TransGrid's Approach to Gamma

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Contents

1 Summary

Gamma (γ) is defined in the National Electricity Rules (NER) as “*the value of imputation credits*”.

TransGrid considers that it is clear that what is required under the NER is an estimate of the value of imputation credits to investors in the business. This interpretation is consistent with the broader regulatory framework and the task set by the NER to determine total revenue, as well as past regulatory practice, and previous decisions of the Australian Competition Tribunal (Tribunal).

This is also the interpretation that best achieves the National Electricity Objective (NEO), as it ensures that the adjustment for imputation credits in the taxation building block properly reflects the actual value of imputation credits to investors, not merely their notional face value or *potential* value. Accounting for gamma in this way ensures that the overall return received by investors (including the value they ascribe to imputation credits) is sufficient to promote efficient investment in, and use of, infrastructure, for the long-term interests of consumers.

TransGrid proposes to calculate gamma in the orthodox manner, as the product of:

- the distribution rate (i.e. the extent to which imputation credits that are created when companies pay tax, are distributed to investors); and
- the value of distributed imputation credits to investors who receive them (referred to as theta).

TransGrid proposes a distribution rate of 0.7, which is consistent with the AER’s Rate of Return Guideline. Recent empirical evidence continues to support a distribution rate of 0.7.

TransGrid proposes a value for theta of 0.35. The reasons why TransGrid is proposing a different value for theta to that in the Rate of Return Guideline include:

- TransGrid does not agree with the conceptual framework adopted by the AER for estimating theta, and in particular the focus on utilisation evidence, rather than market value evidence. The AER’s approach is not consistent with the NEO. It does not measure the required return for the purposes of promoting efficient investment, and would lead to underinvestment;
- In order to provide an acceptable overall return to equity holders, theta must be estimated as the *value* of distributed imputation credits to equity-holders. This is the conventional and orthodox approach to estimating theta. It is also the approach which best gives effect to the NEO, as it provides for recognition of the value to equity-holders of imputation credits and provides for overall returns which promote efficient investment;
- There are compelling reasons why the benefit of imputation credits, which is the amount by which the allowable return otherwise calculated in accordance with the NER should be reduced, is significantly less than the face value of imputation credits

or the utilisation of imputation credits. However, these were not considered in the Rate of Return Guideline;

- The value for theta proposed by TransGrid accords with what one would expect to be the additional benefit conferred by the system of imputation credits. The value of theta proposed in the Rate of Return Guideline does not;

- There are overwhelming problems with the taxation statistics and other forms of evidence given primary emphasis in the Rate of Return Guideline. They are, and are well recognised to be, simply unreliable. Further, a key piece of evidence used by the AER (Handley and Maheswaran (2008)) is not an empirical study at all (because the data was not available), but merely involves an assumption of full utilisation by domestic investors; any reliance upon it involves obvious error;

- The only source of evidence capable of providing a point estimate for the value of distributed imputation credits to investors is market value studies. Evidence of utilisation rates (or potential utilisation rates, as indicated by the equity ownership approach) can only indicate the upper bound for investors' valuation of imputation credits. The conceptual goalposts approach referred to by the AER provides no relevant information on the actual value of credits;

- The best estimate of investors' valuation of imputation credits from market value studies is 0.35.

Combining a distribution rate of 0.7 with a theta estimate of 0.35 produces a value for gamma of 0.25.

TransGrid's reasons for proposing a different value for theta to that in the Rate of Return Guidelines are elaborated below.

2 Definition of gamma

2.1 Rule requirements

Clause 6A.6.4 of the NER requires an estimate of γ (gamma), being "*the value of imputation credits*".[1]

Prior to changes to the NER which took effect in November 2012, gamma was defined as "*the assumed utilisation of imputation credits*". This term in the NER was widely understood to be, and applied by regulators as, the value equity shareholders place on distributed imputation credits.[2] However, as part of the package of amendments to the NER in

[1] *National Electricity Rules*, Clause 6A.6.4.

[2] For example, in its 2009 WACC Review Final Decision, the AER referred to gamma as representing the 'value for imputation credits', noting that "Standard regulatory practice in Australia is to incorporate a value for imputation credits in determining the appropriate company tax allowance (the 'corporate income tax building block') to include in the required revenues of regulated businesses" (AER, *Final Decision: Electricity transmission and distribution network service providers – Review of the weighted average cost of capital (WACC) parameters*, May 2009, p 393).

November 2012, this was clarified by amending the definition of gamma to be the *value* rather than *assumed utilisation* of imputation credits.

The way in which the NER was changed does not suggest that the AEMC was in any way concerned or dissatisfied with how the estimation of gamma had previously been approached. On the contrary, the change made by the AEMC appears to have been directed at better aligning the language of the NER with accepted orthodox regulatory practice. Certainly, there is nothing in the explanatory materials accompanying the rule change which indicates that there was intended to be a fundamental change in the way gamma (and particularly theta) is estimated

If any party (including the AER) had been concerned about how the estimation of gamma had previously been approached, it would have been open to them to propose a more fundamental change to the rules around gamma and/or the calculation of corporate income tax building block more generally. However this was not done.

As will be discussed further below, in the broader context of the NER, and construing the term in line with the objectives of the legislative framework in which it sits, it makes sense that what is relevant is the value that equity holders place on imputation credits, as opposed to simply their face-value or utilisation rate. What the NER are clearly directed at is – consistent with the NEO and the revenue and pricing principles – providing the opportunity to recover at least efficient costs, including a return to equity holders. What is relevant in the context of the broader objectives of the NER is the *value* of imputation credits to equity holders.

The way in which imputation credits are accounted for in the building block framework will ultimately impact upon returns for equity-holders. As such, it is critical that what is taken into account is value of imputation credits to equity-holders, not just their face-value or utilisation rate. Further, it is important that the value for gamma is estimated consistently with values for other rate of return parameters.

2.2 Construing the term "value of imputation credits"

TransGrid considers that the words "*value of imputation credits*" have a clear and unambiguous meaning. We consider that the reference to value of imputation credits is clearly referring to the value to equity-holders of imputation credits that are distributed by the business.

The AER has suggested in the Rate of Return Guideline that "value" could "be used in a generic sense to refer to the number that a particular parameter takes (that is, its numerical value)".[3] If the word "value" was being used in that sense, then the appropriate phrase would be the "value for imputation credits". Such a phrase would be meaningless and provide no assistance in understanding the meaning of gamma. By contrast, the use of the words "value of" indicates that the term has its ordinary meaning – the value of something is its worth. The interpretation in the Rate of Return Guideline clearly is an incorrect

[3] AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, Appendix H, p 150.

interpretation of the rule. To apply that incorrect interpretation of the rule would involve legal error.

However to the extent that there are possible alternative interpretations of the words "*value of imputation credits*", the NEL requires that the interpretation that will best achieve the purpose or object of the NEL is to be preferred to any other interpretation.[4]

The object of the NEL is to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to price, quality, safety, reliability and security of supply of electricity and the reliability, safety and security of the national electricity system.[5] The relevant secondary materials make clear that the NEO is 'an economic concept', which at its core seeks to promote economic efficiency. The second reading speech accompanying the introduction of the NEO states:

> The market objective is an economic concept and should be interpreted as such. For example, investment in and use of electricity services will be efficient when services are supplied in the long run at least cost, resources including infrastructure are used to deliver the greatest possible benefit and there is innovation and investment in response to changes in consumer needs and productive opportunities.
>
> The long term interest of consumers of electricity requires the economic welfare of consumers, over the long term, to be maximised. If the National Electricity Market is efficient in an economic sense the long term economic interests of consumers in respect of price, quality, reliability, safety and security of electricity services will be maximised.[6]

Accordingly, to the extent that the words "*value of imputation credits*" could be susceptible to more than one meaning, the meaning that is more likely to promote economically efficient investment in, and use of, electricity services ought to be preferred.

TransGrid considers that in order to promote efficient investment in, and use of, electricity services, the words "*value of imputation credits*" must be interpreted as the value to equity-holders of imputation credits that are distributed by the business. In the context of determining an adjustment to the corporate income tax building block to account for imputation credits, what is relevant is the value that equity-holders place on those credits, since this is what impacts on the overall return they receive on their investment, and ultimately, incentives to undertake efficient investment. If the value for gamma is set higher (or lower) than the actual value to investors of imputation credits, then the discount applied to the tax building block will overstate (understate) the value to investors of imputation credits, meaning that overall after-tax returns will be too low (or too high), which will lead to over or under investment.

This can be illustrated by the following simple example. If investors require an annual after-tax return of $100 to invest in a particular business, and the business faces an annual tax liability of $50, the level of pre-tax return that is required to promote efficient investment would be $150, if there is no value assigned to imputation credits. However, if investors assign a positive value to imputation credits, the level of pre-tax return that is required to

[4] NEL, Schedule 2, item 7(1).

