

## Review of imputation credits (gamma)

What is the impact of the  
? on the tax system?



## **Review of imputation credits (gamma)**

**Research —Final Decision**  
March 2012

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# 1 Executive Summary

The purpose of this report is to explain our final decision on the value of imputation credits, or gamma ( $\gamma$ ), that we will use for future price determinations.

Under the Australian imputation tax system, shareholders may receive imputation tax credits with dividends, which offset tax liabilities. Therefore, investors would accept a lower rate of return for an investment with imputation credits attached than if there were no imputation tax credits attached. In a post-tax weighted average cost of capital (WACC) model, the value of imputation credits is accounted for, separately from the WACC, in the calculation of tax liabilities and notional revenue required.

As part of our review, we released a discussion paper in December 2011. The discussion paper explained our current practice, recent changes in regulatory practice, empirical studies conducted to estimate gamma and gamma values used in commercial practice. The paper also discussed the impact of using different gamma values on notional revenue, set out our preliminary views on the value of gamma in a post-tax WACC model and sought stakeholder responses.

Our final decision is that the value of gamma in a post-tax WACC model should be 0.25. Previously we used a gamma range of 0.5 to 0.3 with a midpoint of 0.4 within a pre-tax WACC. The decrease in gamma in our final decision increases the notional revenue and prices. Removal of gamma from the WACC calculation narrows the range of the WACC estimate.

While we have adopted a single estimated value for gamma, this estimate remains subject to considerable uncertainty. However, we use gamma to calculate tax expense within our post-tax building block model. This requires a point estimate to be used.

Our decision of 0.25 on the value of gamma was made taking into account:

- ▼ consistency with academic studies
- ▼ consistency with the approach taken by other regulators
- ▼ consistency with commercial practice
- ▼ stability of WACC and prices over time.

The rest of the report explains our review and final decisions in more detail:

- ▼ Chapter 2 provides more context to the review, including the purpose of the review, our previous practice, and the assessment criteria used to make our final decision.
- ▼ Chapter 3 summarises the submission to our discussion paper from the Australian Rail Track Corporation Ltd (ARTC), and discusses our response to ARTC's submission.

- ▼ Chapter 4 discusses our considerations in making our final decision and shows the impact of using different gamma values on notional revenue.

## 2 Context

We changed from a pre-tax WACC to a post-tax WACC approach in December 2011<sup>1</sup>. Under a pre-tax WACC model, gamma is a WACC parameter. Under a post-tax WACC model, gamma is not a WACC parameter, but an input into the calculation of tax liabilities. This is a separate component in the calculation of notional revenue requirement in our building block model (further explained in section 4.5).

In the post-tax building block approach, a lower gamma value will increase the estimate of the amount that investors require to recover the costs of company taxation. This is because the lower gamma value implies a lower level of imputation credits to offset investors' tax liability. As a consequence, the revenue required needs to recover a larger amount of taxation expense.

In 2010, the Australian Competition Tribunal (ACT) was asked to review the value of gamma in the Australian Energy Regulator's (AER) 2010 distribution determinations<sup>2</sup>. The consultants, SFG, were asked to conduct a dividend drop-off study. The ACT's decision in May 2011 on a gamma of 0.25 drew substantially from the new evidence presented in the SFG (2011) dividend drop-off study<sup>3</sup>.

The purpose of our review is to assess the appropriate value of gamma by: analysing academic studies and commercial practices, and taking into account the new evidence on the most likely value of gamma, such as the SFG (2011) dividend drop-off study.

### 2.1 IPART's previous practice

We previously used a gamma range of 0.5 to 0.3 with a midpoint of 0.4. We accounted for uncertainties in the estimate by using a range, rather than a point estimate. We use a domestic version of the capital asset pricing model (CAPM), implying that investors attach at least some value to imputation tax credits.

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<sup>1</sup> IPART, *The incorporation of company tax in pricing determinations – Final Decision*, December 2011.

<sup>2</sup> Australian Competition Tribunal, *Application by ENERGEX Limited (Gamma) (No 5) [2011]*, ACompT 9.

