



2016–2020 Price Reset

**Appendix J
Gamma**

April 2015

**CitiPower
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Table of Contents

1	RULE REQUIREMENTS	3
2	OUR PROPOSAL	4
3	ESTIMATING THE DISTRIBUTION RATE.....	6
4	VALUE OF DISTRIBUTED CREDITS (THETA)	8

CitiPower

2016–2020 Price Reset

Gamma

1 Rule requirements

The key aspects of the National Electricity Rules (**Rules**) and National Electricity Law (**NEL**) relating to gamma are:

- clause 6.5.3 of the Rules requires an estimate of γ (gamma), being ‘the value of imputation credits’;
- clause 6.5.2 of the Rules, which relates to the rate of return, requires consistency between the approaches to estimating the rate of return and the value of imputation credits;
- as with all of its economic regulatory functions and powers, when assessing our regulatory proposal under the Rules and NEL, the Australian Energy Regulator (**AER**) is required to do so in a manner that will or is likely to contribute to the achievement of the National Electricity Objective (**NEO**). Further, where there are two or more possible decisions in relation to our regulatory proposal that will or are likely to contribute to the achievement of the NEO, the AER is required to make the decision that the AER is satisfied will or is likely to contribute to the achievement of the NEO to the greatest degree;
- to the extent the AER’s decision on the value to be adopted for gamma involves an exercise of discretion, the AER must take into account the revenue and pricing principles in section 7A of the NEL.¹ The revenue and pricing principles include that a service provider should be provided with a reasonable opportunity to recover at least its efficient costs and a price or charge for the provision of a direct control network service should allow for a return commensurate with the regulatory and commercial risks involved in providing the direct control network service to which that price or charge relates; and
- we consider it is clear that what is required under the Rules 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 Rules to determine total revenue by reference to the various specified building blocks, as well as being consistent with past regulatory practice, and previous decisions of the Australian Competition Tribunal (**Tribunal**). This is the interpretation that best achieves the 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.

¹ National Electricity (South Australia) Act 1996.

CitiPower

2016–2020 Price Reset

Gamma

2 Our proposal

We propose to calculate gamma in the orthodox manner, as the product of the distribution rate and the value of imputation credits to investors who receive them. We propose a gamma of 0.25, combining a distribution rate of 0.7 with a theta estimate of 0.35. The distribution rate of 0.7 adopted by us is consistent with the Guideline and the findings of the Tribunal, while the theta estimate of 0.35 is a departure from the Guideline. This proposal is consistent with the expert advice of Professor Gray.² This proposal also explains why we have deviated from the Guideline on the estimate of theta.

The correct approach to estimating gamma, which is the approach adopted by us in this regulatory proposal, is as follows:

- gamma is estimated as the product of the distribution rate and the value of distributed imputation credits (theta), consistent with the requirements of the Rules and NEL;
- the distribution rate is observed from Australian Taxation Office (ATO) data, which shows the proportion of imputation credits that are distributed over time. It is widely accepted that this data shows that the distribution rate is 0.7;
- theta is the value of distributed imputation credits to investors, consistent with the requirements of the Rules, and is estimated using the best available market value study. Market value studies indicate the value of imputation credits to investors, as reflected in share price movements. The best estimate of theta from market value studies is 0.35; and
- equity ownership rates and credit redemption rates can only be used to indicate the upper bound for theta, and provide a check on the final point estimate – that is to confirm that the point estimate is not too high. These measures indicate that the upper bound for theta is 0.43, and thus confirm that the estimate of theta from market value studies is not too high.

We consider that this approach to determining gamma – which is fundamentally based on estimating the value of imputation credits to investors in the business – will better achieve the NEO. This approach 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.

The reasons why we are proposing a value for theta that is different to the value in the Guideline include:

- we do 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 under investment;
- 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;

² SFG, Estimating gamma for regulatory purposes, February 2015.

CitiPower

2016–2020 Price Reset

Gamma

- there needs to be consistency in the way the parameters of the weighted average cost of capital (rate of return) are computed and the way gamma is computed which requires the application of relevant empirical methods to the relevant market data;
- the value for theta proposed by us 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 Guideline does not;
- there are overwhelming problems with the taxation statistics and other forms of evidence given primary emphasis in the 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)³) 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; and
- the best estimate of investors' valuation of imputation credits from market value studies is 0.35.

³ 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.

3 Estimating the distribution rate

The Guideline states the AER would apply a distribution rate (or payout ratio) of 0.7.⁴ This is based on an economy wide assessment. Recent empirical evidence also continues to support a distribution rate of 0.7.⁵ Further the Tribunal has recently adopted a distribution rate of 0.7.⁶ Recently the AER has referred to two estimates of the distribution rate:⁷

- a market-wide distribution rate (including listed and unlisted equity) of 0.7; and
- a distribution rate for listed equity only of 0.8.

We consider that it is neither necessary nor appropriate to separately identify a distribution rate for a limited set of listed businesses only. Gamma is conventionally estimated as a market-wide parameter and therefore there is no reason to measure the distribution rate based on data for listed equity only, in circumstances where data is available for both listed and unlisted firms.

AER's own expert, Associate Professor Lally, in a report, states that he favours the inclusion of listed and unlisted firms in the dataset for measuring market parameters where possible.⁸

It is true that some other parameters are estimated using data for listed equity only – for example theta, the MRP and beta are all measured using data for listed equity only. However, as noted by Lally, this is only done as a matter of practicality – data is more widely available for listed firms and in some cases the relevant data for unlisted firms is either unavailable or inadequate.⁹

In the case of the distribution rate however, there is objective and reliable data on the proportion of credits distributed for both listed and unlisted businesses.¹⁰ In these circumstances, there is no reason why consideration should be restricted to listed equity only.

The AER's definition of the benchmark efficient entity is also not confined to listed entities only. The AER's conceptual definition of the benchmark entity is a pure play, regulated energy network business operating within Australia.¹¹ Therefore there is no conceptual basis to confine the dataset for estimating the distribution rate to listed equity. In fact, in its 2009 WACC Review Final Decision, the AER stated that it 'does not agree with that a benchmark efficient NSP be defined as a large, stock market listed NSP'.¹² Therefore, there is no reason why consideration should be restricted to listed equity only.

Professor Gray further notes that even if the dataset were to be limited to listed entities, the AER's estimate of 0.8 is likely to be overstated to the extent that foreign-sourced income enables large listed companies to distribute a higher proportion of imputation credits (compared to the benchmark efficient entity, which is assumed to have no access to foreign-sourced income).