[5] NEL, s 7.

[6] South Australia, *Parliamentary Debates*, Legislative Council, 2 March 2005, 1303 (P Holloway).

promote efficient investment would be somewhat less than $150, depending on how much value is assigned to those credits – for example, if investors assign a value to credits representing 20% of the total face value of all credits generated by the business (gamma of 0.2), the required pre-tax return would be reduced to $140.

The table below illustrates the implication of assigning a value to imputation credits which does not reflect the value actually placed on credits by investors in the business. Clearly, if the value that is assigned to gamma is higher than the value actually placed on credits by investors in the business, the level of pre-tax returns will be below what is required to promote efficient investment.

Table 1: Example of gamma impact on overall returns

	Required returns, based on actual value of imputation credits to investors (assume value of 0.2)	**Required returns, based on higher value of imputation credits to investors (assume value of 0.4)**
Required post-tax return	$100	$100
Company tax	$50	$50
Less value of imputation credits to investors	$10	$20
Required pre-tax return	$140	$130

It is therefore critical that the value for gamma accurately reflects the value of imputation credits to investors, not just their face value or the rate at which they are redeemed. This is the only interpretation of the term 'gamma' which properly gives effect to the statutory objective of promoting efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers. Any other approach would result in the business not being properly compensated for the overall return required by investors, which would in turn lead to inefficient investment.

This approach to interpretation is consistent with the approach taken to other elements of the return on capital. For example, the return on debt is estimated by reference to the returns actually required by investors, as reflected in market prices for the relevant securities. Consistent with this, any offsetting adjustment to the overall return received by investors to account for imputation credits must reflect the value actually ascribed by investors to those imputation credits, not their notional maximum value or nominal face value.

2.3 Components of gamma – the Monkhouse formula

The generally accepted method for calculating gamma is using the Monkhouse formula. This is the approach that has been used by the AER in the past, and which continues to be used by all Australian economic regulatory authorities.

Under the Monkhouse formula, gamma is the product of:

- the credit payout ratio (or distribution rate); and
- "*the utilisation factor*", which Monkhouse defines as measuring "*the market value of imputation credits distributed via a dividend*" (theta).[7]

This formulation of gamma is widely accepted, including by the AER and TransGrid. As will be discussed below, the only area of disagreement is in relation to estimation of theta.

2.4 Previous AER/Tribunal approach to measuring gamma, and that of other regulators

Prior to issuing its Rate of Return Guidelines in December 2013, the AER had taken a highly orthodox approach to estimating gamma. The AER's approach had involved:

- estimating the distribution rate by reference to the observed economy-wide distribution rate, as indicated by Australian Taxation Office (ATO) data; and
- estimating theta as the value of distributed credits to investors.

This previous approach of the AER reflected a correct interpretation of the role of gamma in the building block framework under the NER, as it provided for an estimate of the value of distributed imputation credits to investors. This approach (when properly applied) provided for an overall return to investors which promoted efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers.

The AER's previous approach followed the approach taken by the Tribunal in its May 2011 decision in *Energex*.[8] In that decision, the Tribunal had determined a value for gamma of 0.25, reflecting evidence of the economy-wide distribution rate (0.7) and the market value of distributed credits, as indicated by dividend drop-off analysis (0.35).

The approach previously taken by the AER (following the Tribunal),is in line with the approach taken by other Australian economic regulators, such as the Economic Regulation Authority of Western Australia (ERA). The ERA explained its approach to gamma in the following terms in its recent Rate of Return Guidelines Explanatory Statement:[9]

[7] P. H. L. Monkhouse, 'Adapting the APV valuation methodology and the beta gearing formula to the dividend imputation tax system', *Accounting and Finance* 37 (1997) 69-88, at 72, 74. See also: Monkhouse (1996) and Monkhouse (1993).

[8] *Application by Energex Limited (Gamma) (No 5)* [2011] ACompT 9.

[9] ERA, *Explanatory Statement for the Rate of Return Guidelines: Meeting the requirements of the National Gas Rules*, 16 December 2013, p 210.

> Any value generated by the presence of franking credits in the Australian tax system must be accounted for in the return to equity – and hence the weighted average cost of capital – estimated for regulated businesses… It is widely accepted by Australian regulators that the value generated by franking credits is represented by the parameter gamma (γ), which is a product of two components:
>
> - the fraction of imputation credits created that are assumed to be distributed to shareholders (F);
> - the market value of imputation credits distributed as a proportion of their face value (θ).

In its Rate of Return Guidelines, the ERA determined a range for gamma of 0.25 – 0.39, based on a distribution rate of 0.7 and a range for the market value of imputation credits of 0.35 – 0.55.[10]

2.5 AER revised position in the Rate of Return Guideline

In its Rate of Return Guideline Explanatory Statement, the AER proposes to take a new approach to determining gamma, based on a new conceptual framework. The AER states that it has "*re-evaluated the conceptual task of estimating the value of imputation credits*".[11] The AER then seeks to redefine gamma as "*an estimate of the expected proportion of company tax which is returned to investors through utilisation of imputation credits*".[12]

The AER then goes on to determine a value for gamma principally by reference to information on utilisation / redemption rates. As will be discussed further below in relation to theta, while the AER says that it relies on several sources of evidence including market value studies, only two pieces of evidence appear to be given any material weight. The two pieces of evidence that are given material weight are utilisation rates from tax statistics, and the "equity ownership approach", which indicates the maximum[13] proportion of investors that are eligible to redeem or utilise credits (these are the only two sources of evidence for which the AER's estimate of theta falls within the range of values indicated by the evidence).

Thus, although the AER states that it is assessing "*an estimate of the expected proportion of company tax which is returned to investors through utilisation of imputation credits*", based on the way in which the AER estimates this parameter in the Rate of Return Guidelines, we understand the AER to be interpreting gamma as a measure of the proportion of total company tax payments accounted for by imputation credits that are redeemed, or that can be redeemed, by investors. In relation to this latter aspect, in effect the AER is seeking to answer the question: "*out of total company tax payments, what proportion is accounted for by the total face value of all imputation credits which can be redeemed?*".

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[10] ERA, *Rate of Return Guidelines: Meeting the requirements of the National Gas Rules*, 16 December 2013, pp 30-31.

[11] AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, p 160.

[12] AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, p 158.

[13] As discussed further below, the equity ownership approach only indicates the maximum set of investors eligible to redeem credits, by reference to the proportion of investors that are domestic. Within the set of domestic investors, there are likely to be some that are not eligible to redeem imputation credits, for example due to the 45-day rule.

This new AER approach represents a significant departure from the approach taken by the Tribunal in *Energex,* and the approach of the AER both prior to and following that Tribunal decision.[14] The AER's new approach also represents a very significant departure from orthodox regulatory practice.

Orthodox regulatory practice has been to measure the *value* of imputation credits, not simply the proportion that can be *redeemed*. Orthodox practice has also recognised that the value of imputation credits will not be the same as the face value of those credits that are redeemed or that can be redeemed. Rather, the face value of redeemed utilised credits will provide no more than an upper bound for the true value to equity-holders. As will be discussed further below, there are several reasons why it cannot simply be assumed that the value of imputation credits will equal the face value of all credits that are redeemed. On the contrary, there is strong evidence (set out below) that the true value of imputation credits is significantly less than their face value.

In formulating this revised approach, the AER considers selective passages from the original Officer (1994) paper.[15] Those passages do not support the approach suggested by the AER. They were concerned with explaining the theory of the effect of imputation credits on the calculation of a rate of return under stylised conditions for the purpose of explanation, including an assumption that there a no foreign investors, or that there is full distribution and maximum utilisation of imputation credits.

The AER then goes on to consider the life cycle of tax cash flows, identifying that tax is either kept by the government or returned to the investor as a credit against personal tax.[16] On page 143 of Annexure H to the Rate of Return Guideline, the AER refers to this cash flow analysis, emphasises that it is concerned with the face value of imputation credits, and then says that the cash flow interpretation of the value of imputation credits is supported by the 2004 paper by Officer and Hathaway. However by referring to only a select passage from Officer and Hathaway (2004), the AER misunderstands and misapplies the findings of this paper, which are to completely the *opposite* effect of the statements in Annexure H to the Rate of Return Guideline.

