New South Wales Rail Access Undertaking - Review of the rate of return and remaining mine life from 1 July 2009

Rail Access — Final Report and Decision
August 2009

IPART
New South Wales

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1 Introduction and executive summary

As part of its review of the rate of return and remaining mine life applicable under the NSW Rail Access Undertaking (the Undertaking) the Independent Pricing and Regulatory Tribunal of New South Wales (IPART) has made its final decision on the rate of return and remaining mine life to apply to the Hunter Valley coal network from 1 July 2009.

The Hunter Valley coal network comprises 37 track sectors with 32 sectors leased to Australian Rail Track Corporation (ARTC) on a 60-year lease from 5 September 2004. RailCorp owns the remaining five sectors.

The revised rate of return is to be applied to the regulatory asset base (RAB) to yield a return on the rail infrastructure of the coal network for the five years commencing 1 July 2009. The remaining mine life will determine the rate of depreciation charged over the same period.

1.1 Overview of final decision

IPART's final decision is that:

▼ the rate of return from 1 July 2009 is 8.0 per cent on a real pre-tax basis

▼ the remaining mine life from 1 July 2009 is 30 years.

IPART has decided that the rate of return should be 8.0 per cent because:

▼ This rate of return strikes the right balance between the risks involved, including what IPART considers to be the considerable risks associated with underinvestment in the network.

▼ This rate of return is consistent with current market conditions and risks facing ARTC. Since releasing its draft report IPART has further considered the impact of the global financial crisis on the ability of firms to raise capital. IPART considers that some stability has returned to the estimates of the cost of capital, and the individual parameter estimates adopted by IPART accurately reflect current market circumstances. Therefore, no specific adjustment for the global financial crisis has been made.

▼ The decision provides regulatory certainty. It is consistent with the 2005 decision and the context for the review, in particular the likelihood that regulation of the ARTC sectors will move from IPART to the ACCC in the near future.

The rate of return parameters estimated in this final decision are based on market data as at 21 July 2009.

IPART has decided that the remaining mine life should be 30 years because:

▼ This is consistent with IPART's previous decisions. IPART considers that the existing approach should be retained unless an alternative approach can be shown to be preferable.

▼ It takes adequate account of capacity constraints and prospective mines in the Hunter Valley.

▼ The methodologies that have been suggested by stakeholders each have their strengths and weaknesses. However, no clear consensus about the preferred methodology has been developed between stakeholders.

1.2 Structure of report

This report explains IPART's final decision, including why it reached its final decisions and the process undertaken in reaching those decisions. The final report is structured as follows:

▼ Chapter 2 outlines the approach and review process IPART has used to reach its final decisions and the future process to complete the review, and explains some important contextual matters

▼ Chapter 3 presents IPART's analysis on rate of return and its final decision

▼ Chapter 4 discusses IPART's analysis on remaining mine life and its final decision.

2 IPART's approach to the review and process

IPART has made this final decision in accordance with the Undertaking. Section 2.1 of Schedule 3 of the Undertaking provides:

> Rate of Return means a rate of return in percentage terms approved by IPART for a period of five years to be applied to the average of the Opening and Closing Regulatory Asset Base.

Section 3.2(c) of Schedule 3 of the Undertaking provides:

> The estimate of remaining mine life will be reviewed and if necessary revised every five years from and including 1 July 2004 by IPART or an independent consultant appointed by IPART.

The rate of return and remaining mine life determined by IPART as part of its review are to apply to infrastructure owners of the Hunter Valley coal network, ARTC and RailCorp.[1] The final decision will apply from 1 July 2009 for a period of 5 years, or

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[1] The rate of return will also apply for RailCorp's network assets outside of the Hunter Valley coal network. These assets do not recover their full costs so the decision will, in practice, have no impact on prices for these assets.

until such time as the Undertaking is replaced by another undertaking such as that submitted by ARTC for the ACCC's approval.[2]

2.1 Review process

In November 2008, IPART commenced the review by inviting access providers (ARTC and RailCorp) to propose the rate of return and remaining mine life that should apply from 1 July 2009. IPART then invited stakeholders to comment on the access owners' proposal. IPART has also:

▼ released a discussion paper on rate of return for stakeholder comment

▼ engaged a consultant LECG to review estimates of the remaining mine life and released an issues paper and draft report prepared by LECG for stakeholder comment

▼ held a stakeholder roundtable on 1 April 2009

▼ released a draft decision and report for stakeholder comment.

ARTC submitted a detailed proposal which was released for stakeholder comment in December of last year.[3] RailCorp chose not to submit a detailed proposal; rather it has stated that it is prepared to accept the rate of return and the remaining mine life as determined by IPART in accordance with the Undertaking. RailCorp noted that it would be inappropriate to have different rates of return for it and ARTC.[4]

In reaching its final decision, IPART considered the views stakeholders presented in their written submissions and raised at the roundtable. IPART also considered the recommendations of its consultant LECG on remaining mine life and its own analysis on the rate of return.[5]

For further information relating to the review, including copies of submissions and the roundtable transcript please refer to IPART's website: www.ipart.nsw.gov.au.

2.2 Context for the review

ARTC has submitted to the ACCC a draft Hunter Valley Coal Network Access Undertaking for approval. IPART understands that it is ARTC's current intention that this new undertaking would replace the existing Undertaking for those parts of the Hunter Valley coal network of which ARTC is the rail infrastructure owner. If this new undertaking is approved, the ongoing need for the current Undertaking will

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[2] ARTC Hunter Valley Coal Network Access Undertaking, draft lodged with the ACCC in April 2009, available from the ACCC's website www.accc.gov.au

[3] ARTC's submission to IPART, Review of Rate of Return and Remaining Mine Life of Hunter Valley Mines, 1 December 2008.

[4] RailCorp's submission to IPART, NSW Rail Access Undertaking: Review Rate of Return - Review of Remaining Mine Life, 29 October 2008, p 1.

[5] Staff from the CIE have also assisted IPART in completing this review.

need to be considered. Therefore, this decision could be IPART's last on the rate of return and remaining mine life of the Hunter Valley coal network and it is also highly likely that this decision will not be in effect for the full five years for that part of the network leased to ARTC.

3   IPART's final decision on the rate of return from 1 July 2009

In previous decisions made under the Undertaking, IPART used a real pre-tax weighted average cost of capital (WACC) to determine an appropriate rate of return to apply to the RAB. IPART has again used the real pre-tax formulation in making its final decision. This chapter outlines the key reasons for IPART's final decision on rate of return.

The WACC aims to provide the operator of regulated assets with a rate of return equivalent to that required by the market to invest in those assets.

Under the WACC framework for the Hunter Valley coal network, the overall return on capital is calculated in the following manner:

Return on capital = WACC × average of the opening RAB and closing RAB

The cost of capital is weighted by the return required by the two sources of funding available to a business - equity and debt, and the proportion of each source used by the business. 'Equity' refers to funds raised from the owners of the business, the shareholders. 'Debt' refers to any borrowings of the regulated business.

3.1   Overview of IPART's final decision

IPART's final decision is that a rate of return of 8.0 per cent real pre-tax should apply from 1 July 2009.

IPART has considered public submissions and comments made at the workshop held in April 2009. In assessing the appropriate WACC IPART has had regard to the impact of the current global financial crisis on the cost of debt and equity return and the decisions of other regulators, interstate and overseas. In particular, the AER has released its final decision on its review of the WACC parameters for electricity transmission and distribution network service providers.[6]

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6   AER, *Final decision Electricity transmission and distribution network service providers*, Review of the weighted average cost of capital (WACC) parameters, May 2009.

As discussed in detail below, IPART has not amended individual WACC parameters for the impact of the global financial crisis. Like other Australian regulators, IPART has used a long-run estimate of the market risk premium (MRP) and current risk-free rates in estimating the return on equity. While IPART acknowledges that recent estimates of these parameters have been prone to variability, it considers that the evidence presented to the AER and recent market analysis by IPART supports its approach to estimating these parameters. Therefore, IPART's final decision is the same as its draft and no specific adjustment for the global financial crisis has been made.

IPART's final decision is to adopt the same 60 basis point adjustment in recognition of the risks of underinvestment in the network which was included in IPART's draft decision. Therefore, its final decision of a rate of return of 8.0 per cent is 60 basis points above the mid-point of the WACC range of 7.4 per cent.

IPART considers that its final decision is appropriate for the following reasons:

▼ A rate of return above the mid-point of the WACC range is appropriate given the risks facing ARTC.

▼ It balances the risks appropriately as IPART considers that the costs of underinvestment in the rail infrastructure are high and exceed those attached to overinvestment given the importance of the rail infrastructure to the total coal supply chain in the Hunter Valley. IPART has provided an allowance of 60 basis points to take account of these risks. This is consistent with the 2005 decision for rail access.

▼ It is consistent with current market conditions including the impact of the global financial crisis. IPART considers that some stability has returned to the estimates of the cost of capital, and the individual parameter estimates adopted by IPART accurately reflect current market circumstances.

▼ It has been derived using an approach which is consistent with the 2005 decision. Given the likelihood that ARTC will be regulated by the ACCC in the near future, IPART considers that there is merit in maintaining regulatory certainty at this point rather than adopting substantial change.

The parameters used to calculate the WACC range for this final decision are shown in Table 3.1.

Table 3.1   WACC range – 2009 final decision

Parameter	Value
Nominal risk free rate	5.4%
Inflation	2.7%
Market risk premium	5.5-6.5%
Debt margin	2.0– 3.4%
Debt to total assets	60 – 50%
Dividend imputation factor (gamma)	0.5 – 0.3
Tax rate	30%
Equity beta	0.7-1.0
Cost of equity (nominal post-tax)	9.3 – 11.9%
Cost of debt (nominal pre-tax)	7.4 – 8.8%
WACC (real pre-tax)	**6.0 – 9.1%**
WACC mid point[a]	**7.4%**
WACC (final decision)	**8.0%**

Note: The Tribunal has directly estimated the equity beta rather than calculating it from an estimate of the asset beta.

a IPART calculates the midpoint of the WACC range directly from the midpoints of the individual input parameters. Hence, the midpoint cannot be replicated by simply averaging the lower and the upper bound of the WACC range.

IPART's draft decision was a rate of return of 7.5 per cent on a real pre-tax basis. This rate was 60 basis points above the mid-point of the WACC range of 6.9 per cent. The WACC range for the draft decision was 5.7 to 8.3 per cent.

The increase in the rate of return for the final decision compared to the draft decision stems from an increase in the WACC range for the final decision to 6.0 to 9.1 per cent – this is primarily driven by the increase in the risk-free rate

The 2005 decision is presented in Table 3.2 below. IPART set a rate of return of 7.3 per cent, 70 basis points above the mid-point of the WACC range.

Table 3.2 WACC range – 2005 final decision

Parameter	Value
Nominal risk free rate	5.5%
Inflation	2.7%
Real risk free rate	2.7%
Market risk premium	5.5-6.5
Debt margin	1.13%-1.23%
Debt to total assets	60-50%
Dividend imputation factor (gamma)	0.5-0.3
Tax rate	30%
Equity beta	0.7-1.0
Cost of equity (nominal post-tax)	9.4-12.0%
Cost of debt (nominal pre-tax)	6.6-6.7%
WACC (real pre-tax)	**5.5-8.0%**
WACC mid-point[a]	**6.6%**
WACC (final decision)	**7.3%**

a IPART calculates the midpoint of the WACC range directly from the midpoints of the individual input parameters. Hence, the midpoint cannot be replicated by simply averaging the lower and the upper bound of the WACC range.

In estimating specific parameters and the WACC range, IPART has adopted a consistent approach between this final decision and the 2005 decision for the following parameters:

▼ Risk free rate is calculated using the same approach as the 2005 decision.

▼ The following parameters are the same as for the 2005 decision: MRP; debt to total assets; gamma; tax rate; and equity beta.

A few parameters have been calculated using a different methodology or IPART has adopted a different value.

▼ Inflation – in its 2005 decision IPART used the Fisher equation and differences between the nominal and real risk free rates. For this final decision, IPART has used inflation-indexed swaps.

▼ Debt margin – IPART has maintained the same methodology but has switched from using CBASpectrum to Bloomberg data.

3.2   Pre-tax real WACC or post-tax nominal WACC

The WACC can be calculated before or after tax, and can be expressed in real or nominal terms. Theoretically, the calculation of the WACC as pre-tax or post-tax should have little impact on the revenue outcome for the regulated business, provided the same tax rate is assumed.

In either case, the effective or statutory tax rate may be used. IPART has used the statutory tax rate of 30 per cent in all previous decisions.

In its submission, QRNational Coal stated that its preference was to use a post-tax nominal framework to calculate the WACC.[7] The Minerals Council also supports using a post-tax approach.[8] However, ARTC proposed a pre-tax real formulation.[9] ARTC sees substantial benefits in providing a consistent regulatory framework over time particularly during its substantial investment program. In addition in its proposed new undertaking ARTC proposes to continue to use the real, pre-tax approach.[10]

IPART has used a pre-tax WACC formulation and the statutory tax rate to make its final decision on the rate of return as this is its preferred approach used in recent regulatory decisions and the 2005 rail access rate of return decision. In this regard IPART notes that the importance of consistency over time in its WACC decisions. As the form of presentation of the WACC (ie, real pre-tax or nominal post-tax) should not affect the cash flow outcomes, IPART was not persuaded that a change was warranted.