⁴ The payout ratio would be estimated using the cumulative payout ratio approach. The cumulative payout ratio is an estimate of the average payout rate from 1987, when the imputation system began, to the latest year for which tax data is available. Based on current evidence, this leads to an estimate of 0.7. AER Rate of Return Guideline, p. 23.

⁵ NERA, *The payout ratio*, June 2013.

⁶ Application by Energex Limited (Distribution Ratio (Gamma)) (No 3) [2010] ACompT 9 (24 December 2010), paragraph 4.

⁷ AER, *Draft Determinations of Ausgrid, Directlink, Endeavour Energy, Essential Energy, and Transgrid*, November 2014.

⁸ M Lally, *Review of submissions to the QCA on the MRP, risk-free rate and gamma*, 12 March 2014, p 34.

⁹ M Lally, *Review of submissions to the QCA on the MRP, risk-free rate and gamma*, 12 March 2014, p 34.

¹⁰ While there are some concerns as to the reliability of the ATO data in relation to imputation credit redemption, the ATO data on distribution of credits is reliable, and produces stable estimates of the distribution rate over time.

¹¹ AER, *Better Regulation: Rate of Return Guideline*, December 2013, p 7.

¹² AER, *Electricity transmission and distribution network service providers Review of the weighted average cost of capital (WACC) parameters*, May 2009, p 126.

CitiPower
2016–2020 Price Reset
Gamma

Professor Gray concludes that there is no reasonable basis to adopt a distribution rate of 0.8, even if the data is restricted to listed firms only.¹³

Accordingly, the market-wide distribution rate of 0.7 should be applied. It would be an error to apply a higher distribution rate based on data from a limited set of businesses.

¹³ SFG, Estimating gamma for regulatory purposes, February 2015, [224].

CitiPower

2016–2020 Price Reset

Gamma

4 Value of distributed credits (theta)

4.1.1 Definition of theta

We note that the AER has recently adopted a different definition of theta to that adopted in the Guideline.

In the Guideline the AER defined theta as:¹⁴

...the extent to which investors can use the imputation credits they receive to reduce their personal tax.

This approach implies that gamma would only measure the proportion of total company tax payments accounted for by imputation credits that are redeemed (or that can be redeemed) by investors. Such an approach would have been contrary to the requirements of the Rules and a departure from conventional regulatory practice which is to define gamma as the value of imputation credits to investors.

The AER appears to recognise that theta should reflect the value of imputation credits to investors, not just the proportion of credits that are redeemed or that can be redeemed by investors. The AER defines theta as:¹⁵

the utilisation value to investors in the market per dollar of imputation credits distributed.

The 'utilisation value' definition is consistent with the advice provided to the AER by Associate Professor Handley. Handley's report states (under the heading *Interpretation of the 'Second Parameter'*):¹⁶

It is clear from Monkhouse (1996) that the second parameter refers to the utilisation value of a distributed imputation credit. This parameter is commonly denoted and called theta ϑ . It is also clear from the post-tax basis of the regulatory framework (and the Officer and Monkhouse WACC frameworks) that the item of interest is more precisely described as the after-company-before-personal-tax utilisation value of a distributed imputation credit.

Handley also observes that:¹⁷

Implicit in Officer's WACC framework (and the standard classical WACC framework) is the notion of market value and so the relevant measure of utilisation value is that value as determined by the market.

However, the AER qualifies this definition by noting that, consistent with the building block framework, theta should reflect the *before-personal-tax and before-personal-costs value* of imputation credits to investors.¹⁸ The AER then says that this qualified version of its definition of theta is practically equivalent to the definition adopted in its Guideline, because once the effects of personal tax and personal costs are excluded, an investor that is eligible to fully utilise imputation credits should value each dollar of imputation credits received at one dollar.¹⁹ There are two difficulties with this. The first is that, as discussed below, there are good reasons why investors will

¹⁴ AER, Better Regulation: Explanatory Statement Rate of Return Guideline, December 2013, p 159.

¹⁵ AER Draft Determinations of Ausgrid, Directlink, Endeavour Energy, Essential Energy, and Transgrid November 2014 [4-36].

¹⁶ John C Handley, Advice on the Value of Imputation Credits, 29 September 2014, p 17.

¹⁷ John C Handley, Advice on the Value of Imputation Credits, 29 September 2014, p 9.

¹⁸ AER Draft Determinations of Ausgrid, Directlink, Endeavour Energy, Essential Energy and Transgrid November 2014 [4-36].

¹⁹ AER Draft Determinations of Ausgrid, Directlink, Endeavour Energy, Essential Energy and Transgrid November 2014 [4-36].

CitiPower

2016–2020 Price Reset

Gamma

not value each dollar of imputation credits received at one dollar. The second is that there is no proper basis for excluding the effects of personal tax and costs.

The AER's new qualified definition of theta is novel. We are not aware of theta previously being defined as the *before-personal-tax and before-personal-costs value* of imputation credits to investors. It is certainly true that theta must reflect the value of imputation credits to investors. However, it is unusual for theta to be defined in a way that excludes the effect of certain factors that may impact on value (and which will be reflected in market value measures), such as personal costs.

We do not agree with the AER's revised definition of theta (i.e. the qualified version which ignores the effects of personal costs and taxation). Whilst we agree that theta must reflect the value of distributed imputation credits, we do not agree that this value should be assessed before the effects of personal costs and taxation.

As stated in the expert report of Professor Gray, gamma (and therefore theta) must reflect the value of imputation credits to investors. We consider that this is clear from the words of the Rules, which refer to the 'value of imputation credits'. Further, this approach to estimating gamma (and theta) will best promote the NEO, as it provides for overall returns which promote efficient investment.

As noted by Professor Gray:²⁰

Under the building block approach, the regulator makes an estimate of gamma and then reduces the return that is available to investors from dividends and capital gains from the firm accordingly. In my view, it is clear that this is consistent with a value interpretation. If the value of foregone dividends and capital gains is greater than the value of received imputation credits, the investors will be left under-compensated, and vice versa.

If the value of imputation credits is assessed before personal costs and taxation (i.e. ignoring these costs to investors), the overall return to equity-holders will be less than what is required to promote efficient investment. Quite simply, there will be certain costs incurred by investors – such as transactions costs involved in redeeming credits – which are not accounted for.

The value of imputation credits to investors will necessarily reflect (and will be net of) any transaction costs or other personal costs incurred in redeeming credits. Such costs cannot simply be assumed away. If such costs are assumed away, then the resulting estimate of theta (and therefore gamma) will overstate the true value of imputation credits to investors.