[14] Following the decision in Energex, the AER followed the Tribunal's approach to estimating gamma in determinations in both the electricity and gas sectors (except in some electricity transmission determinations, where, under the previous NER, it was bound to adhere to its position in the SORI). Prior to the Tribunal decision in *Energex*, the AER had correctly recognised that gamma should be estimated as the value of imputation credits, but had made some errors (identified by the Tribunal) in estimating that value. For example, in its 2009 WACC Review Final Decision, the AER referred to gamma as representing the 'value for imputation credits', noting that "Standard regulatory practice in Australia is to incorporate a value for imputation credits in determining the appropriate company tax allowance (the 'corporate income tax building block') to include in the required revenues of regulated businesses" (AER, *Final Decision: Electricity transmission and distribution network service providers – Review of the weighted average cost of capital (WACC) parameters*, May 2009, p 393).

[15] AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, Appendix H, pp 137 – 139.

[16] AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, Appendix H, pp 140 – 143.

Importantly, the Officer and Hathaway (2004) paper referred to by the AER observes:[17]

- first, that in the period 1988 – 2002 approximately $188 billion worth of imputation credits out of total tax collections of $265 billion have been distributed to shareholders, implying a distribution rate of 71%; and

- secondly, that by using dividend drop off studies, it appears that the average *value* of distributed imputation credits is "about 50% of their face value".

Officer and Hathaway (2004) then go on to conclude that the Australia-wide average gamma over the period 1988-2002 was 0.355, based on their estimates of the distribution rate (71%) and the value of distribution imputation credits, as indicated by dividend drop-off analysis (50% of face value).[18] Thus, Officer and Hathaway (2004) clearly characterise gamma as reflecting the *value* of imputation credits, and provide an estimate that is consistent with this characterisation (i.e. an estimate based on dividend drop-off analysis.

The conclusion Officer and Hathaway (2004) on this point is clear, when the passage quoted by the AER on page 143 of Annexure H to the Rate of Return Guideline is read in its full context. In context, the relevant passage is as follows:[19]

> ...it is quite important to recognise that the value factor of credits (the value of distributed credits) is not in itself the "gamma" factor used within the Officer WACC formulae, a point which is often confused or mis-represented. The gamma factor in the various Officer WACC formulae represents that part of the tax paid by companies as company tax but is in reality a pre-payment of personal tax. Because we typically estimate costs of capital after company tax but before personal tax, the portion of company tax prepayments captured as pre-payment of personal tax (ie gamma) is a cash flow that has to be added to shareholders' pre-personal tax cash flow. **The Australia-wide average gamma over all companies and over the entire period 1988-2002 is 0.355. That is, of the $265 billion ostensibly collected as company tax, about 50% of the distributed $188 billion, namely $94 billion, is valued in the market place** as either being a pre-payment of tax liabilities or, recently for some entities, redeemable as cash. So the effective company tax collection has been about $171 billion. **Gamma is not the value of distributed credits alone. It is the compounding of the two factors – the fraction of tax distributed as credits multiplied by the value of distributed credits**. [Emphasis added]

Thus, when in the passage cited by the AER, Officer and Hathaway state that "it is quite important to recognise that the value factor of credits (the value of distributed credits) is not in itself the "gamma" factor used within the Officer WACC formulae", they do not mean that examining the value of distributed credits is incorrect. Rather, they simply mean that the gamma factor is a *combination* of the distribution rate and the value of those distributed credits to investors.

This misuse of the Officer and Hathaway paper is a serious error in Annexure H to the Rate of Return Guideline.

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[17] Neville Hathaway and Bob Officer, *The Value of Imputation Tax Credits: Update 2004*, November 2004, pp 4-5.

[18] Neville Hathaway and Bob Officer, *The Value of Imputation Tax Credits: Update 2004*, November 2004, p 8.

[19] Neville Hathaway and Bob Officer, *The Value of Imputation Tax Credits: Update 2004*, November 2004, pp 7-8.

More generally, the AER's cash flow analysis, and consideration of how much tax is retained by the government, is a complete distraction from the issue that arises under the NER. Corporate income tax is a real cost to the company. It is not merely theoretical. It reduces (usually by 30%) the amount of income available to shareholders (either held in the company or distributed). It therefore reduces the return that otherwise would be available to investors. However, because the payment of this corporate tax may in due course confer a benefit on investors, it is relevant to identify the value and extent of that benefit, because it is a benefit that derives from the payment of corporate income tax by the company and it affects the investor's overall return from the investment. It is *only* the investor's return that is relevant (not the tax earned by the government, or the face value of credits). It is the investor's return – i.e. the *value* they obtain from their investment, and whether it meets their required return – that governs whether they would choose to invest in the entity. To consider the face value of credits, or whether an investor is eligible to receive credits, does not address the correct issue.

Finally, on page 143 of Annexure H, the AER states that using the full face value of imputation credits is "consistent with the common assumption that for simplicity, dividends should be assumed to be worth their face value in the Officer framework". It is a reasonable (albeit simplifying) assumption that a cash dividend paid directly into an investor's bank account is worth the amount of the dividend. However, it is an entirely *unreasonable* assumption to assume that every $1 of imputation credits is worth $1 to investors. As will be discussed below in relation to theta, there are compelling reasons why every $1 of imputation credits are not worth $1 to investors. It cannot be assumed that the value of imputation credits to investors is equal to their face value; rather, the face value of credits represents no more than an upper bound for their true value to investors.

2.6 Conclusion on the correct approach to defining gamma

The correct approach under the NER, having regard to the statutory objective, is to determine gamma as the value to equity-holders of imputation credits. This is the interpretation which is specified by the NER, when properly interpreted, and which best promotes the NEO, because it provides for an adjustment to the income tax building block for imputation credits which properly reflects their value to investors.

This approach aligns with:

- the proper role of gamma within the NER building block framework, and the objectives of that framework as embodied in the NEO;
- the approach to estimating other rate of return parameters, which are directed at estimating returns required by investors, rather than the face value of cashflows;
- the treatment of gamma in the financial and economic literature (particularly Officer (1994) and Monkhouse (1997));
- the approach taken by the Tribunal in *Energex;* and
- previous AER practice (both following the decision of the Tribunal in *Energex*, and prior to that decision) and the practice of other regulators.

The analysis of the payout ratio and theta set out below follows this approach.

3 Payout ratio

3.1 Previous AER/Tribunal approach to the payout ratio

In all decisions over the past three years, the AER has adopted a payout ratio of 0.7, based ATO data on distribution of imputation credits.

The AER's approach to the payout ratio followed the approach taken by the Tribunal in *Energex*. Prior to that decision of the Tribunal, the AER had adopted a value for the distribution rate of 1.0.[20] However, in the course of the Tribunal proceedings in the *Energex* matter, the AER accepted that there was in fact no evidence to support a distribution rate higher than 0.7.[21] Accordingly, in the *Energex* matter, and in all decisions of the AER since, a distribution rate of 0.7 has been adopted.

3.2 AER position in the Rate of Return Guideline

The AER has proposed to adopt a distribution rate of 0.7 in its Rate of Return Guideline.

Consistent with its previous approach, the AER estimates the distribution rate as a market-wide parameter, using ATO data. The AER refers to ATO data over a 23-year period (from 1987-88 to 2010-11), which indicates a cumulative distribution rate of 0.7.

In its Explanatory Statement, the AER refers to some evidence which suggests that the distribution rate may be rising over time, but says this evidence is currently inconclusive.[22]

3.3 Latest evidence on the payout ratio

The most recent evidence on the distribution rate confirms that a value of 0.7 is appropriate. This evidence does not suggest that the payout ratio is increasing over time, as suggested by the AER in its Rate of Return Guideline Explanatory Statement.

NERA's recent report on the payout ratio for the ENA concludes that:[23]

- the cumulative payout ratio up until 2010-11 drawn from tax statistics is 0.69; and
- there is no evidence that the payout ratio has increased over time.

The findings of the NERA report are consistent with earlier studies.[24]

[20] AER, *Final Decision: Electricity transmission and distribution network service providers – Review of the weighted average cost of capital (WACC) parameters*, May 2009, pp 420-421.

[21] *Application by Energex Limited (Distribution Ratio (Gamma)) (No 3)* [2010] ACompT 9, [2].

[22] AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, p 165.

[23] NERA, *The Payout Ratio: A report for the Energy Networks Association*, June 2013.

3.4 Conclusion on the payout ratio

TransGrid therefore proposes a payout ratio of 0.7, consistent with the AER's Rate of Return Guideline. TransGrid agrees that the best estimate of the payout ratio at the present time is 0.7.

4 Theta

4.1 Previous AER/Tribunal approach to theta

Prior to issuing its Rate of Return Guidelines, the AER had taken an approach to theta which reflected an economically correct interpretation of the role of gamma in the building block framework. In measuring the value of distributed imputation credits, the AER sought to measure their market value, or value to equity-holders, rather than simply their redemption rate.

