses, the Allen Consulting Group recommended an assumed financial structure of 35 per cent gearing. The Allen Consulting Group noted that this value is less than assumed in regulatory decisions by the ACCC, ESC and Queensland Competition Authority, which have assumed values in the range of 50 to 60 per cent, largely on the basis of regulatory precedent for energy networks.

2.4.2 Submissions on the Allen Consulting Group's October 2007 Recommendations

63. Submissions on assumed financial structures were made by CCI, APIA and Synergies.

- CCI submitted that the Authority should closely examine recommendations of the Allen Consulting Group on assumptions of financial gearing that differ from the assumptions previously adopted by the Authority, but did not submit that any different level of gearing should be preferred.
- APIA made no submission directly on the assumed financial structure, but submitted that care should be exercised in selecting comparator firms taking into account the limited number of true comparator firms in the Australian economy and the appropriateness of using international firms as comparators.
- Synergies expressed a number of concerns about the Allen Consulting Group's determination of an assumed financial gearing (debt to assets ratio), and submitted that a slightly lower gearing assumption should be applied (30 per cent rather than 35 per cent applied by the Allen Consulting Group).

64. Synergies submitted that the Allen Consulting Group used an inappropriate set of comparable businesses and the set of comparable firms should be limited solely to listed rail businesses, which are necessarily businesses in the United States and Canada. Examining a set of comparable rail businesses, Synergies indicated levels of financial gearing of 18 to 43 percent (average of 26 per cent), and a five-year average level of gearing for the set of firms of 35 per cent. Synergies further submitted that the freight rail network would appropriately be assumed to have a low level of gearing relative to the comparable firms due to:

- the relatively very small size of the WestNet Rail's freight network business relative to the comparable businesses;
- a lack of diversification in the major customer base of the freight network;
- a high systematic risk of the businesses that form the major customer base of the freight network;

- a generally low credit rating of the businesses that form the major customer base of the freight network; and
- greater growth opportunities of WestNet Rail than the comparable businesses.

2.4.3 Draft Determination

65. In its Draft Determination, the Authority took the view that that analysis of comparable firms submitted by Synergies broadly confirms the capital market evidence presented by the Allen Consulting Group.

66. The Authority further took the view in the Draft Determination that it did not accept that there was a reasonable basis for Synergies' submission that the freight network faces a higher level of risk than comparable businesses due to a higher systematic risk of the rail-users' businesses. The Authority indicated that it had previously rejected the notion expressed in Synergies' submission that the level of financial risk faced by the customers of a regulated business has any direct bearing on the financial risk of the regulated business itself, citing a lack of evidence for any such relationship.[14]

67. On the basis of the evidence presented by the Allen Consulting Group and taking into account the Synergies submission, the Authority took the view that an appropriate assumption for the financial structure of both the urban and freight networks is a financial gearing of 35 per cent debt to assets.

2.4.4 Submissions on the Draft Determination

68. No submissions made on the Authority's Draft Determination addressed the assumed financial structures for the urban and freight networks.

2.4.5 Final Determination

69. The Authority maintains its view that an appropriate assumption for the financial structure of both the urban and freight networks is a financial gearing of 35 per cent debt to assets.

2.5 Cost of Debt

2.5.1 Background and the Allen Consulting Group's October 2007 Recommendations

70. Regulators typically establish a value of the debt premium from capital market data on yields on corporate bonds consistent with benchmarks assumptions for the capital structure and credit rating of the regulated business or activity. In the 2003 WACC Determination, the Rail Access Regulator determined a benchmark assumption of an "A" credit rating for both the freight and urban networks, based on a "perception" of its advisors that the operators of the networks would be able to raise capital with this debt rating, and assumptions made by other regulators for rail

[14] Economic Regulation Authority, July 2004, Amended Draft Decision on the Proposed Access Arrangement for the Goldfields Gas Pipeline, paragraphs 283, 284.

businesses. The cost of debt was determined at 1.11 per cent above the risk free rate, with this debt margin estimated from predictions of fair-value yields on corporate bonds obtained from CBA Spectrum.

71. The Allen Consulting Group considered capital market evidence for credit ratings, with this evidence comprising observed credit ratings for the same set of comparable listed businesses indicated in the above section on financial structure. From limited data on credit ratings of comparable firms, and with consideration of precedent regulatory decisions establishing credit ratings of BBB+ for freight rail networks, the Allen Consulting Group recommended assuming credit ratings of BBB to BBB+ for the freight network and A for the urban network.

72. The Allen Consulting Group determined debt margins for the benchmark credit ratings using data from the Bloomberg and CBASpectrum financial data services, corrected for average differences between the fair-value yields indicated by these data sources and observations of yields on actual BBB+ and A rated corporate bonds. These corrections were made in view of concerns raised in several studies during 2007 of potential systematic bias in the predictions of fair value yields. The Allen Consulting Group recommended debt margins of 155 basis points for the freight network and 140 basis points for the urban network (at October 2007).

2.5.2 Submissions on the Allen Consulting Group's October 2007 Recommendations

73. Submissions on debt margins were made by APIA and Synergies.

- APIA submitted that assumptions on the debt margin should take into account recent instability in the market for corporate bonds that has reduced the predictive power of methodologies based on historical data.
- Synergies submitted that debt margins should be derived from predictions of fair-value yields from only the Bloomberg financial data service, with predictions from the CBASpectrum service ignored due to a downward bias in the predictions from this service, with the margin calculated from Bloomberg data over the 20 trading days prior to the Authority's determination. Synergies further submitted that, as at December 2007, a debt margin of 170 basis points is evident from the Bloomberg data.

2.5.3 Draft Determination

74. The Authority observed in the Draft Determination that, subsequent to the Allen Consulting Group's report, more recent studies of debt margins in connection with the ESC's assessment of proposed revisions to the access arrangements for the Victorian gas distribution networks indicate substantial changes to debt margins and identified issues of relevance for use of the Bloomberg and CBASpectrum financial data:[15]

- as of November and December 2007, Bloomberg was not publishing predictions of fair value yields on nine and ten year BBB+ rated corporate

[15] Essential Services Commission, 7 March 2008, Gas Access Arrangement Review 2008–2012 Final Decision – Public Version.

bonds in Australia due to a lack of the bonds in the market, limiting the reliance than can be placed on data from this service;

- contrary to findings early in 2007, there was no empirical justification in November and December 2007 for considering that CBASpectrum systematically under estimates yields; and
- data from both services indicated that debt margins had risen substantially in late 2007 in conjunction with the tightening of global credit markets, with debt margins for BBB+ rated bonds in the order of 200 basis points.

