

Draft Determination

Weighted Average Cost of Capital for The Pilbara Infrastructure's Railway from the Cloud Break Iron Ore Mine in the Pilbara to Port Hedland

9 January 2009

Economic Regulation Authority



WESTERN AUSTRALIA

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DRAFT 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 (**TPI 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. Part 3 of TPI Agreement Act, which amends the Act and the Code to include TPI's railway (from the Cloud Break iron ore mine to Port Hedland) in the Western Australian rail access regime, came into force on 1 July 2008.
3. Schedule 4, section 3(1)(a) of the Code requires the Economic Regulation Authority (**Authority**) to make an annual determination, as at 30 June, of the Weighted Average Cost of Capital (**WACC**) to be applied in calculating the floor and ceiling costs for each of the rail networks covered under Schedule 1 of the Code.
4. The Authority is required to determine the WACC for the TPI 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 the TPI railway is the first greenfields ('new') railway to be included in the Western Australian rail access regime, the Authority has decided to undertake a public consultation process in determining the WACC for the TPI railway.
5. The process being followed by the Authority in undertaking its WACC determination for the TPI 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 the CRA report, the Authority has prepared this draft determination.
 - The Authority will publish a final determination on or before 30 June 2009.
6. The draft determination of the Authority is that the real pre-tax 2009 WACC value for the TPI railway is 10.25 per cent.
7. The Authority calculated this value using the Officer Capital Asset Pricing Model (**CAPM**) and WACC, applying parameter values as indicated in Table 1.
8. The WACC values have been calculated on the basis of an estimated nominal risk free rate and debt margin as at 20 December 2008. The Authority will update these values at the time of its final determination.
9. 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 the TPI railway.

Table 1 2009 WACC Draft Determination for the TPI Railway

WACC	Draft Determination
Nominal risk free rate of return (%)	4.37
Inflation rate (%)	2.5
Real risk free rate of return (%)	1.82
Debt proportion (%)	35
Equity proportion (%)	65
Market risk premium	6.0
Debt Beta	0.0
Asset Beta	1.0
Equity beta	1.54
Debt margin (%)	2.95
Debt issuance costs (%)	0.125
Taxation rate (%)	30
Franking credit value (gamma)	0.5
Nominal pre-tax cost of debt	7.45
Nominal post-tax cost of equity	13.60
Real post-tax cost of equity	10.83
Nominal pre-tax cost of equity	16.00
Real pre-tax cost of equity	13.17
Nominal pre-tax ("Officer") WACC	13.01
Real pre-tax ("Officer") WACC	10.25
Nominal post-tax ("vanilla") WACC	11.45
Real post-tax ("vanilla") WACC	8.73

REASONS FOR THE DRAFT DETERMINATION

Background

Requirements of the Code

10. 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:

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.

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

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

TPI's railway, as defined under Schedule 1 above, currently consists of the line from FMG's Cloud Break iron ore mine to Port Hedland. Under this definition, 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 TPI Agreement Act.

Consultant's Report

11. As part of the process for this determination, the Authority commissioned a report by CRA to provide recommendations for the determination of the TPI 2009 WACC.¹ CRA was not asked to comment on the CAPM or the market risk premium. The CRA report is available on the Authority's website (www.era.wa.gov.au).
12. 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 real approach is consistent with the Authority's 2008 Freight and Urban Railway WACC Determination² and appears to

¹ CRA International 2008, WACC for TPI's Iron Ore Railway, Draft Report for the Economic Regulation Authority, January 2008.

² 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.

be accepted by stakeholders. CRA further notes 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.

Public Consultation

13. 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.

14. The Authority received submissions from five parties. The key points of these submissions are summarised below.

15. Australian Rail Track Corporation (**ARTC**) submits that it is generally supportive of the proposed approach to determining WACC and suggests that the return should be at the higher end of the scale of feasible returns. ARTC also recognises 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 of return, plus the desire to have consistency with the 2008 Freight and Urban Railway Networks determination.

16. ARTC notes 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,^[3] 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.

ARTC considers 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 notes 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.