3.3   WACC parameters

There are a number of input parameters to consider in determining an appropriate WACC range. Some of these parameters are directly determined by the market, while others are determined by IPART according to a preferred theoretical approach.

The calculation of the cost of capital under the WACC framework requires the estimation of the following parameters:

1. Parameters determined by financial market data:

    ▼ Risk free rate (R_f)

    ▼ Debt margin ($R_{D\,-}\,R_f$)

    ▼ Adjustment for expected inflation (Π).

2. Parameters determined through other methods:

    ▼ The market risk premium (MRP) ($R_m - R_f$)

    ▼ The correlation between a business's risk and that of the overall market (β_e - equity beta)

    ▼ The level of gearing (D -debt, E - equity)

    ▼ The value of imputation credits (γ - gamma).

The parameters of the WACC are related to each other. For instance, a higher level of gearing implies a higher debt margin and a higher equity beta than would otherwise be the case.

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[7] QRNational Coal's submission, 8 April 2009, p 1.
[8] NSW Minerals Council's submission, April 2009, p 11.
[9] ARTC's proposal, 1 December 2008, p 3.
[10] ARTC's supplementary submission, April 2009, p 13.

These parameters are combined through the formula below, to give the pre-tax real WACC.

$$WACC = \frac{\left(1+\left\{\frac{R_e}{[1-t.(1-\gamma)]}.(\frac{E}{D+E})+R_d.(\frac{D}{D+E})\right\}\right)}{(1+\Pi)}-1$$

The global financial crisis has led to substantial changes in the operation of debt and equity markets. Some businesses face limited access to financial markets, while others can access financial markets only through intermediated credit or at much higher premiums than was the case over the past few years.

Equity markets have also changed. The value of Australian equity has fallen. Issuing new external equity appears to incur a greater premium than was the case over the past few years.

In addition, market volatility has risen, both in debt markets and equity markets.

These changes may impact on the methods that regulators use to estimate the WACC but the case for changes would need to be considered very carefully. For example, regulators in Australia have generally used current market data for financial market parameters on the principle that it includes full information on past, current and future market conditions. However, other parameters such as the expected market risk premium are difficult to observe contemporaneously and regulators have used long-term averages of past data.

3.4   IPART's final decision on individual WACC parameters

The following sections discuss the reasons for IPART's final decisions on each of the parameters used to calculate the WACC range.

3.4.1   Risk free rate

The nominal risk-free rate is used to calculate the return on equity and the return on debt. A risk free asset is not directly observable, a proxy must be chosen for the risk free asset. The yield to maturity on Australian Commonwealth Government Securities (CGS) is generally considered to be the best proxy in the Australian economy. This is because these bonds are essentially default free (government guaranteed returns) with high liquidity and yields that are transparent and published.

Table 3.3 sets out recent jurisdictional decisions on the risk free rate.

Table 3.3 Jurisdictional decisions on risk free rate

Regulator/year	Decision	Risk free rate proxy	Risk free rate sampling period
AER (2009)	NSW electricity distribution	10-year nominal Commonwealth Government Securities	15 days
ACCC (2008)	Rail Access – Interstate network	As above	20 days
ESC (2008)	Gas	As above	20 days
IPART (2008)	CityRail	As above	20 days
IPART (2008)	Sydney Water	As above	20 days
OTTER (2007)	Electricity	As above	20 days
ESCOSA (2006)	Gas	As above	10 days
QCA (2006)	Gas	As above	20 days

Source: Relevant AER, ESC, ESCOSA, QCA, IPART decisions.

The appropriateness of using CGS yields as a proxy for the risk free rate has recently been subject to debate. As part of the AER's Victorian electricity transmission review, NERA suggested that there existed an 'absolute bias' in the nominal CGS yields.[11] This is attributable to increased institutional demand and reduced supply for these securities. The alternative put forward by NERA is to use the yields on corporate bonds adjusted by credit default swap rates (CDS).[12]

The ACCC and AER continue to use CGS as the risk free proxy in recent regulatory decisions. The regulators received advice from the Reserve Bank of Australia (RBA) and Australian Treasury regarding the above claimed 'absolute bias' inherent in the CGS yields. Both the RBA and Australian Treasury did not consider that there is 'absolute bias' in nominal CGS yields.[13] In its decision on ARTC Access Undertaking – Interstate Rail Network, ACCC has used CGS in estimating the risk free rate.

In its recently completed review of the WACC parameters for electricity transmission and distribution, AER further considered the issue of possible bias in nominal CGS yields. The AER considered arguments put forward that CGS yields are no longer an appropriate proxy for the risk free rate due to the global financial crisis. Some stakeholders put forward an argument that a divergence has emerged between yields on CGS and other risk-free assets and that this reflects a flight to quality or "convenience yield". Stakeholders argued that in these circumstances alternatives to CGS yields or an adjustment should be considered. The AER's decision stated that there was no persuasive evidence to suggest that a more appropriate proxy for the risk free rate exists, or that the CGS yields exhibits a downward bias. The AER also

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[11] Submission to the AER by NERA, *Absolute bias in (nominal) Commonwealth Government Securities*, June 2007.

[12] Ibid.

[13] Debelle, Letter from RBA to Mr Joe Dimasi, 9 August 2007 and Murphy, Letter from the Australian Government to Joe Dimasi, 7 August 2007 as quoted in the AER, Issues Paper, *Review of WACC parameters for electricity transmission and distribution*, August 2008, pp 29-30.

rejected arguments to adjust the CGS yields, it stated that such ad-hoc adjustments are inconsistent with a sustainable, long-term method to estimating the cost of equity capital which creates regulatory uncertainty.[14]

Another issue raised in the AER's review was the maturity used for the risk-free rate. In its explanatory statement, the AER considered that there was persuasive evidence to move away from the 10 year term typically used to a term that matches the regulatory period. However, in its final decision it determined the appropriate term is 10 years.[15]

The final issue involved in calculating the nominal risk free rate is the appropriate sampling period over which the proxy is measured. In theory, the best expectation of future interest rates is the published CGS price on the day that the regulatory decision comes into effect. In practice, regulators have tended to use an average of 10 to 20 days to remove the impact of price fluctuations caused by market volatility.

ARTC's proposal

In its original proposal, ARTC proposed using 10-year nominal CGS yields averaged over a 20-day period as a proxy for the risk free rate on the basis that:

▼ the 10-year CGS is typically considered the longest dated liquid bond and represents the most relevant benchmark to apply

▼ a 20-day average is consistent with current regulatory practice aiming to reduce the impact of spike in yields that may occur on the day of valuation.[16]

This is the approach IPART has adopted in its recent regulatory decisions.

However, in its submission on IPART's discussion paper ARTC argued that the current global financial crisis could impact on the WACC in three ways:

▼ a reduction in the risk free rate given the compression in CGS yields that has resulted from the "flight to quality"

▼ increases in the debt margin

▼ increases in the expected MRP.[17]

ARTC's submission sought an adjustment for the first of these claimed impacts. Its consultant, Synergies economic consulting (Synergies), argued in an attachment to ARTC's submission that while CGS bond rates had been a reasonable proxy for the risk free rate in the past they had become a poor proxy since the global financial crisis primarily because of non-risk factors such as the flight to quality that has

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[14] AER, *Final decision Electricity transmission and distribution network service providers*, Review of the weighted average cost of capital (WACC) parameters, May 2009, pp 134-140.

[15] AER, *Final decision: Electricity transmission and distribution network service providers*, Review of the weighted average cost of capital (WACC) parameters, May 2009, pp 140-169.

[16] Report by Synergies for ARTC, December 2008, pp 24 -25.

[17] Report by Synergies for ARTC, April 2009, pp 9-10.

occurred which has distorted the proxy value. This impact was termed the "convenience yield" by Synergies. Synergies argued that evidence suggests that this convenience yield has spiked in recent years and some adjustment should be made to reflect this impact for at least the duration of the global financial crisis. The increase estimated by Synergies was 60 basis points which should be added to the current estimates of the risk free rate.[18]

IPART's draft decision

IPART's draft decision was to use the 10-year nominal CGS yields averaged over 20 days to determine the risk free rate. As at 6 May 2009, this rate was 4.6 per cent. IPART considered that the 10-year CGS yields were still the most appropriate proxy for the risk free rate.

IPART's draft decision rejected ARTC's approach to estimating the risk free rate by including an adjustment for the impact on the "convenience yield".

Stakeholder comments

The Minerals Council through its consultant ACIL Tasman supported IPART's draft decision to use the 10-year nominal CGS yields averaged over a 20-day period as the proxy for the risk free rate. In particular, it considered that the AER's recent decision for electricity network service providers supported IPART's view that:

▼ there is no downward bias in the yields

▼ no adjustment is appropriate for the "convenience yield"

▼ the use of 10-year securities remains appropriate

▼ an averaging period of 15 to 20 days is appropriate.[19]

In its submission on IPART's draft decision and report, ARTC's consultant Synergies noted the increase in the ten year Commonwealth Government bond rate that has occurred since the release of the draft decision. It therefore concluded that an adjustment for the "convenience yield" may no longer be necessary. However, it requested that this situation is monitored up until IPART's final decision.[20]

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[18] Ibid, p 11.

[19] NSW Minerals Council submission on IPART's draft report and decision - attached report by ACIL Tasman, June 2009, p 1.

[20] ARTC's submission on IPART's draft report and decision - attached report by Synergies, June 2009, p 3.

IPART's final decision

IPART's final decision is to use the 10-year nominal CGS yields averaged over 20 days to determine the risk free rate. This is the same approach as used in the draft decision. As at 21 July 2009, this rate was 5.4 per cent. This approach is consistent with its recent regulatory decisions and the approach used in the 2005 rail access rate of return decision. IPART considers that the 10 year CGS yields are still the most appropriate proxy for the risk free rate.

In making its final decision IPART has considered the submissions received on its draft report. Both the NSW Minerals Council and ARTC supported IPART's approach. In particular, ARTC's consultant considered that an adjustment for the "convenience yield" may no longer be necessary with the recent increase in bond rates. IPART has also noted the recent increases in CGS yields and considers that current rates are returning to levels more consistent with long-term averages.

3.4.2 Adjusting for expected inflation

IPART uses a real WACC on real regulatory asset base framework, while most market data relates to nominal interest rates. To align the market data and regulatory framework therefore requires either using real interest rate data or adjusting nominal interest rate data for expected inflation.

Until recently, jurisdictional regulators commonly used the Fisher equation to estimate market expectations of inflation from the difference in yields on nominal and indexed CGS. The resulting inflation estimate is termed breakeven inflation.

$$\Pi = [(1+r_f)/(1+r_{rf})]-1$$

> where:
>
> Π is the forecast inflation rate
>
> r_f is the nominal risk-free rate and
>
> r_{rf} is the real risk-free rate.

Concerns have been raised that the real risk-free rate data used in the Fisher equation may be biased so that inflation is overestimated.[21] The bias in the real-risk free rate reflects a lack of supply of indexed CGS (the Commonwealth Government decided to cease issuing indexed bonds in 2003) putting upward pressure on prices and hence downward pressure on yields.

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[21] Submission to AER by NERA, *Bias in inflation – indexed CGS yields as a proxy for the CAMP risk-free rate,* March 2007; ACG, *Relative bias of inflation indexed CGS yields as a proxy for the CAMP risk-free rate,* July 2007.

In its decisions on SPAusNet and NSW electricity distribution, the AER departed from estimating forecast inflation based on the Fisher equation given the scarcity of the indexed bonds. Instead, AER has adopted the RBA's short term inflation forecasts (first two years) and the mid-point of its target inflation band beyond that for the remaining years of the 10-year period. While AER acknowledges that this is not a market-based approach, it considers that this approach provides consistency and transparency:

> The AER considers that the RBA's inflation forecasts are objective and represent the best estimates of forecast inflation for the purpose of this draft decision. The RBA's statement on monetary policy examines a wide variety of objective data influencing inflation in both the domestic and international financial markets to develop its inflation forecast. The forecast is produced on a regular basis and is publicly available, including supporting analysis and reasoning.[22]

AER's approach was based on RBA and Australian Treasury's advice:

> Given inflation expectations have been firmly anchored by the Bank's inflation target regime for some time, a rough estimate of a real risk free rate would be the nominal government bond rate less the centre of the inflation target band.[23]

> We suggest that (when) working with nominal yields and where a real return is required, making an inflation adjustment based on the mid point of the RBA's 2 to 3 per cent range, is entirely reasonable. Since the independence of the Reserve Bank Board in conducting monetary policy was formalised in March 1996, annual inflation has averaged 2.5 per cent ….. We therefore recommend that the ACCC use the mid point of the RBA's target band for inflation.[24]

IPART has taken a different approach in its recent decisions. It has adjusted the market implied inflation from the Fisher equation downwards by a scarcity premium of 20 basis points. The scarcity premium reflects the divergence between the debt margin on nominal corporate bonds and the debt margin on real corporate bonds.[25]

Table 3.4 summarises the approaches taken by jurisdictional regulators to estimate forecast inflation.