<sup>3</sup> SFG, *Dividend drop-off estimate of theta, Final Report*, 21 March 2011.



In our WACC decision for the Sydney Desalination Plant in December 2011<sup>4</sup>, we changed the gamma range to 0.5 to 0 with a midpoint of 0.25. In our decision we considered SFG's 2011 dividend drop-off study<sup>5</sup> and the recent ACT decision on gamma.<sup>6</sup>

Under a post-tax WACC approach, gamma is an input into the calculation of tax liabilities in our building block model. We do not use ranges in the input parameters for our building block model. This means that we will use a point estimate of gamma rather than a range in future determinations.

## 2.2 This review

We released a discussion paper in December 2011 which explained our previous practice, recent changes in regulatory practice, empirical studies conducted to estimate gamma and gamma values used in commercial valuations. We also asked our stakeholders a number of questions. We have received one submission from the Australian Rail Track Corporation Ltd (ARTC).

## 2.3 Assessment criteria

Our final decision is based on an assessment of the following factors:

- ▼ consistency with academic studies
- ▼ consistency with the approach taken by other regulators
- ▼ consistency with commercial practice
- ▼ stability of WACC and prices over time.

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<sup>4</sup> IPART, *Review of water prices for Sydney Desalination Plant Pty Limited from 1 July 2012 – Final Report*, December 2011, p 80.

<sup>5</sup> SFG, *Dividend drop-off estimate of theta*, Final Report, 21 March 2011.

<sup>6</sup> Australian Competition Tribunal, Application by ENERGEX Limited (Gamma) (No 5) [2011], ACompT 9.

### 3 Submission and our consideration

We received a submission from ARTC, who supports our preliminary view that the gamma value should be 0.25.

In the submission, ARTC states that in its initial proposal to the 2009 review of the Hunter Valley Coal Network, ARTC put forward evidence arguing that the best estimate for gamma was zero. Their arguments are as follows:

- ▼ the difficulties in estimating a value for gamma may indicate the value is zero
- ▼ since the introduction of the 45-day rule, franking credits have no value to foreign investors, who may be marginal investors in the Australian context (whereas they may have had some value prior to this)
- ▼ recent empirical studies, including those by Synergies Economic Consulting have concluded that a zero value for gamma cannot be ruled out<sup>7</sup>.

Whilst ARTC maintains its previous arguments that gamma should be zero and recommends that IPART reconsider prior evidence submitted, ARTC supports the preliminary view expressed in our discussion paper.

As discussed in Chapter 4, we consider that the SFG's dividend drop-off study (2011) provides important new evidence in support of a lower, but not zero, value of gamma.

### 4 IPART's considerations and final decision

This chapter provides our analysis and considerations in forming our final decision that the gamma value should be 0.25.

In reaching our decision, we reviewed a range of evidence on this issue. We considered the views and evidence presented by ARTC. We investigated recent developments in regulatory practice in Australia. We also considered the views of academics and commercial practitioners.

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<sup>7</sup> Synergies Economic Consulting, *Rate of Return to Apply Under NSW Rail Access Undertaking – Response to Draft Decision*, June 2009, p 20-23

## 4.1 Quantitative evidence

The generally accepted regulatory approach has been to define the value of imputation credits as the product of the distribution ratio<sup>8</sup> ( $F$ ) and the utilisation rate ( $\theta$ ):  $\gamma = F \times \theta$ , where:

- ▼ The distribution ratio ( $F$ ) is defined as the value of imputation credits distributed by a firm as a proportion of the value of imputation credits generated by it in the period.
- ▼ The utilisation rate ( $\theta$ ) is defined as the value of imputation credits distributed to investors as a proportion of their face value.

On the distribution ratio, empirical studies suggest a value of 0.7.

On the utilisation rate, the SFG (2011) study presented evidence for a value of 0.35 through:

- ▼ using a more comprehensive and recent data set
- ▼ applying appropriate econometric methods in its analysis.