75. In the Draft Determination, the Authority applied debt margins of 210 basis points for the (assumed BBB+ rated) freight network and 190 basis points for the (assumed A rated) urban network. However, given the current state of global credit markets and potential effects on the cost of corporate debt, the Authority indicated that it would update the analysis of debt margins closer to the time of its final determination.

2.5.4 Submissions on the Draft Determination

2.5.4.1 Submissions

76. The determination of the cost of debt, or more specifically of the debt margin, is addressed in the submissions of APIA and Synergies.

77. APIA submits that the Authority should take into account in determination of the debt margin the increases in the cost of debt that have been evident subsequent to the "sub-prime" crisis evident in United States capital markets. APIA also submits that the Authority should make an allowance for previously observed bias in the fair value yield predictions of CBASpectrum, either by adopting an allowance of 25.6 basis points derived from an examination of this bias in early 2007, or by undertaking a rigorous analysis of the extent of bias at the current time.

78. Synergies indicates support for the Authority's determination of the debt margin, in particular:

- determining the debt margin from capital market observations over the same period of time as the risk free rate; and
- determining the debt margin at a point close in time to the date of the determination of the WACC.

2.5.4.2 Comment on Submissions

79. As indicated in the Draft Determination, and addressing the submissions of APIA and Synergies, the Authority has updated values of the debt margin. The debt margins have been determined as the average over the 20 trading days to 30 May 2008 of fair value yields published by CBASpectrum for BBB+ rated (freight network) and A rated (urban network) corporate bonds.

80. In the course of updating the values of debt margin, the Authority compared the CBASpectrum predictions of fair value yields with actual observations of implied yields for long-dated corporate bonds. The comparison yields no evidence of systematic underestimation of yields by CBASpectrum.

2.5.5 Final Determination

81. The Authority has obtained updated estimates of debt margins based on CBASpectrum fair value yields for BBB+ rated and A rated corporate bonds, for the freight and urban networks, respectively, averaged over the 20 trading days to 30 May 2008. The debt margins thus estimated are 302 basis points for the freight network and 251 basis points for the urban network.

2.6 Market Risk Premium

2.6.1 Background and the Allen Consulting Group's October 2007 Recommendations

82. The market risk (or equity) premium is the difference between the expected return on a well-diversified portfolio of stocks and the risk free rate. It represents the reward that investors require to accept the risk associated with the diversified portfolio of equity investments. For the purpose of a regulatory determination of the cost of capital it is the *expected* market risk premium that is to be estimated.

83. In the 2003 Determination, the Rail Access Regulator adopted a market risk premium of six per cent taking into account capital market observations of historical returns to equity and precedent decisions of Australian regulators. The value of six per cent is consistent with almost all regulatory determinations on infrastructure pricing in Australia.

84. The Allen Consulting Group recommended continued use of a market risk premium of six per cent, with this recommendation based on consideration of capital market evidence that this value is at the upper end of a reasonable range. This evidence included:

- capital market observations of historical returns to equity;
- studies on imputed expectations of the market risk premium;
- surveys of opinions and assumptions of capital-market participants; and
- qualitative consideration of factors that may cause the expected market risk premium to change over time and to vary from historically observed returns.

2.6.2 Submissions on the Allen Consulting Group's October 2007 Recommendations

85. Submissions on the market risk premium were made by APIA and Synergies.

- APIA submitted that the Allen Consulting Group's recommended value for the market risk premium lies at the lower bound of a reasonable range of values, rather than at the upper bound as claimed.
- Synergies submitted that, in deriving a value for the market risk premium, sole reliance should be placed on historical evidence of equity premia, which indicates that there is "only one appropriate [market risk premium] and it has value of 6.76" and there is no basis for the Allen Consulting Group's assertion that a market risk premium of 6 per cent is at the upper bound of the range of reasonable estimates.

2.6.3 Draft Determination

86. In the Draft Determination, the Authority observed that the submissions of APIA and Synergies are consistent with a long-standing difference of view on the market risk premium between regulators and regulated businesses.

- Regulators (including the Authority) have previously taken views (consistent with the recommendations of the Allen Consulting Group) that the market risk premium should be determined on the basis of both observed historical equity premia achieved in the market and a range of information sources on current and future expectations of equity premia (and adopting values of 6 per cent).
- Regulated businesses have previously taken the view that the market risk premium should be determined solely on the basis of observed historical equity premia, which typically indicate values of between 5 and 8 per cent (and favouring values greater than 6 per cent).

87. The Authority took the view, consistent with regulatory precedent, that the market risk premium should be determined taking into account a range of sources of information including evidence on historically realised equity premia and current practice and expectations of market participants. On this basis, the Authority considered that a market risk premium of six per cent was appropriate.

2.6.4 Submissions on the Draft Determination

2.6.4.1 Submissions

88. In it submission on the Draft Decision, APIA reiterates its earlier submission that a value of 6 per cent is at the lower end of the range of historically observed equity returns over risk free rates.

89. The Department of Industry and Resources queries why regulators have maintained a value of 6 per cent for the market risk premium for some time and queries why the market risk premium should not have changed with changing economic conditions and increased market volatility.

2.6.4.2 Comment on Submissions

The market risk premium is the expected return on a well diversified portfolio of stocks over and above the risk free rate. A value of the market risk premium cannot be determined directly, but rather a considered assumption must be made of the value. As indicated in the Draft Determination, the Authority considers that the market risk premium should be determined taking into account a range of sources of information including evidence on historically realised equity premia, and current practice and expectations of market participants. There has been no marked change in this evidence since the late 1990s with historically realised equity premia suggesting values of between 5 and 8 per cent and the practices of market practitioners pointing to values equal to or less than 6 per cent.

