The Pilbara Infrastructure (TPI)

Final Determination on the 2009 Weighted Average Cost of Capital for TPI's Railway Network

22 June 2009

Economic Regulation Authority
WESTERN AUSTRALIA

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Economic Regulation Authority web site at www.era.wa.gov.au.

For further information, contact:

Economic Regulation Authority
Perth, Western Australia
Phone: (08) 9213 1900

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FINAL DETERMINATION

1. The Economic Regulation Authority (**Authority**) administers the Western Australian railways access regime. The regime consists of the *Railways (Access) Act 1998* (**Act**) and the *Railways (Access) Code 2000* (**Code**). The rail network and types of infrastructure subject to the regime are defined in this legislation. The Authority's role is to administer the Act and the Code.

2. The *Railway and Port (The Pilbara Infrastructure Pty Ltd) Agreement Act 2004* (**Agreement Act**) between the State Government and The Pilbara Infrastructure (**TPI**) – a subsidiary of Fortescue Metals Group Ltd (**FMG**) – relates to the development of a multi-user railway and multi-user port facility in the Pilbara.

3. On 1 July 2008, TPI's Railway was included in the State's rail access regime through proclamation of Part 3 of the Agreement Act. TPI was required, from this date, to comply with the legislative obligations set out for railway owners under the Act and the Code.

4. Schedule 4, section 3(1)(a) of the Code requires the Authority to make an annual determination, as at 30 June, of the Weighted Average Cost of Capital (**WACC**) to be applied in determining the floor and ceiling costs for each of the rail networks covered under Schedule 1 of the Code.

5. The Authority is required to determine the WACC for TPI's railway as at 30 June 2009. While the Code does not require public consultation except for the WACC determination as at 30 June in 2003 and every fifth year thereafter, as TPI's railway is a new ('greenfields') railway, the Authority has decided to undertake a public consultation process in determining the WACC for this railway.

6. The process which was followed by the Authority in undertaking its WACC determination for TPI's railway is as follows:

   - The Authority published an issues paper on 4 September 2008 and invited public submissions with a closing date for submissions of 15 October 2008.
   - The Authority commissioned a study by CRA International (**CRA**) to provide regulatory advice in respect of the Authority's WACC determination for TPI's Railway.
   - Following consideration of submissions received during the public consultation period and consideration of the CRA report, the Authority published a draft determination on 9 January 2009 that provided a real pre-tax 2009 WACC value for TPI's railway of 10.25 per cent.
   - Following consideration of submissions received during the public consultation period on the draft determination, the Authority has prepared this final determination.

7. The final determination of the Authority is that the real pre-tax 2009 WACC value, to apply over 2009-10, for TPI's railway is 11.09 per cent.

8. The WACC values have been calculated on the basis of an estimated nominal risk free rate and debt margin as at 29 May 2009.

9. The Authority calculated the WACC value using the Officer Capital Asset Pricing Model (**CAPM**) and the Officer WACC methodology, applying parameter values as indicated in Table 1.

10. In relation to the stranding risk issue raised by TPI, the Authority will consider this matter under its future floor and ceiling costs determination for TPI's railway.

Table 1 Final Determination on 2009 WACC for TPI's Railway

WACC	Final Determination
Nominal risk free rate of return (%)	5.02
Inflation rate (%)	2.50
Real risk free rate of return (%)	2.46
Debt proportion (%)	30
Equity proportion (%)	70
Market risk premium (%)	6.00
Debt beta	0.00
Asset beta	1.00
Equity beta	1.43
Debt margin (%) [credit rating BBB-]	3.76
Debt issuance costs (%)	0.125
Taxation rate (%)	30
Franking credit value (gamma)	0.50
Nominal pre-tax cost of debt	8.91
Real pre-tax cost of debt	6.25
Nominal pre-tax cost of equity	15.99
Real pre-tax cost of equity	13.16
Nominal post-tax cost of equity	13.59
Real post-tax cost of equity	10.82
Nominal pre-tax ("Officer") WACC	13.87
Real pre-tax ("Officer") WACC	11.09
Nominal post-tax ("vanilla") WACC	12.19
Real post-tax ("vanilla") WACC	9.45

REASONS FOR THE FINAL DETERMINATION

Background

11. TPI's Railway was commissioned in May 2008. This railway is approximately 260 kilometres in length and runs from FMG's Cloud Break iron ore mine in the Chichester Ranges (East Pilbara) to TPI's port facilities at Anderson Point in Port Hedland.

12. On 1 July 2008, TPI's Railway became subject to the Act and the Code through the proclamation of Part 3 of the Agreement Act. TPI was required, from this date, to comply with the legislative obligations set out for railway owners under the Act and the Code.

13. TPI's Railway is owned and operated by TPI. TPI will perform both access-related rail functions and functions associated with the operation of train services.

Requirements of the Code

14. The requirement on the Authority to determine WACC values for railways under the Western Australian rail regime is established under Schedule 4, section 3 of the Code, as follows:

> **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;
>
> (ia) the railway infrastructure associated with that part of the railways network described in item 52 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.

15. Schedule 1 lists the routes covered by the Code. TPI's railway is covered under item 52 of Schedule 1, as follows:

TPI Railway and Port Agreement Route

52. All tracks that are part of the railway constructed pursuant to the TPI Railway and Port Agreement.

16. TPI's railway, as defined under Schedule 1, currently consists of the line from FMG's Cloud Break iron ore mine to Port Hedland. Under the definition of TPI's railway in item 52 of Schedule 1, any new lines constructed by TPI in the future would also come under the Code, as part of extensions or enlargements to this railway pursuant to the approved proposal arrangements under clauses 12 and 13 of the Agreement Act.

Public Consultation

17. The Code does not require public consultation except for the WACC determination as at 30 June in 2003 and every fifth year thereafter. However, as TPI's railway is a new ('greenfields') railway, the Authority has decided to undertake a public consultation process in determining the WACC for this railway.

18. Prior to the commencement of the consultative process, TPI provided a submission to the Authority (on 29 July 2008) outlining its views on the key risks associated with the railway and an overview of possible methodologies for quantifying these risks. This document is available on the Authority's web site (www.era.wa.gov.au).

19. On 4 September 2008, the Authority published an issues paper and invited submissions from interested parties, with a closing date for submissions of 15 October 2008.

20. The Authority received five submissions on its issues paper, from the following parties.

- Australian Rail Track Corporation (**ARTC**)
- Hancock Prospecting Pty Ltd (**HPPL**)
- North West Iron Ore Alliance (**NWIOA**)
- United Minerals Corporation (**UMC**)
- TPI

21. The submission from TPI on the issues paper contained a report prepared on behalf of TPI by Synergies, which is referred to in this determination as the **TPI(Synergies)** submission.

22. Subsequent to the above submissions being placed on the Authority's web site, HPPL lodged another submission, on 10 December 2008, which addressed both the TPI(Synergies) submission on TPI's WACC and the Authority's draft determination on TPI's proposed segregation arrangements. This submission (commissioned by HPPL) contained a report by ACIL Tasman (**ACIL**) which reviewed TPI's 'Cost of Capital' report by Synergies.

23. The two submissions above from HPPL, which both contained reports by ACIL prepared on behalf of HPPL, have been referred to in this determination as **HPPL(ACIL)** submissions.

24. On 9 January 2009, the Authority published its draft determination on TPI's 2009 WACC, and invited submissions from interested parties, with a closing date for submissions of 20 February 2009.

25. The Authority received five submissions on its draft determination from the following parties.

- UMC
- NWIOA
- HPPL
- TPI(Synergies)
- FMG

The submission from TPI on the draft determination, which contained a report prepared on behalf of TPI by Synergies, is also referred to in this determination as the **TPI(Synergies)** submission.

26. All the above submissions are available on the Authority's web site (www.era.wa.gov.au).

Consultant engaged by the Authority

27. As part of the process for this determination, the Authority commissioned a report from CRA to assist in its determination of TPI's 2009 WACC[1]. CRA was not asked to provide the Authority with detailed advice on the CAPM or the market risk premium.

28. CRA's draft report was published on 9 January 2009 and is available on the Authority's web site (www.era.wa.gov.au).

29. In preparing its final report, CRA considered the five submissions received in response to the draft determination published on 9 January 2009.

30. CRA's final report is available on the Authority's web site (www.era.wa.gov.au).

WACC Methodology

Public Submissions on the Issues Paper

31. Comments in the public submissions on the WACC methodology were noted in the draft determination from ARTC, HPPL(ACIL), NWIOA, UMC and TPI(Synergies).

32. Submissions generally supported the methodology adopted by the Authority in previous determinations.

33. ARTC was generally supportive of the proposed approach to determining the WACC and suggested that the return should be at the higher end of the scale of feasible returns. ARTC also recognised that:

> … the use of post tax nominal is more common, being the method applied by most other regulators, however understands the simplicity and transparency of the use of pre-tax rates or return, plus the desire to have consistency with the 2008 Freight and Urban Railway Networks determination.

34. HPPL(ACIL) endorsed the use of a CAPM framework and the use of a real WACC. However, HPPL(ACIL) recommended the Authority adopt a post-tax real WACC.

> Although this requires explicit modelling of taxation costs for the purpose of identifying the cost ceiling, use of a standard transformation to derive a pre-tax cost of capital using the statutory tax rate would significantly over-state TPI's required cost of capital. While use of an effective tax rate would mitigate this problem, the increased complexity involved in deriving an appropriate effective tax rate removes the apparent advantage of a pre-tax approach in terms of simplicity.

35. The NWIOA supported the approach and structure the Authority recently applied to WestNet Rail (**WNR**) (after a careful review of literature and statistical evidence) as a foundation for determining TPI's WACC.

36. UMC made similar comments to the NWIOA and supported the approach and structure the Authority recently applied to WNR in the 2008 Freight and Urban Railway WACC Determination.

[1] CRA International 2009, WACC for TPI's Iron Ore Railway, Draft Report for the Economic Regulation Authority, January 2009.

37. TPI(Synergies) applied the full version of the Monkhouse formula, as specified by the Australian Competition and Consumer Commission (**ACCC**) in its Statement of Regulatory Principles for electricity transmission revenues.[2] The resulting WACC estimate for TPI's railway was then calculated as the post-tax nominal (vanilla) WACC.

38. TPI(Synergies) also noted that if a pre-tax approach is used by the Authority, the continued application of the statutory tax rate would be the most prudent approach. TPI(Synergies) further noted that the Authority previously adopted the market transformation method (which has been the more commonly applied regulatory approach) and would endorse the continued application of this method.

CRA's Draft Report

39. CRA noted in its report that while it would generally recommend the use of a post-tax nominal WACC – applied within a model that explicitly calculates benchmark tax payments by the regulated firm – a pre-tax approach is consistent with the Authority's 2008 Freight and Urban Railway WACC Determination[3] and appears to be accepted by stakeholders.

40. CRA further noted that a pre-tax real approach avoids contentious arguments over how to calculate the benchmark tax allowance and the items that should be included, or excluded from, that allowance.

41. CRA noted that a post-tax nominal rate of return is generally to be preferred in economic regulation, primarily because:

> In theory it more accurately models the cash flows faced by investors in the benchmark firm, and the post-tax WACC is consistent with the post-tax returns required by providers of capital.

42. However, CRA also noted that the desire for consistency with the Authority's 2008 Freight and Urban Railway WACC Determination[4] is one reason why it may be appropriate to employ a pre-tax real WACC in the current determination.

Authority's Draft Determination

43. There are three key matters in estimating a WACC:

- the choice of method in estimating the cost of equity and debt;
- the choice of using a pre-tax or post-tax WACC; and
- the choice of using a real or nominal WACC.

44. On the choice of financial model, the Authority has in previous WACC determinations under the Code applied the CAPM in estimation of costs 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.

[2] The ACCC adopts a vanilla WACC expressed as the weighted average of the partially grossed-up return on equity and the pre-tax cost of debt.

[3] Economic Regulation Authority (ERA) 2008, Final Determination: 2008 Weighted Average Cost of Capital for the Freight (WestNet Rail) and Urban (Public Transport Authority) Railway Networks.

[4] ERA (2008), ibid.

45. The Authority considered that the CAPM remained the most appropriate basis for estimating the cost of capital and used the CAPM methodology in the final determination.

46. The Authority has a preference for a pre-tax real WACC approach, using a forward transformation approach to convert the post-tax (Officer) WACC formulation to a pre-tax formulation. With this method:

- the nominal post-tax (Officer) WACC is grossed up by $(1-T_c)$[5] to obtain the pre-tax nominal WACC; and
- the pre-tax nominal WACC is then adjusted for inflation to obtain the pre-tax real WACC.

47. A pre-tax WACC may be expressed in nominal or real terms (indexed for inflation). The choice to use a real or nominal WACC depends upon the choice of whether to model costs and returns in real or nominal terms.

48. 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. 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.

49. On the treatment of taxation, the Authority has previously 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 corporate income tax rate. Other Australian regulators – with the exception of IPART – prefer to apply post-tax rates of return. This treatment of taxation is now largely unique to the Authority, with other regulators generally applying post-tax rates of return.

50. The Authority's preference for a pre-tax real WACC approach reflects that this method:

- Simplifies financial modelling and precludes the need for an examination of individual tax positions;
- Is consistent with the preferences of the majority of regulated (rail, gas and electricity) utilities in Western Australia; and
- Allows consistency across regulated utilities (including rail providers) in Western Australia.

Draft Determination

51. The Authority considered that it is appropriate to estimate WACC values using the Officer form of the CAPM and specified the WACC values in real, pre-tax terms. The Authority assumed that the effective taxation rate is equal to the statutory rate of corporate income tax.

[5] T_c refers to the company tax rate.

Public Submissions on the Draft Determination

52. HPPL supported the WACC methodology employed by the Authority but recommended the Authority use a post-tax approach.

CRA's Final Report

53. CRA continued to hold the view presented in its draft report regarding the choice of a pre-tax or post-tax WACC:

- A post-tax nominal approach more accurately models the cash flows faced by investors in the benchmark firm, and the post-tax WACC is consistent with the post-tax returns required by providers of capital.
- The pre-tax approach adopted by the Authority appears to be accepted by submitters, and avoids contentious arguments over how to calculate the benchmark tax allowance and the items that should be included in and excluded from that allowance.

54. As in its draft report, CRA applied the Officer version of the CAPM in calculating the WACC, which is consistent with the Authority's established practice.

Authority's Final Determination

55. The Authority considers that its position on this matter, as outlined in the draft determination, should be maintained.