A distribution value of 0.7 and an utilisation rate of 0.35 give a gamma of 0.245.

### 4.1.1 Distribution ratio

The actual market average distribution ratio based on data from the Australian Taxation Office (ATO) is 0.7.<sup>9</sup> The most recent and comprehensive estimate of the market distribution ratio is 0.71, as provided by Hathaway and Officer (2004).<sup>10</sup> A distribution ratio of 0.7 means that a typical Australian company distributes about 70% of the tax credits generated.

Both NERA Economic Consulting<sup>11</sup> and SFG<sup>12</sup> suggest that the distribution ratio should be 0.7 based on the observed distribution ratios of Australian firms.

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<sup>8</sup> Distribution ratio is the same as payout ratio.

<sup>9</sup> JC Handley, *On the Estimation of Gamma – Report prepared for the Australian Energy Regulator*, March 2010, p 36.

<sup>10</sup> NJ Hathaway & RR Officer, *The Value of Imputation Tax Credits – Update 2004*, Capital Research Pty Ltd, November 2004, p 4.

<sup>11</sup> NERA, *AER's Payout Ratio of Regulated Firms*, A report for Gilbert + Tobin, January 2010, p 2.

<sup>12</sup> SFG, *Gamma: Further Evidence to Support Departure from the AER's Statement of Regulatory Intent – Report Prepared for ENERGEX and Ergon Energy*, December 2009, p 15.

#### 4.1.2 Utilisation rate (theta)

There are currently 3 main methods for assessing the value of theta: dividend drop-off, tax statistics<sup>13</sup> and share futures<sup>14</sup>. We consider that the dividend drop-off methodology is the best methodology to estimate the value of theta. Its most important advantage over the other methods is that it measures the observed market value of dividends and imputation credits.

Dividend drop-off studies of theta involve examining share price changes on ex-dividend days. The share price change (on average) on ex-dividend days is assumed to reflect the value of the dividend and imputation credits, separate from the value of shares.

The most recent dividend drop-off study was conducted by SFG in 2011. SFG used market data on dividend-paying events from 2000 to 2010 and examined the average ex-dividend price change associated with the dividend and imputation credits paid.<sup>15</sup> SFG concluded that the appropriate value of theta is 0.35. The appropriate distribution ratio is 0.7. These 2 parameters produce an estimate of gamma of 0.25.

SFG used weighted least squares (WLS) to overcome the expected heteroscedasticity in the data. In addition, the SFG study has been conducted using a more comprehensive database that enables a greater sensitivity analysis of the influence of the inclusion/exclusion of particular observations from the sample.<sup>16</sup>

The SFG estimate is within the range of past estimates of the utilisation rate and the resulting gamma<sup>17</sup>. However, it is below the mid-point of previous studies and adds weight to the evidence for a lower gamma.

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<sup>13</sup> Tax statistics studies estimate the utilisation of imputation credits, which is a measure of the imputation credits redeemed by shareholders. Theta is estimated from a weighted average of utilisation across investors according to the fraction of total imputation credits in the market that they receive.

<sup>14</sup> Share futures studies estimate the value of imputation credits in Australia by inferring the value of cash dividends and tax credits from the relative prices of share futures and the individual shares on which those futures are written.

<sup>15</sup> SFG, *Dividend drop-off estimate of theta – Final report*, Re: Application by ENERGEX Limited (No 2) [2010] ACompT 7, March 2011.

<sup>16</sup> R Officer, *Expert report prepared in respect of certain matters arising from the AER's Merit Review – Determination of Gamma* – Prepared for ETSA Utilities, ENERGEX and Ergon Energy, April 2011, p 16.

<sup>17</sup> IPART, *Review of imputation credits (gamma) – Discussion Paper*, December 2011.

## 4.2 Regulatory practice

Prior to the 2011 ACT decision, most regulators used a gamma value of 0.5.

After the ACT made the decision on gamma of 0.25, 2 Australian regulators changed their estimates of gamma. As shown in Table 4.1, both the AER and Economic Regulation Authority of Western Australia (ERAWA) adopted a gamma value of 0.25.