The AER correctly recognised in its May 2009 Statement of Regulatory Intent on WACC parameters (SORI) that the way in which theta is measured ought to reflect the fact that it represents the value of imputation credits to investors. As such, the AER gave real weight to market value studies in estimating theta. Further, the AER correctly observed that tax statistics could provide no more than an upper bound for theta, since there were various factors which may reduce the value of credits to investors (below face value), including risk of investment and the time value of money.[25]

In the SORI, the AER determined a value for theta of 0.65. This value represented approximately the midpoint between its estimate of the market value of imputation credits (0.57) and its 'upper bound' value from tax statistics (0.74). This value was subsequently applied in a number of AER decisions, including for ETSA Utilities (now SA Power Networks), Energex, Ergon and Jemena Gas Networks (NSW) Ltd (JGN).

In its review of the AER's determinations for ETSA, Energex and Ergon, the Tribunal maintained the AER's approach of seeking to establish a market value for imputation credits. However, the Tribunal identified a number of deficiencies in the AER's approach to measuring market value, including:

- given that the AER had identified tax statistics as providing an upper bound for theta only, it was illogical to average the estimate from tax statistics with the point estimate of market value from dividend drop-off analysis. The Tribunal stated that tax statistics could provide no more than a check on an estimate of theta (i.e. to check that the estimate is not too high);[26] and

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[24] For example: Hathaway, N., Officer, R.R., *The value of imputation tax credits: update 2004*, November 2004, p 11.

[25] AER, *Final Decision: Electricity transmission and distribution network service providers – Review of the weighted average cost of capital (WACC) parameters*, May 2009, pp 455-456.

[26] *Application by Energex Limited (No 2)* [2010] ACompT 7, [91]-[92].

- there were deficiencies in the dividend drop-off analysis that had been relied on by the AER.

In order to resolve these issues, the Tribunal:

- sought a state-of-the-art dividend drop-off study, to provide an estimate of the market value for imputation credits;
- found that the SFG (2011) study provided the best available estimate of market value; and
- set a value for theta of 0.35, based on the results of the SFG (2011) study.[27]

The position of the Tribunal has been adopted by the AER in subsequent determinations in both the electricity and gas sectors (except in some electricity transmission determinations, where, under the previous NER, it was bound to adhere to its position in the SORI).

The position of the Tribunal has also been adopted by other regulators, including the ERA and IPART.[28]

4.2 AER position in the Rate of Return Guideline

As discussed above, the AER takes a very different approach to estimating theta in the Explanatory Statement to its Rate of Return Guideline, and by implication in specifying a value for gamma in the Rate of Return Guideline itself. Rather than seeking to estimate the value of distributed imputation credits, the AER instead seeks to estimate what it refers to as "*the before-personal-tax reduction in company tax per one dollar of imputation credits that the representative investor receives*".[29] Elsewhere in the Explanatory Statement, the AER refers to its conceptual definition of theta as "*the expected ability of equity holders to use the imputation credits they receive to reduce their personal tax*".[30]

The AER says that it has estimated theta (in accordance with its definition) based on the body of utilisation rate estimates, having regard to its strengths and weaknesses.

The AER considers that the relevant body of utilisation rate estimates includes the following:

- The ***equity ownership approach***, which suggests an estimate of theta between 0.7 and 0.8. This approach involves estimating the value weighted proportion of eligible investors (i.e. those eligible to redeem imputation credits) out of all investors in the Australian market. The AER states that this approach provides a "conceptually sound"

[27] *Application by Energex Limited (Gamma) (No 5)* [2011] ACompT 9.

[28] IPART, *Review of imputation credits (gamma): Research – final decision*, March 2012; ERA, *Rate of Return Guidelines: Meeting the requirements of the National Gas Rules*, 16 December 2013, pp 30-31. As noted above, the ERA has determined a range for gamma of 0.25 – 0.39, based on a distribution rate of 0.7 and a range for the market value of imputation credits of 0.35 – 0.55.

[29] AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, p 165.

[30] AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, p 174.

estimate of the representative investor's expected utilisation rate, in the sense that it aligns with the AER's conceptual definition of theta.

- ***Tax statistics estimates***, which suggest an estimate of between 0.4 and 0.8. The AER says that these estimates report "the actual dollar benefit to Australian taxpayers from their imputation credits".[31] It is said that tax statistics estimates align closely with the AER's conceptual definition of the utilisation rate, albeit with some slight differences due to differences between the set of investors who actually redeem credits and the set of eligible equity holders. The AER notes reported problems with data quality and consistency.[32]

- ***Implied market value estimates*** (including from dividend drop-off studies) which suggest an estimate between 0 and 0.5. However, the AER says that these studies do not align with the AER's conceptual definition of the utilisation rate, as well as suffering from interpretation problems (e.g. the AER states that the results of these studies are sensitive to methodological and data choices, and that there is no consensus on all aspects of the methodology).[33] The AER says that is has "somewhat less regard to this approach".[34]

- The ***conceptual goalposts approach*** which suggests an estimate between 0.8 and 1. This approach involves estimating a utilisation rate range which would generate a 'reasonable return on equity' in the majority of scenarios between full capital segmentation and full integration.[35]

The AER concludes, based on the above evidence, that a reasonable estimate of theta is 0.7. The AER does not state precisely how it has weighted each piece of evidence other than stating that it has "somewhat less regard" to implied market value studies. Indeed, it is apparent that little or no weight is given to implied market value estimates, given that the AER's theta estimates falls well outside the range indicated by market value studies. It seems that the AER has almost entirely relied upon the equity ownership approach and tax statistics estimates, reflecting its view that these two methods best reflect its conceptual definition of theta.

The AER's view of the relevant evidence, and their conclusion on theta, is summarised in Figure 1 on the following page (Figure 9.1 from the Rate of Return Guideline Explanatory Statement).

[31] AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, p 174.

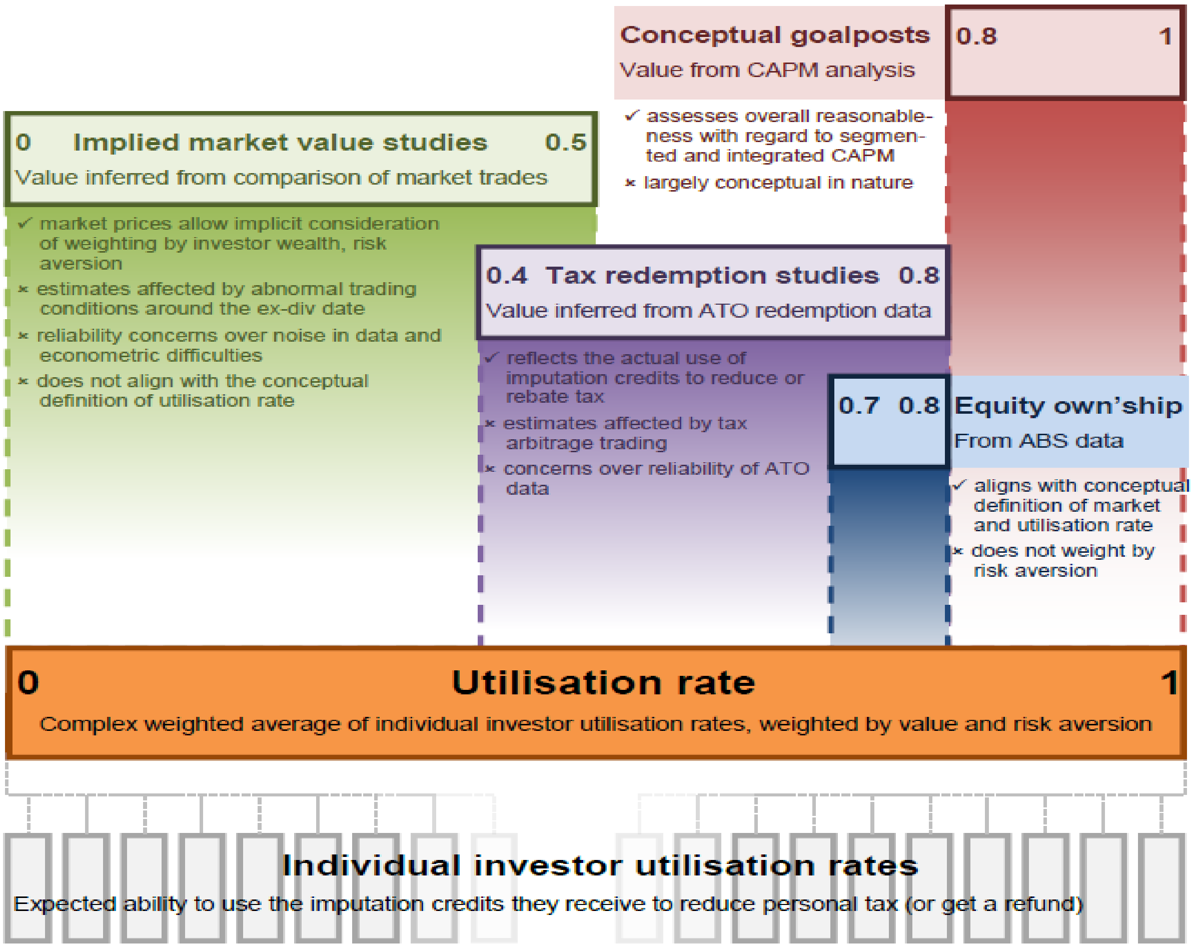
[32] AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, p 159.