Therefore, we propose that the estimate of theta must simply reflect the value of imputation credits to investors. It would be an error to seek to estimate theta as a hypothetical before-personal-tax and before-personal-costs value.

4.1.2 Types of evidence relied on by the AER to estimate theta

There are three types of evidence relied on by the AER in relation to theta. These are, in order of weight given by the AER:

- equity ownership rates (i.e. the share of Australian equity held by domestic investors);
- redemption rates from tax statistics; and
- market value studies.

The AER no longer relies on the 'conceptual goalposts' method, which is referred to in the Guideline. Associate Professor Handley advises that the conceptual goalposts approach is not a reasonable approach.²¹

²⁰ SFG, Estimating gamma for regulatory purposes, February 2015, [12].

CitiPower

2016–2020 Price Reset

Gamma

This section will address the relevance of each of the forms of evidence relied on by the AER recently, in terms of their relevance to the task of estimating the value of imputation credits to investors.

Equity ownership rates

The AER relies on the equity ownership approach as direct evidence of the value of distributed imputation credits. The AER states that its estimate of the value of distributed imputation credits ‘primarily reflects’ the evidence from the equity ownership approach.²²

In relying on equity ownership rates as direct evidence of the value of distributed imputation credits, the AER at least implicitly assumes that:

- all domestic investors are eligible to utilise imputation credits, while foreign investors are not (Assumption 1); and
- eligible investors (i.e. domestic investors) value imputation credits at their full face value because each dollar of imputation credits received can be fully returned to them in the form of a reduction in tax payable (Assumption 2).²³

Both of these assumptions are incorrect.

Assumption 1 is known to be incorrect due to certain tax rules which prevent redemption of credits by domestic investors in some circumstances. In particular, as has been acknowledged by the AER, the 45-day holding rule affects the eligibility of short-term investors to claim imputation credits.²⁴

The AER has sought to dismiss the impact of tax rules affecting eligibility of domestic investors to redeem imputation credits by saying that:²⁵

...we do not consider that there is clear evidence as to effect that these rules have or should be expected to have.

Even if this statement was correct (which it is not), we do not consider that there must be ‘clear evidence’ as to the effect of particular tax rules in order for these to render equity ownership an inappropriate measure. The fact is that these rules exist and they will affect the eligibility of certain domestic investors to redeem imputation credits, and therefore mean that theta cannot be equated to the rate of domestic ownership.

In any event, the fact that the redemption rate indicated by tax statistics is significantly below the domestic equity ownership rate strongly indicates that these tax rules (and possibly other factors as discussed below) are affecting domestic investors’ ability to redeem imputation credits. The redemption rate indicated by tax statistics is approximately 0.43, which is well below the domestic equity ownership rate for all equity.

As for Assumption 2, there are a number of reasons why even eligible investors will not value imputation credits at their full face value. These include transactions costs associated with the redemption of imputation credits and portfolio effects (discussed below).

²¹ John C Handley, Advice on the Value of Imputation Credits, 29 September 2014, p 31.

²² AER Draft Determinations of Ausgrid, Directlink, Endeavour Energy, Essential Energy, and Transgrid November 2014 [4-13].

²³ AER Draft Determinations of Ausgrid, Directlink, Endeavour Energy, Essential Energy, and Transgrid November 2014 [4-18].

²⁴ AER Draft Determinations of Ausgrid, Directlink, Endeavour Energy, Essential Energy, and Transgrid November 2014 [4-53].

²⁵ AER Draft Determinations of Ausgrid, Directlink, Endeavour Energy, Essential Energy, and Transgrid November 2014 [4-53].

CitiPower

2016–2020 Price Reset

Gamma

Given that neither of these assumptions hold, equity ownership rates cannot be used as direct evidence of the value of distributed imputation credits. Equity ownership rates will only indicate the maximum set of investors who may be eligible to redeem imputation credits and who may therefore place some value on imputation credits. Certainly theta cannot be higher than the domestic equity ownership rate, since foreign investors cannot place any value on imputation credits. However, the domestic equity ownership rate cannot be used as direct evidence of the value of imputation credits, because it does not account for the fact that:

- some domestic investors may be ineligible to redeem imputation credits; and
- even eligible investors will not value imputation credits at their full face value.

Therefore concluding that equity ownership rates are direct evidence of the value of imputation credits (or evidence from which a value can be inferred) and in giving these measures the primary role in the determination of a point estimate for theta would be erroneous.

Tax statistics

The AER also appears to have relied on redemption rates from tax statistics as direct evidence of the value of distributed imputation credits. In particular that it has placed ‘some reliance’ on tax statistics in estimating theta, but less reliance than is placed on equity ownership rates.²⁶

Redemption rates from tax statistics will be closer to the true value of imputation credits than domestic equity ownership rates. This is because redemption rates account for certain factors impacting on the value of imputation credits which are not accounted for in the domestic equity ownership rate – for example, redemption rates will reflect the fact that some domestic investors are not eligible to redeem credits due to the 45-day holding rule, and that some investors face costs and other barriers that deter them from utilising imputation credits.

However, redemption rates from tax statistics also cannot be used as direct evidence of the value of distributed imputation credits, because redemption rates do not take into account the fact that investors may value redeemed credits at less than their full face value. There are a number of reasons why investors will not value imputation credits at their full face value, including:

- **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 (meaning that the value of credits redeemed will be less than their face value) and may also dissuade some investors from redeeming credits (thus reducing the redemption rate);
- **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; and
- **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

²⁶ AER Draft Determinations of Ausgrid, Directlink, Endeavour Energy, Essential Energy, and Transgrid November 2014, [4-17].

CitiPower

2016–2020 Price Reset

Gamma

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 imputation 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 expert report of Professor Stephen Gray.

Redemption rates from tax statistics can only indicate the upper bound for theta. Theta clearly cannot be higher than the proportion of credits that are redeemed by investors, since credits that will never be redeemed have no value. However, theta may be (and for reasons referred to above, is likely to be) less than the redemption rate.

Therefore the AER has erred in giving redemption rates a direct role in the determination of a point estimate for theta.

Market value studies

The AER places 'less weight' on market value studies, as it considers that these studies have a number of limitations.

The limitations identified by the AER recently are:²⁷

- the results of these studies can reflect factors such as differential personal taxes and risk, which are not relevant to the utilisation rate;
- these studies can produce nonsensical estimates of the utilisation rate – that is, greater than one or less than zero;
- the results of these studies might not be reflective of the value of imputation credits to investors in the market as a whole;
- these studies can be data intensive and employ complex and sometimes problematic estimation methodologies; and
- it is only the value of the combined package of dividends and imputation credits that can be observed using dividend drop-off studies, and there is no consensus on how to separate the value of dividends from the value of imputation credits (referred to as the 'allocation problem').