17. Hancock Prospecting Pty Ltd (**HPPL**) had a report prepared for it by ACIL Tasman. Regarding the WACC methodology, HPPL/ACIL endorses the use of a CAPM framework and the use of a real WACC. However, HPPL/ACIL recommends 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

³ Hunter Valley Coal Network infrastructure.

deriving an appropriate effective tax rate removes the apparent advantage of a pre-tax approach in terms of simplicity.

Regarding stranding risk, HPPL/ACIL notes 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 lie 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.

HPPL further notes 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.

18. The North West Iron Ore Alliance (**Alliance**) supports the approach and structure the Authority has recently applied to WestNet Rail (after a careful review of literature and statistical evidence) as a foundation for determining TPI's WACC.

Regarding stranding risk, the Alliance concludes 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.

The Alliance 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.

19. United Minerals Corporation (**UMC**) is a member of the Alliance and made similar comments to the Alliance. UMC supports the approach and structure the Authority has recently applied to Westnet in the 2008 Freight and Urban Railway WACC Determination. UMC notes two other main points in relation to the Authority's assessment of the TPI 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.

20. TPI had a report prepared for it by the consultants Synergies. Several key points of this report are detailed below.

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.

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.

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.

21. Further details from the five submissions are noted in the relevant sections of this draft determination.
22. Subsequent to the above submissions being placed on the Authority's web site, HPPL lodged a submission in response to the Authority's draft determination on TPI's proposed segregation arrangements. This submission also contained an ACIL Tasman report (commissioned by HPPL) which reviewed the TPI 'Cost of Capital' report by Synergies. The Authority has taken this HPPL submission into account for the TPI WACC draft determination.
23. All the public submissions are available on the Authority's website (www.era.wa.gov.au).

WACC Methodology

24. There are three matters of general method in estimating a WACC:
 - the choice of method and financial model applied in estimation of costs of equity and debt;
 - the treatment of inflation; and
 - the treatment of taxation.
25. On the choice of financial model, the Authority has in previous WACC determinations under the Code applied the CAPM in estimating the cost of equity and has determined the cost of debt by adding a debt-risk premium (or 'debt margin') to a risk free cost of capital.
26. The Authority considers that the CAPM remains the most appropriate basis for estimating the cost of capital and has used the CAPM methodology in this draft determination.
27. 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 $(1-T_c)^4$ 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.
28. A pre-tax WACC may be expressed in nominal terms or in 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.
29. 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.
30. 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 rate of corporate income tax. Other Australian regulators – with the exception of IPART – prefer to apply post-tax rates of return.
31. CRA notes 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.
32. However, CRA also notes that the desire for consistency with the Authority's 2008 Freight and Urban Railway WACC Determination is one reason why it may be appropriate to employ a pre-tax real WACC in the current determination.
33. Parties that made submissions to the Authority support the general method previously applied by the Authority. HPPL suggested the use of a post-tax real WACC.
34. For the TPI submission, 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.⁵ The resulting WACC estimate for the TPI railway is then calculated as the post-tax nominal (vanilla) WACC.
35. Synergies note 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. Synergies further notes that the Authority has previously adopted the market transformation method (which has been the more commonly applied regulatory approach) and would endorse the continued application of this method.

⁴ T_c refers to the company tax rate.

⁵ 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.

Authority's View

36. 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.
37. The Authority considers that it is appropriate to estimate WACC values using the Officer form of the CAPM and has specified 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

38. 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.
39. 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.
40. Studies by the Commonwealth Treasury, the Reserve Bank of Australia (**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
41. The Australian Energy Regulator (**AER**) and the Essential Services Commission of Victoria (**ESC**) have both accepted the existence of bias in observations of implied yields on real government bonds, but rejected claims of the existence of bias in

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.

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

42. 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
43. 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
44. CRA notes 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.
45. Hancock Prospecting endorsed the Authority’s approach for calculating the risk free rate while the Synergies report noted that the preferred inflation estimate for the TPI WACC is the mid-point (2.5 per cent) of the Reserve Bank’s target band.
46. In the most recent RBA survey of market economists (following the release of the September quarter CPI), the median inflation expectation (for the year to June 2010) was 2.6 per cent.¹¹
47. 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

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.

