Appendix 8.03

Detailed proposal of gamma

1. Summary

The National Gas Rules (NGR) require an estimate of *'the value of imputation credits'* (also referred to as 'gamma') as an input to the calculation of the corporate income tax building block.

When the value ascribed to imputation credits is higher than the value that equity-holders place on them, the overall return to equity-holders will be less than what is required to promote efficient investment in, and efficient operation and use of, gas distribution for the long term interests of consumers.

The estimation method that ActewAGL Distribution proposes to adopt will result in an estimate of gamma that reflects the value equity-holders place on imputation credits. In particular, ActewAGL Distribution identifies that the orthodox method, using the Monkhouse formula,[1] is the correct method to calculate gamma. This method uses the product of:

- the **distribution rate -** the extent to which imputation credits that are created when companies pay tax, are distributed to investors, using ATO data; and
- the **value of distributed imputation credits to investors** who receive them (theta) based on the value of imputation credits reflected in share price movements, using dividend drop-off analysis.

ActewAGL Distribution proposes an observed distribution rate of 0.70, which is consistent with both the rate of return guidelines published by the AEr in December 2013 (**Rate of Return Guideline**)[2] and findings of the Australian Competition Tribunal (the **Tribunal**).[3] We propose that the distribution rate be combined with the best estimate of theta from market value studies (0.35) which leads to an estimate for gamma of 0.25. This proposal is consistent with the expert advice of both Professor Gray (of SFG Consulting, **SFG**)[4] and Simon Wheatley (of NERA).[5]

The AER's approach to determining a value for gamma is currently the subject of merits and judicial review applications before the Tribunal[6] and Federal Court of Australia.[7] Given the similarity of the issues raised by ActewAGL Distribution in this access arrangement information and the issues raised in those proceedings, ActewAGL Distribution expects any findings of the Tribunal or Federal Court to be applied to it. For the avoidance of doubt, ActewAGL Distribution adopts all submissions in respect of the value of gamma made by it in those proceedings for the purposes of this review process.

2. Requirement of the Rules and Law

Rule 87A of the NGR requires an estimate of γ (i.e. gamma), being "*the value of imputation credits*".

Other key aspects of the NGR relating to gamma are:

- **ensure consistency between approaches.** Rule 87(4)(b) of the NGR, which relates to the rate of return, requires the rate of return to be determined on a nominal vanilla basis that is consistent with the value of imputation credits; and

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[1] Monkhouse, P. H.L., *The valuation of projects under the dividend imputation tax system;* Accounting & Finance, 36: 1996, 185–212.
[2] AER, Rate of Return Guideline, p. 23; AER, *Better Regulation: Explanatory Statement Rate of Return Guideline*, Appendices, December 2013, pp. 136–180.
[3] *Application by Energex Limited (Distribution Ratio (Gamma)) (No 3)* [2010] ACompT9.
[4] SFG, Estimating gamma for regulatory purposes, Report for Jemena Gas Networks, Jemena Electricity Networks, ActewAGL, Ausnet Services Directlink, Networks NSW (Ausgrid, Endeavour Energy and Essential Energy), Citipower, Powercor, ENERGEX, Ergon, SA Power Networks, Australian Gas Networks and United Energy, February 2015, para. [22].
[5] NERA, *Estimating Distribution and Redemption Rates from Taxation Statistics,* A report for Jemena Gas Networks, Jemena Electricity Networks, AusNet Services, Australian Gas Networks, CitiPower, Powercor, SA PowerNetworks and United Energy, March 2015.
[6] ACT File Nos. 1-7 of 2015
[7] Federal Court of Australia proceedings VID277/2015, NSD609/2015, NSD610/2015, NSD611/2015 and QUD411/2015

- **reflect the value to investors.** ActewAGL Distribution considers that it is clear that what is required under the NGR and NGO are an estimate of the value of imputation credits to investors in the business.

What is relevant is the value that equity-holders place on imputation credits, as opposed to simply their face-value or utilisation rate. The NGR are clearly directed at providing the opportunity to recover at least efficient costs, including a return to equity-holders, consistent with the NGO and the revenue and pricing principles. The relevant issue, in the context of the broader objectives of the NGR, is what the *value* of imputation credits to equity-holders.

The way that 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 the value of imputation credits to equity-holders, not just their face-value or utilisation rate. Further, it is important that the value of gamma is estimated consistently with values of other rate of return parameters.

3. ActewAGL Distribution proposal for imputation credits

ActewAGL Distribution proposes a gamma of 0.25, as the product of a distribution rate of 0.70 and a theta estimate of 0.35. This proposal is consistent with the expert advice of Professor Gray.[8]
The correct approach to estimating gamma is as follows:

- **Product of distribution rate and theta.** Gamma is estimated as the product of the distribution rate and the value of distributed imputation credits (theta), consistent with the requirements of the NGR and NGO.
- **Use distribution rate for all equity.** The distribution rate is observed from ATO data, which shows the proportion of imputation credits that are distributed over time. It is widely accepted that this data shows that the economy-wide distribution rate is 0.7.
- **Estimate theta as the value to investors.** Theta is the value of distributed imputation credits to investors, consistent with the requirements of the NGR, and is estimated as 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.
- **Use equity ownership and credit redemption rates as an upper bound for theta.** 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.

ActewAGL Distribution considers that this approach to determining gamma – which is fundamentally based on estimating the value of imputation credits to investors in the business – is the superior approach to achieve the NGO. 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 reason why ActewAGL Distribution proposes a value for theta that is different to the value in the Rate of Return Guideline include:

- **Concerns with the AER's conceptual framework.** ActewAGL Distribution 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 NGO. It does not measure the required return for the purposes of promoting efficient investment, and would lead to under investment.
- **'Value' must reflect the value to equity holders, not an observed or assumed rate of redemption.** 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

[8] SFG, *Estimating gamma for regulatory purposes*, February 2015,[22].

conventional and orthodox approach to estimating theta. It is also the approach which best gives effect to the NGO, as it provides for recognition of the value of the imputation credits to equity-holders, and provides for overall returns which promote efficient investment.