In effect, the AER is raising two concerns in relation to market value studies:

- whether market value studies are measuring the right thing (reflected in the first point above); and
- whether the methodology employed in dividend drop-off studies is sufficiently robust such that these studies will accurately measure that thing (reflected in the other four points).

Each of these concerns is addressed below.

²⁷ AER Draft Determinations of Ausgrid, Directlink, Endeavour Energy, Essential Energy, and Transgrid November 2014 [4-22].

CitiPower

2016–2020 Price Reset

Gamma

Are market value studies measuring the right thing?

The first concern flows from the AER's conceptual definition of theta, which seeks to exclude the effects of personal taxes and personal costs. Since market values will reflect the impact of personal costs and taxation, the AER considers that a market value approach may not be compatible with its revised definition of theta.

As noted above, we do not agree with the AER's revised definition of theta (i.e. the qualified version which ignores the effects of personal costs and taxation). Theta must reflect the value of distributed imputation credits to investors, which will necessarily reflect (and will be net of) any transactions costs or other personal costs incurred in redeeming credits.

If the conventional definition of theta is adopted – i.e. defining theta as the value of distributed imputation credits to investors – then use of market value studies is entirely compatible with this definition. Market value studies will reflect the value of imputation credits to investors, as reflected in market prices for traded securities.

Indeed, of the three approaches that have been identified by the AER to estimate theta, an approach based on market value studies is the only approach that is entirely compatible with a definition of theta that is consistent with the National Electricity Rules (**NER**). As discussed above, both equity ownership rates and redemption rates from tax statistics will overstate the true value of theta, since they will not reflect certain factors which affect the value of imputation credits to investors.

Use of market value studies – and more generally, the adoption of a market value measure – is also consistent with how other rate of return parameters are estimated.²⁸ Other rate of return parameters such as the market risk premium and debt risk premium are estimated based on the return required by investors as reflected in market prices. The market value measures of these parameters are not adjusted to account for personal costs or other factors which may be reflected in market prices.

Do market value studies accurately measure that thing?

The AER has listed several methodological concerns with dividend drop-off studies, several of which are not relevant to the particular study relied on by us.

In particular, the AER's concern about 'nonsensical results' clearly does not apply to Professor Gray's dividend drop-off study. Professor Gray's study produces a theta estimate of 0.35, which is an entirely sensible result given that:

- it is within the theoretical bounds for theta (i.e. it is between zero and one);
- it is below the domestic equity ownership rate for both listed equity (0.44) and all equity (0.59). As noted above, the domestic equity ownership rate indicates the maximum set of investors who may be eligible to redeem imputation credits and who may therefore place some value on imputation credits, and therefore it may be expected that the value for theta would be below this figure; and
- it is also below the redemption rate indicated by tax statistics (0.43). Again, this may be expected given that redemption rates will indicate the upper bound for theta and do not capture certain factors affecting value, such as the time value of money, transaction costs and portfolio effects.

²⁸ As noted above, the NER requires the rate of return and the value of imputation credits to be measured on a consistent basis (NER, clause 6.5.2(d)(2)).

CitiPower

2016–2020 Price Reset

Gamma

Indeed, the result of the SFG study is consistent with the other evidence and a result that is to be expected in light of that evidence.

Similarly, the AER's concern about 'problematic estimation methodologies' may apply to *some* market value studies but does not apply to the particular study relied on by us. The methodology used in Professor Gray's study is the product of a consultative development process involving the AER and several regulated businesses and overseen by the Tribunal in the Energex review. The methodology used in Professor Gray's study was designed specifically to overcome methodological shortcomings of previous studies (e.g. shortcomings in the methodology employed by Beggs and Skeels (2006), which were identified by the Tribunal in the Energex review). In accepting the conclusions of Professor Gray's study, the Tribunal expressed confidence in those conclusions in light of the careful scrutiny to which the methodology had been subjected, and the way in which it had been designed to overcome shortcomings of previous studies.²⁹

Professor Gray notes that the dividend drop-off literature has evolved over time, and that the SFG studies use current state-of-the-art techniques. Professor Gray explains:³⁰

In relation to dividend drop-off studies, I first note that the dividend drop-off literature has evolved over time, as do all areas of scientific investigation. This evolution has seen the development of different variations of the econometric specification, different variations of regression analysis, and different types of sensitivity and stability analyses. It has also seen material growth in the available data. The SFG studies use the latest available data, and they apply a range of econometric specifications, regression analysis and sensitivity and stability analyses that have been developed in the literature. The SFG estimate of 0.35 is based on this comprehensive analysis. It is not as though the SFG studies use one of the reasonable approaches and other studies use different reasonable approaches. The SFG studies are comprehensive state-of-the-art studies.

Box 1 outlines the process by which the methodology used in Professor Gray's study was developed, and the conclusions of the Tribunal in relation to that methodology. In light of this, it cannot be said that Professor Gray's study shares the same methodological issues as previous market value studies. Rather, this study was specifically designed to overcome the shortcomings of previous studies.

²⁹ Application by Energex Limited (Gamma) (No 5) [2011] ACompT 9, [22].

³⁰ SFG, Estimating gamma for regulatory purposes, February 2015, [177].

CitiPower
2016–2020 Price Reset
Gamma

Box 1: Key conclusions of the Tribunal in *Energex* in relation to the SFG methodology

In *Application by Energex Limited (No 2)* [2010] ACompT 7, the Tribunal had before it two market value studies which produced different estimates of theta – a study by Beggs and Skeels (2006) and a study by SFG (2010) which sought to replicate the Beggs and Skeels (2006) methodology. The Tribunal identified shortcomings in the methodology used in both studies and observed that the results of both studies should be treated with caution.

The Tribunal therefore sought a new ‘state-of-the-art’ dividend drop-off study.³¹ To this end, the Tribunal directed that the AER seek a re-estimation by SFG of theta using the dividend drop-off method, but without the constraint that the study replicates the Beggs and Skeels (2006) study. The Tribunal encouraged the AER to seek expert statistical or econometric advice to review the approach prior to the estimation proceeding and to consider any possible enhancements to the dataset. It was said that the new study should employ the approach that is agreed upon by SFG and the AER as best in the circumstances.

The terms of reference for the new study were settled between the AER and the businesses involved in the *Energex* review (*Energex*, *Ergon* and *ETSA Utilities*), with oversight from the Tribunal. The AER and the businesses also had the opportunity to comment on a draft of the report, and SFG’s responses to those comments are incorporated in the final report.