⁹ See for example, ESCOSA 2008, Rail Industry (Tarcooaladarwin) 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 2013-14. Essential Services Commission, 6 March 2008, Gas Access Arrangement Review 2008-2012 Final Decision.

¹¹ RBA 2008, *ibid.*

¹² RBA 2008, *ibid.*

The combination of rising tradables inflation and slowly declining non-tradables 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).

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

Authority's View

49. The Authority considers that:
- there is sound evidence for bias in estimates of real risk free rates derived from implied returns on inflation-indexed government bonds; but
 - there has not been a sustainable case put to Australian regulators for the existence of bias in estimates of nominal risk free rates derived from implied yields on nominal government bonds.
50. The Authority considers 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 use of the Fisher equation.
51. The Authority considers the inflation forecast should be based on a range of considerations, including levels of historical inflation, the Reserve Bank of Australia (RBA) target range (2-3 per cent inflation rate) and market forecasts. The Authority has also noted the advice from CRA on this issue.
52. The average yield on 10-year Commonwealth Government Bonds for the 20 trading days ending 20 December 2008 was 4.37 per cent.

53. After considering the RBA and market forecasts, and in line with the RBA target range, the Authority considers that the best estimate of the forecast rate of inflation is 2.5 per cent.
54. Implied yields on nominal government bonds over the 20 trading days to 3 December 2008 indicate a nominal risk free rate of 4.37 per cent. Together with the assumed inflation rate, this nominal risk free rate implies a real risk free rate of 1.82 per cent.

Market Risk Premium

55. The market risk (or equity) premium (**MRP**) 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.
56. 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 market risk premium should be determined on the basis of both observed historical equity premia achieved in the market and a range of information sources on current and future expectations of equity premia – and adopt a MRP value of 6 per cent.
 - Regulated businesses have often taken the view that the market risk premium should be determined solely on the basis of observed historical equity premia, which typically indicate values of between 5 and 8 per cent – and typically favour a MRP value greater than 6 per cent.
57. The submissions offer differing views, either arguing for a higher MRP based on recent studies, or for a lower premium reflecting either the MRP used in a foreign market or for other project-specific factors.
58. CRA notes 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 View

59. The Authority's view, consistent with regulatory precedent, is that the market risk premium should be determined taking into account a range of sources of information, including evidence on historically realised equity premia and current practice and expectations of market participants. On this basis, the Authority is of the view that a market risk premium of 6 per cent is appropriate.

Financial Structure and Credit Rating

60. 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).
61. The estimated average debt gearing for US and Canadian rail comparators is estimated to be in the range of 28 to 48 per cent.¹³ 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).
62. 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.¹⁴ For other Australian rail businesses, regulators have (in the most recent determinations) applied debt gearing levels in the range of 50 to 55 per cent.¹⁵ The recent ACCC

¹³ CRA International 2008, op. cit.; IPART 2008, op. cit.

¹⁴ 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 Allens Consulting Group 2007, Railways (Access) Code 2000: Weighted Average Cost of Capital - 2008 WACC Determinations, Report to the Economic Regulation Authority, October 2007.

¹⁵ 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

decision included a gearing level of 50 per cent with a BBB credit rating for ARTC.¹⁶ 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.¹⁷

63. ARTC notes that the Authority has chosen a relatively lower gearing for the Westnet Rail 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 the TPI network, compared to other bulk networks, in making its assessment.

64. Regarding the appropriate benchmark credit rating for TPI, CRA notes 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.

65. Regarding the appropriate credit rating for a below-rail operator of a single railway servicing a single dominant customer, TPI/Synergies note 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 notional 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.

Authority's View

66. The Authority's view is 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 does not consider that the 10 per cent gearing level proposed by Synergies (based on iron ore companies) is an appropriate gearing level for a benchmark railway owner.
67. The most recent Authority determination for the Westnet freight railway network included a 35 per cent debt gearing.¹⁸ The Authority considers that this gearing is an appropriate benchmark for a railway owner.
68. The Authority does 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 considers the most appropriate benchmark for TPI is a BBB credit rating.