Final Determination

56. The Authority confirms its position as outlined in the draft determination, that it is appropriate to estimate WACC values using the Officer form of the CAPM and to specify the WACC values in real, pre-tax terms. The Authority has assumed that the effective taxation rate is equal to the statutory rate of corporate income tax.

Parameter Values

Risk Free Rate of Return and Inflation

Public Submissions on the Issues Paper

57. Comments in public submissions on the risk free rate of return and inflation were noted in the draft determination from HPPL(ACIL) and TPI(Synergies).

58. HPPL(ACIL) endorsed the Authority's approach for calculating the risk free rate.

59. TPI(Synergies) noted that the preferred inflation estimate for TPI's WACC is the mid-point (2.5 per cent) of the Reserve Bank of Australia's (**RBA**) target band.

CRA's Draft Report

60. On inflation, CRA noted that:

> It has recently been recognised by regulators that estimates of future inflation derived using inflation-indexed bonds are biased upwards. This is because there is a limited supply of inflation-indexed bonds, which tends to result in prices being "too high" and

hence returns on inflation-indexed bonds being too low. When compared with nominal bonds the effect is to overstate future inflation.

One approach is to adopt the mid-point of the Reserve Bank of Australia's inflation target band, i.e. 2.5%. We consider that this is likely to provide reasonable outcomes.

Authority's Draft Determination

61. Australian regulators have historically 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. Both the Authority and other Australian regulators have, until very recently, adopted this approach in determinations of rates of return for other regulated infrastructure.

62. One issue with the above method for determining risk free rates of return and a forecast of inflation arises from features of the market for government bonds. In particular, an excess demand for government bonds may result in the implied returns being 'downward biased' – given the relative scarcity of indexed bonds implies that there is a premium for their acquisition – and therefore under-valuing the risk free rate that should be applied in estimation of WACC values.

63. Studies by the Commonwealth Treasury, the RBA and consultants provide substantial evidence that indexed bond yields are biased downward relative to nominal yields.[6] The RBA also notes that:

> [m]edium term inflation expectations implied by indexed bond yields and inflation swaps have … declined noticeably, to be around 2½ per cent, However, the limited liquidity of these markets makes it difficult to infer too much from derived series for inflation expectations.[7]

64. 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 government bonds, but rejected claims of the existence of bias in observations of implied yields on nominal government bonds. No Australian regulator has examined in any detail the claims of bias in yields on nominal government bonds. Rather, regulators (namely the AER and ESC) have accepted the views of the Commonwealth Treasury and RBA that there is no such bias; given nominal bonds have sufficient supply liquidity to provide a reasonable estimate of the nominal risk free rate.[8]

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[6] See for example:

Allen Consulting Group, 'Relative bias' of inflation-indexed CGS yields as a proxy for the CAPM risk-free rate, July 2007;

Hird T. and D. Young 2008, A methodology for determining expected inflation, A CEG report for ACTEW, 17 January 2008.

[7] RBA 2008, Statement on Monetary Policy, November 2008. The statement refers to the break-even 10-year inflation rate on indexed bonds.

[8] See for example:

Australian Government Treasury 2007, Letter to J. Dimasi ACCC, 7 August 2008;

Essential Services Commission, March 2008, Gas Access Arrangement Review 2008-2012 Final Decision.

65. The Essential Services Commission of South Australia (**ESCOSA**), Independent Pricing and Regulatory Tribunal (**IPART**) and Independent Competition and Regulatory Commission (**ICRC**) consider it appropriate to retain the use of indexed bonds for measuring the risk free rate, with inflation calculated using the Fisher equation.[9]

66. The ACCC, AER, ESC and the Authority (in its 2008 Freight and Urban Railway WACC Determination) have adopted an approach for estimating the real risk free rate and deriving a forecast of inflation as follows:

- 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 (using the Fisher equation).[10]

67. In a RBA survey of market economists that followed the release of the 2008 September quarter CPI, the median inflation expectation (for the year to June 2010) was 2.6 per cent.[11]

68. The long term RBA target range for inflation is 2-3 per cent. The RBA predicts inflation will fall from 4.5 per cent in December 2008 to 2.5 per cent by mid 2011.[12]

> The combination of rising tradeables inflation and slowly declining non-tradeables inflation is likely to keep underlying inflation at close to its current year-ended rate in the near term. Over time, however, overall inflation is expected to gradually fall, with the significant slowing in global and domestic activity implying a further easing of capacity pressures, and some reduction in the pricing power of businesses (including the extent to which firms can pass on higher prices for imports).

69. The ACCC, AER, ESC and the Authority have recently applied values of forecast inflation in the range of 2.5 to 3.0 per cent.

70. The Authority considered that:

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

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[9] See for example:

ESCOSA 2008, Rail Industry (Tarcoola-Darwin) Guideline No. 2, Arbitrator Pricing Requirements;

ICRC 2008, Water and Wastewater Price Review Final Report and Price Determination, Report 1 of 2008, April 2008;

IPART 2008, Review of prices for Sydney Water Corporation's water, sewerage, stormwater and other services.

[10] See for example:

Australian Energy Regulator, January 2008, Final Decision: SP AusNet Transmission Determination 2008-09 to 2013-2014.

Essential Services Commission, 6 March 2008, Gas Access Arrangement Review 2008-2012 Final Decision.

[11] RBA 2008, op. cit.

[12] RBA 2008, op. cit.

- 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.

71. The Authority also considered that the real risk free rate should be calculated 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 using the Fischer equation.

72. In the Authority's view, the inflation forecast should be based on a range of considerations, including levels of historical inflation, the RBA target range (2 to 3 per cent inflation rate) and market forecasts. The Authority has also noted the advice from CRA on this issue (i.e. mid-point of the RBA's inflation target band).

73. The average yield on 10-year Commonwealth Government Bonds for the 20 trading days ending 20 December 2008 was 4.37 per cent.

Draft Determination

74. After considering the RBA and market forecasts, and in line with the RBA target range, the Authority considered that the best estimate of the forecast rate of inflation was 2.5 per cent.

75. Implied yields on nominal government bonds over the 20 trading days to 3 December 2008 indicated a nominal risk free rate of 4.37 per cent. Together with the assumed inflation rate, that nominal risk free rate implied a real risk free rate of 1.82 per cent.

Public Submissions on the Draft Determination

76. HPPL was comfortable with the approach taken by the Authority but noted that conditions have changed since the release of the draft determination and both the long term bond rate and inflation expectations are now trending lower as the world economy continues to falter. HPPL expects that the Authority will revise the values for the risk free rate of return and inflation in preparing the final determination.

77. TPI(Synergies) argued that:

> Using the current risk free rate of return in the WACC calculation reduces the WACC to below where it was before the global financial crisis affected markets. Thus we are faced with the seemingly illogical situation that the world is entering a new uncertain and risky period while rates of return are falling. Normally rates of return and risk have a positive linear relationship. This fundamental financial relationship is distorted due to the global financial crisis.

78. TPI(Synergies) further noted that:

> Given the CAPM is intended to reflect expectations as of the day of analysis, it is theoretically correct to base the risk-free rate on the prevailing yield on the date of the determination. However, problems may occur if there is a spike in yields on the day that the rate is applied. It is therefore now common regulatory practice to average the rate over a short horizon, which typically ranges from between ten and forty days. Averaging removes these spikes where the spikes are seen to be a short term one-off daily event.

79. In addition, TPI(Synergies) observed that there is a bias caused by a desire by fixed interest investors to hold Government bonds:

> This demand results in an upward bias in price (downward bias in yield) which is commonly called the 'uniqueness' premium (it has also been termed 'the convenience yield'). Ignoring the uniqueness bias jeopardises the appropriateness of using unadjusted yields on Government bonds as a proxy for the risk free rate of return. In our view, it is therefore correct to adjust or remove the bias.

80. TPI(Synergies) further noted that:

> This bias is to some extent always present given investors will always pay a premium for the convenience of holding Commonwealth Government bonds (relative to other securities). However, the key issue is that in recent times, the quantum of the bias has blown out considerably…It is only compensation for that difference – not the entire amount of the bias – that we (Synergies) would recommend seeking.

81. The view of TPI(Synergies) was that:

> … it is important to recognise the impact of the crisis, particularly given the rate may well be fixed for a period. Adjustment should be by way of:
>
> - Using a twelve month average increasing the risk free rate from 4.37% to 5.73% (this is the preferred adjustment); or
> - A bias adjustment of 60 basis points representing the change in the bias over the last six months.

82. FMG noted that

> … if the full 120 basis point of the identified 'bias' is added to the risk free rate calculated by the ERA the rate derived, being 5.57%, is reasonably close to the twelve month average that we believe should be used.

83. FMG further suggested that an average between these two (the twelve month average 5.73 per cent and Authority's rate plus 120 basis points 'full bias adjustment' 5.57 per cent) of 5.65 per cent should be adopted.

CRA's Final Report

84. In response to the suggestion by FMG and TPI(Synergies) to use a 12 month average rate for the risk free rate of return, CRA stated:

> There is no valid reason to use a 12-month average for the risk-free rate of return. MRP and betas are measured using many years of data because there is no robust indicator of expected values for these parameters. This is not the case with interest rates and, in an ideal world, an instantaneous observation should be preferred. That is, ideally no averaging should be undertaken at all. However, some averaging may be relevant where price volatility is a function of low liquidity. In this case 20 days appears to be adequate.

85. Regarding the adjustment for the convenience yield, CRA argued:

> Contrary to Synergies' argument, table 1 in Synergies report (p.16) does not appear to show an increase in the convenience yield as suggested. It shows an 80bps increase in the credit default swap (CDS) cost but a decrease in the bias. If the driver of this bias is supply of Commonwealth Government Securities (CGS) relative to GDP (as per Hird and Grundy (2007) cited by Synergies) then given supply is now increasing the bias should be falling. We further note that historically relevant risks which have been overlooked and/or under-estimated are: the underpricing of default risk (e.g. by AIG); and counterparty risk (e.g. Lehman Bros and AIG). We would expect that these risks would be priced more accurately following the financial crisis,

and as such the cost of CDS will increase without having any implication for the risk-free rate.

86. CRA considered that it is important to match the maturities of the benchmark risk free rate with the suggested spread above the risk free rate in order to calculate the hypothetical cost of debt of a marginal investor and therefore relied on 10-year spreads over the benchmark rate to match the Authority's choice of the risk free rate.

87. CRA used the yield on benchmark 10-year Commonwealth Government Bonds as the nominal risk free rate of return, applying the average rate across the most recent 20 trading days. This is consistent with the approach adopted by the AER, ESC and the Authority.

88. The nominal risk free rate calculated by CRA, based on the average yield on 10-year Commonwealth Government Bonds for the 20 trading days prior to 29 May 2009, was 5.021 per cent.

89. Regarding the inflation estimate, CRA notes that inflation forecasts for 2009-10 differ across the RBA's May 2009 Statement on Monetary Policy (which was 2.5 per cent) and the Australian Federal Government's 2009-10 Budget forecast (which was 1.75 per cent).

90. CRA does not comment on the relative accuracy of RBA and Treasury forecasts and instead notes that the Authority is faced with the choice of a high (2.5 per cent RBA forecast) or a low (1.75 per cent Federal Budget forecast) inflation rate.

91. CRA notes that the WACC determination for TPI's railway is applied in determining the floor and ceiling costs for TPI's railway (which determine the bounds for negotiated prices) and that a high inflation forecast increases the chance that floor and ceiling costs are set lower than they should be. CRA further notes that if the floor and ceiling costs are set too low, incentives to invest in infrastructure are reduced and as such considers it better for the Authority to adopt the lower inflation forecast of 1.75 per cent.

92. CRA updated its inflation estimate from 2.5 per cent in its draft report (using the mid-point of the Reserve Bank of Australia's inflation target band) to 1.75 per cent (based on the Federal Government's 2009 Budget forecast of inflation for 2009-10).

Authority's Final Determination

93. The Authority has considered the inflation forecasts provided for 2009-10 by both the Commonwealth Government (economic forecasts associated with its May 2009 Budget Statement) and the Reserve Bank of Australia (monetary policy statement of May 2009). The Authority considers that the Reserve Bank is the most appropriate source to use for the purpose of estimating inflation.

94. The Reserve Bank's 2009-10 inflation forecast, based on its 8 May 2009 Statement on Monetary Policy, is 2.5 per cent.[13]

95. In relation to the nominal risk free rate, the Authority accepts the advice of CRA that, based on the average yield on 10-year Commonwealth Government Bonds for

[13] RBA 2008, Statement on Monetary Policy, May 2009, p69.

the 20 trading days ending 29 May 2009, the nominal risk free rate was 5.021 per cent.

Final Determination

96. The Authority considers that the most appropriate estimate of the forecast of inflation for 2009-10 is 2.5 per cent, based on the Reserve Bank's May 2009 Statement on Monetary Policy.

97. Implied yields on nominal government bonds over the 20 trading days to 29 May 2009 indicate a nominal risk free rate of 5.021 per cent. Together with the assumed inflation rate of 2.5 per cent, this nominal risk free rate implies a real risk free rate of 2.46 per cent.

Market Risk Premium

Public Submissions on the Issues Paper

98. Comments in public submissions on the market risk premium (**MRP**) were noted in the draft determination from ARTC, HPPL(ACIL), NWIOA, UMC and TPI(Synergies).

99. The submissions offered differing views, either arguing for a higher MRP based on recent studies or for a lower MRP reflecting either the MRP used in a foreign market or other project-specific factors.

CRA's Draft Report

100. CRA noted that the MRP for the Australian market as a whole is the most appropriate MRP, with estimates for foreign markets not being particularly relevant.

> There is no case for altering the MRP on a project-specific basis. There is, however, a case that recent studies should be considered by the Authority, but we recommend that this occurs as a separate consultative exercise involving all the industries regulated by the Authority, as the same value should be applied across all industries.

Authority's Draft Determination

101. 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.

102. There has been a long-standing difference of view on the market risk-premium between regulators and regulated businesses.

- Regulators (including the Authority) take the view that the MRP 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 adopt a MRP value of 6 per cent.
- Regulated businesses have often taken the view that the MRP should be determined solely on the basis of observed historical equity premia, which typically indicate values of between 5 and 8 per cent – and typically favour a MRP value greater than 6 per cent.

Draft Determination

103. The Authority's view, consistent with regulatory precedent, was that the MRP 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 that basis, the Authority was of the view that a MRP of 6 per cent is appropriate.

Public Submissions on the Draft Determination

104. HPPL was comfortable with the approach taken by the Authority but noted that:

> … the market risk premium is derived from historical information and this has the risk that the past may not be a good guide to the future. With the world economic situation, positive returns from any investment are going to be difficult to achieve in the short run and things could get worse delaying a return to more normal economic conditions and returns.