In submissions to the Tribunal, the AER raised eight ‘compliance’ issues with the final SFG (2011) study – these were perceived issues of non-compliance by SFG with the agreed terms of reference. The Tribunal was not concerned by any of these issues and considered that they raised no important or significant questions of principle. The Tribunal concluded that any departures from the agreed terms of reference were justified, or even necessary and observed that calling them ‘major compliance issues’ was unnecessarily pejorative.³²

The Tribunal was ultimately satisfied that the procedures used by SFG (2011) to select and filter the data were appropriate and did not give rise to any significant bias in the results obtained from the analysis. It was also not suggested by the AER that the data selection and filtering techniques had given rise to any bias.³³

In relation to the model specification and estimation procedure, the Tribunal concluded:³⁴

In respect of the model specification and estimation procedure, the Tribunal is persuaded by SFG’s reasoning in reaching its conclusions. Indeed, the careful scrutiny to which SFG’s report has been subjected, and SFG’s comprehensive response, gives the Tribunal confidence in those conclusions. In that context, the Tribunal notes that in commissioning such a study, it hoped that the results would provide the best possible estimates of theta and gamma from a dividend drop-off study. The terms of reference were developed with the intention of redressing the shortcomings and limitations of earlier studies as far as possible.

Ultimately, the Tribunal was satisfied that the SFG (2011) study was the best study available at that time for the purposes of estimating gamma in accordance with the Rules.³⁵ The Tribunal did not accept the submission of the AER that either minor issues in the construction of the database or econometric issues would justify giving the SFG study less weight and earlier studies some weight.

³¹ *Application by Energex Limited (No 2)* [2010] ACompT 7, [146]-[147].

³² *Application by Energex Limited (Gamma) (No 5)* [2011] ACompT 9, [18].

³³ *Application by Energex Limited (Gamma) (No 5)* [2011] ACompT 9, [19].

³⁴ *Application by Energex Limited (Gamma) (No 5)* [2011] ACompT 9, [22].

³⁵ *Application by Energex Limited (Gamma) (No 5)* [2011] ACompT 9, [29].

CitiPower

2016–2020 Price Reset

Gamma

The other two issues that have been identified by the AER – the allocation problem, and the possibility that results of these studies might not be reflective of the value of credits to investors in the market as a whole – have previously been considered and addressed by Professor Gray. These issues are again addressed in Professor Gray’s most recent report in relation to:³⁶

- whether estimates reflect the value of credits to investors in the market as a whole, and whether there may be some impact on the theta estimate from ‘abnormal trading’ around ex-dividend day, Professor Gray notes that to the extent this effect is material it would result in the dividend drop-off (and therefore the theta estimate) being higher than it otherwise would be.³⁷ This is because any increase in trading around ex-dividend day would be 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; and
- the allocation issue, Professor Gray notes that empirical evidence provides a very clear and consistent view of the combined value of cash and imputation credits.³⁸ This evidence indicates that the combined value is one dollar. The relevant evidence includes the recent studies by SFG (2011 and 2013) and Vo et al (2013). Allocation can be made based on this clear evidence as to combined value of the cash/credit package.

In summary, the general set of ‘limitations’ referred to by the AER does not provide a justification for placing limited weight on the particular market value study relied on by us. Several of the general limitations do not apply to the SFG study that is relied on by us, with Professor Gray comprehensively addressing all issues.

The AER’s approach to considering market value studies – which involves simply identifying limitations which *may* apply to these studies in general, without considering whether those limitations apply to the particular study relied on by us – is unreasonable. Without considering whether the potential limitations it has identified actually apply to the SFG study, the AER cannot reasonably form a view that this study is unreliable or should be given limited weight.

Accordingly, placing only limited weight on all market value studies in estimating theta the AER will have erred and hence we consider that approach incorrect. Market value studies that are methodologically robust – in particular the SFG study – can and should be used as direct evidence of the value of imputation credits.

4.1.3 Estimates of theta

Estimates of equity ownership relied on by the AER

The AER has recently relied on a range of estimates of theta. For reasons discussed below, we consider that the AER has erred in its construction of these ranges.

The AER has recently concluded that a reasonable estimate of the equity ownership rate is between:

- 0.55 and 0.70, if all equity is considered; and
- 0.40 and 0.60, if only listed equity is considered.

³⁶ SFG, *Estimating gamma for regulatory purposes*, February 2015, [185].

³⁷ SFG, *An appropriate regulatory estimate of gamma*, May 2014, [150]-[153].

³⁸ SFG, *An appropriate regulatory estimate of gamma*, May 2014, [158]-[163].

CitiPower

2016–2020 Price Reset

Gamma

However, these ranges were not supported by the AER’s analysis of equity ownership statistics. The AER’s analysis – based on a refinement of the Australia Bureau of Statistics (**ABS**) dataset to focus on types of equity considered most relevant to the benchmark entity – indicates:³⁹

- the equity ownership rate for listed equity is currently around 0.44, and it has averaged approximately 0.43 over the past five years. At no time since June 1988 (the period covered by the ABS dataset) has the equity ownership rate for listed equity reached 0.60, and for most of that period it has remained below 0.5; and
- the equity ownership rate for listed and unlisted equity is currently around 0.59, and it has averaged approximately 0.57 over the past five years. At no time since June 1988 (the period covered by the ABS dataset) has the equity ownership rate for all equity reached 0.7, and on only a few occasions has it exceeded 0.60.

Table 1 shows the domestic equity ownership rate as at September 2014 (the most recent period for which data is available) and at the same time in each of the previous four years. This shows the proportion of the equity stock held by domestic investors at the relevant points in time, for listed and all equity respectively. These calculations are based on the AER’s refined methodology, as recently described.⁴⁰

Table 1 Domestic equity ownership rate, based on AER refined methodology

Period	Listed equity	All equity
September 2010	0.45	0.57
September 2011	0.39	0.55
September 2012	0.40	0.56
September 2013	0.44	0.59
September 2014	0.44	0.59

Source: ABS, Australian National Accounts: Finance and Wealth, September 2014 (Cat no. 5232.0), table 47, 48.

To the extent that equity ownership rates are relevant at all to the estimation of theta, the only relevant measure is the current domestic equity ownership rate – that is, the proportion of the equity stock currently held by domestic investors. The current equity ownership rate indicates the maximum proportion of current investors in the benchmark business who **may** be eligible to redeem imputation credits and who may therefore place **some** value on those credits. Historical equity ownership rates are of no relevance in the context of considering the eligibility of current investors to redeem imputation credits.