[33] AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, pp 176-177.

[34] AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, p 159.

[35] This approach is based on theoretical research undertaken by Associate Professor Lally, which indicates that a value for theta of 1 is implied by the assumptions underpinning the CAPM (i.e. fully segmented capital markets). The AER extends this analysis to determine a range for theta which would generate a 'reasonable return on equity' in the majority of scenarios between full capital segmentation and full integration.

Figure 1: AER view of relevant evidence on theta



Source AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, Figure 9.1.

The AER acknowledges its altered approach in the Explanatory Statement to its Rate of Return Guideline, stating:[36]

> We acknowledge that we have previously rejected this conceptual framework in favour of a market value framework, similar to that espoused by the ENA and APIA. However, our explanatory statement set out how we had systematically re-evaluated the entire body of evidence on gamma, and why we now reached a different conclusion on the appropriate conceptual framework.

Under the AER's new conceptual approach, theta is defined as "*the extent to which investors can use the imputation credits they receive to reduce their personal tax*".[37] In effect, the AER is simply seeking to estimate the proportion of distributed credits which can be redeemed. The AER is not seeking to estimate the proportion that are in fact redeemed, or (more importantly) the value of redeemed credits to investors.

TransGrid considers that this re-interpretation of theta cannot be supported in light of the statutory objective and context for including gamma in the building block framework. For the

[36] AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, Appendix H, pp 148-149.

[37] AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, p 159.

reasons set out above, theta must be estimated as the *value* of distributed imputation credits to equity-holders. This is the conventional and orthodox approach to estimating theta. It is also the approach which best gives effect to the NEO, as it provides for recognition of the value to equity-holders of imputation credits and provides for overall returns which promote efficient investment.

TransGrid is not aware of any economic theory or expert views which support the AER's novel and unorthodox approach to interpreting theta. Economic experts generally agree that theta should be a measure of the value of imputation credits, not the extent to which they can be redeemed.

In the accompanying expert report, Professor Stephen Gray explains the theoretical basis for defining theta as the value of imputation credits to investors. Professor Gray also notes that the AER is alone in its conceptual definition of theta, and that none of the experts cited by the AER support its position.[38]

4.3 Correct approach to estimating theta

The approach to estimating theta must reflect what this parameter is seeking to measure – the value that is placed on those imputation credits if they are utilised.

Evidence relevant to determining the value of imputation credits

Only one of the sources of evidence referred to by the AER in its Rate of Return Guideline – implied market value estimates – provide a point estimate of the value of distributed imputation credits. Market value studies, and particularly dividend drop-off studies, measure the value of imputation credits to equity-holders, as reflected in stock prices.

None of the other sources of evidence referred to by the AER provide a point estimate for the value of imputation credits, although some may indicate the upper bound for this value.

Role of utilisation/redemption data

Utilisation rates (if measureable) may, at best, provide an indication of the upper bound for value of distributed credits. Clearly the value of distributed credits can be no more than the total face value of those credits that are redeemed by investors. However the value of imputation credits to equity holders may be significantly less than the face value of those that are redeemed, and as such the rate of redemption cannot be assumed to represent the value of credits redeemed. As set out below, the measures of utilisation rates used by the AER are not accurate or reliable. Further, a key piece of evidence relied upon by the AER to derive a utilisation rate is not a measure of utilisation at all.

The equity ownership approach is above any upper bound because not all imputation credits distributed to Australian investors are able to be utilised (for example, because of the 45 day

[38] SFG, *An appropriate regulatory estimate of gamma*, May 2014, Appendix 5.

rule[39]), and a smaller percentage still are actually utilised. The equity ownership approach is therefore not a proper measure of theta, and this is so even on the AER"s revised approach.

Reasons for theta being less than the full face value of distributed credits

There are several reasons why the value of credits may be expected to be lower than rates of redemption or potential for redemption. A number of these reasons were identified by Professors McKenzie and Partington, in a March 2011 report to the AER which is referred to in the Rate of Return Guideline Explanatory Statement. They are also explained in detail in the accompanying expert report of Professor Stephen Gray. They include: [40]

- **45-day rule**. Since 2000, Australian tax rules have prevented investors from redeeming imputation credits where they hold shares for only a short period of time around the ex-dividend day. The 45-day rule (or 'holding period rule') requires traders to hold a share for at least 45 days around the ex-dividend day in order to gain entitlement to the imputation credit. Beggs and Skeels (2006) note that the introduction of this rule (along with other changes introduced round the same time) reduced the capacity of important classes of investors to use imputation credits.[41] It has been estimated that the 45-day rule has about a 5-10% impact on the redemption rate.[42]

- **Transactions costs**. Transactions costs associated with redemption of credits may include requirements to keep records and follow administrative processes. This can be contrasted with realisation of cash dividends, which are paid directly into bank accounts. The transactions costs associated with redemption of imputation credits will tend to reduce their value to investors, and dissuade them from redemption;

- **Time value of money**. There will typically be a significant delay (which can be years) between credit distribution and the investor obtaining a tax credit. This may be a period of several years in some cases, for example where credits are distributed through other companies or trusts, or where the ultimate investor is initially in a tax loss position. Over this period, the value of the imputation credit to the investor may be expected to diminish, due to the time value of money;

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[39] The effect of the 45-day rule is acknowledged by the AER in its Rate of Return Guideline Explanatory Statement (AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, Appendix H, p 137). It has also been noted by the AER's consultants, Professors McKenzie and Partington (Michael McKenzie and Graham Partington, *Report to the AER: Response to questions related to the estimation and theory of theta*, March 2011, p 16).

[40] SFG, *An appropriate regulatory estimate of gamma*, May 2014, [65]-[70]; Michael McKenzie and Graham Partington, *Report to the AER: Response to questions related to the estimation and theory of theta*, March 2011, pp 3-5; David J Beggs and Christopher L Skeels, 'Market Arbitrage of Cash Dividends and Franking Credits, The Economic Record, Vol 82, No 258, September 2006, 239-252.

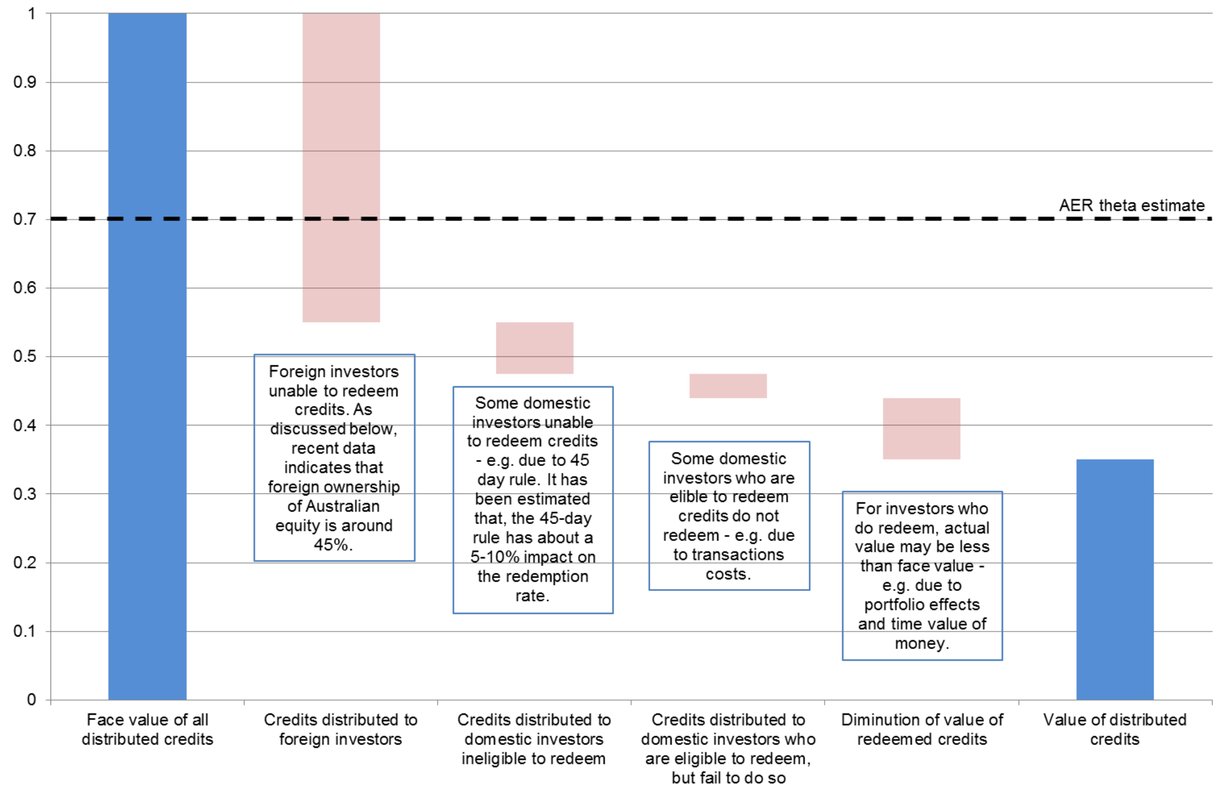
[41] David J Beggs and Christopher L Skeels, 'Market Arbitrage of Cash Dividends and Franking Credits, *The Economic Record*, Vol 82, No 258, September 2006, 239-252, 251.