105. HPPL supported the use of a 6 per cent market premium and would not discourage the Authority from finding that a downward adjustment of some type would be required to reflect the weakness evident in world markets. Certainly a higher premium would not be justified.

106. TPI(Synergies) considered that:

> The market risk premium (MRP) calculated using historic data has declined with the decline in equity returns. The MRP is a premium for risk, and it is indisputable that global and Australian risk of equity has increased. Therefore it logically follows that the current forward looking MRP is higher than it was before the crisis unfolded. Bloomberg report an expected MRP in excess of 7%.

107. FMG was of the view that the impact of the global financial crisis should not be ignored and pointed out that the overall annual realised stock market return in Australia for 2008 was the lowest ever recorded. FMG further pointed out that:

> To the extent that extreme market volatility increases the perceived risk associated with a properly diversified portfolio of equity holdings, the forward looking MRP will increase.
>
> …
>
> "There is a likely inverse relationship between a realised MRP and a forward looking MRP"[14].

108. FMG also pointed out that Officer and Bishop (2009)[15] recommends that the MRP should be increased to "7% if imputation tax benefits were valued at greater than 0.3 when distributed …".[16]

109. The view of FMG was that:

> While consistency in regulatory treatment of a parameter such as MRP might suggest that the ERA should continue to adopt a figure of 6%, it is quite clear that 'Officer and Bishop' based on the latest available data would regard such a figure as

[14] Officer and Bishop, January 2009, Market Risk Premium: Further Comments.

[15] Officer and Bishop (2009), ibid.

[16] FMG clarifies that the reference to "when distributed" should be interpreted as a comment on theta rather than gamma.

> too low, at least for values of theta greater than 0.3. If the ERA intends to stick to the regulatory precedent of using a value of 6% for the MRP, such a precedent would only be acceptable in the context of gamma being reduced to zero. Alternatively if the ERA insists on a value of gamma of say 0.3, it should accordingly increase the MRP to 7%.

CRA's Final Report

110. CRA reiterated the points made in its draft report, in particular that:

> … the appropriate MRP is the MRP for the Australian market as a whole, that estimates for foreign markets are therefore not particularly relevant, and that there is no case for altering the MRP on a project-specific basis.

111. In addressing the points raised in the various submissions for a lower MRP, CRA stated that:

> There is no justification for lowering the MRP in response to a decline in equity prices other than to recognise that the historical average over a 100-year period "with the decline" will be lower than it would be had the decline never occurred.
>
> …
>
> The more interesting point is that such a substantial decline can actually help resolve some of the conflict between historical MRP and the MRP that was implied by high equity prices. That is, high equity prices implied a low discount rate but increased the observed MRP. A substantial fall could imply a substantial increase in the implied discount rate and a slightly lower historical average MRP. Thus reducing or even eliminating the apparent contradiction.

112. In addressing the arguments for a higher MRP, CRA noted that:

> FMG's argument that the MRP should be increased is consistent with the AER's recent decision, although there is some disagreement over the level of the MRP with and without adjustment for imputation credits. The AER also noted that cash flow measures of the MRP, which in recent years had been below the MRP calculated as the average of historical excess returns, have now increased significantly, providing "some evidence … that the MRP (perhaps even the medium term MRP) is above the long run historical MRP".

113. CRA concluded that there is no firm argument for lowering the 6 per cent MRP applied by the Authority.

Authority's Final Determination

114. The Authority notes the arguments put forward by TPI(Synergies) and FMG for an increase in the MRP to 7 per cent. The Authority also notes that the AER adopted a MRP of 6.5 per cent in its final Statement of the Revised WACC Parameters (Transmission) and Statement of Regulatory Intent on the Revised WACC Parameters (Distribution) published in May 2009.

115. Arguments put forward by HPPL suggesting a possible lowering of the MRP below 6 per cent have also been considered by the Authority.

116. The Authority has also taken account of CRA's comments in its final report to the effect that there is no clear justification for increasing or decreasing the MRP in the current economic climate.

117. The Authority's remains of the view that its position as outlined in the draft determination is appropriate and that there is insufficient evidence to justify any change to its assumed value of 6 per cent for the MRP.

Final Determination

118. The Authority confirms its position as outlined in the draft determination, that consistent with regulatory precedent, the MRP 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) and that on this basis, a MRP of 6 per cent is appropriate.

Financial Structure and Credit Rating

Public Submissions on the Issues Paper

119. Comments in public submissions on the issue of financial structure and credit rating were noted in the draft determination from ARTC and TPI(Synergies).

120. ARTC noted that the Authority chose a relatively lower gearing for the WNR freight network:

> ARTC does not, in general, oppose this decision but notes the ACCC electing to use a much higher gearing on ARTC's similar interstate network.
>
> Normally regulators consider a higher gearing more appropriate for bulk networks, but ARTC considers it is reasonable for the Authority to factor in any specific risks associated with TPI's network, compared to other bulk networks, in making its assessment.

121. Regarding the appropriate credit rating for a below-rail operator of a single railway servicing a single dominant customer, TPI(Synergies) noted that:

> … we are of the view that an investor would price this risk based on the risk of the customer, and a lender will take a similar (and more conservative) view. Unless some form of credit enhancement is provided, from a lender's perspective, the credit risk of a loan to the railway can be no better than the credit risk of the major customer.
>
> We therefore propose that the nominal credit rating needs to be based on the risk of the underlying customer. As investment grade credit ratings are only likely to be able to be achieved by very large, diversified mining companies, FMG's B- rating is considered a reasonable benchmark. As discussed previously, this assessment may change if another significant customer/s wanted to secure below-rail access from TPI.

CRA's Draft Report

122. Regarding the appropriate benchmark credit rating for TPI, CRA noted that:

> … a large number of potential comparator firms for TPI either did not have significant debt outstanding or did not have any credit rating data available for them … On a debt-weighted basis, on average these firms had BBB (or equivalent) credit ratings.

Authority's Draft Determination

123. Regulators in Australia typically judge the optimal capital structure for a regulated electricity utility to be 60 per cent, with an equity beta of one. In industries with

higher risks, the optimal capital structure is often judged to have a lower debt level (given the benefits of debt are offset by the costs of financial distress at a relatively lower level of debt).

124. The estimated average debt gearing for US and Canadian rail comparators is estimated to be in the range of 28 to 48 per cent.[17] TPI(Synergies) have proposed a debt gearing of 10 per cent for TPI, based on the average gearing levels for five iron companies over 2003-07 (0 to 20 per cent).

125. In its 2008 Freight and Urban Railway WACC Determination, the Authority considered that the benchmark financial structure (rather than the actual financing structure) of freight networks was a debt gearing of 35 per cent.[18] For other Australian rail businesses, regulators have (in the most recent determinations) applied debt gearing levels in the range of 50 to 55 pre cent.[19] The recent ACCC decision included a gearing level of 50 per cent with a BBB credit rating for ARTC.[20] In the current IPART review of the rate of return for the Hunter Valley Coal Network (IPART Hunter Valley Review), ARTC have proposed a gearing level of 50 to 55 per cent with a BBB credit rating.[21]

126. The Authority's view was that there does not appear to be strong evidence that a benchmark gearing for a rail business is equivalent to the gearing of iron ore companies. As such, the Authority did not consider that the 10 per cent gearing level proposed by TPI(Synergies) (based on iron ore companies) was an appropriate gearing level for a benchmark railway owner.

127. The most recent Authority determination for the WNR freight railway network included a 35 per cent debt gearing.[22] The Authority considered that this gearing was an appropriate benchmark for a railway owner.

128. The Authority did not consider that the benchmark credit rating should reflect the credit rating of major customers. Based on CRA's advice, and after consideration of previous rail regulatory decisions, the Authority considered that the most appropriate benchmark for TPI is a BBB credit rating.

Draft Determination

129. Based on the available evidence, the Authority considered that an appropriate assumption for TPI was a 35 per cent debt gearing with a BBB credit rating.

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[17] CRA International 2008 op .cit.; IPART 2008, op cit.

[18] ERA 2008, op. cit. The 35 per cent gearing reflected the average gearing for a wide range of mature toll-road companies. For further details, see Allen Consulting Group 2007, *Railways (Access) Code 2000*: Weighted Average Cost of Capital – 2008 WACC Determinations, Report to the Economic Regulation Authority, October 2007.

[19] ACCC 2008, Final Decision: Australian Rail Track Corporation Access Undertaking – Interstate Rail Network, July 2008; QCA is currently assessing the QR Network 2009 voluntary draft access undertaking which proposes a gearing of 55 per cent, in line with the current access undertaking; IPART is currently assessing ARTC's proposal for the Hunter Valley Coal Network, which proposes a gearing of 55 per cent. IPART had previously determined a gearing level of 50 to 60 per cent to be appropriate.

[20] ACCC 2008 op. cit.

[21] ARTC 2008, Submission for IPART Consultation – report prepared by Synergies Economic Consulting, December 2008.

[22] ERA 2008, op. cit.

Public Submissions on the Draft Determination

130. HPPL was of the view that there should be no support for applying a gearing that is anything other than related to other providers of infrastructure services. In addition, HPPL does not support using WNR as a basis on which to set the gearing for TPI's railway. HPPL continued to argue for a higher gearing of 50 per cent based on the regulatory examples provided in its submission in response to the issues paper.

131. HPPL supported the use of a BBB credit rating and stated that:

> … the rating should reflect that for an infrastructure provider and not have any regard to the credit rating of the major infrastructure customers.

132. TPI(Synergies) considered that the most appropriate comparable businesses would be single line, single commodity short haul rail services which transport iron ore for the export market and that comparators not having these characteristics must be interpreted with caution.

133. TPI(Synergies) view was that:

> A benchmark single line, single customer short haul rail business transporting iron ore would have a credit rating lower than the BBB average of the US rail businesses.
>
> …
>
> Again, a benchmark single line, single customer short haul rail business transporting iron ore would have a credit rating lower than the BBB- average of the iron ore/diversified mineral businesses.

134. TPI(Synergies) cited the Panama Canal Railway (**PCR**) as a comparator for TPI's railway. The PCR has a BB credit rating, which is stronger than the B credit rating of its parent entities.

135. In the view of TPI(Synergies), the credit rating for TPI must be less than BBB- and not higher than BB with the appropriate credit rating for TPI being B+. TPI(Synergies) also noted that a B+ rating is speculative grade which has no data publicly available, and therefore uses evidence from the US to calculate the appropriate debt margin.

136. In relation to the appropriate gearing ratio for TPI's railway, FMG questioned the comparators used and the associated 35% gearing assumption applied to WNR and TPI:

> Even if it were accepted that 35% was an appropriate benchmark gearing ratio for a company like WestNet Rail, clearly for the same reasons that the size and diversity of the US rail companies makes them less risky – so too does WestNet Rail's size, diversity and long track record, represent a lower risk than a newly established relatively short track operation (approximately 1/20th of the length of track owned by WestNet Rail) going to a single destination and ultimately only suitable for handling a single product (namely iron ore; because there are no other products suitable for transportation from the region of the Pilbara that it traverses). In other words TPI represents a greater risk than WestNet Rail and would be likely to sustain only a lower gearing ratio.

137. FMG argued that if the returns to equity investors are lowered by the adoption of a sub-optimal gearing ratio then access seekers should not be required to compensate equity holders for the adoption of an inefficient structure. FMG also noted that:

> The use of higher benchmark gearing ratios, derived from other inappropriate companies, is only supportable if the gearing is sub-optimally low. In the case of Fortescue, its gearing is as high as the market would sustain at the time the finance was raised, and all the evidence at that time further suggested that TPI as a stand alone entity would simply have been unable to raise any financing at all. Under those circumstances, it is beholden on the ERA to justify why it believes that Fortescue's gearing is sub-optimal, or to accept that Fortescue's actual gearing should be used in the WACC calculation.

138. The view of FMG was that the Authority should adopt Fortescue's actual gearing ratio in preference to the notion of suitable comparators derived from ACG's flawed analysis.

CRA's Final Report

139. CRA disagreed with the conclusions of TPI(Synergies) and FMG with regards to applying a B+ credit rating in TPI's WACC and addressed two key issues arising from the various comments made by TPI(Synergies). These issues were:

- The extent to which large relatively diversified US Class 1 railroads provide an appropriate benchmark for TPI.
- The extent to which customer credit ratings affect the firm.

140. CRA believed that there is support for TPI(Synergies)'s argument that the large diversified Class 1 US railroads provide a poor benchmark for TPI's credit rating, citing Standard and Poor's, as below:

> Standard & Poor's has no minimum size criterion for any given rating level. However, size turns out to be significantly correlated to ratings. The reason: size often provides a measure of diversification, and/or affects competitive position.
>
> …
>
> Small companies are, almost by definition, more concentrated in terms of product, number of customers, or geography. In effect they lack some elements of diversification that can benefit larger companies. To the extent that markets and regional economies change, a broader scope of business affords protection. This consideration is balanced against the performance and prospects of a given business.
>
> …
>
> Large companies have substantial staying power, even if their businesses are troubled. Their constituencies – including large numbers of employees – can influence their fates. Banks' exposure to these companies may be quite extensive, creating a reluctance to abandon them. Moreover, such companies often have accumulated a lot of peripheral assets that can be sold. In contrast, the promise of small companies can fade very quickly …

141. CRA agreed that customer credit ratings are relevant to the credit rating of TPI but does not agree that the credit ratings should be the same. In the case of TPI, CRA considered that TPI's revenue stream could be more secure than any debt issued by TPI's customers.

> However, our view is that TPI clearly provides an essential service. A mine owner could default on debt and have its assets liquidated, but the new owner … could continue to operate the mine and require rail transportation (unless the revenues are unable to match avoidable costs excluding financing costs).

CRA therefore concluded that the appropriate benchmark credit rating for TPI could be higher than the credit rating of debt issued by its customers.

142. With regards to a reasonable estimate of the credit rating of TPI's customers, CRA was of the view that a benchmark rating would lie somewhere in the range from BB- to BBB:

> FMG has a credit rating of B+ and is probably representative of miners with undiversified operations focussed on iron ore, although we note that FMG's relatively high debt level may result in a credit rating that is lower than it otherwise would be. We therefore increase the customer credit rating by one notch to BB- and use this rating as the bottom end of the likely range.