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[22] AER, *Draft Decision - New South Wales distribution determination 2009-10 to 2013-14*, November 2008, p 228.

[23] RBA, *Letter to ACCC*, 9August 2007, p. 3 as quoted in IPART, *Review of Prices for Sydney Water Corporation's Water Sewerage, Stormwater and Other Services from 1 July 2008*, June 2008, pp 159-160.

[24] Australian Treasury, *The Treasury Bond Yield as a Proxy for the CAPM Risk-free rate*, Letter to the ACCC, 7 August 2007, p 5 as quoted in IPART, *Review of Prices for Sydney Water Corporation's Water Sewerage, Stormwater and Other Services from 1 July 2008*, June 2008, p 160.

[25] NERA, *Bias in inflation – indexed CGS yields as a proxy for the CAMP risk-free rate*, March 2007; ACG, *Relative bias of inflation indexed CGS yields as a proxy for the CAMP risk-free rate*, July 2007.

Table 3.4 Approaches to estimating forecast inflation used by regulators

Regulator/year	Industry	Estimation approach	Forecast
AER (2009)	NSW Electricity distribution	Adopted RBA's forecasts for two years and mid-point of RBA target point thereafter and then averaging individual year to derive a forecast of the same term as the nominal risk free rate	2.47%
AER (2008)	SPAusnet electricity transmission	As above	2.59%
ESC (2008)	Gas distribution	Used compound average of actual inflation over the five years prior to the start of the next access period	2.7%
IPART (2008)	CityRail	Fisher equation adjusted downwards by 20 basis points for scarcity premium	2.7%
IPART (2008)	Sydney Water Corp.	As above	3.6%
OTTER (2007)	Electricity distribution	Adopted RBA target inflation band of 2% to 3% and having regard to a range of inflation indicators	2.5%
ESCOSA (2006), QCA (2006), ESC (2006), ICRC (2004)	Gas/electricity distribution	Fisher equation	2% to 3% range

Source: relevant decisions of AER, ESC, OTTER, QCA and ICRC.

The NSW Distribution Network Service Providers (DNSPs) in their recent submissions to AER on the 2008 electricity distribution review suggested a different approach. Rather than giving 100 per cent weight to RBA's forecast, they proposed that the regulator should consider the forecasts of different independent forecasters. The DNSPs noted that RBA's forecasts were the highest of all forecasters and concerns were raised that there may be a systematic upward bias in the RBA's estimates.[26]

On 15 May 2009, IPART released its final decision on its approach to adjusting for expected inflation in deriving the cost of capital.[27] In that decision IPART has maintained its view that using a market based approach to adjusting for inflation expectations is appropriate and has made the decision to use swap market data to estimate the inflation adjustment to the cost of capital in future WACC decisions. In response to stakeholder comments it received, IPART will also use the appropriate breakeven inflation rates and economists' forecasts of inflation as a cross-check.[28]

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[26] Competition Economists Group, *Expected Inflation Estimation Methodology,* Report for Country Energy, April 2008, p 13.
[27] IPART, *Adjusting for expected inflation in deriving the cost of capital*, Analysis and Policy Development Final Decision, May 2009.
[28] Ibid, p 2.

ARTC's proposal

In its original proposal ARTC supported adopting the AER's approach which estimates inflation based on RBA's forecasts for the next two years and the mid-point of the target range for inflation after that.[29]

ARTC's submission on IPART's inflation discussion paper expressed a number of concerns with the reliability of using IPART's suggested approach of using inflation-indexed swaps including:

▼ the inconsistencies in the results of IPART's tests

▼ trading life of the derivatives is unknown

▼ there appears to be too much volatility in the long-term estimates.[30]

IPART's draft decision

IPART's draft decision was to use Australian inflation-indexed swaps to calculate an estimate of inflation. As at 5 May 2009, this approach provided an estimate of inflation of 2.5 per cent.

In making its draft decision, IPART considered that a market-based estimate of the inflation adjustment is preferable to the economists' forecast of inflation. A market-based inflation adjustment ensures that a regulated utility can risk-manage the inflation adjustment used in an IPART cost of capital decision. If IPART used the economists' forecast of inflation, regulated utilities would be subject to additional risk as this inflation rate would most likely differ from the inflation rate which can be risk-managed. IPART noted that most concerns raised in submissions could be addressed by estimating the inflation adjustment based on the swap market and using the breakeven inflation rate and economists' forecasts as a cross-check.

Stakeholder comments

The Minerals Council's submission on IPART's draft decision and report supported IPART's approach to using inflation indexed swaps, with a cross-check using the breakeven inflation rate and economists' forecasts.[31]

In its submission on IPART's draft decision and report, ARTC's consultant Synergies raised some concerns with IPART's proposed approach to estimating inflation. Its concerns regarded the practical implication of IPART's approach, in particular:

▼ Which economists' forecasts will be used to cross-check estimates from inflation indexed swaps given the likely range of views put forward?

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[29] Report by Synergies for ARTC, December 2008, p 29.
[30] Report by Synergies for ARTC – adjusting for expected inflation submission, April 2009, p 3.
[31] NSW Minerals Council submission on IPART's draft report and decision - attached report by ACIL Tasman, June 2009, p 1.

▼ What sort of divergence between the market-based approach and forecasts would warrant a concern?

▼ If there was a concern how would it be resolved?[32]

IPART's final decision

IPART's final decision is the same as the draft and it has used Australian inflation-indexed swaps to calculate an estimate of inflation. As at 21 July 2009, this approach provided an estimate of inflation of 2.7 per cent.

While IPART still considers that a market-based approach is preferable, it also used a combination of the breakeven inflation rate and economists' forecasts as a cross-check of the estimate provided by the inflation-indexed swaps. It considered that the estimates provided by these other means are consistent with its preferred approach, as seen in Table 3.5 below.

Table 3.5   Inflation outcomes from alternative methods

Method	Estimate (five year average)
Breakeven inflation with 20 bp adjustment for scarcity premium	2.2%
RBA forecasts and mid-point of range	2.4%
Inflation based on indexed swaps	2.7%

Source: IPART calculations, 20-day average to 21 July 2009; RBA: based on forecasts for year to June 2010 and year to June 2011.[33]

In making its final decision, IPART considered the issues raised by stakeholders in their submissions. It notes that the NSW Minerals Council supported IPART's draft decision approach. However, Synergies raised a number of practical questions with IPART's approach.

As noted above IPART used the breakeven inflation rate and the RBA's forecasts to check the estimate provided by Australian inflation-indexed swaps. It considers that the estimates obtained from these alternative approaches, while different, are broadly consistent with the estimate of inflation obtained from inflation-indexed swaps.

In terms of Synergies' specific comments, IPART proposes to rely in the first instance on the RBA's forecasts. As Table 3.5 demonstrates the RBA's forecasts are in this instance close to the inflation estimate based on indexed swaps. Were a major divergence to occur in future IPART would be required to undertake further investigation and analysis, based on the circumstances of the time, to determine the best way forward.

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[32] ARTC's submission on IPART's draft report and decision - attached report by Synergies, June 2009, p 15.

[33] RBA, Statement of Monetary Policy, May 2009, p 69.

3.4.3 Market Risk Premium (MRP)

The MRP is the expected return over the risk free rate that investors would require for investing in a well diversified portfolio of risky assets. This generally represents the difference between the return on the market portfolio and the return on the risk-free rate ($R_m – R_f$). The MRP is one of the components used to determine the return on equity, which is given by the CAPM formula.

The CAPM formula is: $R_e = R_f + \beta_e \ x \ (R_m – R_f)$

> where:
>
> R_e is the nominal post-tax cost of equity
>
> R_f is the risk-free market rate
>
> β_e is a measure of the correlation between a business's risk and that of the overall market
>
> R_m is the market rate of return.

MRP is an expected return and is not directly observable. It therefore needs to be estimated through proxies. The most common approaches used include estimating past actual MRP based on historical excess market return (ex-post), adopting the MRP from surveys of market practitioners or based on forecast of future cash flows (ex-ante).

Estimating the MRP based on historical averages involves several issues. These include:

▼ how long a time period should be used for estimating the premium

▼ whether to employ geometric or arithmetic averaging

▼ which market instrument to use as the measure of the risk-free rate, and

▼ how to measure the return to the market portfolio.

The appropriate length of estimation period is generally influenced by economic considerations. Longer term data series may be unrepresentative of expectations because of substantial changes in the market but they provide more precise estimates.

Shorter term data series too may be unrepresentative because they only capture the present stage of a business cycle. However, the shorter term data is more likely to be of higher quality as data sources improve over time, therefore providing a more accurate picture of investors' current and near future expectations. Most commonly, the minimum period used to provide estimates is 30 years.[34]

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[34] S Gray and R R Officer, *A review of the market risk premium and commentary on two recent papers – a report for the Energy Networks Association*, 2005, p 21.

In Australia, past empirical evidence has suggested a MRP range of 6 to 8 per cent reported in various studies and research as set out in Table 3.6.

Table 3.6 Historical MRP in Australia

Source	Period	Risk premium (%)
AGSM- Arithmetic average (including October 1987)	1974 to September 2000	6.2
AGSM- Arithmetic average (excluding October 1987)	1974 to September 2000	7.7
Dimson, Marsh and Staunton (2006)	1900 to 2005	7.8
Gray (2001)	1883 to 2000	7.3
Gray & Officer (2005)	1885 to 2004	7.2
Brailsford et al (2008)	1883 to 2005	6.2, 6.3[a], 6.5[b]

a: imputation credit valued at 50 cents in the dollar.

b: imputation credit at full value.

Source: Deloitte Touche Tohmatsu, *Independent Expert Report to Woodside shareholders*, 19 December 2000; Dimson, Marsh & Staunton, *The World Wide Equity Premium: A Small Puzzle, AFA 2008 New Orleans Meetings Paper, EFA 2006 Zurich Meetings Paper*; S Gray, *Issues in Cost of Capital Estimation*, October 2001; S Gray and R R Officer, *A review of the market risk premium and commentary on two recent papers – a report for the Energy Networks Association*, 2005; Brailsford et al, *Re-examination of the historical equity risk premium in Australia,* Accounting and Finance, Vol. 48, Issue 1, 2008, pp 73-97.

It has been argued that the average MRP estimated over a long period of time provides the best estimate of what the MRP is likely to be in the future. However, estimates of the average MRP can be significantly affected by the choice of start and end dates for the analysis. This can create some difficulties in drawing conclusions about the future MRP from the historical data.

For example, major indices of Australian equity values have declined by about 50 per cent from their peak over the past 18 months. The average excess returns provided by the equity market in the past will be lower now than if the average excess returns were estimated 18 months ago. To the extent that a longer historical period provides a better indicator of the MRP, recent equity market changes should be factored into the estimate of the historical MRP, which would generate a lower MRP than the estimates presented in Table 3.6.

The AER also considered the MRP as part of its recent review of WACC parameters. The AER concluded that prior to the onset of the global financial crisis, 6 per cent was the best estimate of the forward looking MRP and that in stable market conditions this would remain the AER's view. However, it concluded that stable market conditions do not exist at present. It identified two scenarios: that that the prevailing medium term MRP is above the long term MRP, but will return to the long-term MRP over time, or that there has been a structural break in the MRP and the forward looking long term MRP (and consequently also the prevailing MRP) is above the long term MRP that previously prevailed. It finds that the evidence indicates that a MRP above 6 per cent may be reasonable and adopted a value of 6.5 for its final decision, an increase of 0.5 from its preliminary view. While it did make this adjustment it also concluded that the weight of evidence does not suggest that a

MRP significantly above 6 should be set. Rather it found that the estimates of the long-term historic average provide a range of 5.7 to 6.2 per cent.[35]

ARTC's proposal

ARTC proposed a range of 6 to 7 per cent for MRP on the basis that:

▼ estimates of MRP in Australia confirm that its value has remained well above 6 per cent

▼ studies over various time periods have consistently produced estimates that range from 6 to 8 per cent

▼ analysis undertaken by its consultant indicates that the long term average exceeds 7 per cent.[36]

In a report to ARTC Synergies claimed the main concern with IPART's proposed MRP range is that it excludes values in excess of 6.5 per cent suggested by long-term studies. The report also acknowledged that recent estimates of the MRP have fallen but that the current circumstances are unique and that there is a strong argument to exclude 2008 results.[37]

IPART's draft decision

IPART's draft decision was that a MRP estimate of 5.5 to 6.5 per cent is appropriate. IPART did not consider there to be sufficient evidence for it to depart from its traditional approach to estimating the MRP. The draft decision was consistent with the 2005 decision on rail access.