[42] John C Handley, *Further Issues Relating to the estimation of gamma: Report prepared for the Australian Energy Regulator*, 26 October 2010, p 31, footnote 59.

- **Portfolio effects**. Portfolio effects refer to the impact of shifting the investor's portfolio away from the optimal construction (including overseas investments) in order to take advantage of imputation. An investor who would otherwise invest overseas (to get a better return from the overall portfolio) might choose instead to make that investment in Australia to obtain the benefit of an imputation credit. This reallocation of portfolio investment would tend to continue with the relevant credit having less and less marginal value until an equilibrium is reached with the credit having no additional value: that is, on average, the value of the imputation credits will be less than the face value. To the extent that an investor reduces the value of their overall portfolio simply to increase the extent to which they can redeem imputation credits, this lost value will be reflected in a lower valuation of the imputation credits. These portfolio effects are further explained in the accompanying expert report of Professor Stephen Gray.

The impact of each of the above factors is illustrated in Figure 2 below. While the estimated impacts are illustrative only, they are based on available information on the likely impact of each factor where indicated. The actual impact of each factor may potentially be greater than is indicated in the chart, implying a lower value for theta.

Figure 2: Illustrative impact on value of imputation credits



The fact that market value estimates of theta are consistently significantly lower than the face value of distributed credits is consistent with the powerful reasons why actual value is less than face value and indicates that these factors do indeed have a bearing on the value of credits.

Problems with measuring utilisation rates

Even if utilisation/redemption rates were seen as relevant to determining a point estimate of theta, the very significant unresolved problems identified with the tax data would mean that no weight could be placed on the utilisation rates that are estimated using this data. In a recent report for the ENA, Dr Neville Hathaway identifies very significant unexplained discrepancies in the ATO data used to estimate utilisation rates, including:[43]

- whereas the ATO franking account balance data indicates net credit distribution over the period 2004-2011 of $292.2 billion, the ATO company dividend data indicates much lower net credit distribution over this period, of approximately $204.7 billion; and

- due to this large discrepancy, very different estimates of the credit utilisation rates may be derived from the ATO data, depending on whether the franking account balance data or the company dividend data is used to estimate the quantum of credits distributed – if the company dividend data is used then the utilisation rate is 62.3% over the period 2004-2011, but if franking account balance data is used, the utilisation rate falls to 43.7%.

The very significant discrepancies identified by Dr Hathaway remain unexplained, despite queries being lodged with the ATO. In light of these unexplained discrepancies, Dr Hathaway concludes that the ATO statistics cannot be relied upon for making conclusions about the utilisation of franking credits.[44] The AER's expert, Associate Professor Lally, likewise has stated that "the best that can be said about all this is that the redemption rate is uncertain".[45]

The AER uses three estimates for utilisation rates: 0.44, 0.62 and 0.81, which it rounds to range of 0.4 – 0.8.[46] The upper end of this range is derived from the Handley and Maheswaran (2008) utilisation rate study. However, the relevant figure from Handley and Maheswaran utilised by the AER is not the product of a review of taxation statistics or any other data on utilisation rate. For the period 2001-2004 (the period for which the AER relies on this study), no empirical estimate of the actual utilisation rate is provided. Rather, Handley and Maheswaran simply make an assumption that all credits received by individuals and funds will be used.[47] The authors note, at 86-87, that for resident individuals and resident funds they have **assumed** zero Excess Credits (i.e. 100% usage of credits received) for the years 2001-2004, "consistent with investor rationality". This is reflected in

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[43] Dr Neville Hathaway, *Imputation Credit Redemption ATO data 1988-2011: Where have all the credits gone?*, September 2013, p 6.

[44] Dr Neville Hathaway, *Imputation Credit Redemption ATO data 1988-2011: Where have all the credits gone?*, September 2013, p 5. It should be noted however that while the data in relation to utilisation appears unreliable, the ATO data on distribution of credits is reliable, and produces stable estimates of the distribution rate over time.

[45] Lally, *Estimating Gamma*, 25 November 2013, p 15

[46] AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, p 175

[47] John C Handley and Krishnan Maheswaran, 'A Measure of the Efficacy of the Australian Imputation Tax System', *The Economic Record*, Vol 84, No 264, March 2008, 82-94. The authors note, at 86-87, that for resident individuals and resident funds they have assumed zero Excess Credits (i.e. 100% usage of credits received) for the years 2001-2004, "consistent with investor rationality". This is reflected in Table 4, where the utilisation rate for resident individuals and resident funds is set to 1.00 for each of the years 2001-2004.

Table 4, where the utilisation rate for resident individuals and resident funds is set to 1.00 for each of the years 2001-2004. It is not a measurement at all, but an assumption. The reason that the figure is 0.81 rather than 1 is only because the assumption is then weighted between domestic and foreign investors. Accordingly, this study cannot be relied upon to provide information on the actual utilisation rate in the post-2000 period and should be disregarded by the AER. That means that AER's range for utilisation rates of 0.4 – 0.8 cannot be supported, and could only be approximately 0.4 – 0.6, or more accurately 0.44 – 0.62.

The only available empirical evidence on the actual utilisation rate in the post-2000 period is Dr Hathaway's study, which indicates a utilisation rate of 44% or 62% over the period 2004-2011, depending on which ATO data is used. However, given Dr Hathaway's very strong reservations regarding the reliability of this data (in which he cautions against anyone relying on those parts of his earlier reports which focused on ATO statistics), we would submit that these estimates should be disregarded.

Measuring equity ownership

In relation to the equity ownership rates referred to by the AER, there are two important points worth noting.

The first is that rates of domestic ownership in Australian entities are in fact lower than what is stated by the AER. Professor Gray analyses this issue in his report. The figure of 70% used by the AER is drawn from an ABS figure from 2007. However, the ABS data suggests that both before and since, the percentage of Australian ownership is lower (and the percentage of foreign ownership commensurately higher). Further the 2007 statistics referred to by the AER include equity in entities that are not relevant for this purpose, such as the central bank.[48]

Based on the most recent ABS data, Professor Gray estimates that the percentage of foreign ownership is now around 45%.[49] This is confirmed by a recent (2013) estimate from the ASX, which indicates that foreign ownership now stands at 46%.[50] A Reserve Bank study in 2010 recorded the increase in foreign ownership after 2007, brought about by a number of matters including very significant capital raisings in 2008 and 2009 as a result of the GFC.[51]

The second point to note is that these domestic equity ownership rates do no more than indicate a figure that must be higher than theta, given the various reasons why domestic investors cannot and do not fully utilise imputation credits (rules preventing some investors from redeeming, transaction costs, and so forth), not to mention reasons why investors do not fully value credits.

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[48] ABS, *Feature Article: Foreign Ownership of Equity*, September 2007.

[49] SFG, *An appropriate regulatory estimate of gamma*, May 2014, Appendix 8.

[50] ASX, 'Australian Cash Equity Market', 2013. Available at: http://www.asx.com.au/documents/resources/australian_cash_equity_market.pdf (accessed 8 May 2014).

[51] Black and Kirkwood, *Ownership of Australian Equities and Corporate Bonds*, RBA Bulletin, September Quarter 2010.

As noted, the figure for equity ownership (approximately 55%) is no more than an upper bound for theta. This implies that theta must be less than 0.55.

Role of the AER's 'conceptual goalposts' approach

TransGrid considers that the 'conceptual goalposts approach' provides no relevant information on the market value of imputation credits.