It is not appropriate to simply refer to a wide range of estimates for the equity ownership rate based on historical data, in circumstances where the current rate is clearly observable. Such an approach would be in error.

If equity ownership rates are to be used, a current point estimate must be observed from the ABS dataset. As noted above, the AER’s analysis indicates that the current domestic equity ownership rate is 0.44 for listed equity and 0.59 for all equity.

³⁹ AER Draft Determinations of Ausgrid, Directlink, Endeavour Energy, Essential Energy, and Transgrid November 2014 [4-56].

⁴⁰ AER Draft Determinations of Ausgrid, Directlink, Endeavour Energy, Essential Energy, and Transgrid November 2014 [4-55].

CitiPower

2016–2020 Price Reset

Gamma

Estimate from tax statistics

As explained above, tax statistics can only provide an upper bound to the theta value. The AER has observed that the redemption rate from tax statistics is 0.43, based on analysis by Hathaway. However the AER also states that tax statistics ‘support an estimate of the utilisation rate between 0.4 and 0.6’.⁴¹

As is clear from the analysis of the AER, and from the Hathaway paper referred to by the AER, tax statistics clearly support a point estimate for the redemption rate of 0.43 (paired with a distribution rate of 0.7). Given the AER’s adoption of a distribution rate of 0.7, the only redemption rate estimate that would be consistent with this is 0.43.

It would be an error to adopt a redemption rate any higher than 0.43, based on either the Handley and Maheswaran (2008) study or Hathaway’s alternative estimate of 0.61. This is because:

- the Handley and Maheswaran (2008) study cannot be relied on for an empirical estimate of the redemption rate for the post-2000 period. As is clear from that study, for the period 2001-2004 (the period for which the AER has previously relied on this study), the authors do not provide any empirical estimate of the redemption rate. Rather, Handley and Maheswaran simply make an assumption that all credits received by individuals and funds will be used. Therefore, the Handley and Maheswaran study **is not an empirical measure of redemption rates** for the relevant period. This has been pointed out to the AER since the Energex proceedings, and the AER should desist from erroneously using Handley and Maheswaran for this purpose;⁴² and
- Hathaway’s alternative estimate of 0.61 corresponds to a distribution rate of around 0.5, whereas the AER adopts a distribution rate of 0.7.⁴³

We are concerned by the use of redemption rates from tax statistics, for the purposes of estimating theta, including because the redemption rate is necessarily an upper bound for theta rather than a measurement of theta. Redemption rates from tax statistics cannot be used as direct evidence of the value of distributed imputation credits, because redemption rates do not take into account the fact that investors may value redeemed credits at less than their full face value.

However if redemption rates from tax statistics are to be used to indicate an upper bound for theta, the appropriate point estimate for the redemption rate is 0.43.

Range of estimates from market value studies

The AER has recently considered that market value studies support a range for theta of between zero and one.⁴⁴

⁴¹ AER Draft Determinations of Ausgrid, Directlink, Endeavour Energy, Essential Energy, and Transgrid November 2014 [4-59].

⁴² 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 per cent 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.

⁴³ AER Draft Determinations of Ausgrid, Directlink, Endeavour Energy, Essential Energy, and Transgrid November 2014, [4-59]. As noted in the AER Draft Determinations of Ausgrid, Directlink, Endeavour Energy, Essential Energy, and Transgrid November 2014, Hathaway’s calculations actually suggest estimates of the utilisation rate of 0.44 and 0.62 and corresponding estimates of the distribution rate of 0.69 and 0.49, respectively. However, the AER rounds these distribution rate estimates up to 0.7 and 0.5, which implies slightly higher amounts of credits distributed and therefore slightly lower utilisation rates of 0.43 and 0.61.

⁴⁴ AER Draft Determinations of Ausgrid, Directlink, Endeavour Energy, Essential Energy, and Transgrid November 2014 [4-22].

CitiPower 2016–2020 Price Reset Gamma

Underpinning this position appears to be a view that all market value studies should be given equal (or similar) weight, regardless of:

- the time period for estimation (including whether the study relates to the period before or after changes to the tax law in 2000);
- robustness of the methodology; and
- quality of data and filtering techniques.

This is an erroneous and unreasonable approach to consideration of market value studies. We propose a specific value for theta based on a particular study, and this is not just any study, for the reasons set out above. It is not sufficient for the AER to consider a wide range of estimates produced by market value studies, without considering the relative merits of the various studies (and in particular, the merits of the SFG study relied on by us).

As the AER is aware, many of the earlier market value studies have methodological shortcomings and rely on very old data. As explained above, the SFG study relied on by us was specifically designed to overcome the shortcomings of previous studies. In particular, the methodology used in the SFG study:

- was designed, at the request of the Tribunal, to overcome shortcomings in previous studies (particularly the Beggs and Skeels (2006) study);
- was the product of a consultative process involving the AER; and
- relies on more recent data than previous studies.

In effect, the SFG study was designed to supersede previous studies, both in terms of its methodology and the currency of the underlying data.

As noted above, the SFG study was found by the Tribunal (at the time of its May 2011 decision in *Energex*) to be *'the best dividend drop-off study currently available'*.⁴⁵ The Tribunal also did not accept the submission of the AER that either minor issues in the construction of the database or econometric issues justified giving the SFG study less weight and earlier studies (particularly the previous Beggs and Skeels (2006) study) some weight. The Tribunal observed that *'the Beggs and Skeels study, despite not being subjected to anything like the same level scrutiny [sic], is known to suffer by comparison with the SFG study on those and other grounds'*.⁴⁶

We are not aware of any more recent study (apart from Professor Gray's updated study, using the same methodology) which is more robust or is more likely to provide a better estimate of theta.⁴⁷

Unlike the Tribunal in *Energex* review, the AER in its NSW draft decision gives no consideration to the relative strengths and weaknesses of the available market value studies. Rather, the AER has simply grouped all market value studies together and referred to a range of estimates emerging from this broad group.

⁴⁵ *Application by Energex Limited (Gamma) (No 5)* [2011] ACompT 9, [29].

⁴⁶ *Application by Energex Limited (Gamma) (No 5)* [2011] ACompT 9, [29].

⁴⁷ There is one other more recent study by Vo et al (2013). This study adopts a methodology similar to SFG (2011) and SFG (2013), except that additional methodological permutations are run, including to exclude the standard market adjustment (as explained by SFG, the standard market adjustment is a simple adjustment made in most dividend drop-off studies to remove the effect of movements in the broader market). The results of the Vo et al (2013) study with the standard market adjustment are consistent with those reported by SFG, while the result without the standard adjustment is higher. However, as previously explained, the results without the adjustment will be biased due to exogenous factors which may be driving the broader market over the ex-dividend day.