Stakeholder comments

The Minerals Council's submission on IPART's draft decision and report supported IPART's estimated range of 5.5 to 6.5 per cent for the MRP.[38]

In its submission on IPART's draft decision and report, ARTC's consultant Synergies argued that a reasonable range for the MRP is 6.0 to 7.0 per cent based on a variety of academic studies.[39]

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[35] AER, *Final decision Electricity transmission and distribution network service providers*, Review of the weighted average cost of capital (WACC) parameters, May 2009, pp 45-47.

[36] Report by Synergies for ARTC, December 2008, pp 70-71.

[37] Report by Synergies for ARTC, April 2009, pp 16-17.

[38] NSW Minerals Council submission on IPART's draft report and decision - attached report by ACIL Tasman, June 2009, pp 1-2.

[39] ARTC's submission on IPART's draft report and decision - attached report by Synergies, June 2009, pp 16-17.

Final decision

IPART's final decision is that a MRP estimate of 5.5 to 6.5 per cent is appropriate. As was the case for the draft decision, IPART does not consider there to be sufficient evidence for it to depart from its traditional approach to estimating the MRP. This is consistent with the 2005 decision on rail access.

IPART notes that an estimate of the MRP is based on long term historical averages. While the other market parameters are determined on more current market values, this is a long-standing and well-accepted approach. In past decisions, IPART reviewed the available evidence on the Australian MRP and came to the conclusion that a range of 5.5 to 6.5 per cent is an appropriate estimate. This range is based on various Australian studies on the MRP – the results of which are presented in Table 3.7 below.

Table 3.7   Results of academic studies of the MRP

Source	Methodology	Period	MRP
AGSM[a]	Arithmetic average, incl. Oct 1987	1974-1995	6.2
	Arithmetic average, excl. Oct 1987	1974-1995	8.1
	Arithmetic average, incl. Oct 1987	1974-1998	6.2
	Arithmetic average, excl. Oct 1987	1974-1998	7.9
	Arithmetic average, incl. Oct 1987	1974-2000	6.1
	Arithmetic average, excl. Oct 1987	1974-2000	7.6
	Arithmetic average, incl. Oct 1987	1974-2003	5.8
	Arithmetic average, excl. Oct 1987	1974-2003	7.1
Officer	Arithmetic mean[b]	1882-1987	7.9
	Arithmetic mean[c]	1882-2001	7.2
	Arithmetic mean[d]	1946-1991	6.0-6.5
Hathaway[e]	Arithmetic mean	1882-1991	7.7
	Arithmetic mean	1947-1991	6.6
Dimson, Marsh & Staunton[f]	Arithmetic mean	1900-2000	7.6
Gray[g]	Arithmetic mean	1883-2000	7.3

[a] Centre for Research in Finance, AGSM "Risk Premium Estimates for Investors in Fully Paid Australian Listed Equity", Australian Graduate School of Management, August 2004.

[b] Officer, R. "Rates of return to shares, bond yields and inflation rates: An historical perspective", in *Share Markets and Portfolio Theory; Readings and Australian Evidence*, 2ed, University of Queensland Press, 1992.

[c] Provided by Professor Officer to the Essential Services Commission (Review of Gas Access Arrangements, Final Decision, October 2001). Original information published in Officer, R. "Rates of return to shares, bond yields and inflation rates: An historical perspective", in *Share Markets and Portfolio Theory; Readings and Australian Evidence*, 2ed, University of Queensland Press, 1992.

[d] Officer, R. "Rates of return to shares, bond yields and inflation rates: An historical perspective", in *Share Markets and Portfolio Theory; Readings and Australian Evidence*, 2ed, University of Queensland Press, 1992.

[e] Hathaway, N. *unpublished manuscript.*

[f] Cited in: E. Dimson, P. Marsh and M. Staunton, *Triumph of the Optimist: 101 years of Global Investment Returns*, Princeton University Press, 2002.

[g] Gray, S. "Issues in Cost of Capital Estimation", UQ Business Schools, University of Queensland, 19 October 2001.

IPART has considered the AER's decision to increase the MRP to 6.5 per cent. In particular, IPART notes that the AER's own analysis indicates that recent estimates of the MRP are between 5.7 and 6.2 per cent – see report by Handley for the AER.[40] This is consistent with an MRP range of 5.5 to 6.5 per cent. Furthermore, IPART notes that AER concluded that there was not sufficient evidence to warrant a MRP value greatly in excess of 6.0 per cent.

The analysis presented in the Synergies report and the discussion in the AER's decision report highlights the difficulty of using historic data to estimate a forward looking MRP. The recent fall in equity markets has reduced historical estimates of the MRP, but it is unlikely that the risk premium required by the market has fallen in current economic conditions. Synergies acknowledged IPART's concern on this matter in its submission on the discussion paper and the report by Synergies demonstrates that estimates of the MRP taking into account more recent data have fallen substantially. However, it argues that this highlights how unique the current period is.[41]

It is IPART's view that this volatility highlights the need to take long-term historic averages into account when estimating the MRP. IPART does not accept that it is appropriate to exclude periods from an approach which is based on long-term historical averages. Indeed periods of fluctuating market returns are not a new phenomenon and to exclude any period of market volatility which impacts on the historic average will bias estimates of the MRP.

IPART has not made a specific adjustment to the MRP in light of the AER's decision. While IPART considers that normally market conditions will be fully reflected in current market rates, it recognises that the current circumstances are unusual and it is possible that equity investors are seeking higher returns. But on balance the long-term historic averages used by IPART and other regulators support IPART's current MRP range of 5.5 to 6.5 per cent.

3.4.4   Debt margin

Debt margin is a premium that is added to the risk free rate of return to calculate the cost of debt. For a regulated business, the debt margin is influenced by the credit worthiness of the firm, the gearing level, the supply and demand of the relevant debt markets at the time the debt is being raised and debt raising costs.

Australian regulators typically assess a debt margin on the assumption that an efficient regulated business seeks to target at a minimum an investment grade credit rating profile of BBB, BBB+ or A. The debt margin is estimated by reference to data on generic debt margins for investment grade rated debt securities of 10-year

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[40] J. C. Handley, *Further comments on the historical equity risk premium – Report prepared for the AER*, 14 April 2009, cited in AER*, Final decision Electricity transmission and distribution network service providers*, Review of the weighted average cost of capital (WACC) parameters, May 2009, p 215.
[41] Report by Synergies for ARTC, April 2009, p 17.

maturity sourced from CBASpectrum or Bloomberg. An average of debt margins is calculated over 10 to 20 days prior to decision date.

In March 2008, the CBASpectrum fair yield curve for BBB bonds (10 years) and the Bloomberg fair yield curve for BBB bonds (10 years) diverged, with estimates from CBASpectrum yielding increasingly higher margins (Figure 3.1). The Commonwealth Bank of Australia advised IPART in January 2009 that it will no longer provide access to CBASpectrum to non-bank customers, so this source cannot be considered for this decision.

Figure 3.1   Fair yields – CBASpectrum and Bloomberg comparison
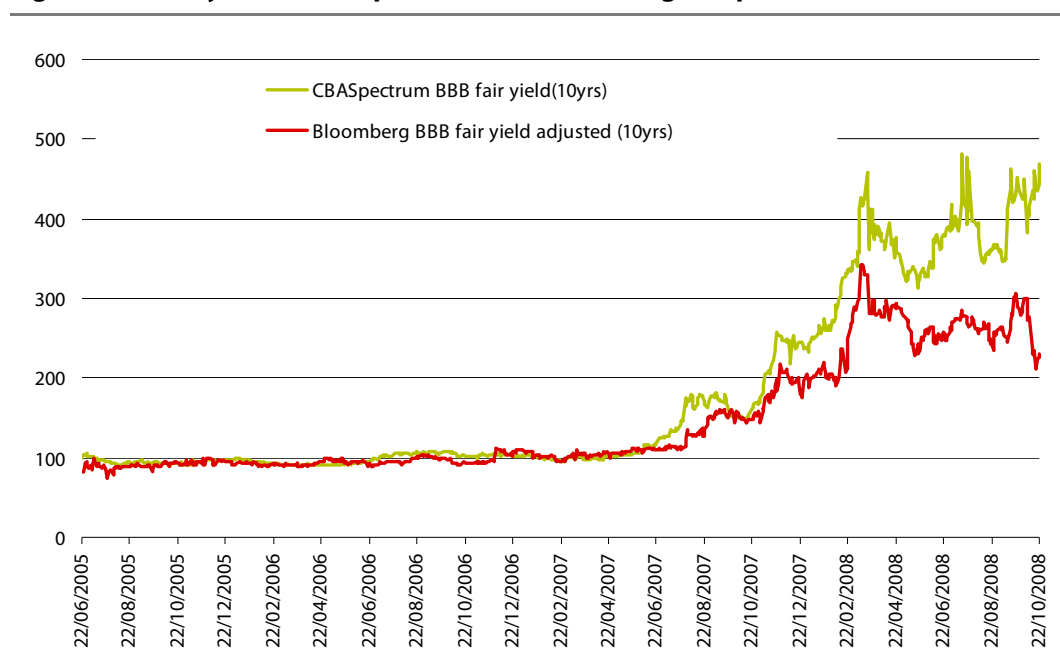
Source: Bloomberg and CBA Spectrum.

The debt margin and credit rating of a firm will be largely determined by the characteristics of the firm, such as its business risk and level of gearing. A regulated firm does not necessarily operate at the optimal capital structure. For instance, ARTC has much lower levels of debt than reflected in its proposal for a 50 per cent to 55 per cent benchmark gearing level. The actual debt that the regulated company has, if any, will therefore not reflect the debt margin relevant to the benchmark gearing level.

The AER has previously used debt margin estimates based on Bloomberg BBB rated fair yields which it considers produce the smallest average error.[42] In its decision on ARTC's Undertaking on its interstate rail network, ACCC followed a similar approach.[43]

Table 3.8 summarises the debt margin estimates determined by Australian regulators in recent regulatory decisions. Recent estimates of the debt margin have been around 3 per cent or 300 basis points.

Table 3.8   Debt margins applied in recent regulatory decisions

Regulator/year	Industry	Methodology	Debt margin[a]
ERA (2009)	The Pilbara Infrastructure railway network	A number of sources to estimate for BBB- credit rating	3.76%
AER (2009)	NSW electricity distribution	Bloomberg BBB fair yield curves and interpolation	3.48-3.52%
ACCC (2008)	ARTC interstate rail access	Same as above	3.42%
AER (2008)	Electricity transmission (SP AustNet)	Same as above	2.11%
IPART (2008)	CityRail	CBA Spectrum fair yield and specific bonds	2.78% to 5.88%
IPART (2008)	Sydney Water	Same as above	3 % to 3.56%
ERA (2008)	WestNet (freight)	Same as above	3.02%

a excluding debt raising costs.
Source: Relevant regulators' decisions.

ARTC's proposal

ARTC is of the view that the credit rating of BBB remains appropriate for its Hunter Valley coal network business based on a benchmark capital structure of 50 per cent to 55 per cent and given the size of the investment program going forward.

Due to concerns regarding the historical downward bias observed in CBASpectrum, ARTC on the advice of its consultant, Synergies, proposed to adopt the methodology used by AER and ACCC in determining the debt margin. The methodology calculates the debt margin based on a 20-day average of the 8-year Bloomberg BBB bond yield plus the difference between the 8 and 10-year A-rated bond yield. At 28 November 2008, this estimate was 300 basis points (3 per cent). ARTC also proposed to include a debt raising cost of 12.5 basis points in the debt margin.[44]

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[42] AER, *Final Decision: SP AustNet transmission determination 2008-09 to 2013-14*, January 2008, p 96. As Bloomberg ceased publishing it BBB fair yield for bonds with 9 or 10 year maturities, the 8-year Bloomberg BBB fair yield was extrapolated to replicate a 10-year benchmark BBB yield.

[43] ACCC, *Final Decision, Access Undertaking – Interstate Rail Network, Australian Rail Track Corporation*, June 2008.

[44] Report by Synergies for ARTC, December 2008, pp 74-76.

To support the above recommendation to ARTC, Synergies considered the results of AER's analysis that showed that the interpolated Bloomberg estimates proved the most reliable proxy for the 10-year Bloomberg fair value BBB yield over an 18 month period. Further, there is no new evidence that shows that the fair yield estimates produced by CBA Spectrum are free of any bias.[45]

ARTC's consultant has expressed some concerns with alternative approaches to estimating the debt margin discussed by IPART in its rate of return discussion paper. In particular, that it included AAA credit wrapped swaps. It argued that these would only be of relevance if the company's underlying credit rating is BBB and that the cost of the credit wrap is added to the AAA debt margin. It argued that it is more appropriate to reference yield curve data from Bloomberg or CBASpectrum.[46]

In IPART's decision for electricity network distribution services in 2004, it included an allowance for debt raising costs based on reasonable estimates by consultants. This decision reflects market evidence that suggests that long-term investments (other than project finance) of more than five years may be difficult to obtain in the Australian market. This implies that businesses frequently have to refinance their debt and incur costs in doing so.

Allowances for debt raising costs suggested in previous consultancy reports by ABNAmro and Westpac indicate values from 12.5 to 25 basis points. Based on this information and informal discussions with credit risk managers at the Commonwealth Bank, IPART has allowed for a debt raising allowance of 12.5 basis points.