The AER's derivation of its 'conceptual goalposts' is not fully explained in the Explanatory Statement to its Rate of Return Guideline. While the conceptual framework for this approach appears to originate from Associate Professor Lally[52], the AER states in its Rate of Return Guideline Explanatory Statement that it has undertaken further analysis using the Lally framework, in order to refine the estimates.[53] The AER says that this further analysis indicates that the relevant goalposts for theta are 0.8 and 1.0, meaning that on the AER's analysis, a utilisation rate between these two values "*will generate a reasonable return on equity… in the majority of permutation scenarios*".[54] It is not explained how the AER has determined its goalposts, nor is it clear what is deemed to be a 'reasonable' return on equity in this context, or what is meant by a 'majority' of permutation scenarios (i.e. whether this is just a bare majority, or most scenarios).

TransGrid has a number of concerns with the way in which the Lally conceptual framework has been used by the AER to determine 'goalposts' for theta, including:

- at a general level, this approach requires assumptions to be made about the required return on equity in a range of hypothetical scenarios. As these hypothetical scenarios do not reflect reality, the assumptions about required returns on equity can have no basis in empirical evidence;

- certain assumptions made by Associate Professor Lally about the required return on equity in certain scenarios are highly debateable at best. In particular, the assumption that the risk-free rate would be the same in the full segmentation and full integration scenarios would seem implausible, given that yields on government bonds will almost certainly be affected by demand from foreign investors;

- the values for theta in each of the scenarios appear to be based on an assumption that imputation credits are fully valued by all investors who receive credits and are eligible to redeem them – this is the only way in which a theta value of 1.0 could be derived in the 'full segmentation' scenario. For the reasons set out above, this assumption is inconsistent with practical and empirical reality.

In any event, neither of the theoretical goalpost values identified by the AER provide any relevant information as to the actual value of theta for investors in the AER's defined market (being the Australian domestic market, recognising the presence of foreign investors to the

[52] Lally, *Estimation of gamma*, November 2013, pp 38-47.

[53] AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, p 181.

[54] AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, p 181.

extent that they invest in the Australian market[55]). Both values are derived based on extreme theoretical assumptions about the investor population. Neither value reflects the actual value of imputation credits to the relevant investor population.

Conclusion – the correct approach to estimating theta

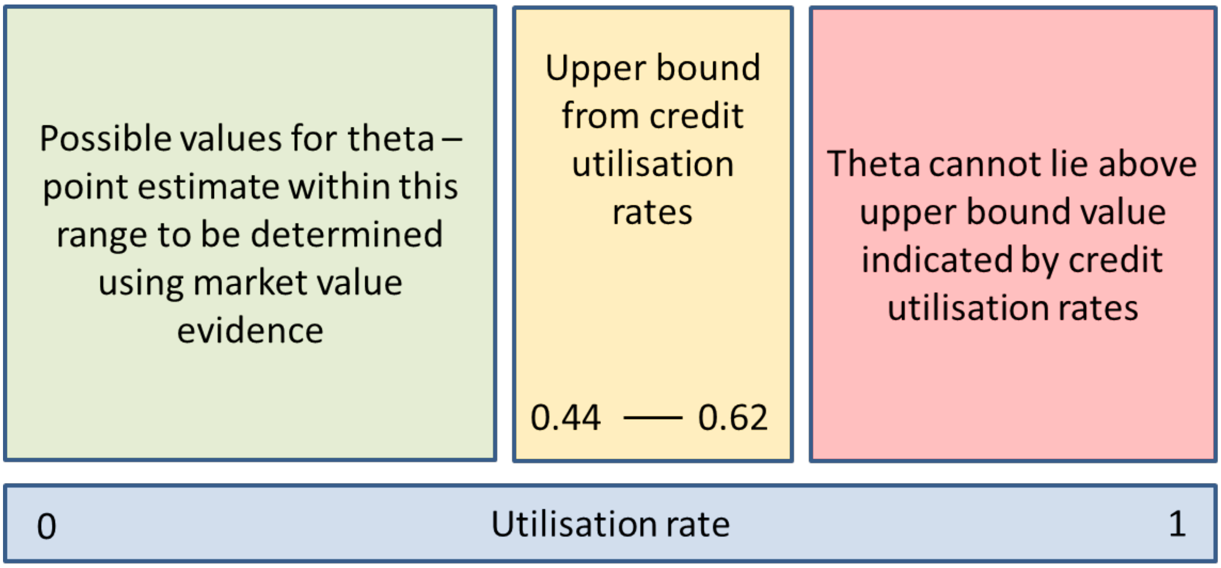
For the reasons set out above, TransGrid considers that the only source of evidence that can be used to derive a point estimate of theta is market value evidence. This is the only available form of evidence which is capable of indicating the actual value of imputation credits to investors.

Further, for the reasons set out above, the market value evidence produces a figure for theta which is plausible and reasonable having regard to the reasons why credits are not fully utilised or fully valued: see Figure 2 above.

To the extent that evidence of utilisation or redemption rates is to be used, this can only be used to indicate the upper bound for theta. In other words, utilisation / redemption rates can only be used to confirm that estimates from market value evidence are not too high.

This approach is depicted in Figure 33 below.

Figure 3: Approach to determining theta



4.4 Current market value evidence

Market value studies provide evidence of the value placed on imputation credits by investors, as reflected in the price they are willing to pay for shares.

[55] In the Rate of Return Guideline Explanatory Statement, the AER states that, consistent with the 2009 WACC review, it proposes to define the market as the Australian domestic market, recognising the presence of foreign investors to the extent that they invest in the Australian market (AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, p 161).

Methods for measuring market value

The most common form of market value study is the dividend drop-off study. This type of study estimates investors' valuation of dividends and imputation credits, by reference to the change in willingness to pay for shares when dividends are distributed.

There are potentially other methods of estimating investors' valuation of imputation credits. For example, analysis of pricing of derivative instruments, such as futures contracts, can be used to infer a value for dividends and imputation credits.[56] Alternatively, if there was a market for trading of imputation credits, a market price could be observed.

However these alternative methods are not as well developed as the dividend drop-off measurement method. In the case of the market price observation method, this is largely because Australian tax laws now prevent the trading of franking credits, meaning that a market price cannot be observed.[57] Some of these alternative methods are discussed briefly below.

TransGrid considers that the best available method for estimating the value of imputation credits to investors is the dividend drop-off method, and we therefore give primary weight to this method in determining a value for theta.

Relevant dividend drop-off studies

The AER identifies a number of recent dividend drop-off studies in its Rate of Return Guideline Explanatory Statement. These studies cover a various time periods and each use different methodologies.

TransGrid considers that not all dividend drop-off studies should be given equal weight, given the differences in methodology, data and time periods covered. Rather, the most relevant dividend drop-off study or studies need to be identified, having regard to the strengths and weaknesses of each one. In particular, the choice of relevant study (or studies) must take into account:

- the time period covered by each study, and the extent to which investors valuation of credits during that time period is likely to be reflective of current valuations; and
- the robustness of the methodology and data relied on.

In relation to time period, TransGrid considers that only studies covering the post-2000 period can be taken into account. Significant changes to Australian tax laws came into effect

[56] These studies are based on a hypothesis that the difference between the futures prices and the cash price of an individual stock or stock-index at any point in time will be a function of the financing cost, and the value of dividends and franking credits over the period to maturity. This hypothesis, and econometric techniques used to derive estimates of theta based on this hypothesis, are explained in detail in: Cannavan, Finn and Gray (2004), ' The value of dividend imputation tax credits in Australia', 73 *Journal of Financial Economics* 167.

[57] In July 1997, the Federal Government introduced a package of amendments aimed at preventing short-term trading in dividends and associated imputation credits. Since then, there has been no market for franking credits in which a value can be observed.

on 1 July 2000, which almost certainly caused a structural break in the way investors valued imputation credits. This has previously been recognised by the AER, causing the AER to (correctly) give no weight to pre-2000 estimates.[58]

There are five dividend drop-off studies covering the post-2000 period, which are identified in Table 2 below. Of these five studies:

- those which use the most robust methodology and data are the two SFG studies.[59] The first of these studies was undertaken at the request of the Tribunal in the *Energex* matter, and its methodology was specifically designed to overcoming shortcomings in previous studies (including the Beggs and Skeels (2006) study);

- the Beggs and Skeels (2006) study has very significant methodological shortcomings, many of which were identified by the Tribunal in the *Energex* matter.[60] As noted above, the first of the SFG studies was designed specifically to overcome shortcomings in the Beggs and Skeels (2006) methodology;

- the Vo et al (2013) study uses a similar methodology to the SFG studies, except that it also reports results with the standard market adjustment removed.[61] The results without this adjustment will be biased due to exogenous factors which may be driving broader market over the ex-dividend day, and according should be given no weight. The results produced by Vo et al with the market adjustment are precisely in line with the results of the SFG studies;

- the Minney (2010) study produces similar results to the SFG and Vo et al (2013) studies.[62] The slightly higher estimate of theta from this study (0.39, compared to 0.35 estimated by SFG and Vo et al) can be explained by the constraining assumption that cash is fully valued. Further, the author recommends that the results be interpreted with caution, due to large standard errors associated with the estimates of franking credit values.