143. CRA considered that the PCR may be a reasonable comparator for TPI's railway from the perspective that it is a single-line railway, but notes that the PCR:

> … has a more diverse source of traffic than TPI (PCR lower risk), but traffic for PCR is likely to be on an opportunistic basis whereas traffic for TPI is more likely to be under contract and, as we have noted, is an essential service for the mines serviced (TPI lower risk), We also note that PCR will not be facing the large level of capital expenditure currently required for establishing TPI's railway (PCR lower risk).

144. Considering all these factors, CRA considered that a BB benchmark credit rating is likely to be appropriate for TPI's railway.

145. CRA was of the view that the impact of credit rating and gearing are not highly correlated:

> A firm's credit rating reflects the riskiness of its debt and this is clearly a function of the riskiness of the firm's assets and its level of indebtedness. Furthermore, the riskiness of a firm's assets is the product of a number of factors including: industry; exposure to particular customers; firm size; and diversification. … all else being equal, higher indebtedness will lead to lower gearing. As a result, it is not possible to set out a deterministic relationship between rating and gearing.

146. CRA noted that its estimates of the equilibrium gearing at a BB credit rating are broadly consistent with the top end of the 10% to 15% range suggested by FMG, and recommends an equilibrium gearing ratio of 16.5% be used in conjunction with a BB credit rating.

147. CRA's view in its final report – that a BB credit rating and a debt proportion of 16.5% is appropriate for TPI's railway, differs from its draft report – that a BBB credit rating and a debt proportion of 28% to 32% is appropriate for TPI's railway.

Authority's Final Determination

148. In relation to the credit rating for TPI's railway, the Authority notes the comments from TPI(Synergies), which are generally supported by CRA, to the effect that the PCR is a good comparator for TPI"s railway and that on this basis TPI's railway should have a credit rating close to the BB rating of the PCR (B+ suggested).

149. The Authority does not consider the PCR to necessarily be a better comparator than those previously considered by CRA in its draft report as there are significant differences between the TPI and PCR railways, such as:

- The railway traffics are different (iron ore for TPI's railway compared with containers, general cargo and passengers on the PCR)

- The commercial and regulatory environments within which these railways operate is different.

- The tonnages of iron ore on TPI's railway are likely to be more certain than for the transport of containers on the PCR where the tonnages are more likely to vary based on a range of factors relating to international trade levels and shipping/port costs.

- TPI's iron ore transport contracts are likely to be based on longer term commitments than PCR's contractual arrangements for the transport of containers where, as noted by CRA, a certain amount of this traffic is opportunistic in nature.

150. For the above reasons, the Authority does not consider that the risk profile for TPI's railway is directly comparable with that of the PCR.

151. However, the Authority has noted the comments in the TPI(Synergies) and FMG submissions related to the particular nature of TPI's railway, being a single commodity greenfields railway in a remote location currently serving only one customer. The Authority considers that the BBB credit rating proposed in its draft determination may not properly reflect the above circumstances relating to TPI's railway in that the risk profile associated with this railway is likely to be less certain than would be implied under a BBB credit rating.

152. In the Authority's view, a credit rating of BBB- is appropriate for TPI's railway. Credit ratings below this level (BB+ and below) represent speculative grade ratings, based on CRA's advice, and attract very significant increases in debt funding costs compared to investment grade ratings (BBB- and above). The Authority does not believe that TPI's railway falls into the speculative grade credit rating category.

153. In relation to gearing, the Authority notes that the comments in submissions reiterated views previously expressed in response to the issues paper. These comments were considered under the draft determination.

154. Based on the Authority's revision of the credit rating from BBB to BBB- for TPI's railway, the Authority has given consideration to the debt gearing ratio of 35% previously proposed under the draft determination. In general, a lower credit rating reflects a reduced capacity to take on debt, relative to the company's asset value. Based on this view, the Authority has reduced the debt gearing ratio for TPI's railway to 30%. The Authority believes that this gearing ratio is more consistent with a credit rating of BBB-.

155. The Authority notes that, as a comparison, under its 2008 Freight and Urban Railways Determination, a credit rating of BBB+ with a debt gearing ratio of 35% was adopted for WestNet Rail.

Final Determination

156. Based on the available evidence, the Authority considers that an appropriate credit rating for TPI's railway is BBB- and an appropriate debt gearing ratio for this railway is 30 per cent.

Cost of Debt

Public Submissions on the Issues Paper

157. No public submission comments on the cost of debt were noted in the draft determination.

CRA's Draft Report

158. CRA calculated the cost of debt as the sum of the risk free rate of return, the estimated debt premium, and the estimated debt issuance costs.

159. The debt premium was calculated by CRA as the average premium for 10-year corporate bonds at a benchmark credit rating over the yield on 10-year Commonwealth Government bonds.

160. CRA noted that:

> The premium would ideally be based on observed premia. However, there are so few 10-year corporate bonds issued in Australia that it is necessary to either rely on a prediction model or to apply the premium for the closest benchmark reported by a source such as Bloomberg.

161. CRA further noted that:

> Bloomberg discontinued the 10-year BBB Corporate index for Australia in March 2008 due to insufficient issues, so it is not possible to directly observe the spread between a benchmark 10-year BBB Corporate bond index and the benchmark 10-year Commonwealth Bond.
>
> However it is possible to obtain information for the 10-year A-rated bond spread over the benchmark government 10-year bond from Bloomberg together with 8-year A and BBB-rated indices for Australian corporate bonds. Using this data the spread for a 10-year BBB-rated Corporate bond can be approximated using the following formula:
>
> Spread = (8-year BBB Corporate – 8-year A Corporate) + (10-year BBB Corporate – 10-year Government benchmark)
>
> From the data available on Bloomberg, the average over the 20 trading days to 2 December 2008 was
>
> - 8.41bps for the spread between BBB and a-rated corporate 8 year Australian corporate bonds; and
> - 291.84bps for the spread between A-rated 10-year Australian corporate bonds and the benchmark 10-year Australian government bonds.
>
> Adding these two spreads together, we arrive at an average spread of 300.24bps.
>
> It should be noted that comparably rated bonds in the US seem to have higher spreads for both A and BBB-rated bonds of similar maturity. We use the approach recommended by the Authority and use 300.24bps as the debt premium above risk-free rate for TPI's hypothetical cost of debt.

162. CRA also noted alternative methods used to calculate debt premium:

> For the 2008 Freight and Urban Railways Determination the Allen Consulting Group (ACG) utilised the predictions generated by Bloomberg and by CBASpectrum, and

adjusted those predictions to reflect average differences compared with actual data.[23]

An alternative approach used by the Victorian Essential Services Commission is to apply the premium for benchmark Australian corporate 8-year bonds.

It is also possible to draw conclusions from the levels of spreads internationally and not just in Australia.

Authority's Draft Determination

163. Regulators typically establish a value of the debt premium from capital market data on yields on corporate bonds consistent with benchmark assumptions for the capital structure and credit rating of the regulated business or activity.

164. Debt margins are typically estimated from Bloomberg and CBASpectrum financial data services.[24] Data from both services indicates that debt margins rose substantially in late 2007 and early 2008 in conjunction with the tightening of global credit markets.

165. Bloomberg and CBASpectrum use different methods to calculate the debt margin. The majority of regulators now accept that while CBASpectrum provides a reasonable estimate of shorter term investment-grade bonds (A rated bond), CBASpectrum is likely to under-estimate yields of longer term (10 years) lower-rated (BBB and BBB+) corporate bonds. In recent decisions, regulators have either added a point spread to CBASpectrum yield,[25] or have exclusively used the Bloomberg yields for lower-rated corporate bonds.[26]

166. At present, Bloomberg is not publishing predictions of fair value yields on nine and ten-year BBB rated corporate bonds in Australia due to a lack of the bonds in the market. Due to the unavailability of the Bloomberg fair yields for BBB rated 10-year corporate bonds, it is necessary to adopt an alternative proxy for deriving a 10-year BBB benchmark debt risk premium.

167. The AER found that using the Bloomberg A fair yield approach provided the best estimate of Bloomberg BBB fair yield when compared to other methods such as using the Commonwealth Government Security (**CGS**) 8 and 10-year spread, or using CBASpectrum data.[27]

168. In recent decisions, the AER and ACCC have used the 8-year Bloomberg BBB fair yield plus the yield spread between 8 and 10-year BBB benchmark.[28]

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[23] ACG (2007) Railways (Access) Code 2000: Weighted Average Cost of Capital, 2008 WACC Determinations, Report to the Economic Regulation Authority, October, pp. 20-21.

[24] Allen Consulting Group, 25 January 2008, Gas Access Arrangement Review 2008: updating estimates of debt margin for 20 trading days to November 2007 and December 2007, Memorandum to the Essential Services Commission.

[25] See for example, Queensland Competition Authority, 2006, Revised Access Arrangement for Gas Distribution Networks: Allgas Energy, Final Decision.

[26] See for example:

ACCC 2008, Final Decision: Revised access arrangement by GasNet Australia (Operations) Pty Ltd and GasNet (NSW) Pty Ltd for the Principal Transmission System, 25 June 2008;

AER (2008) Final Decision: SP AusNet Transmission Determination 2008-09 to 2013-14, January 2008.

[27] AER 2008, Final Decision: SP AusNet Transmission Determination 2008-09 to 2013-14, 31 January 2008.

[28] See for example:

169. The Authority considered that the method used by the AER/ACCC is currently the most rigorous for estimating yields for BBB bonds.

170. Using the 8-year Bloomberg BBB fair yields plus the yield spread between 8 and 10-year Bloomberg A fair yields (to replicate a 10-year BBB benchmark) – averaged over the 20 trading days to 20 December 2008 – the debt margin in estimated to be 295 basis points.

Draft Determination

171. Based on the above, the Authority applied a debt margin of 295 basis points.

Public Submissions on the Draft Determination

172. TPI(Synergies) agreed with the approach taken by the Authority in determining the debt margin but believed that the appropriate credit rating in determining the debt margin for TPI is B+ rather than BBB as applied by the Authority.

173. TPI(Synergies) used the spreads in credit ratings from the US but also recognised that:

> Inferring information from US spreads and applying to Australian market data clearly presents challenges yet there is no better alternative given the absence of an Australian data source. In any case, we are of the view that the US market data would almost certainly understate the cost of raising speculative grade debt in Australia, given there is significantly more liquidity and depth in the US market.

174. TPI(Synergies) noted a significant difference between spreads on investment grade and speculative grade debt particularly evident in the current market environment.

> Standard and Poor's data (from early September) suggests that the spreads on speculative grade bonds have widened to 796 points in the US, compared to 283 basis points for investment grade … the difference between investment grade and speculative grade was around 200 points one year ago.

175. TPI(Synergies) pointed out that a BBB rating would result in spreads of around 300 basis points, on average from December 2008 to the present; and that the spreads incurred by FMG were more than 1,000 basis points greater than this. TPI(Synergies) has estimated a debt margin of 634 basis points for TPI, based on the yearly average spread between a BBB bond and the risk free rate as at 31 December 2008 of 294 basis points and the estimated yearly average spread between 10-year US BBB and B rated bonds of 340 basis points.

176. FMG argued that the actual gearing and credit rating are appropriate proxies for benchmark measures and notes that the current cost of debt is running at 11.87% and the inclusion of a figure lower than this would, in effect, be requiring Fortescue to subsidise access seekers.

CRA's Final Report

177. In addressing the point raised by FMG regarding the use of FMG's actual cost of debt, CRA argued that:

AER 2008, Final Decision: SP AusNet Transmission Determination 2008-09 to 2013-14, 31 January 2008; AER 2008, Final Decision: ElectraNet transmission determination 2008-09 to 2012-13, 11 April 2008.

> ... it is always correct to use the market rate of interest rather than a historical rate. … Just as market values are used for calculating the cost of equity, market values should also be used for calculating the cost of debt. If FMG "marked to market" the book value of its debt, then it would observe that its true cost of debt varied as market interest rates varied. The historical weighted average of 11.87% is therefore not a meaningful number for inclusion in the calculation of WACC and would instead at the very least have to be adjusted to reflect changes in market interest rates.

178. CRA noted that:

> There are so few 10-year corporate bonds issued in Australia that it is necessary to either rely on a prediction model or to apply the premium for the closest benchmark reported by a source such as Bloomberg.

179. CRA further noted that there are insufficient Australian corporate bond issues at most of the credit ratings in the BBB and BB ranges to have a benchmark index developed or published. As a result, CRA uses the spreads on US corporate bonds as a proxy for the spreads on Australian corporate bonds. More specifically, CRA develops a proxy for the 10-year BB rated corporate bond by adding

> … (a) the spread between 10-year BB and A rated US corporate bonds to (b) the spread between 10-year A rated Australian corporate bonds and 10-year Australian government bonds.
>
> …
>
> The same approach is adopted for each other credit rating of interest.

180. CRA's final report shows the debt premia (as at 29 May 2009) that correspond to credit ratings between BB- and A. This table is reproduced below.

Table 2: Calculation of Debt Premium on Australian Corporate Bonds for Selected Credit Ratings (as at 29 May 2009)

	Bond Rating						
	BB-	BB	BB+	BBB-	BBB	BBB+	A
US Spread to A Corporate (%)	4.2768	4.2524	4.1266	2.2721	1.3873	1.2917	
Spread between AUS A Corporate and Govt Bond (%)	2.5182	2.5182	2.5182	2.5182	2.5182	2.5182	2.5182
Total Spread (%)	6.7950	6.7707	6.6448	4.7904	3.9056	3.8100	2.5182
Debt Premium (bps)	679.50	677.07	664.48	479.04	390.56	381.00	251.82

181. CRA explained that the large increase in premium from a BB+ to a BBB- credit rating is due to the large increase in default risk that occurs when moving from investment grade (BBB- and above) ratings to speculative grade (BB+ and below) ratings.

> … the ten-year default rates show that by the end of ten years, 5.16% of BBB rated issuers and 16.02% of BB rated issuers will have defaulted. Over ten years the default risk is thus 3.1 times higher for BB rated debt than for BBB rated debt.

Market interest rates reflect a premium for the increased default risk of lower-grade debt, and also reflect the effect of higher demand for investment-grade securities due to restrictions on the type of securities that some institutions (such as US banks and pension funds) are able to invest in.

182. The debt margin applied in CRA's final report is based on a credit rating of BB, and not the credit rating of BBB applied in CRA's draft report.

Authority's Final Determination

183. As mentioned in the previous section on financial structure and credit rating, the Authority considers a BBB- credit rating to be appropriate for TPI's railway.

184. The Authority considers that the risk profile in the US corporate bond market is different to the risk profile in the Australian corporate bond market and as such has chosen not to rely on the debt margins calculated using yields on US corporate bonds.