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.

¹⁶ ACCC 2008, op. cit.

¹⁷ ARTC 2008, Submission for IPART Consultation – report prepared by Synergies Economic Consulting, December 2008.

¹⁸ ERA 2008, op. cit.

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

Cost of Debt

70. 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.
71. Debt margins are typically estimated from Bloomberg and CBASpectrum financial data services.¹⁹ 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.
72. Bloomberg and CBASpectrum use different methods to calculate the debt margin. The majority of regulators now accept that while the CBASpectrum provides a reasonable estimate of shorter term investment-grade bonds (A rated bond), the 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 the CBASpectrum yield,²⁰ or have exclusively used the Bloomberg yields for lower-rated corporate bonds.²¹
73. 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.
74. 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 CGS 8 and 10- year spread, or using CBA Spectrum data.²²
75. 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 Bloomberg A fair yields to replicate (using an average over 20 trading days) a 10-year BBB benchmark.²³

Authority's View

76. The Authority considers that the method used by the AER/ACCC is currently the most rigorous for estimating yields for BBB bonds.
77. 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

¹⁹ 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.

²⁰ See for example, Queensland Competition Authority, 2006, Revised Access Arrangement for Gas Distribution Networks: Allgas Energy, Final Decision.

²¹ 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 2013-1*, 31 January 2008.

²² AER 2008, *Final Decision: SP AusNet Transmission Determination 2008-09 to 2013-1*, 31 January 2008.

²³ See for example, AER 2008, *Final Decision: SP AusNet Transmission Determination 2008-09 to 2013-1*, 31 January 2008, AER 2008, Final Decision: ElectraNet transmission determination 2008–09 to 2012–13, 11 April 2008.

over the 20 trading days to 20 December 2008 – the debt margin is estimated to be 295 basis points.

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

Debt Issuance and Equity Raising Costs

79. Regulators typically use a benchmark approach 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.²⁴

80. 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.²⁵

81. 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.

Authority's View

82. An allowance of 12.5 basis points should be made for the costs of raising debt finance.

83. The Authority considers 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.

Debt Beta

84. 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).

85. 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;
- consider the systematic risk component of the company's debt.

86. 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)

²⁴ AER 2008, Issues Paper: Review of the weighted average cost of capital (WACC) parameters for electricity transmission and distribution.

²⁵ AER 2008, *ibid.*

- uncertainty premium (compensation for lack of diversification)
87. 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.
88. 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).
89. Davis (2005) estimated debt betas on traded bonds and found they tended to fall between 0.1 and 0.2.²⁶ 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.’²⁷
90. 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 nonsystematic in nature. Deriving a debt beta via the CAPM would then overstate the true systemic debt risk.²⁸
91. 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).
92. 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.
93. 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).
94. Although the debt beta may have a small positive value – and 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.²⁹

Authority’s View

95. The Authority notes 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

²⁶ Davis, K. (2005) ‘The Systematic Risk of Debt: Australian Evidence,’ Australian Economic Papers, 44 (1), pp. 30-46.

²⁷ IPART 2002, Weighted Average Cost of Capital: Discussion Paper DP56.

²⁸ QCA 2008, QR Network Access Undertaking (2009).

²⁹ Australian Competition and Consumer Commission 2004, Decision: Statement of Principles for the Regulation of Electricity Transmission Revenues – Background Paper, December.

difference to the preciseness of estimated equity beta, as long as the same value debt beta is used to unlever/re-lever the beta.

96. 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.
97. Based on the above discussion, the Authority considers that an appropriate value for debt beta is zero.