CitiPower

2016–2020 Price Reset

Gamma

It would be unreasonable for the AER to simply adopt a wide range of estimates from market value studies and to criticise such studies as a group, without having regard to the relative strengths and weaknesses of each study. In considering the appropriate estimate for theta from market value studies, the AER must consider which of these studies are most appropriate having regard to factors such as the robustness of their methodology and currency of data.

We maintain our view that the best estimate of theta from market value studies is 0.35. This reflects the output of the best dividend drop-off study currently available.

Lally/Handley adjustment to estimates from dividend drop-off studies

The AER has recently referred to the adjustment to dividend drop-off estimates of theta proposed by Associate Professor Lally and referred to by Handley. This adjustment is said to account for factors such as personal taxes and risk which means that cash (and by implication credits) will be valued at less than face value.

This adjustment to dividend drop-off estimates of theta is unnecessary and inappropriate. As explained above, in valuing imputation credits, personal costs which may affect the value investors place on imputation credits cannot be ignored or assumed away. Accordingly, any adjustment to exclude the impact of these factors would be inappropriate and would lead to overestimation of the true value of imputation credits to investors.

The AER's recent draft decisions (depicted in table 2) have recently concluded that a reasonable estimate of the value of imputation credits is in the range 0.30 to 0.50, and that a reasonable point estimate for gamma is 0.40. Given the values adopted by the AER for the distribution rate this implies:

- for listed equity, a theta estimate of 0.5 (i.e. 0.4 divided by 0.8); and
- for all equity, a theta estimate of 0.57 (i.e. 0.4 divided by 0.7).

This conclusion is clearly inconsistent with the evidence presented recently to the AER, including the AER's own analysis of the empirical data.

The evidence presented recently demonstrates that:

- the current domestic equity ownership rate is 0.44 for listed equity and 0.59 for all equity. This means that the maximum set of investors who **may** be eligible to redeem imputation credits and who may therefore place **some** value on imputation credits is 44 per cent of listed equity investors and 59 per cent of all equity investors. This implies that a theta value of 0.5 for listed equity cannot be correct – theta cannot be higher than 0.44 for listed equity and will in fact be lower than this for the reasons explained above;
- the redemption rate is 0.43 for all equity-while tax statistics do not show the redemption rate for listed equity only, it is likely that this will be lower than 0.43, due to higher foreign ownership of listed equity. This means that the upper bound for theta is 0.43 for all equity, and will likely be lower for listed equity. This implies that a theta value of 0.5 for listed equity and 0.57 for all equity cannot be correct; and
- the value of imputation credits to investors – as indicated by market value studies – is in fact 0.35. Alternatively, if the market value estimate is adjusted to remove the effect of differential personal taxes and risk, the adjusted value is 0.4.

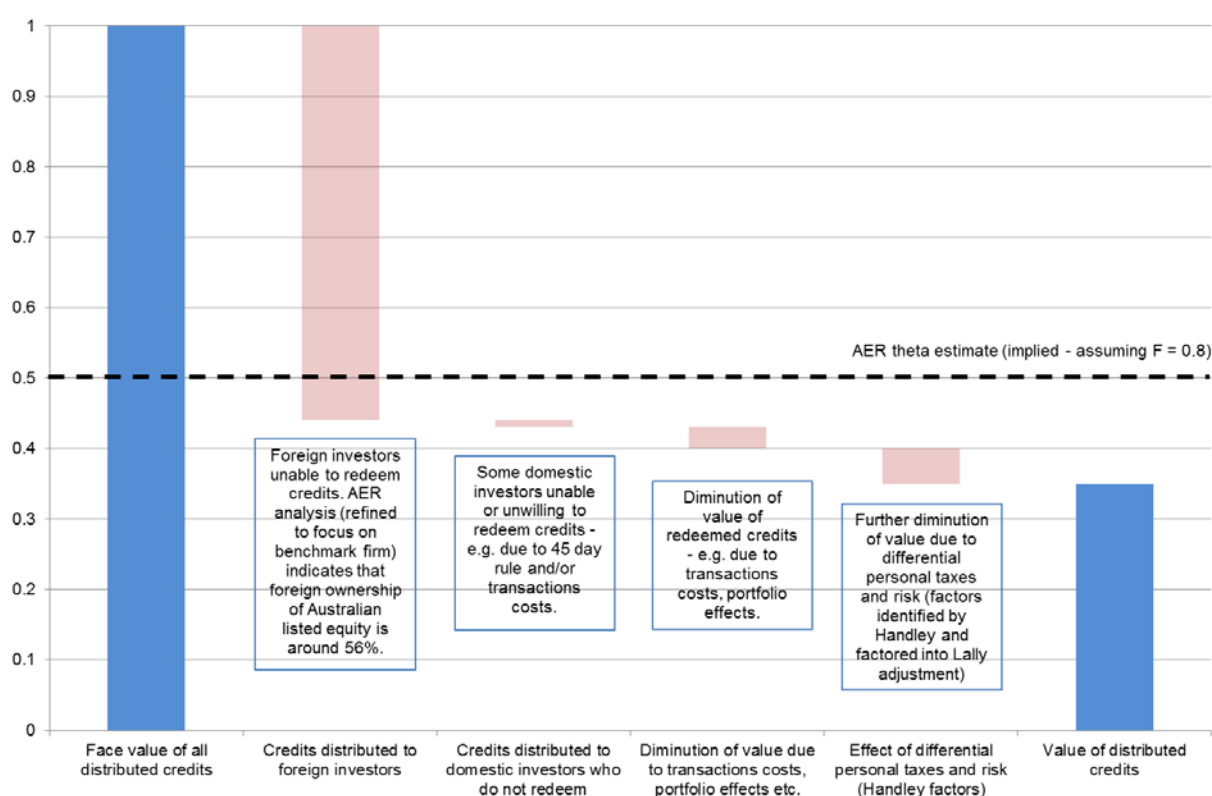
In order to illustrate the key implications of the empirical evidence, [Entity] proposes an analysis of the data for listed equity (Figure 1) reflecting the AER's updated approach. This reflects the data for listed equity, including:

CitiPower 2016–2020 Price Reset Gamma

- a domestic equity ownership rate of 0.44;
- a redemption rate of 0.43 (although as noted above, the redemption rate for listed equity investors is likely to be lower than 0.43, due to higher foreign ownership);
- a market value estimate excluding the effects of differential personal taxes and risk (i.e. with the Lally/Handley adjustment) of 0.40; and
- a market value for imputation credits of 0.35.