185. However, the Authority considers that the relationship between yields on various credit ratings can be applied across markets. For example the ratio of the spreads between (a) 10-year US BBB- corporate bonds and 10-year US A corporate bonds and (b) 10-year US BBB corporate bonds and 10-year US A corporate bonds, would be similar to the ratio of the spreads between (a) 10-year AU BBB- corporate bonds and 10-year AU A corporate bonds and (b) 10-year AU BBB corporate bonds and 10-year AU A corporate bonds.

186. Therefore the Authority has applied the following formula in calculating the debt margin for a BBB- credit rating in Australia.

Dividing

1) the spread between 10-year US BBB- corporate bonds and 10-year US A corporate bonds, by

2) the spread between 10-year US BBB corporate bonds and 10-year US A corporate bonds,

a ratio of 1.6378 is obtained.

This ratio is then applied to the spread between 10-year AU BBB corporate bonds and 10-year AU A corporate bonds to obtain an estimate of the spread between 10-year AU BBB- corporate bonds and 10-year AU A corporate bonds.

187. Data for AU Corporate Bonds and 10-year Commonwealth Government Securities are obtained from Bloomberg and are shown in Table 3.

Table 3: Data obtained from Bloomberg

Date	10Y CGS (GACGB10 Index)	10Y A Corporate Bond (C35910Y Index)	8Y A Corporate Bond (C3598Y Index)	8Y BBB Corporate Bond (C3568Y Index)	7Y BBB Corporate Bond (C3567Y Index)
20090504	4.695	7.4286	7.3964	7.9406	7.8954
20090505	4.815	7.5587	7.5181	8.02	7.9749
20090506	4.782	7.5195	7.4895	8.0363	7.9938

20090507	4.903	7.5635	7.5491	8.0981	8.0585
20090508	4.967	7.6294	7.6202	8.1823	8.1408
20090511	4.922	7.4876	7.4811	8.1506	8.1067
20090512	4.93	7.3909	7.3822	8.2067	8.1599
20090513	4.924	7.4149	7.4122	8.1541	8.1079
20090514	4.876	7.37	7.3729	8.1683	8.1226
20090515	4.867	7.3022	7.3056	8.1582	8.1134
20090518	4.856	7.3187	7.3225	8.11	8.0661
20090519	4.989	7.4505	7.4607	8.1455	8.108
20090520	5.066	7.5242	7.5332	8.2228	8.1917
20090521	5.108	7.556	7.5658	8.2325	8.1933
20090522	5.207	7.6239	7.629	8.3415	8.3135
20090525	5.268	7.7105	7.7065	8.3809	8.3451
20090526	5.218	7.6697	7.6618	8.3734	8.3376
20090527	5.381	7.8116	7.7946	8.5057	8.4627
20090528	5.361	7.7223	7.7063	8.442	8.3989
20090529	5.279	7.7258	7.7102	8.4674	8.4221
Average	**5.0207**	**7.538925**	**7.530895**	**8.216845**	**8.175645**

188. The 10-year AU BBB corporate bond yield is estimated by using a linear extrapolation of fair value yield estimates for 7-year AU BBB corporate bonds and 8-year AU BBB corporate bonds. Yields for the 7-year and 8-year AU BBB corporate bonds are averaged over the 20 trading days to 29 May 2009, as shown in Table 3.

189. Based on the above, the estimated yield for 10-year AU BBB bonds is 8.299245 (i.e. 8.216845 + 2*(8.216845 - 8.175645)).

190. The spread between the estimated 10-year AU BBB rated bonds and 10-year AU A rated bonds is 0.76032 (i.e. 8.299245 – 7.538925). Therefore, the estimated spread between 10-year AU BBB- rated bonds and 10-year AU A rated bonds would be 1.2453 (i.e. 1.6378*0.76032).

191. The spread between the 10-year AU A Corporate bond and the 10-year CGS is 2.5182 (i.e. 7.538925 – 5.0207).

192. The estimated debt margin for a credit rating of BBB- is therefore 3.7635 (i.e. 2.5182 + 1.2453).

Final Determination

193. Based on a credit rating of BBB-, the Authority has applied a debt margin of 376.35 basis points.

Debt Issuance and Equity Raising Costs

Public Submissions on the Issues Paper

194. No public submission comments on debt issuance and equity raising costs were noted in the draft determination.

CRA's Draft Report

195. CRA noted that:

> For the 2008 Freight and Urban Railways Determination, ACG recommended that the Authority adopt an allowance for debt issuance costs of 12.5bp. The Authority also adopted this value in its final determination.

196. CRA's view was that it is appropriate to include an allowance for initial debt raising costs for TPI's railway. The debt raising costs could be included either as a mark-up on the cost of debt (as a cash-flow item) or capitalised into the asset base.

197. CRA's considered there is reasonable argument for capitalising the initial debt raising costs as these costs are incurred in railway construction and for provision of the railway over a long time horizon.

Authority's Draft Determination

198. Regulators typically use a benchmark to set debt and equity raising costs.

> The AER considers that using a benchmark approach is likely to ensure that incentives relating to debt and equity raising costs are consistent with the benchmarking approach to estimate the WACC parameters (such as gearing) … benchmarks also ensure customers do not bear the costs associated with inefficient financing decisions.[29]

199. Australian regulators have generally included equity raising costs as an allowance in the regulatory asset base or as an operating expenditure allowance. Jurisdictional regulators have consistently fixed debt raising costs at 12.5 basis points while the ACCC and the AER have used a sliding scale of debt raising costs.[30]

200. In the Authority's 2008 Freight and Urban Railway WACC Determination, an addition to the debt margin of 12.5 basis points was made as an allowance for the costs of raising debt finance.

Draft Determination

201. The Authority considered that an allowance of 12.5 basis points is an appropriate adjustment for the costs of raising debt finance.

202. The Authority considered that an allowance for equity raising costs, if appropriate, should be considered as a capitalised cost in the regulatory asset value and not as a component of the WACC.

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[29] AER 2008, Issues Paper: Review of the weighted average cost of capital (WACC) parameters for electricity transmission and distribution.

[30] AER 2008, ibid.

Public Submissions on Draft Determination

203. HPPL supported the Authority's approach of including the cost of equity raisings in TPI's asset base in the future, if appropriate. HPPL also noted that there is a general agreement that 12.5 basis points be used as an allowance for the cost of raising debt.

204. NWIOA supported the draft determination to capitalise equity raising costs within the regulated asset value and is of the opinion that if this did not occur, and subsequent decisions require reincorporation into the regulated asset value, regulatory issues may arise.

CRA's Final Report

205. CRA reiterated the points made in its draft report regarding debt raising costs and continued to support the use of 12.5 basis points as an allowance for debt issuance costs as in its draft report.

Authority's Final Determination

206. The Authority notes that submissions generally support the Authority's position, as outlined in its draft determination.

207. The Authority confirms its position on debt issuance and equity raising costs as set out in the draft determination.

Final Determination

208. The Authority confirms its position as outlined in the draft determination, that:

- An allowance of 12.5 basis points is an appropriate adjustment for the costs of raising debt finance.
- An allowance for equity raising costs, if appropriate, should be considered as a capitalised cost in the regulatory asset value and not as a component of the WACC.

Debt Beta

Public Submissions on the Issues Paper

209. No public submission comments on the debt beta were noted in the draft determination.

CRA's Draft Report

210. CRA reviewed recent studies on debt betas. The average value of the debt beta for bonds with a BBB rating was estimated to be 0.04. Given a standard deviation of 0.025, this suggested a debt beta range of 0.015 to 0.065 (one standard deviation either side of the mean).

Authority's Draft Determination

211. The debt beta attempts to measure the systematic risk borne by debt holders (the extent to which the likelihood of the company defaulting on its debt obligations is correlated with movements in market returns).

212. There are three common approaches to estimating the debt beta:

- assume that the debt beta is either zero or a point estimate of 0.2 or less;
- estimate the debt beta using the structure of the CAPM; and
- consider the systematic risk component of the company's debt.

213. The margin that a borrower has to pay primarily reflects three types of risk:

- default premium (credit risk of the borrower);
- liquidity premium (compared to government bonds); and
- uncertainty premium.

214. A key issue in applying a CAPM-based approach to estimating the debt beta is that the main driver of the debt margin is default risk, much of which is non-systematic in nature. The CAPM method then delivers an over-estimate of the systematic component of debt risk.

215. In practice, the relationship between the cost of debt and the systematic risk is likely to be non-linear (i.e. the additional margin for default risk increases at an increasing rate relative to the level of gearing).

216. Davis (2005) estimated debt betas on traded bonds and found they tended to fall between 0.1 and 0.2.[31] The systematic risk of debt is typically considered to be relatively small. IPART notes that 'the risk involved in debt securities is the default risk'. The issue of debt beta is important for businesses that are net lenders, i.e. with large amounts of capital invested in debt securities. Given that the regulated utilities invest little in debt instruments, the debt beta is likely to be small.[32]

217. Consistent with common market practice, the majority of regulators in Australia and internationally (e.g. United Kingdom) apply a debt beta of zero in regulatory determinations.

218. The Queensland Competition Authority (**QCA**) has previously noted that the turbulence in financial markets has resulted in a significant increase in the debt margin. If the debt beta is derived via the CAPM, this in turn would imply a significant increase in the debt beta and a significant increase in the systematic risk of debt. However, increases in debt margins are primarily due to perceived increase in default risk, much of which is non-systematic in nature. Deriving a debt beta via the CAPM would then overstate the true systematic debt risk.[33]

[31] Davis, K. (2005) 'The Systematic Risk of Debt: Australian Evidence', Australian Economic Papers, 44 (1), pp. 30-46.

[32] IPART 2002, Weighted Average Cost of Capital: Discussion Paper DP56.

[33] QCA 2008, QR Network Access Undertaking (2009).

219. The QCA is one of the few regulators that consistently apply a positive debt beta value. QCA notes that given the CAPM method overstates the estimate of systematic risk, QCA selects a mid point debt beta value (0.1) being between zero and the CAPM estimate of the debt beta (historically around 0.2).

220. Although the debt beta may have a small positive value – assuming a debt beta of zero may therefore be incorrect – the precise value adopted for the debt beta makes little difference to the estimated equity beta, as long as the same value is used to unlever/re-lever the beta.[34]

221. The Authority noted that although the value of the debt beta is likely to be non-zero, the likely magnitude of debt beta is likely to be small and difficult to measure precisely. In addition, the point value adopted for the debt beta makes little difference to the preciseness of estimated equity beta, as long as the same value of debt beta is used to unlever/re-lever the beta.

222. Rather than arbitrarily assuming a low value for the debt beta, recent regulatory decisions (both in Australia and overseas) have set debt beta to zero. This is consistent with common market practice.

Draft Determination

223. Based on the above discussion, the Authority considered that an appropriate value for debt beta is zero.

Public Submissions on the Draft Determination

224. HPPL noted that the case for a small positive debt beta exists but this has not developed to the point where it could provide a better estimate. HPPL agreed that the best estimate for the debt beta is zero and that Authority's position is a pragmatic response.

CRA's Final Report

225. CRA's pointed out that the reason debt beta is routinely assumed to be zero by regulator authorities around the world is that even a significant large positive debt beta will have no material effect on either the equity beta or the WACC if the debt beta is consistently applied in the de-levering and re-levering calculations.

226. CRA adopted a debt beta of zero in its calculation of TPI's WACC, which is the lower bound of the debt beta range (0 to 0.1) adopted in its draft report.

Authority's Final Determination

227. The Authority considers that its position on the debt beta as set out in its draft determination is appropriate.

[34] Australian Competition and Consumer Commission 2004, Decision: Statement of Principles for the Regulation of Electricity Transmission Revenues – Background Paper, December.

Final Determination

228. The Authority confirms its position as outlined in the draft determination, that an appropriate value for the debt beta is zero.

Systematic Risk (Beta)

Public Submissions on the Issues Paper

229. Public submission comments on the issue of systemic risk were noted in the draft determination from TPI(Synergies).

230. Key points outlined by TPI(Synergies) were as follows:.

> Given the extent of TPI's dependence on the risk profile of the mining ventures it has been built to service, we are of the view that it is not appropriate to assess its beta by comparing it to other rail transport businesses.
>
> We cannot identify any ways in which (or reasons why), TPI's systematic risk would differ from the systematic risk of FMG's iron ore business … Even if the new junior miners come on stream, their contribution to revenues, and hence TPI's risk profile, will be relatively minimal. The only way this could change is if a significant third party user obtained access to the railway, and only then if such entry has an impact on systematic risk.
>
> This assessment is not dependent on the relationship between TPI and FMG but is reflective of FMG as an emerging mining company.
>
> The two key WACC inputs that are driven by the risk profile of the business are beta and capital structure … we have assessed these parameters with sole reference to other iron ore businesses including FMG … This assessment is contingent on FMG being the dominant customer.
>
> Few mining companies have credit ratings and most have very low gearing levels. FMG does have a rating, and is currently rated B- … We are therefore of the view that the efficient benchmark firm with this risk profile is likely to be rated speculative grade. This therefore warrants the inclusion of an additional margin to reflect the difference between the cost of debt for a BBB and B rated issuer.

231. TPI(Synergies) used observed equity betas for a comparator sample of five Australian iron ore producers, including FMG. The equity betas were de-levered to produce an average asset beta for the comparator sample of 1.85, with TPI proposing that this is an appropriate asset beta for their business. An assumed gearing of 10 per cent, together with a zero gamma and debt beta resulted in TPI determining an equity beta of 2.05 for the business.

CRA's Draft Report

232. CRA reviewed and provided comments on the submissions, noting that there was:

> … generally little comment on the beta that should be employed for the TPI railway, Hancock supports the use of QRs[35] coal network as a suitable comparator as the nature of the traffic means that QR's network embodies similar systematic risk characteristics to TPIs railway. ARTC considers that TPIs systematic risk is strongly linked to the iron-ore mining industry rather than general rail, and the beta should

[35] Queensland Rail.

> reflect this. ARTC suggests that an appropriate asset beta would be in the range of 0.5-0.6 which is slightly lower than the asset beta of 0.65 applied by the ACCC for ARTC's interstate network.

233. CRA further noted that the submissions:

> … provide some support for the proposition that the appropriate beta is the beta for mining in general, and iron ore mining in particular, rather than a beta that is generally related to infrastructure or to railways.