IPART's draft decision

IPART's draft decision was that the appropriate level of the debt margin was 2.8 to 3.5 per cent inclusive of an allowance of 12.5 basis points for debt raising costs (as at 5 May 2009).

In its draft report IPART noted that it had further considered the composition of the portfolio of bonds referenced in its recent decisions and that one of the bonds that IPART used in estimating the debt margin, the AGL bond, should be excluded. This was because it will mature in September this year, therefore its yield is not likely to be representative of the yield of 10-year corporate debt.

Except for excluding the AGL bond from its portfolio of proxy corporate bonds, IPART retained the same methodology used in its recent decisions when making its draft decision.

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[45] Ibid, p 75.
[46] Report by Synergies for ARTC, April 2009, pp 14-15.

Stakeholder comments

The Minerals Council supported IPART's draft decision approach on debt margin in light of the AER's final decision. However, its consultant ACIL Tasman argued that an allowance of 0.083 per cent for debt raising costs is appropriate. It also considered that some of the options identified in IPART's discussion paper on debt margin had merit.[47]

ARTC did not support a move to the alternative approaches to determining the debt margin presented in IPART's debt margin discussion paper. It is in favour of an approach which utilises independent data provided by Bloomberg or CBASpectrum. Its consultant Synergies recommended adopting the AER/ACCC's approach of using an 8-year BBB yield and adjust for term structure based on the difference between a 10-year and 8-year A rated yields.[48]

IPART's final decision

IPART's final decision is that the appropriate level of the debt margin is 2.0 to 3.4 per cent inclusive of an allowance of 12.5 basis points for debt raising costs (as at 21 July 2009). IPART has adopted the same approach as that used in making its draft decision.

IPART based its debt margin estimate on a 20-day average of fair value yield curve data obtained from the 8-year Bloomberg fair value curve for BBB rated Australian corporate bonds,[49] as well as actual bond yields for BBB and BBB+ rated securities (Table 3.9).[50] An allowance of 12.5 basis points was made for transaction costs associated with the raising of debt.

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47 NSW Minerals Council submission on IPART's draft report and decision - attached report by ACIL Tasman, June 2009, p 2.

48 ARTC's submission on IPART's draft report and decision, June 2009, p 2 and attached report by Synergies, June 2009, p 19.

49 Bloomberg does not provide a 10-year BBB corporate fair value curve. IPART has engaged a consultant to provide advice on a potential maturity adjustment to Australian corporate bond yields.

50 For example, see IPART, *Review of CityRail fares, 2009-2012 – Final Report*, December 2008; and IPART, *Gosford City Council and Wyong Shire Council – Prices for water, sewerage and stormwater drainage services from 1 July 2009 to 30 June 2013 - Draft Report*, March 2009.

Table 3.9   Debt margin as at 21 July 2009

Security[a]	20-day average to 21 July 2009
Bloomberg fair value BBB (8 year)	315
Coles (July 2012, BBB+)	198
General Property Trust (August 2013, BBB)	288
Santos (September 2015, BBB+)	337
Snowy Hydro (February 2013, BBB+)	269

a ratings are S&P ratings.

Source: Bloomberg, all quotes inclusive of a 12.5 basis points debt raising costs allowance.

IPART is still considering the views of stakeholders on its debt margin discussion paper and the comments received from ARTC and Synergies will be considered as part of its deliberations on the debt margin paper. For this decision IPART has used its traditional approach to estimating the debt margin.

IPART has included an allowance of 12.5 basis points in the debt margin in recognition that debt raising and debt refinancing costs are costs above the debt margin that businesses incur in competitive markets.

3.4.5   Level of debt to total assets (gearing)

Gearing refers to the capital structure of an entity measured as the proportion of total assets that are funded by debt. Gearing is used to weigh the costs of debt and equity in estimating the WACC. Gearing is also used to determine the credit rating and debt premium and to re-lever asset betas into equity betas.

It is a common regulatory practice to benchmark a regulated business's capital structure by reference to gearing levels of businesses operating in similar industries rather than using the regulated business's actual capital structure. In doing this the regulator is aiming to approximate the optimal capital structure of the business.

US listed rail infrastructure companies provide one benchmark for ARTC, although they differ in many ways to ARTC. These companies comprise rail infrastructure operations, typically for freight, and many also offer transportation services. They operate in the US, Canada and Mexico. The most recent observed gearing level of US rail infrastructure companies are shown in Table 3.10.

Table 3.10 Gearing levels of North American rail operators

Firm/company	Description of operation	Capital Structure (gearing)
Burlington Northern Santa Fe Corp	Operates a railroad system in the US and Canada, including provision of infrastructure and transportation	46%
CSX Corporation	International freight transportation company	49%
Genesee & Wyoming Inc.	Owns and operates regional freight railroads and provides rail services	39%
Kansas City Southern	Operates rail freight services in the US and Mexico	49%
Norfolk Southern Corporation	Owns and operates rail track, rail services and a land corporation	41%
Union Pacific Corporation	Rail transportation provider	37%

Source: ARTC, 2008, pp 98-99, Bloomberg, IPART calculations.

US rail infrastructure companies had gearing levels of between 37 per cent and 49 per cent, as of January 2009. These gearing levels are above the historical averages for these firms, reflecting recent declines in equity values.

Australia regulators have used an assumed gearing level of 30 per cent to 60 per cent in rail access or firms in related industries (Table 3.11).

Table 3.11 Gearing level adopted by Australian regulators for rail and coal infrastructure

Regulator	Industry	Gearing (Debt/Debt+Equity)	Credit rating
ERA (2009)	The Pilbara Infrastructure railway network	30%	BBB-
ACCC (2008)	ARTC (interstate network)	50%	BBB
ERA (2008)	WestNet Rail (freight)	35%	BBB+
QCA (2005)	Queensland Rail	55%	BBB+
QCA (2005)	Dalrymple Bay Coal Terminal	60%	BBB+
IPART (2005)	Hunter Valley coal network	50% to 60%	BBB to BBB+

Source: ACCC; QCA; IPART; ERA.

Generally, the capital structure of a firm is driven by the business risk of the firm and the cost of debt versus equity. Where the business risk of a firm is high, it is expected that the firm will carry less debt and vice versa. Accordingly, a coal network is expected to have a more stable cash flow than a rail network that carries general freight that may face more competition from other forms of transport. Arguably, a below rail service provider could sustain a more highly geared capital structure.

ARTC's proposal

ARTC proposes a debt to total assets range of 50 to 55 per cent. The lower bound is set by reference to recent regulatory decisions and the average gearing of rail operators (48 per cent over the last five years). The upper bound is set at 55 per cent which is based on ACCC's standard gearing assumption for regulated distribution and transmission businesses (60 per cent) adjusted downward to reflect the higher business risk faced by an access provider to a coal rail network relative to regulated energy network companies.[51] In its proposal ARTC noted that its higher business risk relative to energy transmission or distribution reflects an uncertain demand outlook for ARTC's services on the Hunter Valley coal network.[52]

IPART's draft decision

IPART's draft decision on the appropriate level of debt to total assets was 50 to 60 per cent. This was consistent with its previous rail access decision.

Stakeholder comments

The Minerals Council supported IPART's draft decision.[53]

ARTC's submission did not address this issue beyond noting a recent determination by the Economic Regulatory Authority (ERA) of WA included a debt gearing estimate of 30 per cent.[54]

IPART's final decision

IPART's final decision on the appropriate level of debt to total assets is 50 to 60 per cent.

In its recent regulatory decisions for other industries IPART has adopted a debt funding level of 60 per cent. However, in its last rail access decision, IPART adopted a lower level of debt funding (50 to 60 per cent) which was consistent with the 1999 decision on rail access.

IPART's final decision is to maintain the approach used in past rail access decisions and adopt a debt to total assets range of 50 to 60 per cent. The estimation of other parameters for the WACC reflects this assumed capital structure. IPART also notes that US rail infrastructure assets had debt funding levels below 50 per cent and that other Australia regulators have used an assumed gearing levels of 30 per cent to 60 per cent in similar reviews.

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[51] Report by Synergies for ARTC, December 2008, p 31.
[52] Ibid, p 30.
[53] NSW Minerals Council submission on IPART's draft report and decision - attached report by ACIL Tasman, June 2009, p 2.
[54] ARTC's submission on IPART's draft report and decision, June 2009, p 2.

IPART notes the recent decision by the ERA to adopt a 30 per cent debt gearing estimate for the Pilbara Infrastructure railway network. In making its decision the ERA noted the particular characteristics of the railway; that it was a single commodity (iron ore) greenfields railway in a remote location currently serving only one customer.[55] IPART considers that the characteristics of that railway and the other parameter decisions made by the ERA means that the ERA decision is not directly relevant to its considerations for this review.

3.4.6 Dividend imputation factor (gamma)

Under Australia's dividend imputation system, domestic equity investors receive a tax credit (franking credit) for dividends paid out from after-tax company profit. The franking credit can be offset against the personal tax of equity investors and hence represents additional cash flow to these investors. The value of the imputation credit is represented by 'gamma' (γ).

The cost of capital was first adjusted by Officer to reflect the imputation credit.[56] The value of gamma is the product of two elements:

▼ the proportion of company tax paid distributed to shareholders as franking credits (distribution rate), and

▼ the value placed by an investor on one dollar of franking credits (utilisation rate or theta).

The distribution rate was found to be around 71 per cent (Hathaway and Officer 2004).

A number of empirical studies using different methodologies to estimate the utilisation rate of imputation credits have been undertaken. The results from these studies are shown in Table 3.12.

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55 ERA, *Final Determination: 2009 Weighted Average Cost of Capital for TPI's Railway*, June 2009, p 25.

56 R R Officer, *The Cost of Capital under an imputation tax system, Accounting and Finance*, 1994, pp 1-17.

Table 3.12 Empirical estimates of gamma utilisation rate

Study	Methodology	Value of franking credit	Gamma[a]
Hathaway & Officer (2004)	Analysis of tax statistics	0.50	0.36
Cannavan, Finn & Gray (2004)	Inference from value of individual share futures (ISF) and low exercise price options (LEPO)	0.50 (pre 45-day rule)	0.36
		0.00 (post 45-day rule)	0.00
Bellamy & Gray (2004)	Dividend drop-off (adjusted), 1995-2002	0.00	0.00
Beggs and Skeels (2006)	Dividend drop-off (1987 – 2000)	0.57	0.41
Feuerherdt, Gray & Hall (2007)	Dividend drop-off, hybrid securities	0.00	0.00
Handley and Mahesawaran (2008)	Analysis of tax statistics	0.81	0.58

a assumes a distribution rate of 71 per cent.

Source: Hathaway and Officer, *The value of imputation tax credits – Updated 2004*, Capital Research Pty Ltd, November 2004, p 26; Cannavan, Finn and Gray, *The value of dividend imputation tax credits in Australia*, 73 Journal of Financial Economics, 2004, p 192.; Beggs and Skeels, *Market arbitrage of cash dividends and franking credits*, 82 The Economic Record 258, 2006, p 252; SFG, *The impact of franking credits on the cost of capital of Australian companies*, Report prepared for Envestra, Multinet and SP AustNet, October 2007, p 45; Feuerherdt, Gray & Hall, *The Value of Imputation Credits on Australian Hybrid Securities*, International Review of Finance, 2007, p 3; Handley and Mahesawaran, *A measure of the efficacy of the Australian imputation tax system*, The Economic Record, Vol. 84, No. 264, March, 2008, pp 82-94..

Dividend drop-off method

The dividend drop-off method is commonly used to empirically estimate theta. Essentially, the analysis compares the share price before dividend issue (cum div price) with the share price after the dividend issue (ex-div price). The difference in the prices (drop-off) represents the cash value of the dividend and the market value of imputation credit attached to the share.[57] It is widely held that this method suffers from statistical problem (multi-collinearity) which makes it difficult to separate the value of cash dividends from the value of imputation credits. As a result, it is difficult to obtain a reliable value for the individual coefficients.

Utilisation of franking credits inferred from derivatives

This methodology essentially compares the difference in the pricing of certain derivative securities and their underlying shares. The 2004 study undertaken by Cannavan et al suggested that equity investors place a very low value on imputation credit, in particular after the introduction of the 45-day holding period rule.[58] Compared with the dividend drop-off methodology it uses a larger number of observations for a given company and this tends to enhance the reliability of the

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[57] Beggs and Skeels, *Market arbitrage of cash dividends and franking credits*, 82 The Economic Record 258, 2006, p 258.