- **There are good reasons why the value of imputation credits is less than their face value.** 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 NGR should be reduced—is significantly less than the face value of imputation credits or the utilisation of imputation credits.
- **Redemption rate estimates provide only an upper bound on the value of theta.** The Tribunal has earlier concluded that redemption rates cannot be used to estimate theta as the value of distributed credits and that this rate can be used only as a check for the upper bound check on estimates of theta obtained from the analysis of market prices.
- **Only market value studies provide a point estimate of theta.** 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 of the value of imputation credits by investors.
- **Using market values to measure theta is consistent with how rate of return parameters are estimated.** There needs to be consistency in the way that rate of return parameters are computed and the way gamma is computed—which requires the application of relevant empirical methods to the relevant market data.
- **The best estimate of theta is 0.35.** The best estimate of investors' valuation of imputation credits from market value studies is 0.35. As such, the value for theta proposed by ActewAGL Distribution accords with what one would expect to be the additional benefit conferred by the system of imputation credits.

These reasons are elaborated on further below.

3.1 Approach

As noted above, gamma is defined in the NGR as the value of imputation credits. The initial theory upon which the NGR is based was developed by Officer. The AER has asserted that its particular conceptual framework for gamma was developed by Officer; this is not the case. As explained in NERA's report,[9] Officer's 1994 paper provided two different definitions for gamma:

- the proportion of credits created that are redeemed; and
- the value of a dollar of tax credits created to a representative shareholder.

As a result of extensive further expert work predominantly undertaken for stakeholders and the regulators, it is now known that the two definitions diverge from each other.

It is important to remember that when Officer originally published his paper with these two inconsistent definitions, the detailed market studies and tax statistic studies that are available today had not been undertaken and he did not have any occasion to consider whether or why the two above concepts might diverge from each other.[10]

To the extent that there is any utility in trying to imagine which formulation Officer would have favoured in 1994 if he had known then what is known today, ActewAGL Distribution points out that the most obvious way to read the two together was that Officer was seeking the second definition - a value of a dollar of tax credits created to a representative shareholder - and assumed without having the detailed data and reasoning at hand, that the first concept was a means to estimate the second.

The approach that is appropriate to adopt today should take full account of the extensive expert material that has been prepared since Officer's 1994 paper. NERA explains that it is only the 'value of a dollar of tax credits created to a representative shareholder' that is consistent with the way in which the equity allowance is calculated, which is to draw on market data for market parameters such as the market risk premium (**MRP**), when estimating the Sharpe-Lintner CAPM.

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[9] NERA, *Estimating Distribution and Redemption Rates from Taxation Statistics*, March 2015, p. i.
[10] The reasons they diverge are summarised in Figure 4.1 and Figure 4.2.

The relevant valuation is arrived at by taking the product of the distribution rate and the value of distributed imputation credits (theta). While the AER has taken an economy wide distribution rate in the past and—in the absence of an energy network specific metric—ActewAGL Distribution considers the 0.7 value to be acceptable, NERA explains[11] that this parameter can vary on a firm specific basis. On the other hand theta must be a marketwide valuation because investors from across the market can access credits by buying and selling shares before and after dividends are paid (which attract credits). Each of these is discussed further below.

3.1.1 ESTIMATING THE DISTRIBUTION RATE

The Rate of Return Guideline states that the AER proposes to apply a distribution rate (or payout ratio) of 0.70. The Tribunal has also recently adopted a distribution rate of 0.70.[12]

In its April/June 2015 final decisions, the AER has not specified separate estimates for the distribution rate and theta, but has referred to estimates of the distribution rate including: [13]

- a market-wide distribution rate (including listed and unlisted equity) of 0.70; and
- a distribution rate for listed equity only of 0.80 or, more recently, 0.77.

ActewAGL Distribution considers that recent empirical evidence relevant to estimating the distribution rate continues to support a value of 0.70. In considering a range of 0.7 to 0.8 for the distribution ratio, the AER has given undue weight to evidence of the distribution rate for a small and (for this purpose) unrepresentative set of listed companies, and has not had proper regard, or given insufficient weight, to evidence of the market-wide distribution rate. ActewAGL Distribution considers that the market-wide distribution rate is a much better proxy for the distribution rate for the benchmark entity than a distribution rate for listed equity.

In its April/June 2015 final decisions, the AER also refers to advice from Professor Handley (May 2015) in relation to the distribution and redemption rates from taxation statistics. Together with other businesses, ActewAGL Distribution engaged NERA that has considered Handley's advice. NERA states:[14]

> *…there is little in Handley's May 2015 report to alter the view we that expressed in our March 2015 report. 15 We believe that the AER's 2009 statement that a benchmark network service provider need be neither large and publicly listed nor publicly listed is correct. Thus we believe that Handley is wrong to advocate the use of a distribution rate that places a large weight on large publicly listed firms and no weight on private firms. It is difficult to see that there is a case for setting the distribution rate to be any different than the value accepted by the Australian Competition Tribunal in its 2010 decision and the market-wide value chosen in the AER's Rate of Return Guideline of 0.70. 16 This value is based on a cumulative distribution rate computed using tax statistics aggregated across all companies – both private and public.*

ActewAGL Distribution considers that there are two acceptable means to reach a distribution rate:

- **Economy-wide**: To date, the AER has adopted an economy wide rate which delivers a distribution rate of 0.70, which does not assume knowledge of the benchmark entity.
- **Firm-specific**: As NERA explains, however, the distribution rate might better be thought of as a firm specific parameter (in this case, the benchmark efficient entity) which, on its estimates, also delivers a figure of approximately 0.70.[15]

As explained by NERA,[16] it would be unacceptable to select a unrepresentative subset of the firms in the economy (i.e. large listed firms) without a proper basis to conclude that this subset of firms is a good proxy for the benchmark efficient firm. Such a measure would result in a distribution rate of 0.80

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[11] NERA, Estimating Distribution and Redemption Rates from Taxation Statistics, March 2015, page ii.