2.6.5 Final Determination

90. The Authority maintains the view that the value of the market risk premium should be determined taking into account a range of evidence (including both historically observed equity premia and evidence for the current assumptions of market practitioners) and on this basis a value of 6 per cent for the market risk premium is considered appropriate.

2.7 Systematic Risk (Beta)

2.7.1 Background and Allen Consulting Group's October 2007 Recommendations

91. The systematic risk (beta) of a firm is the measure of how the changes in the returns to the firm's stock are related to the changes in returns to the market as a whole. It reflects the business's exposure to non-diversifiable risk, which is that portion of the variance in the return on an asset that arises from market-wide economic factors that affect returns on all assets, and which cannot be avoided by holding the assets as part of a diversified portfolio of assets.

92. In the 2003 WACC determination, the Rail Access Regulator applied an equity beta of 1.0 for the freight network and an equity beta of 0.66 for the urban network, with an assumed financial gearing of 55 per cent debt to assets. This equated to asset beta values of 0.45 for the freight network and 0.3 for the urban network. These values were derived from advice provided by NECG to the Office of the Rail Access Regulator at the time of the 2003 WACC determination (asset beta of 0.45 for the freight network and 0.30 for the urban network), based in turn on capital market evidence on observed beta values for comparable businesses and qualitative considerations of the systematic risk of the customers of the rail services.

93. The Allen Consulting Group recommended asset beta values of 0.60 for the freight network and 0.30 for the urban network, based on capital market evidence of beta values for a set of comparable Australian and overseas businesses. These asset beta values equate to equity beta values of 0.92 and 0.38 at a financial gearing of 35 per cent debt to assets.[16]

2.7.2 Submissions on the Allen Consulting Group's October 2007 Recommendations

94. Submissions on the systematic risk of the rail networks were made by CCI, Alcoa, APIA and Synergies.

95. CCI submitted that the Authority should reject the recommendations of the Allen Consulting Group on assumptions of the systematic risk (beta) in favour of maintaining assumptions previously adopted by the Authority for reasons that:

[16] Any direct comparison of the Allen Consulting Group's recommended beta values with the values adopted for the 2003 WACC determination should only be on the basis of the asset beta values. Direct comparison of equity beta values is not possible due to different assumptions of financial gearing.

- there has been no change to the underlying risk profile of the rail business in Western Australia;
- the Allen Consulting Group was unable to identify businesses exactly comparable with the Western Australian rail operations and it is unreasonable to justify variations to the systematic risk values based upon comparisons with non-equivalent businesses.

96. Alcoa submitted that the Authority should reject the recommendations of the Allen Consulting Group for an increase in the asset beta value for the freight network for reason that the level of systematic risk faced by the freight network should be decreasing as the business growth in the freight network is occurring in the lowest-risk part of the business, being the bulk haulage business. Alcoa contended that the asset beta for the freight network should be reduced from the value adopted in the 2003 WACC Determination and should be established as a weighted average of beta values for the various components of the business of the freight network, being an asset beta value of 0.44 based on:

- an asset beta value of 0.43 for the bulk mineral freight component, being towards the low end of a range of values contemplated by the Queensland Competition Authority and the ESC and reflecting a more diversified market of bulk mineral freight in Western Australia;
- an asset beta of 0.45 for the bulk grain freight component, as contemplated by the Office of the Rail Access Regulator's advisors in the 2003 WACC Determination; and
- an asset beta of 0.5 for the intermodal freight component, consistent with the ESC's observation of an asset beta for an above-rail freight company;
- an asset beta of 0.31 for the passenger component on the freight network, derived from an ESC determination of an asset beta of 0.37 for a mixed freight and passenger rail service and the Allen Consulting Groups recommended value of the urban network of 0.25; and
- weights in proportion to revenue from each business component of 60 percent bulk mineral freight, 17 per cent bulk grain freight, 19 per cent intermodal freight and 4 per cent passenger services.

97. APIA submitted that there are significant differences of view on appropriate beta values to apply in a regulatory determination and the Authority should consider a broader range of evidence than that provided by the Allen Consulting Group.

98. Synergies expressed a number of concerns about the Allen Consulting Group's determination of an asset beta value and submitted that a substantially higher asset beta should be applied (0.8 rather than 0.6 applied by the Allen Consulting Group),

99. Synergies submitted that:

- consideration of beta values for comparable businesses should be restricted to a set of seven Class 1 United States rail businesses considered to face similar risks to the freight network in Western Australia and with statistically significant estimates of beta values, indicating an average asset beta of 0.76;
- the systematic risk of the freight network "must" be similar to the systematic risk of the major customers of the network (which range between 0.9 and 2.9) and the beta value should be considered to be greater than the average for comparable businesses;

- the freight network has a high volume risk correlated with the state of the world and Australian economies, indicating a higher beta value;
- the freight rail network has a small group of customers with high systematic risk and long term contracts, meaning that the freight network is exposed to the high systematic risk of these customers for a long period, and may have limited opportunity to pass through cost increases to customers;
- the freight network is not sheltered from systematic risk by the regulatory regime (as it would be if the regulatory regime took the form of a revenue cap);
- the freight network has large growth options, indicating a higher beta value than the average for comparable United States businesses; and
- the costs of the freight network are largely fixed costs which causes the profitability of the network to be sensitive to changes in freight volumes and revenues, suggesting a higher beta value.

2.7.3 Draft Determination

100. In the Draft Determination, the Authority addressed the matters raised in submissions as follows.

101. First, the Authority indicated that the recommendation of the Allen Consulting Group for higher asset beta values than applied by the Office of the Rail Access Regulator in the 2003 WACC Determination does not necessarily indicate a change in the systematic risk facing the rail networks. Rather, the recommendations stem from an assessment of different capital market data. The relevant matter for consideration of the Authority is what a current assessment of capital market data reveals for asset beta values. Any empirical estimates of beta values are inherently imprecise. The results and recommendations of the 2003 and 2007 advice are considered to be similar in the asset beta recommended for the urban network (0.30 in 2003 compared with 0.25 in 2007), but there is a more significant difference for the freight network (0.45 in 2003 compared with 0.60 in 2007).