[58] The Australian Taxation Office introduced the 45-day rule in 1997 to prevent short term trading in imputation credits. The rule requires an investor to hold a stock for at least 45 days prior to announcement of dividend by the company to qualify for the imputation credit.

results. Also, as derivatives trade well in advance of ex-dividend dates, prices are not contaminated by the activities of short term arbitrage traders. However, some finance experts argue that those trading in derivative instruments may not value imputation credit in the same way as the average investor under CAPM.[59]

Analysis of tax statistics

The utilisation of franking credit can also be estimated by examining ATO data on the redemption of franking credits by taxpayers. Studies that use tax statistics *directly* calculate the utilisation rate for all investors across the Australian market based on the proportion of credits redeemed by taxpayers. A recent study by Handley and Maheswaran estimated a utilisation rate of 81 per cent and 71 per cent over the periods 2001 – 2004 and 1990 – 2004 respectively.[60]

Gamma value adopted by Australian regulators

A majority of recent regulatory decisions in Australia, excluding the AER, have adopted a gamma of 0.50 as shown in Table 3.13.

Table 3.13 Gamma value adopted by jurisdictional regulators

Regulator	Sector	Gamma (final)
ERA (2009)	The Pilbara Infrastructure railway network	0.5
AER (2009)	Electricity WACC review, final decision	0.65
AER (2009)	NSW Electricity Distribution	0.50[a]
IPART (2008)	CityRail	0.30 – 0.50
IPART (2008)	Sydney Water	0.30 – 0.50
ESC (2008)	Gas	0.50
ERA(2008)	WestNet (freight)	0.50
ESCOSA (2006)	Gas	0.48
QCA (2006)	Gas	0.50
ACCC (2008)	ARTC interstate rail network	0.50

a The National Electricity Rules clause 6.5.3 deems the assumed gamma to be 0.5.
Source: relevant decisions of IPART, AER, ACCC, ESC, QCA, ESCOSA and ERA.

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[59] Cannavan et al, op cit, 2004, pp 167-197.
[60] Handley & Maheswaran, *A measure of the efficacy of the Australian imputation tax system,* 84 The Economic Record 264, 2008, p 90.

ARTC's proposal

Guided by recent empirical studies and analysis undertaken by its consultant, ARTC submitted that it was appropriate to assume a value of zero for gamma on the basis of evidence including:

▼ Statistical problems in estimating a reliable gamma using the dividend drop-off methodology.

▼ The introduction of the 45-day rule introduced from July 1999 resulted in a major structural change that has impacted on the value of franking credits as found by recent studies.

▼ The influence of foreign investors is already recognised in all market determined parameters including the risk free rate, debt margin and the MRP. It is therefore inconsistent to assume a fully segmented market and ignore the presence of foreign investors in the Australian market (Synergies disagrees with IPART in that the Australian market is fully segregated and the marginal investor is therefore a domestic investor).[61]

In its submission on the discussion paper, ARTC's consultant questioned why IPART uses a range from 0.3 to 0.5 when there is evidence to suggest that a value of zero is feasible. Not including zero within the range suggests that it is not a reasonable outcome which runs counter to evidence provided by a number of reputable studies.[62]

IPART's draft decision

IPART's draft decision was to adopt a gamma of 0.3 to 0.5. This was consistent with its 2005 decision.

Stakeholder comments

The NSW Minerals Council's consultant ACIL Tasman argued that IPART's choice of a gamma range of 0.3 to 0.5 is out of step with regulatory practice in other jurisdictions. It argued that ACCC is likely to adopt a value of gamma of 0.65 consistent with the AER and that IPART's choice of a range of values below this will create a discontinuity once the regulation of ARTC moves to the ACCC.[63]

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[61] Report by Synergies for ARTC, December 2008, pp 91-92.
[62] Report by Synergies for ARTC, April 2009, p 19.
[63] NSW Minerals Council submission on IPART's draft report and decision - attached report by ACIL Tasman, June 2009, p 2.

ARTC's consultant argued that the evidence relied upon by the AER did not in its view support a value of gamma of 0.65. It noted that a recent study by Handley to the AER concludes that a reasonable estimate for gamma is within range of 0.3 to 0.7. ARTC's submissions stated that it would not object to IPART retaining its draft decision on gamma of a range of 0.3 to 0.5.[64]

IPART's final decision

IPART's final decision is to adopt a gamma of 0.3 to 0.5 which is consistent with both its draft decision and the 2005 decision.

In arriving at this decision, IPART had regard to submissions received on its draft decision, and a number of studies where gamma has been estimated.[65] While the evidence from the academic studies on gamma is mixed, IPART considers that its range of 0.3 to 0.5 is still appropriate. In particular, IPART considers that there is insufficient evidence to move away from its approach.

In terms of the Minerals Council's comments, IPART cannot second guess what the ACCC will do in regards to its consideration of the issue of gamma. However, in its most recent rail access decision the ACCC reviewed the evidence presented by ARTC in support of its proposed value of gamma for its interstate rail network undertaking and decided on a gamma of 0.5.[66] IPART considers that its estimated range of 0.3 to 0.5 is consistent with that decision by the ACCC. Furthermore, as outlined above in Table 3.13 most recent regulatory decisions in other jurisdictions have adopted a value of 0.5 for gamma. Again, IPART considers its final decision consistent with those decisions.

With regard to the AER's recent decision to adopt a gamma of 0.65, IPART notes there is some evidence that the value of gamma could exceed 0.5, but it also notes that there is evidence which suggests a value below 0.5.[67] IPART considers that this divergence in results and opinion on this issue further supports its view that its range of 0.3 to 0.5 is appropriate.

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[64] ARTC's submission on IPART's draft report and decision, June 2009, p 3 and attached report by Synergies, June 2009, pp 20-22.

[65] See for example, Cannavan, Finn & Gray, *The value of dividend imputation tax credits in Australia,* Journal of Financial Economics 73,1, pp 167-197; Bellamy, D and S. Gray (2004). *Using Stock Price Changes to Estimate the Value of Dividend Franking Credits.* Working Paper University of Queensland, Business School; Chu, H., Partington G. *The market value of dividends: evidence from a new method*, working paper, UTS, 2001.

[66] ACCC, *Final Decision Australian Rail Track Corporation Access Undertaking – Interstate Rail Network*, July 2008, pp 164.

[67] AER, *Final decision Electricity transmission and distribution network service providers*, Review of the weighted average cost of capital (WACC) parameters, May 2009, p 48.

3.4.7 Tax rate

IPART's final decision is to use a pre-tax real WACC to set the rate of return from 1 July 2009. To calculate the pre-tax real WACC requires the use of a tax rate regulators can either choose:

▼ an effective (or actual) tax rate, or

▼ the statutory tax rate (30 per cent).

Differences between the effective and actual tax rates can reflect regulatory depreciation versus depreciation allowed for tax purposes and tax minimisation possibilities.

ARTC's proposal

ARTC has proposed to use the statutory tax rate. ARTC opposed using an effective tax rate. It contends that while its effective tax rate could possibly fall both below and above 30 per cent, any timing differences could be expected to balance out in the long-term such that the effective and statutory rates should equate.[68]

IPART's draft decision

IPART's draft decision was to use the statutory tax rate of 30 per cent as it has done in its recent regulatory decisions.

Stakeholder comments

The Minerals Council's consultant ACIL Tasman submitted that IPART should use the effective tax rate as opposed to the statutory rate. It argued that, while IPART argued in its draft decision that the effective and statutory tax rates should equate over the longer-term, over the coming five years ARTC's effective rate of tax is likely to be significantly lower than the statutory tax rate. It argued that it would be practical for IPART to estimate an effective tax rate for ARTC in line with the approach adopted by the ACCC.[69]

IPART's final decision

IPART's final decision is to use the statutory tax rate of 30 per cent as it has done in its recent regulatory decisions. This is also consistent with the 2005 rail access rate of return decision.

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[68] ARTC's supplementary submission, April 2009, p 14.
[69] NSW Minerals Council submission on IPART's draft report and decision - attached report by ACIL Tasman, June 2009, p 3.

Its reasons for adopting this approach are unchanged from the draft decision. That is, in practice most practitioners use the statutory tax rate. Given that effective tax rates are continually changing over time and are largely specific to individual companies, it is extremely difficult to derive a generally applicable effective tax rate. Furthermore, effective and statutory tax rates should equate over the longer-term.

3.4.8   Equity beta

Under the CAPM, the systematic risk of an asset is measured by its 'beta' factor. In statistical terms, the beta factors reflect the extent to which future returns are expected to co-vary with the overall market. An equity beta of 1 means the equity in the asset has the same risk as the market whereas higher risk equity will have a beta greater than one.

A business entity's equity beta is determined by its 'business risk' and 'financial risk'. Business risk arises from the variability of the business's cash flow to the overall economic activity while financial risk refers to the debt level (or gearing) of the business. A higher debt level implies a higher equity beta.

Equity beta is used to estimate the equity return of a business by the CAPM formula:

$Re = Rf + \beta e \times (Rm - Rf)$.

If a firm is listed on a stock exchange, its equity beta can be estimated by analysing the movement of the firm's share price relative to that of the market. For a firm not listed on a stock exchange, the common approach to determine the firm's equity beta is to undertake the de/re-levering process based on observed equity beta of comparable firms that are listed on share markets. As comparator firms have different gearing levels the observed equity betas needs to be de-geared to produce an asset beta. In essence, the asset beta removes the effect of financial risk from the systematic risk. The equity beta for the regulated firm is then estimated by re-gearing the asset beta by the benchmark gearing level chosen for the regulated firm. The process is undertaken through the Monkhouse formula:

$\beta e = \beta a + (\beta a - \beta d) * \{1 - [Rd/(1+Rd)] * [t*(1-\gamma)]\} * D/E$

Where:

    βa = asset beta

    βd = debt beta

    Rd = the cost of debt capital

    t = corporate tax rate

    γ = gamma

D/E = value of debt/value of equity

The most recent equity betas of US rail infrastructure companies and operators, and their asset betas estimated by applying the Monkhouse formula with a zero debt beta are set out in Table 3.14.

Table 3.14 Equity and asset beta estimates of North American rail operators

Company	Equity beta	Gearing	Asset beta
Burlington Northern Santa Fe Corp	0.78	0.46	0.42
CSX Corporation	1.00	0.49	0.51
Genesee & Wyoming Inc.	1.42	0.39	0.87
Kansas City Southern	1.39	0.49	0.71
Norfolk Southern Corporation	1.06	0.41	0.63
Union Pacific Corporation	0.91	0.37	0.58

Source: Bloomberg, IPART calculations.

Regulators also arrive at the value for the equity beta by assessing a number of other relevant issues including:

▼ risk relative to that of comparable listed companies and other regulated industries, both in Australia and overseas

▼ a first principles analysis of asset risk, including:

– variability in revenues and covariability with economic activity

– structure of regulation

– operating leverage (the extent to which costs are fixed)

▼ submissions from the regulated firms and relevant stakeholders

▼ previous regulatory decisions.

Table 3.15 summarises recent regulatory decisions on rail made by Australian regulators.

Table 3.15 Recent regulatory decisions on asset beta

Regulator/year	Sector	Asset beta
ERA (2009)	The Pilbara Infrastructure railway network	1.00
ACCC (2008)	ARTC Interstate rail network	0.65
ERA (2008)	WestNet Rail (freight)	0.65
QCA (2008)	Queensland Rail	0.50
QCA (2005)	Dalrymple Bay Coal Terminal	0.50
IPART (2004)	Hunter Valley Coal Network	0.32 to 0.46

Source: Relevant decisions of ACCC, ERA and QCA.

ARTC's proposal

ARTC proposes an asset beta range of 0.50 to 0.60, based on an assessment of its systematic risk factors that impact on the asset beta (first principles analysis) and having regard to asset betas of a set of comparable companies (listed on sharemarkets) with similar business and risk profile as ARTC and relevant regulatory decisions.

Its consultant's first principles analysis concludes that:

▼ ARTC has high operating leverage (due to high fixed cost base) and hence high systematic risk.

▼ Demand for ARTC's service is closely intertwined with demand for coal, in particular thermal coal for export.

▼ ARTC is regulated by revenue cap which provides some revenue certainty for the term of regulatory period.

▼ ARTC possesses market power but regulation prevents it exercising this power.[70]

The lower bound of the asset beta range proposed by ARTC mirrors the recent QCA decision in relation to Queensland Rail's Central Queensland Coal Network while the upper bound is based on other rail regulatory decisions as well as estimates from listed coal and rail companies used in the analysis of comparable companies.[71]

Based on the asset beta range of 0.50 to 0.60, and applying the Monkhouse formula, the corresponding equity beta proposed by ARTC is 0.99 to 1.32.[72]

IPART's draft decision

IPART's draft decision adopted an equity beta of 0.7 to 1.0.

Stakeholder comments

The Minerals Council supported IPART's draft decision.[73]

ARTC's submission did not address this issue.

IPART's final decision

IPART's final decision is to adopt an equity beta of 0.7 to 1.0. This is consistent with its 2005 rail access decision on equity beta.

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[70] Report by Synergies for ARTC, December 2008, pp 56-57.
[71] Ibid, 2008, p 57.
[72] Ibid, p 8.
[73] NSW Minerals Council submission on IPART's draft report and decision - attached report by ACIL Tasman, June 2009, p 3.

IPART notes that the AER's recent decision on equity beta for electricity network businesses adopted a value of 0.8.[74] IPART does not consider that this decision sets a precedent for this rail access decision as the evidence and analysis presented as part of that decision reflects a different industry and therefore different systematic risks.