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

[13] See, for example, AER, *Final decision ActewAGL distribution determination 2015-16 to 2018-19*, April 2015, Attachment 4, p. 4-21*; Final decision Jemena Gas Networks (NSW) Ltd Access Arrangement 2015-20,* June 2015, Attachment 4, p. 4-21.

[14] NERA, Estimating Distribution and Redemption Rates: Response to the AER's Final Decision for the NSW and ACT Electricity Distributors, and for Jemena Gas Networks, June 2015, p. vii

[15] NERA, Estimating Distribution and Redemption Rates from Taxation Statistics, March 2015, page iv.

[16] NERA, Estimating Distribution and Redemption Rates from Taxation Statistics, March 2015, pp. 12–20.

or 0.77, which diverges from the 0.70 figure established on the basis of a market-wide distribution rate or the distribution rate of a benchmark efficient entity.

ActewAGL Distribution considers that it is neither necessary, nor appropriate, to separately identify (as the AER has done in recent decisions) a distribution rate for a limited subset of listed businesses only, most of which are large ASX listed companies.

The distribution rate is a firm specific parameter meaning that the AER must determine the distribution rate for a benchmark efficient entity. The distribution rate of listed entities is not a good proxy for the distribution rate of a benchmark entity because:

- almost two thirds of the value of listed entity comprises the top 20 firms, which tend to be large multinational firms with significant foreign earning;[17] and
- while franking credits are only created where tax is paid on Australian earning, franking credits may be distributed by franking any dividend (whether the dividend results from the distribution of Australian earnings or foreign earnings). The existence of significant foreign profits (and thus foreign tax liabilities) for large listed entities means that for a given amount of dividends and imputation credits distributed, the distribution rate will be higher than for an entity with less foreign profits.[18]

In addition, in a report prepared in June 2015, Professor Gray comments on Handley's consideration of the top 20 listed firms and how they differentiate from the benchmark entity. He notes that Handley's analysis:[19]

> *…seems to miss the point entirely. The point is that any firm with foreign profits will be able to distribute more imputation credits than they would otherwise have been able to. The 20 largest multinational companies obviously have material foreign income and they would obviously be able to distribute fewer imputation credits without that foreign income.*
>
> *The fact that firms consider many things before they settle on a dividend policy is self-evidently true, but irrelevant to the point at hand. The point is that the 20 large multinationals have foreign profits that inflate their ability to distribute imputation credits, and that the benchmark firm has no such ability. If these multinationals differ from the benchmark domestic entity in other ways as well (e.g., because of their size or other considerations they make in setting their dividend policy) then there would be even more reason to exclude them*

Further, the AER has not (either in its Rate of Return Guideline or historically) defined the benchmark efficient entity as a listed entity. The AER, in its 2009 WACC review final decision, provides an analysis of the characteristics of a benchmark efficient entity and states that 'the AER does not agree that a benchmark efficient [network service provider] be defined as a large, stock market listed network service provider[20]. Similarly, Associate Professor Lally, in a report for the Queensland regulator, states that he favours the inclusion of listed and unlisted firms in the dataset for measuring market parameters where possible.[21] In its Rate of Return Guideline, the AER does not define the benchmark efficient entity as a large, stock market listed firm. [22]

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.[23]

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[17] SFG, *Estimating gamma for regulatory purposes*, February 2015, pp. 44-45.

[18] This is illustrated by way of example in: SFG, *Estimating gamma for regulatory purposes*, February 2015, p. 44.

[19] Frontier Economics*, An appropriate estimate of gamma,* June 2015 , p. 29

[20] AER, *Final decision Electricity transmission and distribution network service providers: Review of the weighted average cost of capital(WACC) parameters*, May 2009, p. 105.

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

[22] AER, Rate of Return Guideline, p. 7.

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

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.[24] The AER's conceptual definition of the benchmark entity is a pure play, regulated energy network business operating within Australia.[25] That is, it is not confined to listed entities. There is therefore no conceptual basis to confine the dataset for estimating the distribution rate to listed equity.

Professor Gray notes that even if the dataset were to be limited to listed entities, the AER's estimate of 0.80 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. Professor Gray concludes that there is no reasonable basis to adopt a distribution rate of 0.80, even if the data is restricted to listed firms only.[26]

It is not surprising that the market-wide distribution rate is lower than distribution rate for listed equity. This is because, for a company with Australian earnings only, distributing 70% of earnings means that only 70% of imputation credits can be distributed. By contrast, a company with significant foreign earnings can distribute 70% of overall earnings (and retain 30%) but also distribute significantly more than 70% of franking credits, by attaching franking credits produced by tax on Australian earnings to dividends paid on a mix of Australian and foreign earnings. The benchmark entity is, by definition, an entity with 100% Australian income, and thus it cannot consistently raise its franking credit distribution rate above its earnings distribution rate and the distribution rate of listed equity is not a good proxy for the distribution rate of the benchmark entity.

NERA estimates the distribution rate:

- for a public company to be 0.76;
- for public companies that are not top-20 ASX listed to be 0.69;
- for private companies to be 0.51; and
- for all firms to be 0.68.

As there is no basis to assume that the benchmark efficient entity would be publicly listed or of a particular size, the market-wide distribution rate of 0.70 should be applied. It would be an error to apply a higher distribution rate based on data from a limited set of businesses.