**Table 4.1 Australian regulators' gamma decisions (post-ACT decision)**

Regulatory decision	Industry	Gamma value
<b>Australian Energy Regulator (AER)</b>		
Queensland distribution 2011/15	Electricity distribution	0.25
<b>Economic Regulation Authority of Western Australia (ERAWA)</b>		
Dampier to Bunbury Natural Gas Pipeline access arrangement 2011	Gas transmission	0.25

## 4.3 Commercial practice

In past gamma decisions we referred to WACC calculations done as part of independent expert reports. These commercial valuations based their WACC estimate on a classical tax system and hence used a gamma value of 0.

In 2011, SFG noted that:

The great majority of independent expert valuation reports make no adjustment at all to either cash flows or discount rates to reflect any assumed value of franking credits (Lonergan, 2001; KPMG, 2005).

The great majority of CFOs of major Australian companies (who between them account for more than 85% of the equity capital of listed Australian firms) make no adjustment at all to either cash flows or discount rates to reflect any assumed value of franking credits (Truong, Partington and Peat, 2008).<sup>18</sup>

We have recently held informal talks with market practitioners. They indicated that, in valuations where an imputation tax system is being used, they tend to use a gamma of 0.25 since the ACT's 2011 gamma decision.

<sup>18</sup> SFG, *Regulatory estimates of gamma in light of recent decisions of the Australian Competition Tribunal*, Report prepared for DBP, 20 July 2011, p 14.

## 4.4 Final decision

We consider that 0.25 provides a better estimate of gamma than our current assumption of 0.4. The SFG (2011) study provides evidence that the best estimate of theta from a dividend drop-off analysis is 0.35. Empirical evidence<sup>19</sup> suggests that the best available estimate of the distribution rate is 0.7. These 2 parameters produce an estimate of gamma of 0.25.

Our assessment is based on the criteria set out in Chapter 2.

▼ Stability of WACC and prices over time.

We currently use a gamma range of 0.5 to 0.3, with a mid-point of 0.4. The change in gamma has an impact on notional revenue, but the impact is small. This will be explained in detail in Section 4.5. We judge that the evidence for a lower gamma is sufficient to justify this change.

▼ Consistency with the approach taken by other regulators.

The AER has adopted a gamma value of 0.25 based on the ACT's 2010/11 decision. The ERAWA also changed its gamma to 0.25 for the 2011 Dampier to Bunbury Natural Gas Pipeline access arrangement.

▼ Consistency with academic studies.

Academic and independent expert studies have produced a wide range of estimates of the gamma. The SFG study is a significant addition to these studies and adds weight to the evidence for a lower gamma.

▼ Consistency with commercial practice.

Most commercial valuations use a classical tax system with a gamma value of 0. For those that use an imputation tax system, we confirmed that, after the ACT decision, some practitioners use a gamma value to 0.25.<sup>20</sup>

Having regard to the available evidence, our final decision is to use a gamma value of 0.25 in our future price determinations.

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<sup>19</sup> NJ Hathaway & RR Officer, *The Value of Imputation Tax Credits – Updated 2004*, Capital Research Pty Ltd, November 2004, p 3.

<sup>20</sup> Discussions with commercial practitioners.

## 4.5 Analysis of impact of our final decision

Under a post-tax WACC framework, the value of gamma is modelled as part of the tax liabilities, which is a component of notional revenue, even though gamma itself does not affect the actual tax payable by the regulated entity. The reason is to allow the required level of return for investors (from the calculation of notional revenue) to account for the value investors place on imputation credits (value of gamma).

A post-tax real WACC can be estimated using the following formula:

$$WACC^{post-tax} = \frac{\left(1 + \left\{R_e \cdot \left(\frac{E}{D+E}\right) + R_d \cdot \left(\frac{D}{D+E}\right)\right\}\right)}{(1+\Pi)} - 1$$

where  $R_e$  is the return on equity,  $R_d$  is the return on debt,  $\frac{E}{D+E}$  is the proportion of equity,  $\frac{D}{D+E}$  is the proportion of debt, and  $(1+\Pi)$  is the inflation adjustment.