102. Secondly, the submission from Alcoa raised the issue of the significance of bulk minerals and grain fright in the freight network business. Alcoa submitted that this part of the business was likely to have a low systematic risk and is reason for assuming a lower beta value, which accords with the conclusions of the Allen Consulting Group. Alcoa submitted that this adjustment should be made on the basis of taking low values in ranges of beta values contemplated by other regulators. However, this approach has the problem of there being no direct consideration of recent capital-market evidence and is, in effect, a subjective adjustment of beta values to take into account the characteristics of the business. The Authority indicated that such subjective considerations may be appropriate in assessments of beta values.

103. Thirdly, the Authority considered that the analysis presented by Synergies, as outlined below.

- Consideration was given only to a set of non-Australian comparable businesses. International comparators have the problem that beta values are calculated for a stock market that is of a different composition to the Australian stock market and asset betas are not directly translatable for application to an Australian business in applying the CAPM to the Australian economy. Beta

values for international comparators should generally be seen as a secondary source of information.

- Synergies selected comparator businesses on the basis of a high correlation coefficient and statistical significance of beta values. This may not be a valid basis for selection of comparator businesses, as statistical analysis of beta values is characterised by low correlation coefficients and absence of statistical significance due to the limited extent to which systematic risk explains variations in stock returns.
- It is not clear that the systematic risk of an infrastructure provider should resemble the systematic risk of its customers. There is no necessary connection between the profit risk of the customer firms and the volume of use of the infrastructure service or the payments for the infrastructure service under usage contracts. This argument has previously been rejected by the Authority on the basis of a lack of evidence for any relationship.[17]
- The existence of growth options for the freight network is not a reason for taking a higher value of the asset beta than evident from comparable businesses. The asset beta should reflect the regulated asset (and risks to cash flows of the asset) as the asset exists at the present time.

104. The Authority determined asset beta values for the freight and rail networks given the limited capital market evidence from studies of the 2003 advisor to the Office of the Rail Access Regulator and the Allen Consulting Group.

- For the freight network, the Authority considered that current capital market evidence pointed to an asset beta value range from 0.65 to 0.75. The Authority accepted that this range could be adjusted downwards by 0.1, to a range of 0.55 to 0.65, to reflect a suspected low systematic risk of the freight network's bulk minerals and grain business and the significance of this business in the total business of the freight network.
- For the urban network, current market data points to an asset beta value of 0.25 to 0.30. Given the imprecision of capital market evidence on beta values, the Authority considered that the market data would support maintaining the value of 0.30 as applied in the 2003 determination.

105. The Authority also observed that the asset beta values recommended by the Allen Consulting Group are broadly consistent with asset beta values determined by other regulators for rail services (asset beta values of 0.5 to 0.6 for predominantly freight rail services and 0.37 for a mixed freight and passenger rail service).

106. In the Draft Determination, the Authority took the view that the appropriate beta values are 0.60 for the freight network (corresponding to an equity beta of 0.92 at a financial gearing of 35 per cent debt to assets) and an asset beta of 0.30 for the urban network (corresponding to an equity beta value of 0.46).

[17] Economic Regulation Authority, July 2004, Amended Draft Decision on the Proposed Access Arrangement for the Goldfields Gas Pipeline, paragraphs 283, 284.

2.7.4 Submissions on the Draft Determination

2.7.4.1 Submissions

107. Submissions on the beta values for the freight and urban networks were made by APIA, Synergies, BBI and the Department of Industry and Resources.

108. APIA submits that the Authority should consider a range of submissions (and supporting expert reports) that were made to the ESC as part of the ESC's review of proposed revisions to the access arrangements for the Victorian gas distribution networks. In particular APIA submits that the Authority should consider:

- the statistical reliability of the beta estimates derived by the Allen Consulting Group for comparator businesses, taking into account commentary by SFG and NERA on the reliability of statistical estimates;[18]
- the prospect for low beta values leading to values of the cost of equity that are close to or below estimates of the cost of debt, and accordingly too low, taking into account commentary of SFG;[19]
- studies of equity beta values of gas distribution businesses that derived beta values for gas distribution businesses by a different method (discounted cash flow analysis) and that considered beta values implied in United States regulatory decisions for gas distribution businesses;[20] and
- claims that the form of CAPM that has been conventionally applied by the Authority and other Australian regulators (the "Shape CAPM") systematically underestimates the cost of equity when equity beta values of less than one are applied.[21]

109. APIA suggests two options to deal with shortcomings of proxy beta estimates:

- apply a statistical adjustment known as the Blume adjustment to the Allen Consulting Group's historical analysis of proxy betas to partially correct for the unreliability of observed beta estimates; or
- use an alternative method proposed by CECG (other than the CAPM) for estimating the cost of equity, which is use of an empirically observed relationship between returns on equity and beta values.

110. BBI's submission addresses two issues relating to the determination of beta values for the freight network.

111. First, BBI submits that there has not been a proper basis established for the downward adjustment of the beta value for the freight network: the downward adjustment by the Authority (consistent with advice from the Allen Consulting Group) of asset beta values ranging from 0.65 to 0.75, evident from comparable

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[18] SFG Consulting, 25 October 2007, Equity beta estimates for Victorian gas distribution businesses, report prepared for Envestra, Multinet and SP Ausnet. NERA, 29 October 2007, Equity Beta for Gas Distribution APIA, ENA and ETNOF.

[19] SFG Consulting, 25 October 2007, Equity beta estimates for Victorian gas distribution businesses, report prepared for Envestra, Multinet and SP Ausnet.

[20] NERA, 29 October 2007, Equity Beta for Gas Distribution APIA, ENA and ETNOF.

[21] CECG, 26 October 2007, Estimating Relative Risk in the Market for Funds.

businesses, by 0.1 to derive an asset beta value of 0.60 as applied in the Draft Determination.