234. CRA was unable to find any direct comparators for TPI's railway. CRA noted that:

> … this is because single-use railways are generally part of a larger firm, whether as part of a firm that owns and operates multiple railroads or as part of a firm that uses or produces the commodity transported. As a result, we were not able to identify any single-use railways on any stock market. There are also no firms in other industries that provide a direct comparator.
>
> One option is to estimate the beta for an infrastructure firm based on the betas of freight railroads in Canada and the United States, and on marine ports. We have selected these firms as comparators because they are focussed on the transportation of freight. However, the large and diversified nature of the firms may mean that their betas are lower than the betas that might apply to a relatively small single-use railroad. Weighting the asset betas by total enterprise value, this suggests an asset beta of 0.69 if the debt beta is zero, and an asset beta of 0.72 if the asset beta is 0.1. Due to the much larger value of the Canadian and US freight railroads, these asset beta estimates are essentially identical to the betas of the freight railroads alone. The asset beta estimates are those that might apply to a general freight railroad such as WestNet.
>
> Another option is to rely on the beta of Genesee & Wyoming Inc (**GWI**), which owns, leases, and operates a total of 48 regional short-line railroads. GWI is the sole estimate that we have for shortline railroads, and the portfolio of railroads owned by GWI mean that it is in some ways representative of the "short line railroad" industry. GWI has an asset beta of 1.02 if the debt beta is zero, and an asset beta of 1.04 if the debt beta is 0.1. However, GWI also has considerable diversity across industries served, and across regions, so again it might not provide a particularly good comparator for TPI. In addition, the practice of relying on the beta for a single firm is usually discouraged because the high errors inherent in beta estimates mean that a single beta estimate may have significant inaccuracies.
>
> Our view is that there is likely to be some sharing of risk between mines and an independent railway that was serving those mines. As a result the asset beta for such a railroad would lie somewhere along a continuum between the asset beta for a diversified freight railroad and the asset beta for mining. Exactly where the beta might lie is a matter of judgement. A weighted average across both infrastructure and mining-related firms provides an asset beta estimate of 0.77 if the debt beta is zero, and 0.79 if the debt beta is 0.1.

235. The equity/asset betas for railroads, infrastructure and mining businesses are presented in CRA's report. The equity betas and estimated asset betas (with zero debt beta) for the eight sampled US and Canadian freight railways are detailed below.

Table 4 Beta Estimates for US and Canadian Freight Railways

Company Name	Debt/Equity	Equity Beta	Asset Beta
Kansas City Southern	1.02	1.50	0.75
Genesee & Wyoming Inc	0.28	1.37	1.07

CSX Corp.	0.5	1.12	0.76
Union Pacific Corp.	0.28	0.97	0.76
Norfolk Southern Corp.	0.36	1.05	0.77
Burlington Northern Santa Fe Corp	0.31	0.88	0.68
Canadian Pacific Railway Limited	0.73	0.91	0.53
Canadian National Railway Company	0.30	0.68	0.52
Total	0.37		0.69

236. Across infrastructure firms (railway and ports), CRA estimated the weighted average asset beta to be 0.69, resulting in an equity beta of 0.96 (with 28 per cent gearing and zero debt beta). This compares to an asset beta of 0.77 for both infrastructure and mining-related firms, resulting in an equity beta estimate of 1.12 (32 per cent gearing and zero debt beta).

Table 5 Average Gearing and Beta Estimates

Sector	Debt Gearing	Equity Beta	Asset Beta
Infrastructure (Railways and Ports)	0.28	0.96	0.69
Infrastructure and Mining	0.32	1.12	0.77

Authority's Draft Determination

237. 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' 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 holder the assets as part of a diversified portfolio of asset.

238. Asset betas (non-observable) can be derived from the combination of observed equity betas and the level of gearing for the respective companies. The Monkhouse formula is the most common approach applied by Australian regulators for the de-levering and levering process.

239. Observed equity betas are converted into estimated asset bases by removing the effect of leverage ('de-levering'). The result is an estimate of the asset beta of the firm as if it had zero debt gearing. The asset beta is then re-levered by the appropriate benchmark gearing to derive a re-levered equity beta.

240. For TPI's WACC determination, the equity beta could be derived from:

- the calculated average asset betas of suitable comparators; or
- an asset beta value in the range associated with comparator businesses.

241. The Authority could also adopt an equity beta value, taking into account the particular characteristics of TPI's railway and the associated level of risk. This 'first principles' approach requires a judgement on the sensitivity of TPI's returns to movements in economy/market.

242. In comparison to TPI's proposed asset beta, other regulatory rail determinations have set an asset beta of 0.55 (equity beta 1.28/60 per cent gearing) in relation to the Alice Springs to Darwin rail line and an asset beta of 0.6 (equity beta 1.29/50 per cent gearing) in relation to the ARTC interstate network.[36] In the current IPART Hunter Valley Review, ARTC have proposed an asset beta in the range of 0.5 to 0.6.[37]

243. The systematic risk of an infrastructure owner does not directly equate to the systematic risk of its customers, given it is also dependent on a number of other factors, including the nature of the contractual arrangements between the infrastructure owner and customers. The Authority has consistently rejected the argument that the systematic risk of an infrastructure owner necessarily reflects the customer base.[38]

244. The eight sampled US and Canadian railways are commonly used by regulators as potential comparators for Australian freight railways. However, there are few comparable companies for the nature of the risk faced by TPI's bulk iron ore traffic. The Authority accepts that while a number of comparators (e.g. listed rail infrastructure businesses in the US and Canada) may be appropriate comparators for most Australian regulated railways, as noted by CRA, there are a number of reasons why they not be appropriate comparators for TPI.

245. The Authority noted that amongst the comparators, Genesee & Wyoming Inc. (**GWI**) is likely to be the best comparator for a short-line railway, notwithstanding that GWI has significantly greater diversity than TPI. GWI has the highest asset beta (1.07) of all the comparator railways. Unlike the other railway comparators, GWI derives around 30 per cent of its operating revenues from overseas assets (primarily Australia and Canada). The Australian Wheat Board (**AWB**) is GWI's largest single freight customer, contributing around 17 per cent of GWI's operating revenue. GWI notes that the revenue from AWB is sensitive to seasonal conditions, while the level of revenue from overseas operations increases the company's exposure to exchange rate risks.[39]

246. CRA used observed weekly equity beta data over a 5-year period (ending November 2008) to estimate the associated asset betas. For the purposes of comparison, the Authority compared the shorter-term US data to CRA's results. For three of the US railways, namely GWI, CSX and Burlington, from mid-2006 to mid-2007 the observed equity betas were significantly higher than the long-term trend. Using data from June 2007 to November 2008, the betas for the three companies would be around 12 per cent lower than those detailed by CRA. As an

[36] ESCOSA 2008, Rail Industry (TarcoolaDarwin) Guideline No. 2, Arbitrator Pricing Requirements, ACCC 2007 ARTC Interstate Access Undertaking.

[37] ARTC 2008, op. cit.

[38] ERA 2008, op. cit.; ERA 2004, Amended Draft Decision on the Proposed Access Arrangement for the Goldfields Gas Pipeline, July 2004.

[39] GWI 2007, Annual Report.

example, GWI would have an estimated equity beta of 1.22 and an asset beta of 0.95.

247. In its recently released paper, the AER commented on the use of overseas comparators in the setting of benchmark equity betas.

> The AER recognises that differences between market gearing and cross sectoral weights are but two of the many limitations that the United States (or other foreign equity betas) has when comparing equity or equity beta estimates to Australia. The AER notes that differences in the regulation of businesses, the regulation of the domestic economy, geography, business cycles, weather and a number of other different factors are likely to result in differences between equity beta estimates for firms in similar industries but different countries. Therefore, the AER will be exercising extreme caution when examining foreign beta estimates for the purposes of setting a benchmark efficient equity beta.

248. The Authority noted that while asset and equity beta values provide some guidance on a reasonable range, estimated equity and asset betas are also very sensitive to the estimation methodology and the selected period. In 2002, ESCOSA estimated the asset betas for US railways, with the sample including the majority of comparators assessed by CRA. At that time, the asset betas were significantly lower, with for example, GWI and CSX having asset betas of 0.4 and 0.34 respectively.[40] In the current IPART Hunter Valley Review, the average asset beta for the eight US and Canadian railways was estimated at 0.83 (de-levered from an average debt gearing of 48 per cent).[41]

249. Given the available evidence, there does not appear to be appropriate comparators for TPI's railway which would be used by the Authority to directly estimate an asset or equity beta for this railway with a reasonable level of confidence. As such, the Authority has been required to make an assessment of a suitable asset beta for a benchmark (efficient) railway owner.

250. The Authority noted that a single commodity railway in a remote location that exclusively serves mining-related export demand is likely to have a higher associated level of risk than a diversified inter-modal (container) or general freight railway.

251. On the available evidence, the Authority considered that an appropriate asset beta for TPI's railway would be higher than the average for the overseas railway comparators (0.69 in the current sample) or the Australian regulated freight railways (typically in the range of 0.5 to 0.65).

252. The Authority considered that an asset beta value in the range of 0.7 to 1 would be reasonable for TPI's railway. Given the particular circumstances of TPI's railway (remote railway with a single mining commodity), the Authority considered that an asset beta at the higher end of this range would be more appropriate. On balance, the Authority considered that an asset beta of one is appropriate for TPI's WACC determination.

253. Based on an asset beta of one and gearing of 35 per cent, the estimated TPI equity beta would be 1.54.

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[40] ESCOSA 2002, Tarcoola-Darwin Railway: Regulated Rates of Return – Draft Determination October 2002.

[41] IPART 2008, op. cit.

254. In comparison, the equity beta set for WNR in the Authority's 2008 Freight and Urban Railway WACC Determination (also a 35 per cent gearing level) was one. The higher equity beta for TPI reflects the relatively higher risk associated with a remote single commodity railway.

Draft Determination

255. Based on the above discussion, the Authority's view was that the cost of equity for TPI should be determined on the basis of an equity beta value of 1.54, at a debt gearing of 35 per cent.

Public Submissions on the Draft Determination

256. HPPL argued for an asset beta of 0.44 to 0.5 based on the Hunter Valley and Queensland Rail networks and noted that:

> While not as remote as the Pilbara, both rail systems are hardly metropolitan in nature and would seem to still seem to be reasonable comparisons. We could accept that TPI may be seen as being at the high end of the Australian examples but would find it difficult to see that it should be at the high end of the US/Canada examples. Then to add in a large premium for the "particular circumstances" by going from an equity beta of 0.7 to 1.0 is even more difficult to understand.

257. In addition, HPPL was of the view that TPI's railway was built and economically justified to carry iron ore from FMG's mines to FMG's port facilities at Port Hedland and even if there was no third party traffic the railway would still have been built. HPPL argued that on this basis the third party use is extra revenue that is above that required to justify the building of the railway and entails no risk. HPPL further argues that:

> On this argument alone it is hard to see why TPI should be somehow rewarded for building the railway by having a beta that is higher than other heavy haul railways in Australia and therefore be able to gain more revenue from third parties use of the rail.

258. HPPL suggested the Authority reconsider its position and, at the highest, allow an equity beta of 0.5 at the top end of the range. HPPL further suggests that:

> If the ERA is not inclined to this position, we would argue that there is no case for an equity beta of 1.0 and the ERA should be satisfied that lower end of its range ie an equity beta of 0.7 is appropriate to the TPI railway. This is above the highest equity beta of the regulated railways in Australia and well above the equity beta we believe is appropriate.

259. While FMG agreed that the systematic risk of an infrastructure owner does not directly equate to the systematic risk of its customers, TPI(Synergies) pointed out that FMG Chichester is the only customer that TPI currently has (ignoring Atlas as its contractual relationship is a temporary arrangement) and therefore TPI is not able to rely on a range of customers to diversify the risk.

260. FMG also argued that:

> Similarly iron ore is the only product likely to be transported so there is no ability to diversify risk through transporting a variety of different products (with different demand cycles). Moreover, whilst there are assertions made by third parties about the large amount of Mineral Resources that represent latent demand for transport services – it is important to distinguish between Mineral Resources, which merely attest to the existence of iron molecules in the ground, and Ore Reserves which attest to the commercial viability of extracting the ore from the ground and selling it.

261. FMG believed that:

> To the extent that it is equity in Fortescue that supports the capital investment in the infrastructure that asset seekers will require access to, the cost of equity to TPI is the cost of equity to Fortescue. With TPI effectively exposed to the same risk as Fortescue, TPI should be considered to have the same asset beta as Fortescue, namely 2.14 – see Synergies WACC Draft Determination Response – [p.23]. This asset beta combined with the average gearing for Fortescue over the past 5 years, namely 30.5% - see Synergies WACC Draft Determination Response – [p.24], would give an equity beta of 3.08.

262. In addition, FMG argued that:

> Most damaging to TPI's interests is the unwarranted assumption of a contractual relationship between FMG Chichester and TPI that transfers risk from TPI to FMG Chichester. Without that assumption TPI's risk profile becomes Fortescue's risk profile and an asset beta of 2.14 becomes clearly warranted. In contrast the ERA has chosen to adopt an asset beta of 1.0 which is below the best comparator (GWI; which is clearly less risky than TPI). The compromise suggested by Synergies, namely an asset beta of 1.85 would be an acceptable compromise although TPI remains of the view that the figure of 2.14 should be used.

263. FMG continued to maintain that the correct asset beta to be employed should be its asset beta but accepts that the compromise figure of an asset beta of 1.85 suggested by TPI(Synergies) represents a reasonable balance.

> If one were to attempt to adjust for the lower level of risk associated with TPI's operations, in spite of the fact that there has been no contractual apportionment of risk between the two entities, then the bottom of the range being considered should be well above the asset beta recorded for Fortescue, we would expect the compromise to be far closer to the top of the range than the bottom.

264. NWIOA did not disagree with submissions to the Authority indicating the beta range may be above that of a general freight railway, however consideration of key factors underpinning demand for Australian exports, and the lower demand volatility for iron ore over a longer time horizon suggest the beta should not be at the highest end of the range.

265. NWIOA requested that the Authority review the beta range determination taking into account coal comparators. NWIOA believed that from an economic demand viewpoint, both coal and iron ore are similarly linked to the demand for steel and hence have similar risks.

266. In particular, NWIOA requested that the Authority review its setting of the beta at the high end of the range (i.e. at 1.0). NWIOA notes that Professor R. G. Bowman observed extreme inaccuracy in asset betas estimation in reviewing the reports prepared by the Allen Consulting Group on proxy betas commissioned by the QCA and recommended that:

> … comparisons be done over a long time frame, the forward view be over a lengthy time horizon and that regulators choose a WACC value from the 75th percentile of the range (as a lower percentile may lead to underinvestment).