ActewAGL Distribution observes that the firm specific distribution rate (i.e. the distribution rate of the benchmark efficient entity) may, in some circumstances, differ from the market-wide distribution rate. As noted by NERA, however, if significant weight is placed on estimates of the distribution rate for companies that are not large ASX-listed companies (as the AER's statements in 2009 WACC review final decision suggest should occur), an estimate for the benchmark efficient entity is also approximately 0.7.[27]

3.2 VALUE OF DISTRIBUTED CREDITS (THETA)

3.2.1 Definition of theta

In the Rate of Return Guideline the AER defined theta as[28]:

> *…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 NER and a departure from conventional regulatory practice which is to define gamma as the *value* of imputation credits to investors.

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[24] 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.

[25] AER, Rate of Return Guideline, p. 7.

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

[27] NERA, *Estimating Distribution and Redemption Rates from Taxation Statistics*, March 2015, pp.12–13.

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

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'*):[29]

> *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:[30]

> *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, in its April/June 2015 final decision, 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. [31]

The AER describes its conceptual definition of theta in its April/June 2015 final decisions as follows:[32]

> *We understand the utilisation rate to be the utilisation value to investors in the market per dollar of imputation credits distributed. In the Monkhouse framework, the utilisation rate is equal to the weighted average, by wealth and risk aversion, of the utilisation rates of individual investors. For an 'eligible' investor, each dollar of imputation credit received can be fully returned to the investor in the form of a reduction in tax payable or a refund.* ***Therefore, we consider that eligible investors have a utilisation rate of 1.*** *Conversely, 'ineligible' investors cannot utilise imputation credits and have a utilisation rate of 0.* ***It follows that the utilisation rate reflects the extent to which investors can utilise the imputation credits they receive to reduce their tax or obtain a refund.*** *[Bold emphasis added]*

The AER recognises that its definition of theta is practically equivalent to the definition adopted in its Rate of Return 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. [33]

The AER's new qualified definition of theta is novel. ActewAGL Distribution is not aware of theta previously being defined as the *before-personal-tax and before-personal-costs value* of imputation credits to investors. 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.

ActewAGL Distribution does not agree with the AER's revised definition of theta - namely, the qualified version which ignores the effects of personal costs and taxation.

There are three difficulties with the AER's conceptual definition of theta as follows.

- First, it is inconsistent with amended Rule 87A, where the words 'assumed utilisation' were changed to 'value' and which therefore requires consideration to be given to the *value* of imputation credits to investors, and with the proper function of gamma in the regulatory scheme.
- Secondly, as discussed below, there are good reasons why investors will not value each dollar of imputation credits received at one dollar.
- Thirdly, there is no proper basis for excluding the effects of personal tax and costs.

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

[30] John C Handley, *Advice on the Value of Imputation Credits*, 29 September 2014, p. 9.

[31] AER, Attachment 4: Value of imputation credits, ActewAGL final decision, April 2015, p 4-15.

[32] AER, Attachment 4: Value of imputation credits, ActewAGL final decision, April 2015, pp. 4-22 to 4-23.

[33] AER, Attachment 4: Value of imputation credits, ActewAGL final decision, April 2015, p 4-28.

It is clear that the change of language in Rule 87A and clause 6.5.3 of the NER draws some distinction between 'utilisation' and 'value'. However, the AER's April/June 2015 final decisions do not grapple in any sense with the change of language in Rule 87A and clause 6.5.3 of the NER. They do not explain what the change signifies, or how the AER's approach is consistent with the change of language in the NGR and NER. The final decisions simply ignore the change in language and give it no role. Indeed, whereas the language employed by Rule 87A and clause 6.5.3 in defining gamma has been changed from 'utilisation' to 'value', the AER's approach has gone the other way – moved from 'value' to 'utilisation' in its strict sense.

In response to the recent April/June 2015 final decisions by the AER, ActewAGL Distribution together with other businesses engaged Professor Gray to focus on whether theta represents (i) the value of distributed imputation credits, or (ii) the proportion of distributed credits that are likely to be redeemed. The report is included in appendix 8.32. Professor Gray notes that given that the regulatory framework reduces the allowed return that the firm can pay to its shareholders by the assumed value of imputation credits, an estimate of the value of credits is needed (as being the worth to investors they would be prepared to pay) rather than an estimate of how many credits might be redeemed. Otherwise investors will not be properly compensated. Professor Gray also points out that the AER's definition of theta is nothing else than the redemption rate[34]:

> *Throughout the Guideline process, and since, the AER has used a number of different definitions for theta, all of which are equivalent to the redemption rate. That is, the AER approach is to simply define theta to be equal to the redemption rate – even though the name it has used has changed on numerous occasions. In my view, the redemption rate is not a measure of value, no matter what it is called or how it is motivated. Consequently any estimate of gamma that is based on the redemption rate is not an estimate of the value of imputation credits.*

As stated in the expert reports of Professor Gray, gamma (and therefore theta) must reflect the value of imputation credits to investors. ActewAGL Distribution considers that this is clear from the words of Rule 87A, 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:[35]

> *In the regulatory setting, the regulator first estimates the return that shareholders' require and then reduces that according to the estimate of gamma. For example, suppose the regulator determines that shareholders require a return of $100 and that those shareholders will receive imputation credits that are worth $20 to them. The regulator would then allow the firm to charge prices so that it can pay a return of $80 to the shareholders.That is, the regulator's estimate of gamma determines the quantum of the reduction in the return that the firm is able to provide its shareholders by other means (dividends and capital gains).*
>
> *If, for example, the regulator's assessment of the value of imputation credits is greater than the true value of imputation credits to shareholders, the shareholders will be under-compensated.*