112. Secondly, BBI makes the same submission as APIA that the form of CAPM that has been conventionally applied by the Authority and other Australian regulators (the "Shape CAPM") systematically underestimates the cost of equity when equity beta values of less than one are applied and provides the same expert report by CECG in support of this submission.[22] BBI submits that the systematic bias of the Sharpe CAPM does not necessarily warrant using a different form of the CAPM in estimating the cost of equity, but the Authority should have regard to the systematic bias when considering whether to make adjustments from beta values observed for comparable businesses. BBI contends that the bias of the Sharpe CAPM is reason for the Authority to not make any downwards adjustment from the range of asset beta values of 0.65 to 0.75 evident from beta estimates for comparable businesses.

113. Synergies reiterates a range of matters addressed in its submission prior to the Draft Determination, paraphrased as follows.

114. First, Synergies submits that the Authority (and the Allen Consulting Group) took into account an inappropriate set of comparator businesses when considering empirical estimates of beta values. Synergies indicates that consideration of empirical estimates of only three of the Australian comparator businesses (Adstream Marine, Patrick Corporation and Toll Holdngs) and the United States and Canadian Rail Businesses examined by the Allen Consulting Group supports an asset beta value of 0.8 for the freight network.[23]

115. Secondly, Synergies defends the position taken in its earlier submission of limiting its consideration of beta estimates for comparable firms to those firms with statistically significant beta estimates. Neither submission indicates the comparable firms that were excluded from analysis on this basis and the effect on the beta estimate.

116. Thirdly, Synergies defends its earlier analysis of taking into account the high beta values of the customers of the freight network and the presence of "unusually significant" growth options for the freight network as reasons for considering the asset beta value for the freight network to be relatively high within the range of estimates of beta values for comparator firms. This is in contrast to position taken by the Authority in its Draft Determination for the asset beta of the freight network to be relatively low in comparison with beta values for comparable firms for reason of the predominance of bulk-commodity freight on the Western Australian network.

117. The Department of Industry and Resources submits that the Authority needs to be convinced that, in adopting an equity beta value of less than one, the freight network is less risky than the market and that any reduction in the beta values from 2003 is consistent with a reduction in the risk of the freight rail business.

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[22] CECG, 26 October 2007, Estimating Relative Risk in the Market for Funds.

[23] The Synergies submission does not indicate the method used to derive asset beta values from the observed equity beta values of each company. The cited observed equity beta values and gearing levels would correspond to an average asset beta of 0.85 calculated by the Brealey and Myers (1999) formula with a debt beta equal to zero.

2.7.4.2 Comments on Submissions

118. The Authority has addressed the matters raised in submissions on the Draft Determination as follows.

Range of Evidence and Statistical Reliability

119. In submissions on the Draft Decision, APIA and Synergies address a relative lack of empirical evidence on beta values for rail network businesses, particularly on comparable Australian businesses, and the low level of statistical reliability that can be placed on statistical analysis of beta values. APIA submits that the low level of statistical reliability should be addressed by either using a statistical technique known as the "Blume adjustment" or using an alternative method for determining the cost of equity, which is to determine the cost of equity from empirical observations of equity returns.

120. The Authority does not accept APIA's submission that analysis of beta values of comparable businesses should incorporate the Blume adjustment. The Blume adjustment applies a weighted average formula to the "raw" (observed) equity beta estimates that has the effect of drawing beta values up to unity if the raw beta is below unity, and down to unity if the raw beta is above unity. This adjustment is based on observations that, over time, businesses tend to diversify their activities and develop a risk profile closer to that of the average for the entire market. The Authority considers that this adjustment is inappropriate in the context of regulation as it is a particular activity that is regulated (in the current case, the rail activities of the freight and urban networks) rather than the larger business of the parent entity. By definition, the regulated activity does not undertake merger and diversification activities.

121. The Authority also does not accept APIA's submission that empirical observations of returns on equity should be used as an alternative method for establishing the cost of equity. There is no evidence to suggest that use of the CAPM by regulators is resulting in under-estimation of the cost of equity for regulated businesses, and use of an alternative method would be inconsistent with the widespread use of the CAPM by financial-market practitioners in Australia.

122. The Authority acknowledges that the imprecision of statistical analyses of beta values is an inherent difficulty in using the CAPM to determine the cost of equity. In answer to the submission of the Department of Industry and Resources, the Authority notes that the statistical imprecision may be a reason for variation in beta estimates from time to time, along with changes in relative risk. The statistical imprecision is a particular problem for rail infrastructure, for which there are no pure-play rail network businesses listed in Australia and a limited number of internationally comparable businesses. For this reason, the Authority accepts the approach taken by the Allen Consulting Group of examining beta values for a wide set of businesses including Australian and international transport and transport-infrastructure businesses and United States and Canadian railroad businesses.

123. In considering evidence on beta values provided by the Allen Consulting Group, the Authority notes that the Allen Consulting Group utilised the Brealey-Myers formula to de-lever observed equity beta values to asset beta values and re-lever asset

beta values to equity beta values at a constant level of gearing.[24] In doing so, the Allen Consulting Group applied a debt beta value of zero.[25] Different values of the debt beta in the Brealey-Myers formula would give different asset beta values and, accordingly, the asset beta values presented by the Allen Consulting Group and considered in this Final Determination are not directly comparable with values calculated under different assumptions. The assumption on the value of the debt beta does not, however, affect conclusions drawn from values of re-levered equity betas as presented by the Allen Consulting Group. As a general observation, the value of the debt beta assumed in de-levering and re-levering calculations is not important where the level of gearing of the comparator businesses and the benchmark gearing assumption for re-levered equity betas are approximately the same. The Authority has undertaken its own analysis to confirm this conclusion.

124. For the freight network, observations on equity-beta data for comparable businesses that has been presented by the Allen Consulting Group and Synergies are set out below.