267. TPI(Synergies) believed that single commodity businesses servicing one customer would result in the systematic risk of the business being similar to the business that it is servicing and that TPI effectively is an extension of the operations of FMG:

> The operations of the two businesses are so closely linked in this situation that the systematic risk of TPI is similar to that of FMG. … At the extreme, the asset beta for TPI would be the same as that of FMG. FMG has an asset beta of 2.14.

268. TPI(Synergies) further commented that systematic risk of the iron ore business should be considered in determining TPI's asset beta:

> Consideration should be given to other iron ore businesses as iron ore is the product that TPI is transporting. Fundamental to TPI's risk profile is identifying and analysing the demand for its core services. Particularly where the analysis relates to major infrastructure that is not feasible to economically duplicate, the analysis needs to be extended to the services from which the infrastructure's demand is derived, which in this case, is the demand and supply of iron ore.

269. TPI(Synergies) believed that the appropriate asset beta would fall between the asset beta of the business it services as it is an extension of the operations and that of the rail firm that most closely approximates the nature of the operations of TPI:

> The asset beta for TPI must fall somewhere between 2.14 (the asset beta for TPI) and 1.07 (the asset beta for Genesee & Wyoming).

270. TPI(Synergies) believed there is no reason to deviate from the 1.85 estimate of asset beta, which is the average of the iron ore sample group (Aquila Resources, BHP Billiton, FMG, Gindalbie Metals Limited and Rio Tinto), in its earlier submission.

CRA's Final Report

271. CRA disagreed with most of the arguments raised in the submissions on the draft determination.

272. In response to HPPL's comments, CRA pointed out that:

> TPI lacks diversification across customers and across commodities and this lack of diversification increases the sensitivity of returns to movements in the economy, thus increasing systematic risk. The US and Canadian Class 1 railroads provide a lower limit on the likely asset beta.

273. CRA further noted that HPPL's argument confused profitability and incremental revenues with risk:

> Incremental revenues might not be required to justify the project, but they are neither risk-free in an absolute sense (i.e. are not guaranteed constant revenues) nor risk-free in the sense that they have no systematic risk (i.e. they will have some correlation with overall market returns).

274. CRA further pointed out that commercial viability and the quantity of ore mined is likely to vary in line with commodity price cycles, giving risk to positive systematic risk.

275. CRA considered HPPL's position on the asset beta, gearing and equity beta are inconsistent:

> An asset beta of 0.44 to 0.50 with gearing of 50% translates into an equity beta of 0.87 to 0.90, which is well above HPPL's recommended equity beta of 0.70. In our view it is not appropriate to focus on achieving any particular equity beta, as this is significantly influenced by gearing. Instead, it is important to consider the appropriate range for the asset beta.

276. CRA was of the view that although coal and iron ore are both important inputs into steel, the demand for coal is likely to be more stable than the demand for iron ore, both from the perspective of total demand and from the perspective of systematic risk. CRA attributes this to the fact that:

> Coal is also a major fuel for electric power generation, so demand for coal will be significantly affected by power generation both in Australia and in the Asia-Pacific region.

277. CRA agreed with NWIOA's suggestion that it is appropriate the Authority selects an asset beta value from the upper end of the range because a lower value may lead to underinvestment.

278. Regarding FMG's comments, CRA pointed out that:

> FMG's logic is not correct. It is the systematic risk of the activity that determines the appropriate asset beta, not the systematic risk of the equity investor's other investment(s). It is also our view that measuring the beta of mining stocks against the ASX will overstate those betas by including an element of idiosyncratic (non-systematic) risk in the estimated beta.

279. CRA agreed with TPI(Synergies) that iron ore mining should determine the upper bound for TPI's asset beta, but notes that measuring the beta against the ASX will bias the beta. However, CRA disagreed that GWI's asset beta should necessarily be considered to be the floor for TPI's asset beta:

> Conceptually, GWI can be thought of as a portfolio of the component railways and thus GWI's observed beta is the weighted average of the beta for each of those railways. Being a weighted average, this suggests that some of the component railroads will have a higher beta and some will have a lower beta. Differences in industries served, number of customers and profitability / cost structure will all be factors affecting the beta of the individual railroads. We do not know the range in which the betas for the individual railroads will fall but we do know that it will stretch from somewhere between the observed beta for GWI to somewhere above the observed beta. Even if we did know that range, we do not know where in that range the beta for TPI's railroad would fall. Although still imprecise, the beta for GWI thus provides the best available estimate of TPI's beta within the range bounded by the beta for the Class 1 freight railroads and iron ore mining.

280. CRA reiterated that it was unable to find any direct comparators for TPI's railway and reaffirmed the two options for estimating the asset beta stated in its draft report (estimating the beta based on the betas of freight railroads in Canada and the United States and relying on the beta of GWI).

281. CRA's view was that there would be some sharing of risk between mines and an independent ore-carrying railway and as a result the asset beta for such a railroad would lie somewhere between the beta for a diversified freight railway and the beta for iron ore mining.

282. In CRA's view, the asset beta for TPI's railway is likely to lie between 0.71 and 1.55, which is a larger range than the 0.69 to 0.77 suggested in its draft report.

Authority's Final Determination

283. The Authority generally agrees with the views expressed by CRA in relation to the comments outlined in the public submissions.

284. The Authority confirms its position as set out in the draft determination to the effect that an asset beta in the range of 0.7 to 1 is reasonable for TPI's railway and given the particular circumstances of this railway (new, remote, single commodity railway) an asset beta of 1 at the top of this range is appropriate.

285. Based on a 30 per cent debt gearing ratio, as outlined earlier, an asset beta of 1 results in an equity beta of 1.43.

Final Determination

286. The Authority confirms its position as outlined in the draft determination that an asset beta of 1 is appropriate for TPI's railway. Based on a debt gearing ratio of 30 per cent the cost of equity for TPI should be determined on the basis of an equity beta value of 1.43.

Taxation and Dividend Imputation

Public Submissions on the Issues Paper

287. Comments in public submissions on taxation and dividend imputation were noted in the draft determination from TPI(Synergies).

288. TPI(Synergies) undertook a review of a number of studies. The more recent studies (2004 onwards) found that the value of franking credits ranged from zero to 0.57, while the value of gamma ranged from zero to 0.41.

289. The submission by TPI(Synergies) also noted that a prudent approach would be the continued application of the statutory tax rate.

CRA's Draft Report

290. CRA noted that the appropriate tax rate for calculating the post-tax cost of debt is the statutory corporate tax rate of 30 per cent.

291. The CRA report indicated that it is reasonable to assume that 71 per cent of imputation credits created are distributed. CRA's interpretation of the empirical studies is that there is support for a theta of zero and support for a theta as high as 0.57. Taken together, this suggested a range of 0 to 0.40 for gamma.

Authority's Draft Determination

292. 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.

293. 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 and 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 (i.e. a gamma value between zero and one).

294. The Authority's 2008 Freight and Urban Railway WACC Determination incorporated a gamma value of 0.5.

295. In the 2008 ARTC determination, the ACCC considered that the proposed use by ARTC of a gamma of 0.30 was not reasonable, noting that (given current studies on the value of imputation credits to shareholders) a gamma of 0.30 would result in revenue ceilings that are too high and would over-compensate ARTC for the present value of the tax it would incur if it was operating at its revenue ceiling. The

ACCC's recommendation to change the gamma value to 0.50 was accepted by ARTC.[42]

296. Some of the issues that would need to be resolved to help resolve the debate on the appropriate value of gamma are:

- whether the value of gamma should be determined by the 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.

297. Australian regulators are faced with varying and conflicting theory and evidence on the value of franking credits. Evidence on the value of the imputation factor (including the impact of changes in taxation law on this value) supports gamma values anywhere in the range of zero to one.[43]

298. The Authority is left with a need to make a determination on the current value of gamma to be applied in TPI's WACC Determination with the major conceptual issues unresolved.

Draft Determination

299. In view of the current state of the debate on the value of dividend imputation, the Authority considered that it is appropriate to continue to apply a gamma value of 0.5.

300. The Authority accepted that the statutory tax rate of 30 per cent be used in the WACC calculation to ensure consistency with other regulators using the real pre-tax approach to calculating the WACC.

Public Submissions on the Draft Determination

301. HPPL agreed that given the current state of the debate on the value of dividend imputation, 0.5 is an appropriate value of gamma, although the debate seems to be moving in the direction of gamma being higher. HPPL suggests that the Authority might want to reconsider this value in reaching its final determination.

302. HPPL continued to argue against using the statutory rate of corporate income tax as it believed that this would overstate TPI's tax liability. HPPL encouraged the Authority to estimate the effective tax rate paid by TPI and use the estimated tax rate if it is more than marginally below the statutory tax rate.

[42] ACCC 2008, op. cit.

[43] See for example:

Hathaway, Neville 2005, Imputation and Valuation, Tax parameters updates 2005 and a very common error;

SFG Consulting 2007, Internal consistency in regulatory estimates of the value of franking credits, Report Prepared for Envestra, 22 March 2007;

Essential Services Commission, March 2008, Gas Access Arrangement Review 2008-2012 Final Decision.

303. FMG argued for a gamma of zero on the basis that the marginal investor is a foreign investor and unable to utilise imputation credits, and on the basis that suitable empirical studies support this assumption.

304. FMG also argued that the ACCC decision rejecting the use of a gamma of 0.3 was highly specific to ARTC, and that nothing justifies the use of a gamma above 0.37.

CRA's Final Report

305. CRA's noted the varied opinions on the value of gamma:

> Submitters to the current review are strongly divided on the appropriate value for gamma. In submissions on the Issues Paper, potential users of the TPI railway argued for a value of at least 0.5, while ARTC and TPI argued for a value of zero based on studies of the ability for foreign investors to utilise dividend imputation credit. The Authority adopted a value of 0.5 in the Draft Determination. In its submission on the Draft Determination, HPPL again argues for a value of at least 0.5 and makes the unsupported assertion that the debate is moving in the direction of the value being higher. FMG argues for a gamma of zero on the basis that the marginal investor is a foreign investor and is unable to utilise imputation credits, and on the basis that suitable empirical studies support this assumption. FMG also argues that the ACCC decision rejecting the use of a gamma of 0.3 was highly specific to ARTC and that nothing justifies the use of a gamma above 0.37.

306. CRA was of the view that the estimation of gamma should proceed on a consistent basis with the estimation of other parameters, i.e. it should be derived from actual data. CRA further notes that the ESC also considered that the value of gamma should be estimated on a basis consistent with the degree of market integration assumed in the estimation of other parameters. [44]

307. CRA considered that TPI(Synergies)'s study supported a gamma value of less than 0.5, although CRA did qualify this view with the fact it had not reviewed TPI(Synergies) data or calculations.

308. CRA suggested that a reasonable range for gamma is between zero and 0.34:

> In the absence of evidence to the contrary, it is reasonable to assume that 71% of imputation credits created are distributed in the year they are created. Imputation credits retained and paid out in future years still have positive value. If retained imputation credits are paid out over a period of one to five years, then it is reasonable to adopt a value of 93% for the effective payout ratio.
>
> Multiplying together the values for theta and the effective payout ratio suggests a range of 0 to 0.34 for gamma.

309. On balance, CRA considers that a gamma of 0.34 is a reasonable value to employ based on the following.

- It is consistent with the Gray (2009) estimate of theta.
- It is consistent with an effective payout ratio calculated using a methodology such as that in AER (2009).
- It is consistent with foreign investors having a weight of 60%, which is slightly higher tha their actual ownership of Australian equities, with the higher

[44] Essential Services Commission, Gas Access Arrangement Review 2008-2012, Draft Decision, 28 August 2007.

weighting reflecting a superior ability to move capital into, and out of, Australia.

- It is consistent with Australian domestic investors having a weight of 40% and not being able to fully utilise imputation credits due to factors (but still with a utilisation rate being higher than 90% for domestic investors).
- It is consistent with the broad conclusion from Synergies (2008) that gamma is less than 0.5.

310. CRA's view that a reasonable value for gamma of 0.34 is within the range suggested in its draft report of zero to 0.40.

Authority's Final Determination

311. The Authority notes that FMG and CRA support a gamma lower than 0.5 and that HPPL supports a value of 0.5 or higher.

312. The Authority also notes that the AER has recently adopted a gamma of 0.65 in its final Statement of the Revised WACC Parameters (Transmission) and Statement of Regulatory Intent on the Revised WACC Parameters (Distribution) in May 2009.

313. However, the Authority does not consider that the uncertainty relating to an appropriate value for gamma, as outlined in its draft determination, has significantly changed since this determination was published earlier this year.

314. On this basis, the Authority confirms its position on the value of gamma as set out in its draft determination.

315. The Authority also confirms its view, as outlined under its draft determination, that the statutory taxation rate is the appropriate taxation rate to be used in the WACC calculation for TPI's railway.

Final Determination

316. The Authority confirms its position as outlined in the draft determination, that:

- In view of the current state of the debate on the value of dividend imputation, a gamma value of 0.5 is appropriate.
- The statutory taxation rate of 30 per cent should be used in the WACC calculation to ensure consistency with other regulators using the real pre-tax approach to calculating the WACC.

Asymmetric Risk (Stranded Assets)

Public Submissions on the Issues Paper

317. Comments on the issue of stranded assets were noted in the draft determination from ARTC, HPPL(ACIL), NWIOA and UMC.

318. ARTC noted that a third party access provider should be able to obtain compensation for commercial risks, including stranding risk:

> ARTC recognises that truncation of returns to a particular level can result in long term under recovery of an appropriate return for investors particularly where sub-optimal returns can only be realised during early stages of a project.
>
> In the Hunter Valley[45], ARTC has proposed an approach it calls a 'loss capitalisation' approach that permits investors to earn returns in excess of the conventional building blocks returns for a period sufficient to recover earlier losses capitalised from the project, so that a reasonable long term return can be achieved, thus encouraging market based investments.
>
> ARTC recognises other approaches exist, such as accelerated depreciation, but would support a loss capitalisation approach in such circumstances. Other approaches such as selecting returns at the higher end of feasible ranges of returns as described earlier, an uplift factor, or endeavouring to quantify truncation, can understate such risks in ARTC's view.

319. ARTC considered the foundation markets (iron ore/bulk) available to TPI to be less risky than those associated with the intermodal markets initially faced by the Tarcoola-Darwin railway. However, ARTC further noted that while Chinese resource demand has had positive impacts for the industry, Chinese steelmakers are currently slowing production. This has direct impacts in terms of shipment delays, iron ore prices, and ultimately, returns for the infrastructure owner.