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 mere invocation by the AER of the word 'value' in various places in its April/June 2015 final decisions does not overcome this difficulty, because the AER goes on to make clear that it does not seek to calculate the value to the investor of imputation credits, but rather seeks to calculate the ratio of credits available to be utilised by eligible investors.[36]

The value of imputation credits to investors will necessarily reflect (and will be net of) any transactions costs or other personal costs incurred in redeeming credits. ActewAGL Distribution notes that recent academic work by Ainsworth, Partington and Warren (2015) also set out the basic economic principle

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[34] Frontier Economics, *Appropriate measure of gamma,* June 2015, p 15

[35] Frontier Economics, *Appropriate measure of gamma,* June 2015, p 8

[36] AER, Attachment 4: *Value of imputation credits*, ActewAGL final decision, April 2015, pp 4-22 and 4-42.

that the fact that an investor receives and redeems an imputation credit does not mean that the investor must value that credit at the full face amount:[37]

> *The fact that a domestic investor holds a stock and can fully utilise any imputation credits does not provide incontrovertible evidence that they attribute full value to imputation in exchange. It is entirely possible that a domestic investor could be holding a domestic stock due to expectations of receiving high pre-tax returns or other reasons, and not pricing in the imputation credits in the process. Just because an investor receives imputation credits does not necessarily mean they fully price them, and hence require a commensurately lower pre-imputation return from the company as a consequence.*

This reinforces that transaction costs or other personal 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. A 'value' based conceptual definition for gamma accords with the manner in which the returns on debt and equity are estimated, which reference bond and share prices that are not adjusted for transaction costs. This approach is also consistent with the manner in which theta should be estimated.

Therefore, ActewAGL Distribution proposes that the estimate of theta must 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.

3.2.2 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 - that is, 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 that is referred to in the Rate of Return Guideline. Associate Professor Handley advises that the conceptual goalposts approach is not a reasonable approach.[38]

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.

3.2.2.1 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.[39]

However, if a correct interpretation of the Rules in relation to gamma is adopted, it is clear that equity ownership rates will not provide a reliable estimate of theta. Equity ownership rates do not measure the 'value' of distributed imputation credits. Rather domestic equity ownership rates will only indicate the maximum set of investors who could potentially be eligible to redeem imputation credits (since foreign investors cannot redeem those credits) and who may therefore place some value on imputation credits.

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

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[37] Ainsworth, Partington and Warren, *Do franking credits matter*?, Research working paper, Centre for International Finance and Regulation, June 2015 p. 14

[38] John C Handley, *Advice on the Value of Imputation Credits*, 29 September 2014, p. 31.

[39] AER, Attachment 4: Value of imputation credits, ActewAGL final decision, April 2015, p 4-16.

- 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**).[40]

Both of these assumptions are incorrect.

Assumption 1

Assumption 1 is 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.[41]

The AER has sought to dismiss the impact of tax rules affecting eligibility of domestic investors to redeem imputation credits by saying that:[42]

> *…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), ActewAGL Distribution does 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,[43] which is well below the domestic equity ownership rate for all equity. [44]

Assumption 2

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).

Given that neither assumption holds, 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.

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[40] AER, Attachment 4: Value of imputation credits, ActewAGL final decision, April 2015, p 4-22.

[41] AER, Attachment 4: Value of imputation credits, ActewAGL final decision, April 2015, p 4-55. Although the "qualified persons" rules, and the 45-day holding rule within those rules, were repealed from the *Income Tax Assessment Act 1936* (**ITAA36**) in 2002, they still have ongoing application as a result of being imported into the imputation rules by section 207-145(1)(a) of the *Income Tax Assessment Act 1997* (**ITAA97**). Section 207-145(1)(a) of the ITAA97 provides that the amount of the franking credit on a distribution is not included in the assessable income of an entity or allowed as a credit where the entity is not a "qualified person" in relation to the distribution. A "qualified person" for the purposes of this "section" (per section 160APHO(2)) is, broadly, a taxpayer who has held shares or an interest in shares on which a dividend has been paid, "at risk" for a continuous period of not less than 45 days. To work out whether the shares are "at risk", a taxpayer is required to first work out their "net position", which is determined under the rules contained in the repealed section 160APHJ of the ITAA36.

[42] AER, Attachment 4: Value of imputation credits, ActewAGL final decision, April 2015, p 4-71.

[43] AER, Attachment 4: Value of imputation credits, ActewAGL final decision, April 2015, p. 4-75.

[44] The current domestic equity ownership rate for listed equity is 0.45 and the current domestic equity ownership rate for all equity is 0.6, as can be observed from the chart on p. 4-74 of AER, Attachment 4: Value of imputation credits, ActewAGL final decision, April 2015.

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 is erroneous.

3.2.2.2 Tax statistics

The AER appears to rely on redemption rates from tax statistics as direct evidence of the value of distributed imputation credits. In particular it has placed "some reliance" on tax statistics in estimating theta, but less reliance than is placed on equity ownership rates.[45]

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.
- **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 imputation credit having less and less marginal value until 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.[46]

Redemption rates from tax statistics can only indicate the upper bound for theta. Theta 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.

It has previously been accepted by the Tribunal that redemption rates from tax statistics simply indicate the upper bound for theta. In *Application by Energex Limited (No 2)* [2010] ACompT 7, the Tribunal observed (at [91]):

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[45] AER, Attachment 4: Value of imputation credits, ActewAGL final decision, April 2015, p 4-23.

[46] See: SFG, Estimating gamma for regulatory purposes, February 2015; and SFG, An appropriate regulatory estimate of gamma, May 2014.

The AER accepted that utilisation rates derived from tax statistics provide an upper bound on possible values of theta. Setting aside the manner in which the AER derived a value from the tax statistics study, it correctly considered that information from a tax statistics study was relevant. However, its relevance could only be related to the fact that it was an upper bound. No estimate that exceeded a genuine upper bound could be correct. Thus the appropriate way to use the tax statistics figure was as a check.