- Data for Australian non-rail transport and transport-infrastructure businesses presented by the Allen Consulting Group indicates an average asset beta value of 0.73. This corresponds to an equity beta value of 1.12 at a financial gearing of 35 per cent debt to assets.
- Data for New Zealand non-rail transport and transport-infrastructure firms presented by the Allen Consulting Group indicates an average asset beta value of 0.66. This corresponds to an equity beta value of 1.02 at a financial gearing of 35 per cent debt to assets.
- Data for United States railroad businesses presented by the Allen Consulting Group indicates an average asset beta value of 0.69. This corresponds to an equity beta value of 1.05 at a financial gearing of 35 per cent debt to assets.
- Data for Canadian railroad businesses presented by the Allen Consulting Group indicates an average asset beat value of 0.73. This corresponds to an equity beta value of 1.11 at a financial gearing of 35 per cent debt to assets.
- Data for an almost identical set of United States and Canadian railroad businesses presented by Synergies (but with differences in observations presumed to be over a different time period that used by the Allen Consulting Group) indicates an average asset beta value of 0.85 (when the same method of calculation is used as applied by the Allen Consulting Group[26]), which corresponds to an equity beta value of 1.30 at a financial gearing of 35 per cent debt to assets.

125. In the Draft Determination, the Authority indicated that the observations of beta values for comparable businesses suggest an asset beta value for the freight rail network in the range of 0.65 to 0.75 (when calculated with the Brealey-Myers formula with a debt beta of zero), corresponding to a range of equity beta values at

[24] Brealey, R., Myers, S., Partington, G. and Robinson, D., 2001. Principles of Corporate Finance 1st Australian Edition: Roseville Australia, McGraw Hill, pp 250, 251.

[25] The debt-beta assumption of the Allen Consulting Group is different to that previously applied by the Authority for the purposes of most other regulatory determinations, where the Authority has used a debt beta value equal to the ratio of the debt margin and the market risk premium. In accordance with practice of its advisor of the time, the Office of the Rail Access Regulator did, however, use a debt beta of zero in re-levering calculations undertaken for the 2003 WACC Determination.

[26] Synergies has not stated the method used in its analysis for de-levering and re-levering beta values.

35 per cent gearing of 1.0 to 1.15. The Authority took that view that a downward adjustment from this range is appropriate to reflect a suspected low systematic risk of the freight network's bulk minerals and grain business and the significance of this business in the total business of the freight network. The Authority accordingly determined in the Draft Determination to apply an equity beta of 0.92 (at a financial gearing of 35 per cent debt to equity), derived from an asset beta value of 0.60.

126. Synergies reiterates its earlier submission that the Western Australian freight network should be considered to have a relatively high beta value relative to comparator businesses for reasons of high beta values of customers, high growth options for the freight network and low operating leverage of the freight business (a low ratio of variable costs to fixed costs).

127. As indicated in the Draft Determination, the Authority does not accept that that high beta values of customers of the freight network necessarily result in high beta values for the freight-network business itself. This is because revenues to the freight network are dependent on volumes of freight that, for the bulk commodity part of the businesses are determined by a much wider range of factors than the variability of returns to the customer businesses, and are also dependent on the nature of the contracts between the freight network business and the customers.

128. The Authority acknowledges that the low operating leverage of the freight-network business (a low proportion of operating costs as a proportion of total costs) may, all other things being equal, contribute to a relatively high sensitivity of profits to changes in levels of demand and a higher beta value for the freight-network business.

Bias in the Sharpe CAPM

129. APIA and BBI draw attention to a paper by CEG that was presented in submissions to the ESC as part of the ESC's assessment of proposed revisions to the access arrangements for the Victorian gas distribution networks. The central argument to this paper is that the form of CAPM applied by the Authority and other Australian regulators (the Sharpe CAPM[27]) systematically underestimates the cost of equity for the relevant business or stock. APIA submits that this provides reason to use an alternative method for estimating the cost of equity, while BBI submits that this provides reason to use a higher equity beta value in the Sharpe CAPM (to offset the bias) or at least is reason not to make a downward adjustment from beta values estimated for comparable businesses.

130. The ESC obtained advice on the CECG paper from the Allen Consulting Group concluding that the arguments and evidence presented in CECG's submissions do not conclusively establish that use of the Sharpe CAPM results in significant under-estimation of the cost of equity for regulated utility businesses such as the gas distribution businesses (which was the context in which the paper was prepared).[28] The Allen Consulting Group's stated reasons for this conclusion were as follows.

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[27] Sharpe, W.F. (1964), 'Capital asset prices: A theory of market equilibrium under conditions of risk,' *Journal of Finance*, Vol. 19, pp.425-442.

[28] Allen Consulting Group, 2 May 2008, Memorandum to Essential Services Commission of Victoria "Response to CECG paper titled 'Estimating relative risk in the market for funds' and associated submissions" (http://www.esc.vic.gov.au/public/Energy/Regulation+and+Compliance/Decisions+and+Determinations/Gas+access+arrangements+review+2008-12/Consultant+reports.htm)

Empirical studies that test the predictive power of the Sharpe CAPM have mixed results and may not support the view that the Sharpe CAPM would necessarily under-estimate the cost of equity for businesses with the particular characteristics of the gas distribution businesses. We are not satisfied that CECG has undertaken a full and balanced review of relevant empirical studies, and we suggest that studies not addressed by CECG would support contrary findings (i.e., that the Sharpe CAPM does not systematically under-estimate the cost of equity for businesses with low equity betas). Furthermore, we consider that a more detailed study of businesses with characteristics of the gas distribution businesses would be necessary to reach a definitive view on whether the Sharpe CAPM would systematically under-estimate costs of equity for businesses of this type.

The theoretical basis for considering that the Sharpe CAPM would under-estimate the cost of equity for businesses such as the distribution businesses has not been conclusively established. It is our view that CECG has not established that the theoretical basis for the underestimation of the cost of equity (a high level of "theta risk" or covariance of returns of a business with reductions in investment opportunities) is necessarily of significance for businesses with characteristics of the gas distribution businesses. There are reasons for considering that this may not be the case. Again, further analysis would be necessary to reach a definitive view on this issue.

131. The Authority also notes that the Sharpe CAPM is the method for estimating the cost of equity that is most widely used by finance practitioners in Australia, suggesting that the finance industry does not consider the claimed problems with the Sharpe CAPM to be of importance.

132. The Authority is therefore not satisfied that there is sufficient reason to take into account any systematic bias in using the Sharpe CAPM to estimate to cost of equity.