Systematic Risk (Beta)

98. The systematic risk (beta) of a firm is the measure of how the changes in the returns to the firm's stock are related to the changes in returns to the market as a whole. It reflects the business's exposure to non-diversifiable risk, which is that portion of the variance in the return on an asset that arises from market-wide economic factors that affect returns on all assets, and which cannot be avoided by holding the assets as part of a diversified portfolio of asset.
99. 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.
100. Observed equity betas are converted into estimated asset betas 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.
101. For the TPI 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.
102. The Authority could also adopt an equity beta value, taking into account the particular characteristics of the TPI railway and the associated level of risk. This 'first principles' approach requires a judgement on the sensitivity of TPI's returns to movements in the economy/market.
103. TPI 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, results in TPI determining an equity beta of 2.05 for the business.
104. 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 0.65 (equity beta 1.29/50 per cent gearing) in relation to the ARTC interstate network.³⁰ In the current IPART

³⁰ ESCOSA 2008, Rail Industry (TarloolaDarwin) Guideline No. 2, Arbitrator Pricing Requirements, ACCC 2007 ARTC Interstate Access Undertaking.

Hunter Valley Review, ARTC have proposed an asset beta in the range of 0.5 to 0.6.³¹

105. 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^[32] coal network as a suitable comparator as the nature of the traffic means that QR's network embodies similar systematic risk characteristics to TPI's railway. ARTC considers that TPI's systematic risk is strongly linked to the iron-ore mining industry rather than general rail, and the beta should 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.

106. 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.

107. CRA was unable to find any direct comparators for TPI's railway. CRA notes 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 debt 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 Genessee & 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.

108. 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

³¹ ARTC 2008, op. cit.

³² Queensland Rail.

debt beta) for the eight sampled US and Canadian freight railways are detailed below.

Table 2 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

109. 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 percent gearing and zero debt beta).

Table 3 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 View

110. 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.³³
111. 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.
112. The Authority notes that amongst the comparators, Genessee & 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

³³ ERA 2008, op. cit.; ERA 2004, Amended Draft Decision on the Proposed Access Arrangement for the Goldfields Gas Pipeline, July 2004.

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.³⁴

113. 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 has 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 the past 18 months data (ending November 2008), the betas for the three companies would be around 12 per cent lower than those detailed by CRA. As an example, GWI would have an estimated equity beta of 1.22 and an asset beta of 0.95.

114. 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.

115. The Authority notes 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 assets betas of 0.4 and 0.34, respectively.³⁵ 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).³⁶

116. Given the available evidence, there do not appear to be appropriate comparators for the TPI railway which could 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.

117. The Authority notes 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.

³⁴ GWI 2007, Annual Report.

³⁵ ESCOSA 2002, Tarcoola-Darwin Railway: Regulated Rates Of Return - Draft Determination October 2002.

³⁶ IPART 2008, op. cit.

118. On the available evidence, the Authority considers that an appropriate asset beta for the TPI 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).
119. The Authority considers that an asset beta value in the range of 0.7 to one would be reasonable for the TPI railway. Given the particular circumstances of the TPI railway (remote railway with a single mining commodity), the Authority considers that an asset beta at the higher end of this range would be more appropriate. On balance, the Authority considers that an asset beta of one is appropriate for the TPI WACC determination.
120. Based on an asset beta of one and gearing of 35 per cent, the estimated TPI equity beta would be 1.54.
121. In comparison, the equity beta set for Westnet 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.
122. Based on the above discussion, the Authority view is 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.

Taxation and Dividend Imputation

123. CRA noted that the appropriate tax rate for calculating the post-tax cost of debt is the statutory corporate tax rate of 30 percent. The submission by TPI also noted that a prudent approach would be the continued application of the statutory tax rate.
124. 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.
125. 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)
126. For the TPI submission, 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.
127. The CRA report indicates that it is reasonable to assume that 71 percent 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 suggests a range of 0 to 0.40 for gamma.
128. The Authority's 2008 Freight and Urban Railway WACC Determination incorporated a gamma value of 0.5.
129. 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.³⁷

130. 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.

Authority's View

131. 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.³⁸
132. The Authority is still left with a need to make a determination on the current value of gamma to be applied in the TPI WACC Determination with the major conceptual issues unresolved.

133. In view of the current state of the debate on the value of dividend imputation, the Authority considers that it is appropriate to continue to apply a gamma value of 0.5.
134. The Authority accepts 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.