IPART also notes the recent decision by the ERA to adopt an asset beta of 1.0 and equity beta of 1.43 for the Pilbara Infrastructure railway network. As was the case with its decision on the level of gearing, the ERA took into account the particular characteristics of the railway when making its decision on betas.[75] Again, IPART considers that the characteristics of that railway and the other parameter decisions made by the ERA means that the ERA decision is not directly relevant to its considerations for this review. In its submission on IPART's draft decision and report, ARTC noted the ERA decision but acknowledged the market and commercial differences between the Hunter Valley coal network and the Pilbara Infrastructure.[76]

3.5   Choosing within the WACC range

IPART has chosen WACC estimates at various points within the range in the past. These decisions have reflected:

▾   IPART's view on the likely values of the parameters within each range

▾   the risks from choosing a WACC that is too high versus choosing a WACC that is too low

▾   stakeholders' views of the appropriateness of various estimates of the WACC for new investment.

A further issue to be considered is the impact of the global financial crisis on the ability of firms to raise capital and its cost. IPART notes that the AER gave weight to the impact of the global financial crisis in its decision to increase the MRP. While IPART considers that normally market conditions will be fully reflected in current market rates, it recognises that the current circumstances are unusual. If an adjustment for these circumstances is warranted it could be incorporated through an adjustment to the risk free rate, an adjustment to the MRP, or the choice of a higher WACC within the range. The latter option was not available to the AER under its approach, but is available to IPART for this review.

In its 2005 decision, IPART chose a WACC above the mid-point of the range. This reflected broad agreement between the stakeholders that the appropriate rate of return was above the mid-point of the range in order to encourage new investment.

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[74]   AER, *Final decision Electricity transmission and distribution network service providers*, Review of the weighted average cost of capital (WACC) parameters, May 2009, p 48.

[75]   ERA, *Final Determination: 2009 Weighted Average Cost of Capital for TPI's Railway*, June 2009, pp 43-45.

[76]   ARTC's submission on IPART's draft report and decision, June 2009, p 6.

ARTC's proposal

ARTC's original proposal argued that IPART should set a rate of return at around the 75th percentile of the range. Its proposal determined a real pre-tax range of between 8.84 and 10.53 per cent, and based on that analysis ARTC proposed a rate of return of at least 10 per cent (as at November 2008). It argued for this based on:

▼ The costs of underinvestment that result from setting a WACC that is too low are smaller than the costs of setting a WACC that is too high. This reflects the costs of discouraging efficient investment.

▼ The asymmetric risks faced by ARTC (which ARTC argues should be incorporated by choosing an equity beta from the upper bound of a reasonable range).

▼ Consistency with previous regulatory decisions.

ARTC updated this WACC range to reflect updated market parameters in its submission on IPART's rate of return discussion paper. This affected the value of the risk free rate and debt margin. It has also added the 60 basis points increase to the risk free rate to reflect the impact of the global financial crisis. The updated range as at 31 March 2009 was 9.3 to 11 per cent, and ARTC sought a rate of return towards the top of that range of 10.5 per cent.[77]

IPART's draft decision

IPART's draft decision was a rate of return of 7.5 percent. IPART's draft decision included an adjustment of 60 basis points to the mid-point of the WACC range of 6.9 per cent in recognition of the investment risks imposed by setting a rate of return that is too low. This decision was consistent with the 2005 and 1999 decisions.

While acknowledging that the costs of rail access affects the viability of some mines particularly more marginal new mines, IPART considered that the analysis presented in ARTC's submission and its own analysis suggests that the cost of rail access to the mines is a small proportion of the export price of coal. However, the costs associated with underinvestment in the Hunter Valley coal network may exceed those of overinvestment. Therefore, IPART decided in its draft report that the substantial costs of underinvestment supported IPART adopting a rate of return above the mid-point of the range.

IPART did not make any specific allowance for the impact of the global financial crisis for its draft decision however it noted that its preliminary view was that if an adjustment was warranted it may be more appropriate to choose a rate of return above the mid-point of the range than make ad-hoc adjustments to individual parameters, particularly if the market data does not fully support such adjustments. This would involve a two stage decision process: firstly consideration of the choice of the WACC within the range in the absence of the global financial crisis; and

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[77] ARTC's submission, April 2009, p 4.

secondly, consideration of an explicit adjustment to the WACC in light of the global financial crisis.

At the time of its draft decision IPART had limited time to consider the AER's decision, in particular its decision to reject an adjustment to the risk free rate for the "convenience yield" and the adjustment to the MRP from 6 to 6.5. But IPART stated that it would consider both the impact of the global financial crisis and the AER's decision further before finalising its decision. These points are addressed below.

Stakeholder comments

The Minerals Council and its consultant ACIL Tasman argued that it is important to set a cost of capital that is sufficient to remunerate ARTC's new investment but that this is achieved by setting a cost of capital at the mid-point of the range. While the Minerals Council considered that the cost of underinvestment would be substantial, this is equally true for many infrastructure providers for whom the cost of capital is determined at the mid-point. But if IPART believed that the cost of underinvestment is disproportionate, the Minerals Council agreed that this is best taken into account through the choice of a WACC above the mid-point. The Minerals Council considered that there is no asymmetric risk involved in servicing the new mines and that no adjustment is required for the global financial crisis.[78]

ARTC's submission on IPART's draft decision and report generally supported IPART's approach to determining a range of feasible returns and selecting a rate of return above the mid-point of this range. However, it argued that the decision should incorporate asymmetric risks facing the access provider and recognise stranding risk particularly if IPART was to adopt the alternative approach to estimating remaining mine life proposed in LECG's report.[79]

IPART's final decision

IPART's final decision is to set a rate of return of 8.0 per cent which is 60 basis points above the mid-point of the WACC range of 7.4 per cent.

In making its decision on the appropriate choice of WACC within the range IPART made only one specific adjustment to account for the risks of underinvestment in the network. This adjustment was set out in the draft report. IPART has made the same 60 basis point adjustment for the final decision in recognition of these risks.

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[78] NSW Minerals Council submission on IPART's draft report and decision, July 2009, p 1 and attached report by ACIL Tasman, June 2009, pp 3-4.

[79] ARTC's submission on IPART's draft report and decision, June 2009, p 2 and attached report by Synergies, June 2009, pp 10-11.

In making this 60 basis point adjustment, IPART considers the risks of underinvestment in the network exceed those of overinvestment. As noted in the draft decision, the cost of rail access to the mines is a small proportion of the export price of coal. But the risks to the entire Hunter Valley coal chain capacity from underinvestment in the rail infrastructure could be substantial.

IPART also notes that the Undertaking requires that ARTC (and RailCorp) undertake consultation prior to carrying out capital expenditure. The current Undertaking and the consultation requirements which underpin it, and the general consultative approach used by coal chain stakeholders generally means that capital projects are scoped, costed and explained to all stakeholders prior to construction. IPART understands that ARTC regularly meets with the industry to seek their views on proposed capital projects. IPART takes these consultations into account when it makes its regulatory decisions on compliance with the Undertaking each year. Therefore, IPART considers that these mechanisms reduce the risks of overinvestment in the network.

For this final decision, IPART has further considered the impact of the global financial crisis on the ability of firms to raise capital. As noted in the discussion for the individual parameter decisions above, IPART considers that some stability has returned to the estimates of the cost of capital. In particular, the recent increases in CGS yields are returning that proxy estimate to levels more consistent with long-term averages.

IPART has also further considered the AER's decision to increase the MRP to 6.5 per cent. In particular, the AER's own analysis which indicated that recent estimates of the MRP were between 5.7 and 6.2 per cent. While IPART considers that normally market conditions will be fully reflected in current market rates, it recognises that the current circumstances are unusual and it is possible that equity investors are seeking higher returns. But the evidence provided by the long-term historic averages used by IPART and other regulators does not support adopting an adjustment to IPART's current MRP range of 5.5 to 6.5 per cent.

Therefore, after further inspection of the AER's recent decision and evidence submitted to it and its own analysis, IPART considers that a specific adjustment to reflect the global financial crisis is not warranted.

IPART has not provided any compensation for asymmetric or stranding risks in this decision. IPART does not consider that this decision on the rate of return and its decision to maintain the existing implied terminal life for ARTC's assets materially increases the risks facing ARTC. In making this decision IPART had regard to both the views put forward by the Minerals Council and other regulatory decisions such as the ERA's on the Pilbara Infrastructure. In that decision the ERA did not provide any compensation for asymmetric risks in the WACC but found that this issue is better dealt with by other measures.[80]

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[80] ERA, *Final Determination: 2009 Weighted Average Cost of Capital for TPI's Railway*, June 2009, pp 55-56.

While acknowledging that new investments may have some risks it is IPART's view that the current robust forecast for coal exports suggests that the risks of stranding of assets in the Hunter Valley may actually reduce in the future as mines' production rates increase substantially. If the risk of stranding of assets does become a substantial problem in the future IPART's view is that there may be more appropriate measures than the WACC to address this issue such as depreciation schedules.

Finally, IPART's 2009 decision is consistent with its previous decisions to adopt a rate above the mid-point. As stated above the 2005 decision provided a rate of return of 7.3 per cent, above the mid-point (6.6 per cent) of the WACC range of 5.5 to 8.0 per cent. In 1999, IPART adopted a rate of return of 8 per cent, again a rate above the mid-point of the range of 5.3 to 8.8 per cent.

4 IPART's final decision on remaining mine life from 1 July 2009

The remaining mine life is used in the Undertaking as a proxy for the remaining useful life of the relevant sectors of the Hunter Valley coal network. Depreciation is calculated on a straight-line basis using this estimate of the useful life of the assets. The depreciation rate is then applied to the average RAB of the constrained network to calculate the depreciation amount for inclusion in the 'full economic cost' of the constrained network. The Undertaking's ceiling test limits the recovery of access revenue (of the constrained network) to their 'full economic cost' (Schedule 3).[81] Consequently, a reduction in the remaining mine life has the effect of increasing the annual depreciation that the infrastructure owner is able to recover over a shorter remaining life.

The Undertaking prescribes the initial estimate of the remaining mine life as 40 years from 1 July 1999 (Schedule 3, Clause 3.2(c)(iii)). This is based on IPART's Final Report *Aspects of the NSW Rail Access Regime*, dated 28 April 1999.[82] In 2004, IPART reviewed the estimate of remaining mine life under the Undertaking and decided to preserve the status quo based on consensus among stakeholders. Therefore, the remaining mine life from 1 July 2004 was held to be 35 years.[83]

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81 The constrained group of mines contains those situated along the mainline between the Port of Newcastle and a point near Muswellbrook. The calculation of full economic costs is on a stand alone basis. The Undertaking requires that access revenue must not exceed the ceiling specified under Schedule 3 of the Undertaking.

82 This was determined as a fair compromise between the 30 year life sought by the then asset owner (RAC) and the 50 year life sought by the mining industry in 1999.

83 In 2004 Booz Allen engaged by IPART, recommended a shortening of the remaining mine life. However, IPART did not accept this recommendation, given the consensus that had emerged in favour of maintaining the status quo.

RailCorp has chosen not to propose an estimate for the remaining mine life of Hunter Valley coal mines for this review. ARTC proposed an estimate of the remaining mine life of 22.8 years from 1 July 2009, based on analysis by its consultant Booz & Co. (Booz).[84] ARTC noted that a better estimate of the remaining mine life provides the appropriate incentive to invest efficiently in the Hunter Valley coal network.

This chapter outlines the key issues in determining the remaining mine life, including stakeholder submissions and the findings of the assessment undertaken by LECG (IPART's consultant).

4.1   Overview of IPART's decision

IPART's final decision is that the remaining mine life from 1 July 2009 is 30 years. In making this decision, IPART has been cognisant of the fact that ARTC's Hunter Valley rail assets are soon likely to be transferred to an access arrangement overseen by the ACCC. At present, these are the only assets for which the remaining mine life decision would have pricing impacts.

IPART's decision on the remaining mine life reflects its views that:

▼ The existing approach to determining mine life should be retained unless there is clear evidence that an alternative approach would be preferable.

▼ Capacity constraints should be adequately accounted for in determining the remaining mine life.

▼ Prospective mines should be included in the remaining mine life.

▼ Stakeholders have made a number of suggestions regarding alternative methodologies but no clear consensus regarding a preferable methodology has occurred.

▼ The methodologies that have been proposed by stakeholders each have their strengths and weaknesses.

In making its final decision IPART has given consideration to the submissions by stakeholders, including the Booz approach to estimating the remaining mine life and the analysis of its consultant LECG.

LECG were engaged by IPART to provide expert advice on the remaining mine life. In March 2009, IPART released an issues paper from LECG for stakeholder comment.[85]

After receiving submissions on its issues paper, including additional confidential information submitted by ARTC on Booz's approach, and conducting further

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84 ARTC submission to IPART, 1 December 2008, p 5; Booz & Co., Mine Life Assessment Hunter Valley Coal Network, 28 November 2008 (at Appendix B to ARTC, 1 December 2008 submission).