2.7.5 Final Determination

133. The Authority maintains the view that the Western Australian freight network is likely to have a low beta value relative to comparator businesses due to the predominance of bulk grain and minerals freight. On reconsideration, however, the Authority accepts that there is limited justification to adopt a beta value outside of the range derived from observations for comparator businesses. The Authority accordingly takes the view that the cost of equity for the freight network should be determined on the basis of an equity beta value of 1.0 at a gearing of 35 per cent debt to assets.

134. The Authority maintains the view expressed in the Draft Determination that the cost of equity for the urban network should be determined on the basis of an equity beta value of 0.46 at a gearing of 35 per cent debt to assets.

2.8 Taxation Imputation

2.8.1 Background and Allen Consulting Group's October 2007 Recommendations

135. A franking credit is received by Australian resident shareholders for corporate taxation paid at the company level when determining their personal income taxation liabilities under the system of dividend imputation.

136. The actual value of franking credits, represented in the WACC by the parameter 'gamma', depends on the proportion of the franking credits that are created by the firm that are distributed, and the value that the investor attaches to the credit, which depends on the investor's tax circumstances (that is, their marginal tax rate). As these will differ across investors, the value of franking credits may be between nil and full value (ie. a gamma value between zero and one)

137. In the 2003 Determination, the Rail Access Regulator applied a gamma value of 0.5 based on regulatory precedent, while recognising that arguments for establishing any particular value for gamma are inconclusive. This is consistent with decisions of other regulators.

138. The Allen Consulting Group recommended adoption of a gamma value towards the lower end of a range of 0.4 to 0.8 that was recently determined by the ESC as appropriate for gas distribution networks. The Allen Consulting Group indicated that maintaining the value of 0.5 as applied in the 2003 WACC Determination would be consistent with this recommendation.

2.8.2 Submissions on the Allen Consulting Group's October 2007 Recommendations

139. A submission on the value of taxation imputation was made only by Synergies. Synergies submitted that no value should be ascribed to franking credits, indicating that there is substantial disparity in results of studies that seek to determine the value of franking credits and the effect of changes in taxation law on this value, and results may variously be used to support different values of gamma between zero and one. Synergies further submitted results of its own analysis to indicate that franking credits are of no value to the marginal investor and hence no value should be ascribed to gamma in the Authority's WACC Determination.

2.8.3 Draft Determination

140. In the Draft Determination, the Authority observed that, subsequent to the Authority being provided with the report of the Allen Consulting Group, the ESC received submissions on the value that should be ascribed to franking credits (in relation to its review of access arrangements for gas distribution networks), with these submissions differing in either supporting a zero value of gamma (submissions made by distributors) or some positive value (submissions made on behalf of network users).

141. These submissions better defined some of the issues that would need to be resolved to reduce the debate on the appropriate value of gamma to apply in determination of regulated rates of return, which are:

- whether the value of gamma should be determined on the basis of an average value of franking credits to investors or a value to a notional marginal investor; and
- issues of consistency between empirical studies of the value of franking credits (dividend drop-off studies) and the form of the CAPM employed by Australian regulators.

142. These submissions indicated that Australian regulators are still faced with varying and conflicting theory and evidence on the value of franking credits and, as a consequence, the Authority is left with a need to make a determination on the value

of gamma to be applied in the WACC Determination with the major conceptual issues unresolved.

143. Taking account of the current state of the debate on the value of dividend imputation, the Authority took the view that it is appropriate to continue to apply a value of gamma at 0.5.

2.8.4 Submissions on the Draft Determination

2.8.4.1 9 Submissions

144. APIA submits that the best evidence on the value of imputation credits is for these credits not to be attributed value in determination of the WACC, i.e. a gamma value of zero. Drawing on an expert report submitted to the ESC during the ESC's assessment of proposed revisions to the access arrangements for the Victorian gas distribution networks and to the Essential Services Commission of South Australia,[29] APIA submits that the reasons for a gamma value of one are inconsistent with the form of CAPM applied by Australian regulators, and that correct analysis of the value of imputation credits points to values in the range of zero to 0.4, with a strong weighting towards zero.

2.8.4.2 Comments on Submissions

145. As indicated in the Draft Determination, the Authority acknowledges that the valuation of taxation imputation credits in determining the WACC is made complex by unresolved theoretical issues. The opposing theoretical propositions are as follows.

- The Australian capital market is segmented from global capital markets, in which case the value of franking credits distributed should, as a matter of theory, be assumed to be one.
- The Australian capital market is integrated with global capital markets, in which case the value of franking credits distributed should, as a matter of theory, be assumed to be zero.

146. In practice, it is not clear which of these two positions best represents the Australian capital market and empirical evidence is resorted to as a means of determining an appropriate value of imputation credits. In empirical studies, the two opposing arguments are that:

- when a gamma value is derived as part of the CAPM, it should reflect the average utilisation of credits (the value of imputation credits to investors on average), which tends to support (for infrastructure businesses) a high value of imputation credits with a gamma value greater than 0.5; and
- the appropriate value of imputation credits to the marginal investor, which needs to be derived from prices of derivatives or dividend drop off studies, which tend to support a low or zero value of imputation credits.

[29] SFG Consulting, 25 October 2007, The impact of franking credits on the cost of capital of Australian companies, report prepared for Envestra, Multinet and SP AusNet. SFG Consulting, 3 May 2006, Issues on the regulated rate of return for gas distribution assets, report prepared for Envestra

147. A recent further argument developed by SFG in the expert report cited by APIA is that theoretical consistency with the form of CAPM that is employed by Australian regulators requires the value of imputation credits distributed to be estimated subject to the constraint that the market value of $1 of cash dividends is $1 (which is equivalent to assuming that there are no tax benefits to capital gains over income). This imposition constraint means a difference in the estimated value of imputation credits distributed of about 50 to 60 per cent of face value (a gamma of about zero to 0.5 for infrastructure businesses) under an unconstrained estimate and approximately zero under a constrained estimate.

148. In addition, there is an interaction between the value of imputation credits and the value of the market risk premium that is adopted for determining the WACC. Application of a zero value of gamma may require a lower value of the market risk premium to be adopted.