Asymmetric Risk

Regulatory Treatment of Stranded Assets

135. 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 a self-insurance premium as an operating expense in the cash flows.
136. In the calculation of floor and ceiling costs the Code allows for the accounting of 'economic' asset life rather than 'physical'.

³⁷ ACCC 2008, op. cit.

³⁸ 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.

137. 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.
138. 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.
139. 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.³⁹ The owner of regulated rail infrastructure must set access prices between the ceiling and floor costs (excludes capital costs).
140. 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.
141. 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.
142. 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 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.
143. In the 2003 Westnet Rail (**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.
144. 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.⁴⁰

³⁹ Rail Access Code 2000, Schedule 4.

⁴⁰ QR Network 2009 Draft Access Undertaking, Issues Paper October 2008.

145. 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.⁴¹
146. UK regulators typically allow accelerated depreciation for potentially stranded assets. In the US, FERC uses both return on equity ROE incentives and accelerated depreciation allowances to provide an incentive for investment in the interstate power grid.⁴²

TPI Railway and Asymmetric Risk

147. The TPI 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.⁴³
148. 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.

149. 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 event that the ERA does not allow an adjustment to the WACC to account for asymmetric risk, the fair value of the impact of asymmetric risk be included in the operating costs for the purposes of calculating floor and ceiling costs.⁴⁴
150. All parties other than TPI commented on the treatment of asymmetric risk in their submissions in response to the Issues Paper. CRA notes 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 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

⁴¹ See for example, Australian Competition and Consumer Commission 2004, Decision: Statement of Principles for the Regulation of Electricity Transmission Revenues – Background Paper.

⁴² 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 an 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.

⁴³ The five companies listed in the Alliance submission as potential third party users are Atlas, BC Iron, Brockman Resources, Ferraus and HPPL.

⁴⁴ TPI 2008, Costing Principles July 2008.

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.

151. 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.
152. CRA notes 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.

153. Regarding the appropriate regulatory approaches to stranding risk, CRA notes 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 contentious 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 View

154. The Authority notes 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 \$US65 per tonne in December 2008⁴⁵ – well below 2008 contract prices of around \$US200 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 2009.⁴⁶
155. 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.⁴⁷ In this event, future production levels (for both FMG and juniors) may be less than was anticipated when the submissions were lodged.
156. The Authority considers that if stranding risk is found to be material for the TPI railway, there should be some accounting for this additional risk.
157. A range of options are available to account for standing risk (should the Authority find that there is a material stranding risk for the TPI railway), including a reduction in relevant asset lives.

⁴⁵ Metal Bulletin iron ore index.

⁴⁶ ABARE 2008, Australian commodities, vol 15 no 4, December quarter 2008.

⁴⁷ Westpac 2008, Westpac Regional Economic Report, Third Quarter 2008; RBA 2008, op. cit.

158. The Authority considers 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 the TPI railway.

159. The Authority does 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 the TPI railway.

Conclusion

160. The parameter values and resultant 2009 WACC for the draft determination on the TPI railway are outlined in Table 4.

161. The draft determination of the Authority is that the real pre-tax 2009 WACC value for the TPI railway is 10.25 per cent.

Table 4 2009 WACC Draft Determination

WACC	Draft Determination
Nominal risk free rate of return (%)	4.37
Inflation rate (%)	2.5
Real risk free rate of return (%)	1.82
Debt proportion (%)	35
Equity proportion (%)	65
Market risk premium	6.0
Debt Beta	0.0
Asset Beta	1.0
Equity beta	1.54
Debt margin (%)	2.95
Debt issuance costs (%)	0.125
Taxation rate (%)	30
Franking credit value (gamma)	0.5
Nominal pre-tax cost of debt	7.45
Nominal post-tax cost of equity	13.60
Real post-tax cost of equity	10.83
Nominal pre-tax cost of equity	16.00
Real pre-tax cost of equity	13.17
Nominal pre-tax ("Officer") WACC	13.01
Real pre-tax ("Officer") WACC	10.25
Nominal post-tax ("vanilla") WACC	11.45
Real post-tax ("vanilla") WACC	8.73