Tax liabilities can be estimated using the following formula:

$$T = \frac{1}{(1+\Pi_c)} \left[ R \cdot (1+\Pi_c) - OPEX \cdot (1+\Pi_c) - TD - I \right] \left[ \frac{t \cdot (1-\gamma)}{1-t \cdot (1-\gamma)} \right]$$

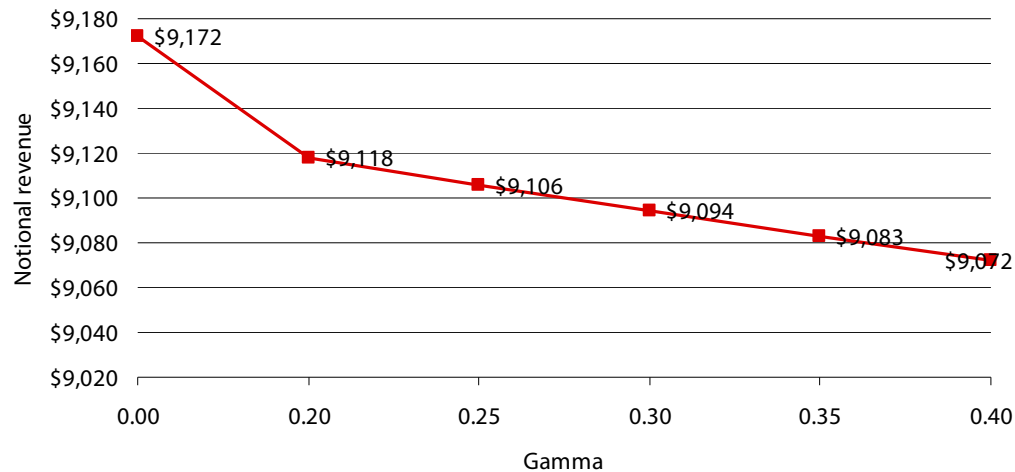
Where  $T$  is the real tax liability,  $(1+\Pi_c)$  is the cumulative inflation adjustment,  $R$  is real allowable regulated revenue *exclusive of tax*,  $OPEX$  is real operating costs,  $TD$  is nominal tax depreciation,  $I$  is nominal interest payments,  $t$  is the corporate tax rate and  $\gamma$  is the value of imputation credits.

The formula above indicates an inverse relationship between gamma and the tax liability, that is, a decrease in gamma will contribute to an increase in tax liability and vice versa. Consequently, a decrease in gamma will increase total notional revenue. In other words, if gamma is lower, shareholders place less value on imputation credits and will require more compensation for the return on investments – the regulated entity will require higher post-tax revenue.

In the case where shareholders place no value on imputation credits (gamma is equal to zero), then the allowed tax component of notional revenue is equal to the expected tax liability of a business that operates according to the regulatory assumptions. Conversely, if imputation credits have full value (gamma is equal to 1) then there is no allowed tax component as shareholders fully utilise any tax paid by the company through imputation credits.

Under the post-tax WACC framework, gamma is not a parameter of WACC; therefore, a change in the value of gamma does not affect the regulatory depreciation and return on regulatory asset base.

**Figure 4.1 Impact of change of gamma on notional revenue — Sydney Water Review (2012/13 to 2015/16) (\$2011/12)**



**Note:** The notional revenue is the total revenue for 4 years (2012/13 to 2015/16). The notional revenues calculated based on different gamma values are based on Sydney Water Corporation's submission.

Figure 4.1 shows the inverse relationship between gamma and notional revenue. As illustrated, based on Sydney Water's submission to the review of prices for water, sewerage and stormwater services for 2012/13 to 2015/16, a decrease in gamma from 0.4 to 0.25 would contribute to an increase in notional revenue of 0.4% (\$34m = \$9,106m - \$9,072m).