This shows that the AER's implied theta estimate for listed equity (0.57) is well above any possible measure of the value of distributed imputation credits.

Figure 1 Illustrative impact on value of imputation credits – listed equity



Note: (1) the proportion of credits distributed to foreign investors is set equal to 0.56, based on the current foreign equity ownership rate (as at September 2014), calculated using the AER's refined methodology (refer to Table 1 above); (2) the proportion of domestic investors unable or unwilling to redeem credits is set equal to the difference between the domestic equity ownership rate (0.44) and the observed redemption rate (0.43) – this is likely to be an under-estimate of the proportion of domestic investors in listed equity that are unable or unwilling to redeem credits because (as discussed above) 0.43 will likely overstate the redemption rate for listed equity; (3) the diminution of value of redeemed credits due to factors such as transactions costs is calculated as the difference between the redemption rate (0.43) and the value of distributed credits estimated by Professor Gray, adjusted for the effects of differential personal taxes and risk, as proposed by Handley (0.40); (4) the further diminution of value due to differential personal taxes and risk is the difference between the Handley-adjusted estimate of the value of distributed credits (0.40) and Professor Gray's unadjusted estimate (0.35).

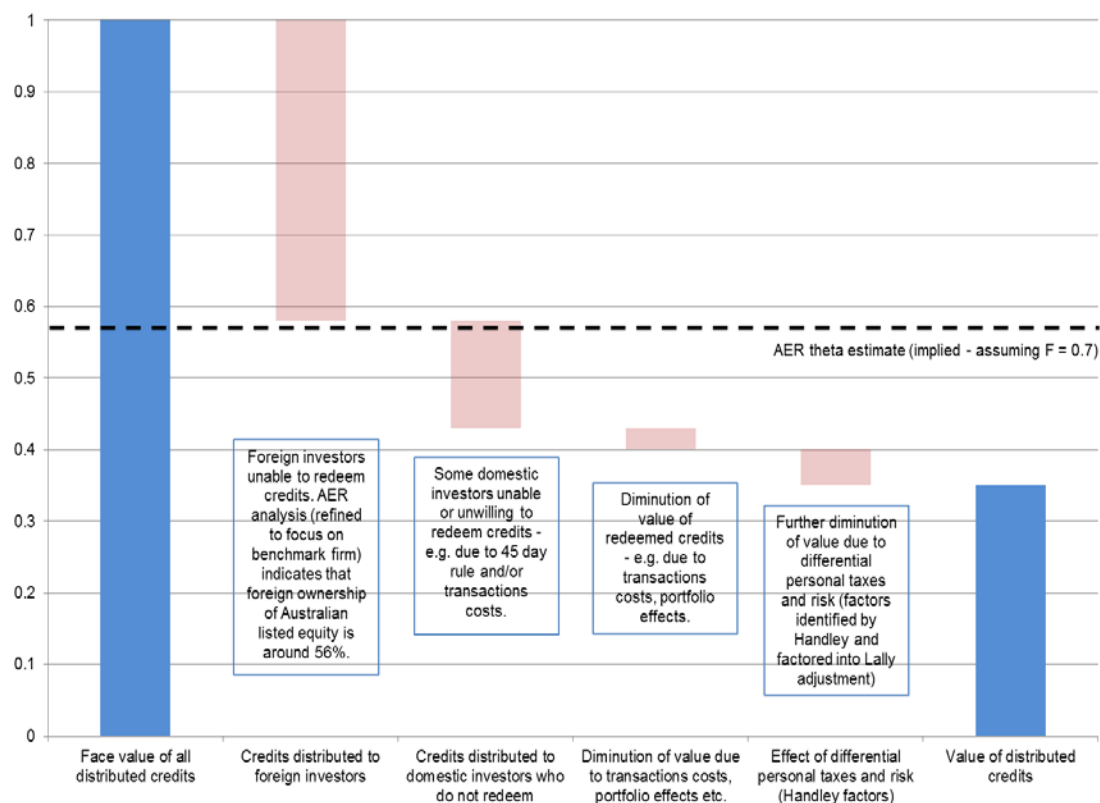
Similarly, for all equity, the AER's implied theta estimate (0.57) is only marginally below the domestic equity ownership rate, and is well above the observed redemption rate and the market value of distributed credits (Figure 2).

Figure 2 Illustrative impact on value of imputation credits – all equity

CitiPower

2016–2020 Price Reset

Gamma



Note: (1) the proportion of credits distributed to foreign investors is set equal to 0.41, based on the current foreign equity ownership rate (as at September 2014), calculated using the AER’s refined methodology (refer to Table 1 above); (2) the proportion of domestic investors unable or unwilling to redeem credits is set equal to the difference between the domestic equity ownership rate (0.59) and the observed redemption rate (0.43); (3) the diminution of value of redeemed credits due to factors such as transactions costs is calculated as the difference between the redemption rate (0.43) and the value of distributed credits estimated by Professor Gray, adjusted for the effects of differential personal taxes and risk, as proposed by Handley (0.40); (4) the further diminution of value due to differential personal taxes and risk is the difference between the Handley-adjusted estimate of the value of distributed credits (0.40) and Professor Gray’s unadjusted estimate (0.35).

The AER’s value for gamma of 0.4 is not consistent with evidence. This value is well above even the upper bound values indicated by the equity ownership approach and tax statistics.

The evidence indicates:

- gamma can be no higher than 0.30 (combining a distribution rate of 0.7 with the upper bound for theta of 0.43);
- even if the AER’s new conceptual definition of theta were to be accepted, which is clearly inappropriate, this would imply a gamma point estimate of 0.28 (applying the Lally adjustment to Professor Gray’s estimates to exclude the effect of factors such as differential personal taxes and risk); and
- if the correct definition of theta were to be accepted, consistent with the requirements of the NER, this would imply a gamma point estimate of 0.25.

As demonstrated above, the AER’s recent approach to adopting a value for gamma is based on several errors of fact and reasoning. These include errors in the use of certain measures as direct evidence of the value of imputation credits, and errors in the interpretation of empirical data.

CitiPower
2016–2020 Price Reset
Gamma

On a proper interpretation of the empirical evidence a value of 0.25 for gamma is clearly correct. The AER's recent approach leads to overestimation of gamma and consequently underestimation of the overall return required by investors. Accordingly, the AER's recent approach will not contribute to the achievement of the NEO whereas 0.25 for gamma is clearly correct.