Therefore, giving redemption rates a direct role in the determination of a point estimate for theta would be in error. However, tax statistics are nevertheless very significant as an upper bound. In its April/June 2015 final decisions, the AER noted that tax statistics supported an estimate of the utilisation rate (i.e. the AER's notion of theta) of between 0.4 and 0.6, with the upper part of that range associated with estimates of the distribution rate of around 0.5, and the lower part of this range associated with estimates of the distribution rate of around 0.7.[47] The AER then (correctly) concluded that its estimate of the distribution rate (0.7) 'implies that we should adopt a utilisation rate of around 0.43 from within this range'.[48]

Therefore, tax statistics indicate a maximum value of theta of 0.43 for all equity. It is unsurprising that the figure from tax statistics, which measure actual utilisation, would be lower than the figure from the equity ownership approach, given that the equity ownership approach does not include the proportion of investors who cannot (e.g. due to the 45 day rule) or do not utilise imputation credits.

Taking a maximum value for theta of 0.43, the maximum value of gamma is 0.3 (with a distribution rate of 0.7).[49], This is significantly less than the AER's figure for gamma in the April/June 2015 final decisions of 0.4.

3.2.2.3 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:[50]

- These studies can produce nonsensical estimates of the utilisation rate – that is, greater than one or less than zero.
- The results of these studies can reflect factors, such as differential personal taxes and risk, which are not relevant to the utilisation rate.
- 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.
- 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:

1. Whether market value studies are measuring the right thing (reflected in the first point above); and
2. 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).

These concerns are now addressed.

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, ActewAGL Distribution does not agree with the AER's revised definition of theta, namely, the qualified version which ignores the effects of personal costs and taxation. Theta must

[47] AER, Attachment 4: Value of imputation credits, ActewAGL final decision, April 2015, p.4-75.
[48] AER, Attachment 4: Value of imputation credits, ActewAGL final decision, April 2015, p.4-75.
[49] AER, Attachment 4: Value of imputation credits, ActewAGL final decision, April 2015, p. 4-18, Table 4-1.
[50] AER, Attachment 4: Value of imputation credits, ActewAGL final decision, April 2015, p 4-27.

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, that is, 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 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.[51] Other rate of return parameters such as the MRP 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 that may be reflected in market prices.

Do market value studies accurately measure the right 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 ActewAGL Distribution. In particular, the AER's concern about 'nonsensical results' does not apply to Professor Gray's dividend drop-off study. Professor Gray's study produces a theta estimate of 0.35, which is a 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. Therefore it is expected that the value for theta would be below this figure.
- It is also below the redemption rate indicated by tax statistics (0.43) - 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.

Indeed, the result of the SFG study is consistent with the other evidence, and is as 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 ActewAGL Distribution. 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 it which it had been designed to overcome shortcomings of previous studies.[52]

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:[53]

> *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*

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[51] As noted above, the NGR requires the rate of return and the value of imputation credits to be *measured* on a consistent basis (NGR, rule 87 (2)(4)(b)).

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

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

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.

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[54]. 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.[55]

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.[56]In relation to the model specification and estimation procedure, the Tribunal concluded:[57]

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.[58] 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.

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

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

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

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

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

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

a whole - have previously been considered and addressed by Professor Gray. These issues are again addressed in Professor Gray's most recent report as follows:[59]

- **Allocation of value between cash and credits (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.[60] 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.
- **Market representative -** that is, 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 exdividend 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.[61] 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.

In summary, the general set of 'limitations' referred to by the AER do not provide a justification for placing limited weight on the particular market value study relied on by ActewAGL Distribution. Several of the general limitations do not apply to the SFG study that is relied on by ActewAGL Distribution, and the other concerns have been comprehensively addressed by Professor Gray.[62]

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 ActewAGL Distribution, is illogical and 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, by placing only limited weight on all market value studies in estimating theta the AER will have erred and ActewAGL Distribution considers that approach to be 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.

3.2.3 ESTIMATES OF THETA

3.2.3.1 Estimates from equity ownership statistics

For the reasons outlined above, the equity ownership rates are not a correct way to quantify theta. However, even if they were, the AER has in its April/June 2015 final decisions concluded that a reasonable estimate of the equity ownership rate is between[63]:

- 0.56 and 0.68, if all equity is considered; and
- 0.38 and 0.55, if only listed equity is considered.

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 ABS dataset to focus on types of equity considered most relevant to the benchmark entity – indicates:[64]

- **Listed equity –** the equity ownership rate for listed equity is currently around 0.45,[65] and it has averaged approximately 0.43 over the past five years. At only a few times since

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

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

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

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

[63] AER, *Attachment 4: Value of imputation credits*, ActewAGL final decision, April 2015, p 4-24.

[64] AER, *Attachment 4: Value of imputation credits,* ActewAGL final decision, April 2015, p 4-74.

[65] AER, *Attachment 4: Value of imputation credits*, ActewAGL final decision, April 2015, p 4-74.

September 2000 (the period covered by the ABS dataset in the AER's April 2015 final decision) has the equity ownership rate for listed equity reached 0.55, and for most of the time it has remained well below 0.55. In other words, there is only limited support for the upper end of the AER's 0.38 to 0.55 range; and

- **All equity –** the equity ownership rate for listed and unlisted equity is currently around 0.60, and it has averaged approximately 0.60 since September 2000. During the period covered by the ABS dataset in the AER's April 2015 final decision, the equity ownership rate for all equity has only once reached 0.68.

Table 1 shows the domestic equity ownership rate as at September 2014 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.[66]

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

	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 0.45 for listed equity and 0.60 for all equity.