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[58] AER, *Final Decision: Electricity transmission and distribution network service providers – Review of the weighted average cost of capital (WACC) parameters*, May 2009, pp 428-430. Associate Professor Lally also appears to recognise that studies based on pre-2000 data should be given limited weight, saying results of these studies "are of much less interest as estimates of the current value of [theta]" (Lally, *Estimation of gamma*, November 2013, p 22).

[59] SFG, *Updated estimate of theta for the ENA*, June 2013.; SFG, *Dividend drop-off estimate of theta, Final report, Re: Application by Energex Limited (No 2) [2010] ACompT 7*, 21 March 2011.

[60] D. Beggs and C. Skeels, 'Market arbitrage of cash dividends and franking credits', *The Economic Record*, vol. 82, 2006, pp. 239–252.

[61] D. Vo, B. Gellard and S. Mero, 'Estimating the market value of franking credits: Empirical evidence from Australia', *ERA working paper*, April 2013.

[62] A. Minney, 'The valuation of franking credits to investors', JASSA: *The FINSA journal of applied finance*, vol. 3, 2010, pp. 29–34.

Table 2: Dividend drop-off studies covering the post-2000 period

Author(s)	Theta estimate	Notes
SFG (2013)	0.35	Methodology replicates SFG (2011) (see below). Dataset extended to cover 2001-2012.
Vo et al (2013)	0.35 – 0.55 (But correctly 0.35)	Methodology similar to SFG (2011) and SFG (2013). However, additional methodological permutations are run, including to exclude the standard market adjustment. As noted by SFG, the standard approach in dividend drop-off studies is to assume that, but for the dividend, the stock price would have followed the movement in the broad market over the ex-dividend day.[63] That is, if the broad market index increases by 2% over the ex-dividend day, it is assumed that, but for the dividend, the particular stock would also have increased by 2%. An adjustment is therefore made in most dividend drop-off studies to remove the effect of movements in the broader market. Vo et al (2013) report results both with the standard market adjustment, and without it. The results without this adjustment will be biased due to exogenous factors which may be driving the broader market over the ex-dividend day, and according should be given no weight. The results produced by this study with the market adjustment are precisely in line with the results of the SFG studies.
SFG (2011)	0.35	Undertaken at the request of the Tribunal in the *Energex* matter, with a methodology designed to overcoming shortcomings in previous studies (including the Beggs and Skeels (2006) study). In particular, the functional form was designed to overcome issues of multicollinearity and the dataset was compiled with a view to eliminating erroneous and outlying observations. Accordingly, the results of this study should be given precedence over those of earlier studies such as Beggs and Skeels (2006). Point estimate reflects the authors' view as to what is the most stable and robust function form (referred to as 'Model 4'). This is a yield model accounting for heteroskedasticity through a weighting variable that accounts for stock volatility (inverse stock return variance). Using this model produces an average theta estimate of 0.35. The results produced by this model specification are supported by the results of other specifications.

[63] SFG, *An appropriate regulatory estimate of gamma*, May 2014, [138]-[139].

Author(s)	Theta estimate	Notes
Minney (2010)	0.39	The author of this study recommends that his results should be interpreted with caution, due to large standard errors associated with the estimates of franking credit values. One reason for the large standard errors and slightly higher estimate of theta compared to the SFG studies may be the constraining assumption that cash is fully valued. This constraint is not imposed in the SFG or Vo et al studies.
Beggs and Skeels (2006)	0.57	Significant shortcomings in the methodology used in this study were identified by the Tribunal in the *Energex* matter. As noted above, the first of the SFG studies was designed specifically to overcome these shortcomings. The most significant limitation of this study relates to the functional form used for the regression analysis, which gives rise to multicollinearity issues. Moreover, the methodology and data used for this study could not be subject to same level of scrutiny as the SFG and Vo et al (2013) studies, because the underlying data, code and filters are not available for review. Clearly, this study is also not as recent, and relies on an older and more limited dataset. Whereas the SFG (2013) study uses data up to 2012, this study only covers the period up to 2004.

TransGrid therefore considers that the best estimate of the value of imputation credits, as reflected in share prices, is 0.35. This is value for theta recommended in the expert report of Professor Stephen Gray.[64]

The proposed value for theta is based on the results of the most recent and robust dividend drop-off analysis (the SFG (2013) and SFG (2011) studies). The same result is produced by the Vo et al (2013) study when the standard market adjustment is applied. For the reasons set out above, TransGrid considers that the Beggs and Skeels (2006) and Minney (2010) studies should not be given any weight.

The SFG methodology, which is largely replicated by Vo et al (2013) has been carefully reviewed and amended where necessary to address concerns expressed by the AER and its consultants. Each of the concerns that have been raised by the AER and its consultants in relation to this methodology has been thoroughly addressed. SFG's response to each of these concerns is set out in detail in its report, and summarised in Table 3 on the following page.

[64] SFG, *An appropriate regulatory estimate of gamma*, May 2014, [220].

Table 3: SFG responses to methodological issues raised by the AER and its consultants[65]

AER issue	SFG response
Increased or abnormal levels of trading around ex-dividend day may potentially affect empirical estimates.	SFG notes that to the extent this effect is material, it results in the dividend drop-off (and therefore the theta estimate) being higher than it otherwise would be. This is because the increase in trading around ex-dividend day is driven by a subset of investors who trade shares to capture the dividend and imputation credit and who are therefore likely to value imputation credits highly (i.e. higher than the average investor). These investors tend to buy shares shortly before payout of dividends (which pushes up the share price) and tend to sell shortly after (which pushes down the share price), the overall effect of which is to increase the size of the price drop-off.
Stability of estimates.	While the estimates produced by Vo et al exhibit some instability, SFG's estimates are highly stable and robust to the removal of influential observations.
Allocation of value as between cash and imputation credits.	This issue is addressed in the expert report of Professor Stephen Gray.[66] As noted by Professor Gray, empirical evidence provides a very clear and consistent view of the combined value of cash and imputation credits – this evidence indicates that the combined value is one dollar. The relevant evidence includes the studies by SFG (2011 and 2013) and Vo et al (2013) referred to above. Allocation can be made based on this clear evidence as to combined value of the cash/credit package.

65 SFG, *An appropriate regulatory estimate of gamma*, May 2014, [149]-[170].

66 SFG, *An appropriate regulatory estimate of gamma*, May 2014, [158]-[163].

Other market value evidence

As noted in the AER's Rate of Return Guideline, some other forms of market value evidence are also available. These include:

- futures pricing studies, the most recent of which (conducted by SFG) indicates a value for theta of 0.12; and
- simultaneous trade studies, of which there are none covering the post-2000 period.

TransGrid considers that these alternative methods are not as well developed as the dividend drop-off study method. The data and methodology used in these studies has not been subject to nearly the same level of scrutiny and refinement as the data and methodology used in recent dividend drop-off studies (particularly the SFG studies). Further, many of these studies do not cover the post-2000 period.

Accordingly, while these studies may provide some indication as to the reasonableness of estimates from dividend-drop off studies, TransGrid considers that at this stage they cannot be given any significant weight in determining a value for theta.

As noted by the AER, these studies indicate a range of values for theta, between 0 and 0.5.[67] Thus, the range produced by these studies broadly supports the theta value indicated by the SFG dividend drop-off studies.

4.5 Conclusion on theta

TransGrid proposes a value for theta of 0.35.

The reasons why TransGrid is proposing a different value for theta to that in the Rate of Return Guideline include:

- TransGrid does not agree with the conceptual framework adopted by the AER for estimating theta, and in particular the focus on utilisation evidence, rather than market value evidence;
- Theta must be estimated as the *value* of distributed imputation credits to equity-holders. This is the conventional and orthodox approach to estimating theta. It is also the approach which best gives effect to the NEO, as it provides for recognition of the value to equity-holders of imputation credits and provides for overall returns which promote efficient investment.
- TransGrid considers that the only source of evidence capable of providing a point estimate for the value of distributed imputation credits to investors is market value studies. Evidence of utilisation rates (or potential utilisation rates, as indicated by the equity ownership approach) can only indicate the upper bound for investors' valuation of imputation credits. The conceptual goalposts approach provides no relevant information on the actual value of credits;
- The best estimate of investors' valuation of imputation credits from market value studies is 0.35.

[67] AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, Appendix H, pp 173-174.