2.8.5 Final Determination

149. The Authority maintains the view that until debate on the value of imputation credits are resolved, it is appropriate to apply a value of gamma of 0.5.

2.9 Debt and Equity Raising Costs

2.9.1 Background and the Allen Consulting Group's October 2007 Recommendations

150. In the 2003 Determination, the Rail Access Regulator provided for an addition to the debt margin of 12.5 basis points as an allowance for the costs of raising debt finance. No consideration was given to the costs of raising equity finance.

151. The Allen Consulting Group recommended that the Authority maintain an allowance of 12.5 basis points for debt raising costs on the basis that this value is likely to be close to (or a slight over-estimate) of these costs. This is consistent with regulatory precedent throughout Australia.

152. The Allen Consulting Group indicated that equity raising costs *may* be a legitimate cost to be recovered in regulated prices, but that this cost should be taken into account in the valuation of assets rather than in the regulated rate of return.

2.9.2 Submissions on the Allen Consulting Group's October 2007 Recommendations

153. In a submission made on the Allen Consulting Group's report, Synergies submitted that an appropriate cost of raising equity funds would be 5.6 per cent of equity raised, but did not submit that this should necessarily be taken into account in the WACC.

2.9.3 Draft Determination

154. In the Draft Determination, the Authority took the view that an allowance of 12.5 basis points in the cost of debt is an appropriate allowance for debt issuance costs.

155. Consistent with the recommendations of the Allen Consulting Group, the Authority took the view that an allowance for equity raising costs would appropriately be considered as a capitalised cost in the regulatory value of assets and not as a component of the WACC.

2.9.4 Submissions on the Draft Determination

2.9.4.1 Submissions

156. Allowances for debt issuance costs and equity raising costs are addressed in the submissions of BBI and Synergies.

157. BBI submits that the Authority, and regulators generally, have failed to recognise indirect costs of capital raising in allowances for debt and equity raising costs. In particular, BBI submits that regulators have failed to recognise the indirect costs that occur through under-pricing of debt and equity issues to avoid under-subscription.

158. BBI contends that the Authority should make greater allowance for debt issuance costs, submitting that the allowance should be 15.5 basis points rather than 12.5 basis points provided for by the Authority under the Draft Determination.

159. BBI further contends that equity raising costs should be allowed at an amount of 7.6 per cent of any equity raised.

160. In support of its submission, BBI has provided a report from Competition Economists Group (CEG).[30] CEG provides estimates of indirect costs by reference to several empirical studies of under-pricing costs in capital raisings.

161. Synergies provides a further analysis of equity raising costs contending that these costs amount to 5.6 per cent of any amount of equity capital raised.

2.9.4.2 Comments on Submissions

162. The Authority has considered the submissions made on debt and equity raising costs.

163. The Authority is not convinced that there is a case for including indirect costs of capital raising as an element of debt and equity raising costs for a regulated business, as submitted by BBI.

164. The claim of indirect costs in the form of under-pricing costs implies that an amount of funds raised by the firm in an equity or debt issue is ultimately worth less than that amount to the business. The Authority accepts that this may apply to business and capital raisings generally. However, recognition of indirect costs in the form of under-pricing costs is inconsistent with the benchmark assumption underlying the determination of regulated prices: that is, every increment of capital investment gives rise to earnings equal to the WACC and, hence, a dollar of capital investment is worth a dollar in the business. If the cost of under-pricing of capital issues were to be recognised in a higher WACC, consistency in determination of regulated

[30] Competition Economists Group, 2 May 2008, Debt and Equity Raising Costs: a report for Babcock and Brown Infrastructure (Draft).

prices would require that the higher WACC be applied only to the increment in the value of the regulated business, which would be less than the value of debt or equity raised.

165. Accordingly, the Authority does not accept that indirect costs of the type referred to by BBI should be recognised in any allowance for debt and equity raising costs.

166. On the matter of equity raising costs, the Authority maintains the view expressed in the Draft Determination that, where appropriate, equity raising costs should be recognised in valuation of the regulatory asset base and in new capital expenditures and not in the WACC. As such, the Authority has not given consideration in this Final Determination to either the quantum of equity raising costs or the circumstances in which it would be appropriate to make an allowance for equity raising costs in the regulatory asset values for the freight and urban networks.

2.9.5 Final Determination

167. Taking the above matters into account, the Authority has maintained an allowance of 12.5 basis points for debt raising costs and makes no allowance for equity raising costs.

2.10 Conclusions

168. After giving consideration to submissions on the Draft Determination, the Authority has determined the 2008 WACC values for the freight and urban networks as indicated in Table 4.

Table 4: WACC values for the 2008 WACC Final Determination

CAPM or WACC parameter	Freight network 2008 value	Urban network 2008 value
Nominal risk free rate of return (%)	6.37	6.37
Inflation rate (%)	2.75	2.75
Real risk free rate of return (%)	3.52	3.52
Debt proportion (%)	35	35
Equity proportion (%)	65	65
Market risk premium	6.0	6.0
Equity beta	1.00	0.46
Debt margin (%)	3.02	2.51
Debt issuance costs (%)	0.125	0.125
Taxation rate (%)	30	30
Franking credit value (gamma)	0.5	0.5
Nominal pre-tax cost of debt	9.52	9.01
Nominal post-tax cost of equity	12.37	9.14
Real post-tax cost of equity	9.36	6.22
Nominal pre-tax cost of equity	14.55	10.75
Real pre-tax cost of equity	11.49	7.79
Nominal pre-tax ("Officer") WACC	12.79	10.14
Real pre-tax ("Officer") WACC	**9.77**	**7.19**
Nominal post-tax ("vanilla") WACC	11.37	9.09
Real post-tax ("vanilla") WACC	8.39	6.17

Notes: (a) The nominal risk free rate is determined as the average of implied yields on 10 year Commonwealth Government Securities over the 20 trading days to 30 May 2008. The debt margin is determined as the average of fair-value yields for 10-year BBB+ rated (freight network) and A rated (urban network) corporate bonds as stated by CBASpectrum over the same period.

(b) The equity beta is derived from consideration of empirically derived equity beta and asset beta values as described in section 2.7.5 of this determination.