3.2.3.2 Estimate from tax statistics

As explained above, tax statistics can provide an upper bound to the theta value but not a point estimate. 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*'.[67] 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 that the Rate of Return Guideline adopts a distribution rate of 0.70, 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. The reasons for this are as follows:

[66] AER, ActewAGL draft decision, attachment 4: Value of imputation credits, November 2014, p. 4-55.

[67] AER, ActewAGL draft decision, attachment 4: Value of imputation credits, November 2014, p. 4-25.

- **Handley and Maheswaran (2008) study –** this cannot be relied on for an empirical estimate of the redemption rate for the post-2000 period. It is clear from this study that 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[68].
- **Hathaway's alternative estimate –** this estimate of 0.61 corresponds to a distribution rate of around 0.5, whereas the AER adopts a distribution rate of 0.7.[69]

ActewAGL Distribution is concerned by the use of redemption rates from tax statistics for the purposes of estimating theta, as 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 since 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.

3.2.3.3 Estimates from market value studies

The AER has recently considered that market value studies support a range for theta of between zero and one.[70] 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.

The AER refers to results from nine dividend drop-off studies dating back to 1993, only five of which contain results for a post-2000 estimation period,[71] despite the AER having previously acknowledged that studies that use data from the current tax regime (after 2000) are more relevant.[72]

This is an erroneous and unreasonable approach to consideration of market value studies. ActewAGL Distribution proposes a specific value for theta based on a particular study; this is not just any study, as explained 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. In particular, the AER should consider the merits of the SFG study relied on by ActewAGL Distribution.

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 ActewAGL Distribution 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.

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[68] 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, pp. 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.

[69] AER, Attachment 4: Value of imputation credits, ActewAGL final decision, April 2015, p. 4-75. As noted in the draft determinations, 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.

[70] AER, Attachment 4: Value of imputation credits, ActewAGL final decision, April 2015, p. 4-27

[71] AER, Attachment 4: Value of imputation credits, ActewAGL final decision, April 2015, p. 4-80.

[72] Rate of Return Guideline Explanatory Statement, p. 176.

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'.*[73] 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'.*[74]

ActewAGL Distribution is 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.[75]

Unlike the Tribunal in *Energex*, the AER in its April 2015 final decisions 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.

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.

ActewAGL Distribution maintains its 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.

3.2.3.4 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 mean 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.

4. CORRECT INTERPRETATION OF THE EMPIRICAL EVIDENCE

4.1 RECENT AER DECISIONS

The AER's recent April 2015 final decisions[76] (depicted in Table 4-1) concluded that a reasonable estimate of the value of imputation credits is in the range 0.3 to 0.5, and that a reasonable point estimate for gamma is 0.40.

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

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

[75] 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.

[76] AER, Attachment 4: Value of imputation credits, ActewAGL final decision, April 2015, p. 4-18.

Table 4.1: Final decision estimates of gamma based on redemption rate re-definition of theta

Estimation approach	Theta	Payout ratio	Gamma
Equity ownership (all equity)	0.56 to 0.68	0.7	0.40 to 0.47
Tax statistics (all equity)	0.43	0.7	0.30
Equity ownership (listed equity)	0.38 to 0.55	0.8	0.31 to 0.44

Source: AER, attachment 4: Value of imputation credits, ActewAGL final decision, April 2015, p 4-18.

Given the values adopted by the AER for the distribution rate this implies:

- For listed equity, a theta estimate of 0.48 (i.e. 0.38 divided by 0.80)
- For all equity, a theta estimate of 0.60 (i.e. 0.42 divided by 0.70).

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

4.2 EVIDENCE PRESENTED TO THE AER

The evidence presented recently demonstrates that:

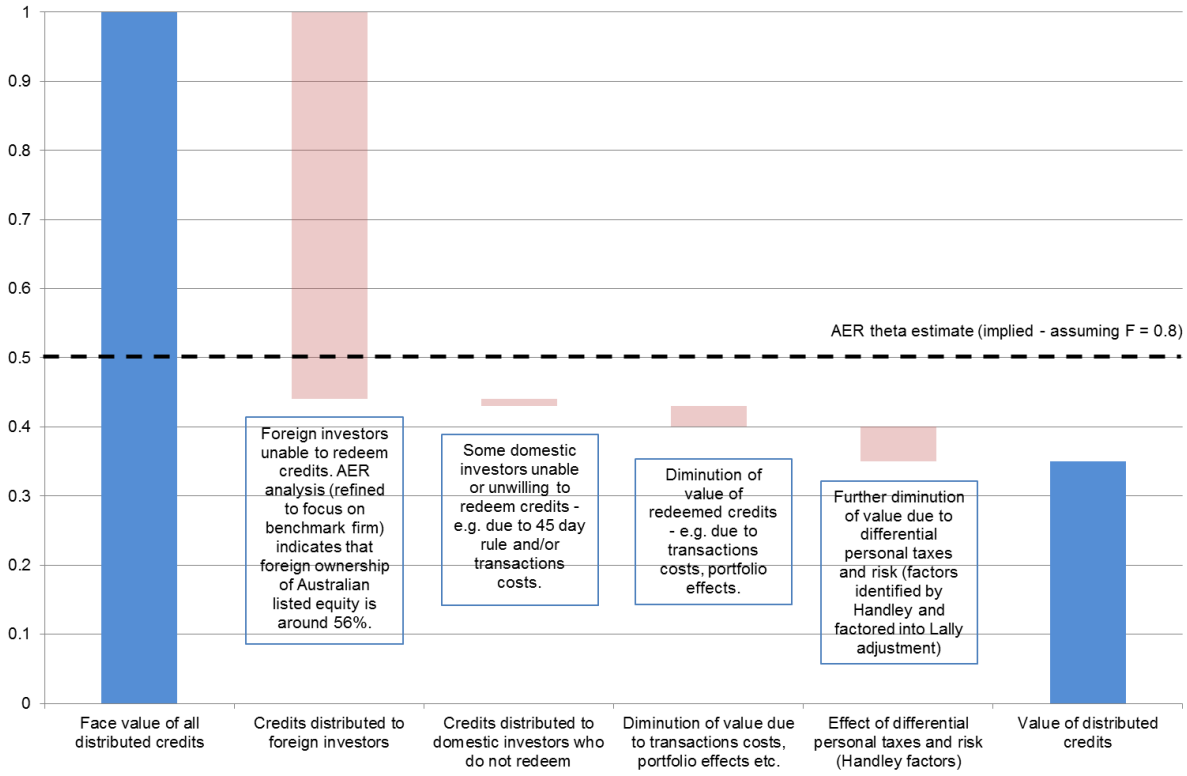
- **Domestic ownership.** The current domestic equity ownership rate is 0.44 for listed equity and 0.59 for all equity. This means that the maximum set of investors who **may** be eligible to redeem imputation credits and who may therefore place **some** value on imputation credits is 44% of listed equity investors and 59% of all equity investors. This implies that a theta value of 0.50 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.
- **Redemption rate.** The redemption rate estimate using tax statistics is 0.43 for all equity consistent with a distribution rate of 0.70. 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 (corresponding to a distribution rate of 0.70), and will likely be lower for listed equity. This implies that a theta value of 0.50 for listed equity and 0.57 for all equity cannot be correct.
- **Market value.** The value of imputation credits to investors – as indicated by market value studies – is in fact 0.35.