320. Regarding stranding risk, HPPL(ACIL) noted that it does not believe that the risk of stranding is likely enough to warrant incorporation into the regulatory framework:

> If TPI were a genuinely independent party, we would expect that the stranding risk would be shared between the two, in proportion to their ability to manage the risk. In our view, the majority of stranding risk in that situation would like with FMG (and be reflected in foundation contracts that would be expected to have take or pay provisions) rather than TPI per se.
>
> HPPL does not consider that TPI has made a case for the presence of asymmetric risk and the need for compensation.

321. HPPL(ACIL) further noted that:

> TPI appears to have proposed relatively short depreciation lives for a number of its assets. The assumption of short lives allows TPI to recover accelerated depreciation in line with the expected life of mines, rather than the economic lives of the assets involved. This acts similarly to the tilted depreciation allowance discussed by ERA on page 26 of the Issues Paper.

322. Regarding stranding risk, the NWIOA concluded that:

> TPI has very significant scope to mitigate this risk via long term contractual commitments from FMG and third parties, together with associated capital contributions to meet capacity expansions. The effect of the proposed treatment of depreciation would be to greatly enhance this risk mitigation.

323. The NWIOA commented on the proposed treatment of depreciation, noting that under the Costing Principles, TPI has included:

> … accelerated depreciation for major capital items such as earthworks, bridges and rails, using asset lives of one-half/one-third that of WestNet Rail.
>
> The effect of this is to accelerate the return on capital by increasing the capital component of user charges.

[45] Hunter Valley Coal Network Infrastructure.

324. UMC noted two other main points in relation to the Authority's assessment of TPI's WACC:

> First, United Minerals considers there is a need for a consistent approach to risk evaluation to be applied across the WACC calculation and the Costing Principles. TPI's current proposals would in principle allow for the reflection of their assessment of residual risk to be included via an enhanced depreciation charge. If the case for significant residual risk is not accepted then there should be no depreciation uplift included in third party charges.
>
> Secondly, from an access seeker perspective United Minerals would be prepared to share the cost of ensuring the railway can perform the task and is renewed and, given the difficulties of estimating the capital base, would suggest that the Authority consider the use of an approved Major Periodic Maintenance program in lieu of a depreciation charge.

CRA's Draft Report

325. CRA noted that:

> NWIOA and UMC presented material arguing that there is considerable demand for iron ore, particularly from the growing economies of India and China. The suggestion is made that this growth would continue for the foreseeable future, thus making it unlikely that there was any material stranding risk.
>
> Hancock and the NWIOA and UMC noted that asymmetric risk should not be compensated in the WACC if it is already allowed for elsewhere. TPI's own proposals to utilise accelerated depreciation were noted by NWIOA and UMC, as was the ability for TPI to require up-front capital contributions to help meet the cost of capacity expansions. ARTC suggested the adoption of a "loss capitalisation" approach – whereby losses over the early period of the project are capitalised – in preference to accelerated depreciation. ARTC also suggests that an increment on the WACC or selecting a value from the upper end of a range of values could understate the risks to TPI. The NWIOA noted that the railway should not be treated as a whole when assessing stranding risk – we agree with this and note that individual branch connections and capacity upgrades for a specific user are far more likely to be stranded than the mainline. The NWIOA and UMC propose an approved programme of Major Periodic Maintenance as an alternative to depreciation.

326. In reviewing the submissions, CRA noted that NWIOA and UMC argued strongly that there is little risk of a large scale reduction in demand (and hence stranding), while ARTC noted that there has been a drop-off in orders from some suppliers. CRA is somewhat less optimistic about the future than the NWIOA or UMC, but also considers that a supply curve produced by FMG suggests that FMG's Pilbara operations could be largely insulated in the event of a decline in demand.

327. CRA noted that although stranding risk in total does not appear to be large, CRA considered that it is reasonable for TPI to require some protection against asymmetric risk.

> Although stranding risk in total does not appear to be large, it is still possible that stranding risk could be material for particular parts of the TPI system, particularly in relation to parts of the network that have been constructed specifically at the request of third parties. It is reasonable, therefore, to have some means of providing compensation for, or protection against, asymmetric risk.

328. Regarding the appropriate regulatory approaches to stranding risk, CRA noted that:

> [u]p-front capital contributions will eliminate stranding risk for the portion of any capacity expansion that is covered by the contribution, and accelerated depreciation would significantly reduce stranding risk for the residual.

> There are a range of mechanisms available for this [protection against asymmetric risk] that do not rely on contentions estimates of an additional premium, including accelerated depreciation, up-front capital contributions, alternative treatment of major periodic maintenance, etc. We recommend that the Authority uses those mechanisms to minimise asymmetric risk rather than increasing the WACC.

Authority's Draft Determination

329. Stranded asset risk could be accounted for in a number of ways, including by:

- enhanced capital allowances (e.g. incorporating an appropriate premium into the CAPM/WACC); or
- incorporating accelerated depreciation or self-insurance premium as an operating expense in the cash flows.

330. In the calculation of floor and ceiling costs the Code allows for the accounting of 'economic' asset life rather than 'physical'.

331. Under Schedule 4, clause 2(4) of the Code the annual cost calculation is to be made by applying:

(a) the Gross Replacement Value ("GRV") of the railway infrastructure as the principal;

(b) the Weighted Average Cost of Capital ("WACC") as the interest rate; and

(c) the economic life which is consistent with the basis for the GRV of the railway infrastructure (expressed in years) as the number of periods.

332. Regarding prices for the provision of access, under Schedule 4, clause 13 of the Code:

(f) prices should allow a railway owner to recover over the economic life of the railway infrastructure concerned the costs of the owner in respect of any extension or expansion to accommodate the requirements of an operator.

333. The regulatory ceiling cost reflects an appropriate allocation of total costs, including capital costs (i.e. the depreciation and risk adjusted return (WACC) on the relevant railway infrastructure), operating costs and system overheads.[46] The owner of regulated rail infrastructure must set access prices between the ceiling and floor costs (excludes capital costs).

334. Stranded asset risk can be accounted for by accelerated depreciation (reducing the assumed economic life to reflect a probability weighted asset life). The stranded asset risk is then effectively reflected in higher access prices.

335. A number of Australian regulatory decisions pre-2001 included a WACC increment in recognition of evident asymmetric risk. Since that time, regulatory practice has evolved in favour of cash flow allowances.

336. In the determination of the regulated rates of return for the Alice Springs-Darwin railway, ESCOSA gave consideration to setting the ceiling rate of return above the industry-wide WACC to ensure that regulatory truncation did not result. However, given the industry-wide WACC (7 per cent) exceeded the maximum expected rate

[46] *Railways (Access) Code 2000*, Schedule 4.

of return on total assets (3.9 per cent), ESCOSA did not provide for any uplift factor or imputed self-insurance premium beyond the industry-wide WACC.

337. In the 2003 WNR WACC Determination, the Independent Rail Access Regulator (**IRAR**) considered WNR's proposal for a 0.84 per cent WACC increment to reflect stranded asset risk. IRAR concluded that the stranded asset risks identified by WNR were already adequately protected by a number of factors – including allowing WNR to calculate the annuity based on a shorter asset – and rejected WNR's proposal.

338. To compensate for asset stranding risk, Queensland Rail has proposed that QCA allow accelerated depreciation (20-year cap on asset lives) for all new capital expenditure from 2009. This compares to a QCA-endorsed average asset life of 35 years (maximum life of 50 years) for previous capital expenditure.[47]

339. Gas, electricity and water regulators in Australia (e.g. ESC, AER) allow the value of any stranded assets (created by an initially 'prudent' investment) to be recovered through accelerated depreciation prior to their removal from the asset base.[48]

340. UK regulators typically allow accelerated depreciation for potentially stranded assets. In the US, the Federal Energy Regulatory Commission (**FERC**) uses both return on equity (**ROE**) incentives and accelerated depreciation allowances to provide an incentive for investment in the interstate power grid.[49]

341. TPI's railway is a new ('greenfields') investment, with revenue based on a single commodity. Its prospective third party users are likely to be a small number of junior miners.[50]

342. TPI's original submission to the ERA argued strongly for compensation for asymmetric risk.

> TPI is exposed to significant stranding risk on its rail network investments. This risk is not currently compensated via WACC. We are of the view that there is a compelling case for this risk to be compensated, with any such compensation commensurate with the residual risk borne by TPI after any risk mitigation strategies are employed. The key issue revolves around quantifying this risk.

343. In TPI's draft Costing Principles submitted to the Authority, TPI further noted that:

> … an allowance for asymmetric risk will be estimated for inclusion as an increment to the WACC. In the even that the ERA does not allow an adjustment to the WACC to

[47] QR Network 2009 Draft Access Undertaking, Issues Paper October 2008.

[48] See for example, Australian Competition and Consumer Commission 2004, Decision: Statement of Principles for the Regulation of Electricity Transmission Revenues – Background Paper.

[49] FERC uses incentive rate treatment for planned transmission investments that can demonstrate a nexus between a higher return on equity and/or accelerated depreciation incentive and the particular risks of the project. For example, FERC granted New England transmission owners a 100 basis point adder to the ROE for new projects completed by Dec. 31, 2008, while Westar Energy, Inc. (**Westar**) was given a incentive rate treatment (accelerated depreciation of 15 years) for a transmission upgrade project known as the Wichita-to-Reno-to-Summit Line. Source: FERC 2008, 'FERC encourages transmission grid investment', Docket No: ER06-278-000 News Release: March 20, 2008.

[50] The five companies listed in the NWIOA submission as potential third party users are Atlas, BC Iron, Brockman Resources, Ferraus and HPPL.

> account for asymmetric risk, the fair value of the impact of asymmetric to be included in the operating costs for the purpose of calculating floor and ceiling costs.[51]

344. The Authority noted that the recent decline in global iron ore demand has resulted in a sharp fall in spot prices – from around US$180 per tonne (cost and freight China) in July 2008 to US$65 per tonne in December 2008[52] – well below 2008 contract prices of around US$200 per tonne (Pilbara lump blend). This decline in spot prices – together with the decline in steel prices – is likely to place significant downward pressure on contract prices which will be negotiated in early 2009.[53]

345. With increasing evidence that the global commodity price cycle has peaked, the average export price for iron ore is forecast to decline in the medium term.[54] In this event, future production levels (for both FMG and juniors) may be less than was anticipated when the submissions were lodged.

346. The Authority considered that if stranding risk is found to be material for TPI's railway, there should be some accounting for this additional risk.

347. A range of options are available to account for stranding risk (should the Authority find that there is a material stranding risk for TPI's railway), including a reduction in relevant asset lives.

348. The Authority considered that stranding risk is more appropriately accounted for in cash flows rather than an ad hoc adjustment of the WACC. To be consistent with the Authority's policy of using WACC to only reflect systematic risk, stranding risk (non-systematic risk) will be assessed in the future determination of floor and ceiling costs for TPI's railway.

Draft Determination

349. The Authority did not consider that stranding risk should be accounted for in the WACC and will consider the issue of stranding risk under its future floor and ceiling costs determination for TPI's railway.

Public Submissions on the Draft Determination

350. NWIOA agreed with the draft determination regarding the WACC financial parameters and suggests that the Authority treats TPI's railway on a stand-alone basis when determining the regulated asset value.

351. NWIOA was also concerned with probable overestimation of the appropriate capital base for an efficient stand alone railway through the use of the actual capital and financing costs incurred by FMG.

352. NWIOA reiterated its view that stranding risk would be minor on the main line and suggests that:

> Alternatively, the Authority may wish to consider applying the stranding risk to sections of line but in any event the NWIOA considers there is merit in urging the

[51] TPI 2008, Costing Principles July 2008.

[52] Metal Bulletin iron ore index.

[53] ABARE 2008, Australian commodities, vol 15 no 4, December quarter 2008.

[54] Westpac 2008, Westpac Regional Economic Report, Third Quarter 2008; RBA 2008, op. cit.

> Authority to take note of these considerations when assessing floor and ceiling pricing.

353. Given the difficulties of estimating the capital base, NWIOA again suggested that the Authority consider the use of an approved Major Periodic Maintenance program in lieu of a broad depreciation charge with an uplift for stranding risk if found to be material for TPI's railway.

354. HPPL agreed with the Authority position that stranding risk is better considered under the future floor and ceiling cost considerations rather than in the WACC.

CRA's Final Report

355. CRA reiterated the points made in its draft report and also noted that:

> … employing upfront capital contributions in the manner suggested would also respond to NWIOA's concerns that the railway not be treated as a whole because capacity additions for a junior miner, and hence the attendant stranding risks, are likely to be relatively minor on the main line.

356. CRA continued to recommend that the Authority use measures other than increasing the WACC to minimise asymmetric risk, as in its draft report.

Authority's Final Determination

357. The Authority agrees with CRA's view that measures other than increasing the WACC should be considered in relation to dealing with the asymmetric risk, if any, associated with TPI's railway.

358. The Authority confirms its position on stranding risk as set out in its draft Determination.

Final Determination

359. The Authority confirms its position as outlined in the draft determination, that stranding risk should not be accounted for in the WACC and will consider the issue of stranding risk under its future floor and ceiling costs determination for TPI's railway.

Conclusion

360. The parameter values and the resultant final determination on the 2009 WACC for TPI's railway are outlined in Table 5.

361. The final determination of the Authority is that the real pre-tax 2009 WACC value for TPI's railway is 11.09 per cent.

Table 6: Final Determination on 2009 WACC for TPI's Railway

WACC	Draft Determination	Final Determination
Nominal risk free rate of return (%)	4.37	5.02
Inflation rate (%)	2.50	2.50
Real risk free rate of return (%)	1.82	2.46
Debt proportion (%)	35	30
Equity proportion (%)	65	70
Market risk premium (%)	6.00	6.00
Debt beta	0.00	0.00
Asset beta	1.00	1.00
Equity beta	1.54	1.43
Debt margin (%)	2.95	3.76
Debt issuance costs (%)	0.125	0.125
Taxation rate (%)	30	30
Franking credit value (gamma)	0.50	0.50
Nominal pre-tax cost of debt	7.45	8.91
Real pre-tax cost of debt	4.83	6.25
Nominal pre-tax cost of equity	16.00	15.99
Real pre-tax cost of equity	13.17	13.16
Nominal post-tax cost of equity	13.60	13.59
Real post-tax cost of equity	10.83	10.82
Nominal pre-tax ("Officer") WACC	13.01	13.87
Real pre-tax ("Officer") WACC	10.25	11.09
Nominal post-tax ("vanilla") WACC	11.45	12.19
Real post-tax ("vanilla") WACC	8.73	9.45