85 LECG, *Issues Paper – Remaining Mine Life Hunter Valley coal network*, March 2009.

analysis LECG provided a draft report and findings which IPART released for stakeholder comment.[86] LECG has now provided a final report.

4.2   IPART's draft decision

IPART draft decision was a 30 year remaining mine life from 1 July 2009. In making its draft decision IPART considered the views of stakeholders, in particular ARTC's proposal to shorten the remaining mine life utilising Booz's analysis and the Minerals Council's view that a remaining mine of at least 30 years is appropriate. IPART also agreed with the advice provided in LECG's draft report that 30 years is the appropriate remaining mine life.

4.3   Issues and IPART's considerations

4.3.1   Methodology for estimating remaining mine life

Estimates of the remaining mine life in the Hunter Valley are based on the amount of coal available for extraction and the amount of extraction likely to occur each year. Mines will have different remaining lives, providing different useful lives for the rail infrastructure that they use. The timeframe required to extract coal from the mines will depend on the port and rail infrastructure capacity and market conditions.

ARTC's proposal

ARTC and its consultant, Booz, use a weighted average approach to estimate the remaining life of mines, taking into account the relative size of each mine. The methodology that Booz has applied is based on the combined effect of mine production rate as well as the coal chain capacity. It gives recognition to the fact that the production rates of mines are affected by coal chain capacity constraints and mine production varies over time, in particular during startup and shutdown phases. Further, the estimates produced by Booz are based on the marketable reserves of coal at each mine in 2008 and existing capacity of the Hunter Valley coal network up to 2012. It assumes that the capacity beyond 2012 is sufficiently expanded to match the demand forecast.[87]

Table 4.1 sets out the four scenarios put forward by Booz to support its assessment of the appropriate remaining mine life that should be applied.

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86 LECG, *Draft Report – Remaining Mine Life Hunter Valley coal network,* May 2009.
87 Booz & Co, *Mine Life Assessment Hunter Valley Coal Network*, 28 November 2008, pp 1-2.

Table 4.1 Booz's estimates of remaining mine life

	Option A	Option B	Option C	Option D
Coal chain capacity constrained	No	Yes	No	Yes
Prospective mines (Watermark, Caroona and Maules Creek) included	No	No	Yes	Yes
Average mine life (years)	22.5	22.8	25.2	25.5

Source: Booz & Co, *Mine Life Assessment Hunter Valley Coal Network*, 28 November 2008, p 2.

Booz's analysis demonstrates that the inclusion of prospective mines would extend the remaining mine life from 22.8 to 25.5 years. Removing constraints on coal chain capacity would reduce remaining mine life by 0.3 years.

ARTC notes that the use of a production-weighted average mine life approach provides for a stable regulatory outcome over time and reduces the risk that depreciation associated with ARTC's intended investment in the Hunter Valley will not be recovered after the closure of the bulk of the mines paying for that investment.[88]

LECG's methodology

In its final report, LECG proposes two alternative methodologies to estimating the remaining mine life.[89] The first, and theoretical ideal, allocates depreciation expense according to a fixed price per tonne (the unit of production method). The second method is based on the longest lived substantial mine on each line segment of the Hunter Valley coal network.

As noted by LECG, the unit of production method is inconsistent with the straight line depreciation required by the Undertaking. In particular, LECG suggests that the life of the longest-lived mine on a line should be considered to be the economic life of the line. This is because the railway infrastructure cannot be decommissioned until the longest-lived mine has stopped producing.[90]

LECG also notes that there are inherent weaknesses with the weighted-average approach to estimating the remaining mine life.[91]

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88   ARTC's submission on IPART's draft report and decision, June 2009, pp 3-6.
89   LECG, *Final Report – Remaining Mine Life Hunter Valley coal network,* July 2009, p 16.
90   Ibid, p 16.
91   Ibid, pp 13-16.

Stakeholder comments

ARTC, in considering LECG's methodology, notes that this method could increase stranding risk and discourage investment.[92]

LECG has considered ARTC's comments and acknowledges its concerns regarding stranding risk. However, LECG has formed the view that ARTC's own approach also creates a stranding risk because as coal tonnages hauled decrease towards the end of useful lives of the mines, effective real access prices per tonne will increase under the Booz methodology.[93]

IPART's final decision

IPART has considered the three alternative methodologies for estimating the remaining mine life.

▼ It notes that the longest-lived mine approach provides an estimate of around 30 years but that in the longer-term it could increase the risk of asset stranding.

▼ IPART also notes LECG's view that the Booz approach could also increase the risk asset stranding, particularly when compared to LECG's preferred unit of production approach.

▼ While it may provide theoretical advantages, the unit of production approach is likely to require an amendment to the existing Undertaking and has not been discussed with stakeholders.

In making its final decision, IPART has given consideration to the methodologies to estimate the remaining mine life put forward by ARTC/Booz, the Minerals Council and LECG.

4.3.2 Capacity constraints

The speed with which coal can be extracted from the existing and future mines will depend on the capacity of the infrastructure, such as rail and port. The greater the capacity constraints, the longer the lives of the mines, as the coal will take longer to extract.

ARTC's proposal

Booz modelled the remaining mine life with and without capacity constraints. It found only minimal difference between these scenarios, with capacity constraints increasing the remaining mine life by 0.3 years.

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92 ARTC's submission on IPART's draft report and decision, June 2009, p 28.
93 LECG, *Final Report – Remaining Mine Life Hunter Valley coal network,* July 2009, p 18.

The capacity constraints modelled by Booz were:

▼ Coal chain capacity to increase to 185m tonnes per annum by end of 2012 consistent with the capacity data of the Hunter Valley Coal Chain Logistic Team (HVCCLT). In the years prior to 2013, Booz has used estimates from ARTC investment strategy which is closely aligned with known port capacity. ARTC's strategy is to ensure capacity is expanded ahead of demand and constraints are kept to a minimum.

▼ There would be no constraints on capacity after 2012.

Following IPART's draft decision, ARTC acknowledged a revision in its results arising from aligning annual coal extraction rates in the Hunter to the port capacity. This increased the remaining mine life estimates from its original proposal - for Option B from 22.8 to 23 years and for Option D from 25.5 to 25.9 years.[94]

ARTC also noted that the Minerals Council's consultant appeared to have based its production forecasts on constrained coal capacity of between 27 to 42 per cent over the 8 year period between 2011 to 2018 and that this extent of constraint would contradict efforts by the industry to develop new port and rail capacity.[95]

LECG's analysis

In its final report, LECG recommends that the capacity assumptions proposed by ARTC are reasonable. Previous dispute, covered in LECG's draft report, arose from a misunderstanding of the modelling undertaken.[96]

Stakeholder comments

In its submission on IPART's draft decision and report, the Minerals Council supported LECG's concerns regarding the impact of capacity constraints and potential new mines on the estimate of remaining mine life.[97]

IPART's final decision

Discussions between Booz and LECG following the draft decision resolved the disputes about the modelling of capacity constraints.

IPART is satisfied that the adjusted capacity numbers presented by ARTC are accurate. However, the extent to which future capacity constraints on both the rail and port infrastructure can be resolved will only be known with certainty over time.

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94   ARTC's submission on IPART's draft report and decision, June 2009, p 5.
95   ARTC's supplementary submission on IPART's draft report and decision, 20 July 2009, p 3.
96   LECG, *Final Report – Remaining Mine Life Hunter Valley coal network,* July 2009, p 24.
97   NSW Minerals Council submission on IPART's draft report and decision – attachment 2, July 2009, pp 1-2.

4.3.3   Inclusion of prospective mines

The estimation of the remaining mine life will be influenced by the inclusion or exclusion of prospective mines, as these mines will tend to have longer economic lives than mines currently in operation.

For ARTC's network, the prospective mines that can be identified are Maules Creek, Caroona and Watermark in the Gunnedah basin.

ARTC's proposal

Booz assessed the remaining mine life with and without the inclusion of prospective mines at Maules Creek, Caroona and Watermark. It found that the inclusion of prospective mines added 2.7 years to the estimate of the remaining mine life, using the weighted average methodology.

Booz's excludes prospective mines on the basis that the production estimates and start dates for each of the prospective mines are considered extremely speculative in the light of current global demand for coal.[98]

ARTC is of the view that the three prospective mines should be excluded from the assessment to be consistent with the intention of the Undertaking and that this approach is consistent with that taken in previous reviews.

ARTC also noted that there is some evidence to suggest that there is a significant over-estimate of marketable reserves in the Booz estimate which could act as a buffer for possible conversion of resources in the future.[99]

LECG's analysis

LECG's report recommends that prospective mines be included in the assessment of the remaining mine life, with the effect of adding about 2.7 years to the estimate. LECG argues that prospective mine contribute to the expected mine life. It would be inappropriate to allocate these mines a probability of zero, instead of assessing a non-zero probability of the opening of such mines.

LECG also recommends that it would be inappropriate to exclude prospective mines because they would not begin operating within the next regulatory period. The economic life of the rail infrastructure is not determined by the production of mines that will commence within the regulatory period.[100]

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98 Booz & Co, *Mine Life Assessment Hunter Valley Coal Network*, 28 November 2008, p 3.
99 ARTC's supplementary submission on IPART's draft report and decision, 20 July 2009, pp 6-7.
100 LECG, *Final Report – Remaining Mine Life Hunter Valley coal network*, July 2009, p 25.

Stakeholder comments

In its submission on IPART's draft decision and report, the Minerals Council supported LECG's concerns regarding the impact of potential new mines on the estimate of remaining mine life.[101]

Based on analysis undertaken by Wood McKenzie, the Minerals Council claimed that with additional reserves and new mining projects it is likely that the remaining mine life will be at least 30 years. The Minerals Council argued that its approach is more appropriate than that used by Booz as it better reflects the circumstances applying to the Hunter Valley coal network over the coming five year period. It further argued that ARTC's proposal to decrease the remaining mine life is incompatible with the basic characteristics of the industry that additional reserves will be proven in the future.[102]

IPART's final decision

IPART agrees with both the advice received from LECG and the views expressed by the Minerals Council. Therefore, IPART considers that prospective new mines should be included in the estimates. Using Booz's methodology (Option D) this provides an estimate of 26 years compared to the existing estimate of 30 years.

4.4   IPART's final decision

ARTC proposed an estimate of the remaining mine life of 22.8 years from 1 July 2009. This is approximately seven years shorter than an estimate based on the roll-forward of the mine life determined by IPART in 2005.[103] As outlined above, IPART considers that the most realistic estimate provided by the Booz methodology is 26 years as this takes into account both capacity constraints and prospective mines. This estimate is four years shorter than the current estimate. However, IPART notes that the Booz methodology has been criticised by some stakeholders and IPART's consultant LECG.

IPART's final decision is that the remaining mine life is 30 years from 1 July 2009. This decision is the same as its draft decision and is consistent with the previous two rail access decisions by IPART. The 1999 decision set the terminal year at 2039 by determining a remaining mine of 40 years. The 2005 decision adopted the same terminal year by determining a remaining mine life of 35 years.

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101 NSW Minerals Council submission on IPART's draft report and decision – attachment 2, July 2009, pp 1-2.
102 Ibid.
103 ARTC submission to IPART, 1 December 2008, p 5.

In making its decision IPART has considered the following key issues:

▼ In 2005, IPART did not accept Booz's preferred methodology and recommendation to shorten the remaining mine life. Its decision reflected a consensus amongst stakeholders that the existing estimate of mine life should be rolled forward. In the absence of clear evidence that an alternative approach would be preferable, IPART has decided to continue its previous approach to determining mine life.

▼ The absence of a consensus amongst stakeholders, in particular ARTC and the Minerals Council, on the best available methodology and estimate.

▼ The LECG report discusses the strengths and weaknesses of alternative depreciation methodologies. LECG's preferred approach, to make the depreciation charge depend on the amount of production, is not available under the NSW Rail Access Undertaking. However, it notes that the production-weighted average life approach that was adopted by Booz can lead to inaccurate results where mines have unequal lives. LECG has used an alternative methodology under which the life of the network equals the life of the longest-lived substantial mine that uses it. It argues that, under this alternative methodology, mine life is approximately 30 years from 2009 for each of the three major sectors of the Hunter Valley rail network even under conservative assumptions about prospective mines.[104] LECG also notes that application of any of the straight line depreciation schedule will lead to rising access prices as the line's tonnages trail off and hence to the risk of stranding assets.[105]

In the absence of methodology which is clearly superior and endorsed by stakeholders, IPART has decided that the best decision available to it is to continue the current approach and set a remaining mine life of 30 years from 1 July 2009. This will leave the implied terminal year unchanged at 2039. IPART's decision is not to endorse one methodology over the other, but to determine the appropriate remaining mine life taking into account all the relevant considerations set out above.

If IPART were to change its approach to determining the remaining mine life in the future it would consider all possible approaches. This would include Booz's methodology and those put forward by LECG.

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[104] LECG, *Final Report – Remaining Mine Life Hunter Valley coal network,* July 2009, p 18.
[105] Ibid, p 19.