In order to illustrate the key implications of the empirical evidence, ActewAGL Distribution 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:

- 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 Handley /Lally 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 (0.5) is well above any possible measure of the value of distributed imputation credits.

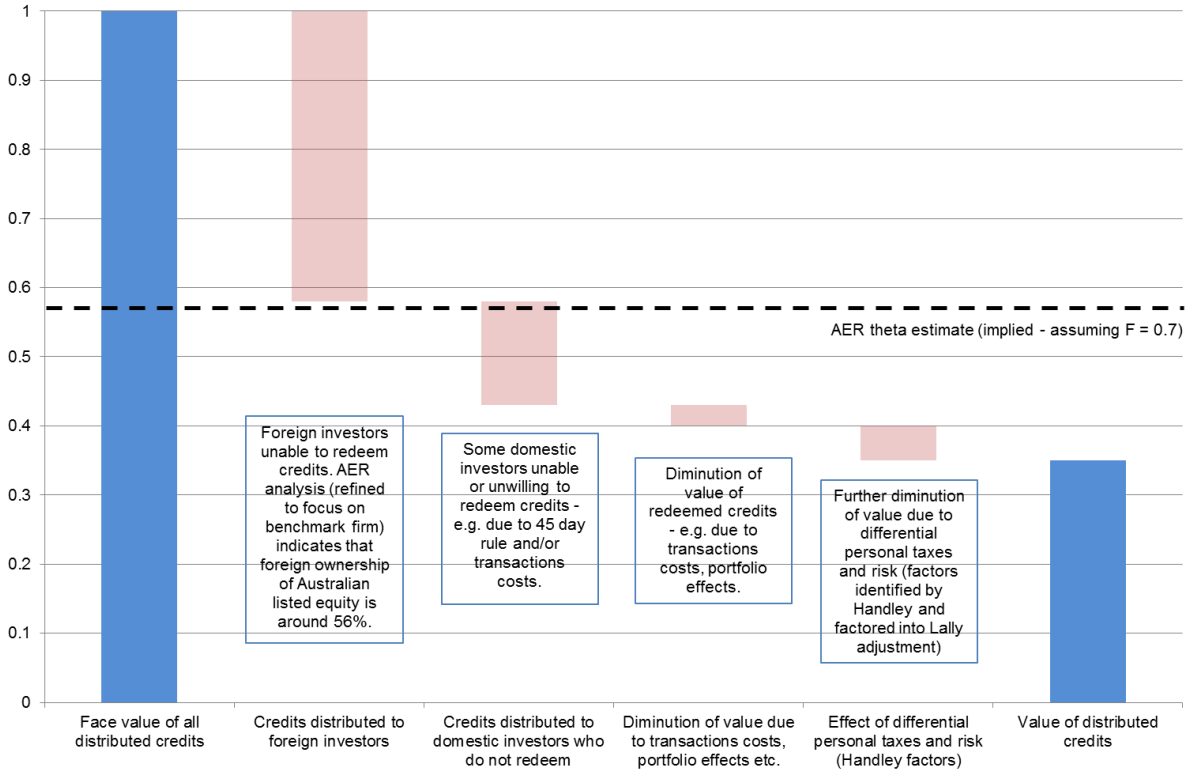
Figure 1: Illustrative impact on value of imputation credits – listed equity



(1) The proportion of credits distributed to foreign investors is set equal to 0.56, based on the foreign equity ownership rate calculated using the AER's refined methodology (see Table 3–1 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



(5) The proportion of credits distributed to foreign investors is set equal to 0.41, based on the foreign equity ownership rate calculated using the AER's refined methodology (see Table 3–1 above).
(6) 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).
(7) 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).
(8) 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).

4.3 RECENT AER DECISIONS INCONSISTENT WITH THE EVIDENCE

The AER's value for gamma of 0.4 is inconsistent 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 legally impermissible, 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 Rule 87A, this would imply a gamma point estimate of 0.25.

As demonstrated above, the AER's 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.

On a proper interpretation of the empirical evidence a value of 0.25 for gamma is clearly correct. The AER's approach in recent April/June 2015 final decisions overestimates gamma and consequently underestimates the overall return required by investors. Accordingly, the AER's recent approach will not contribute to the achievement of the NGO whereas 0.25 for gamma will.