



Estimating gamma within the regulatory context

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1 Executive summary

1.1 Instructions

- 1 Frontier Economics has been engaged by Aurizon Network to provide expert advice in relation to the estimation of the value of dividend imputation tax credits, gamma (γ).
- 2 We note that we have previously provided a report on this topic in the context of Aurizon Network's submission to the QCA for UT5 dated November 2016 and titled "Estimating gamma for regulatory purposes."
- 3 We have now been asked to provide our views on two recent developments that are relevant to the estimation of the value of dividend imputation tax credits in the regulatory context:
 - a. The recent findings of the Federal Court in the *PLAC-Ausgrid* appeal proceedings; and
 - b. The AER's new rationale for its utilisation estimate of theta, as developed in the Tribunal hearings in relation to the Victorian distribution businesses (*Vic DB*) and in the AER's submissions to the Federal Court in relation to the recent *SAPN* appeal proceedings and in the AER's most recent regulatory determinations.

1.2 Primary conclusions about recent developments

Recent developments

- 4 The recent judgments and submissions in the proceedings set out above have explored, in more detail, the role of gamma in regulatory allowances.
- 5 In particular, the Federal Court has taken a "regulatory context" approach whereby gamma is interpreted in light of its role in setting regulatory allowances. In that context, the regulator first determines the *total* return required by equity holders (Step 1) and then deducts the estimated value of imputation credits (Step 2) – the remainder being included in the firm's allowed revenues. Thus, the revenues that would otherwise be available to equity holders are reduced by the estimated value of imputation credits, which in turn is determined by gamma.
- 6 In its recent submissions and determinations, the AER has recognised that *all* matters that affect the value that investors ascribe to imputation credits are relevant and should not be ignored. That is, every matter that might lead an investor to value a credit at less than the full face amount must be taken into account. The AER has also recognised (correctly in our view) that observed market prices *do* reflect all value-relevant matters. For example, share prices reflect all matters that investors consider when determining the value that they ascribe to dividends and they also reflect all matters that investors consider when determining the value that they ascribe to imputation credits. That is, every reason why investors do not value

imputation credits at the full face amount is reflected in the share price. In other words, the share prices reflect the *market value* of imputation credits.

7 The AER goes on to conclude that, because the market value of credits has already been captured in the share prices that the AER uses in Step 1 of its regulatory framework, the full face amount of credits should be used in Step 2 in order to avoid double counting. In our view, this is incorrect. Rather, within the regulatory context, the market value of credits must be used consistently throughout. Any inconsistency in the way gamma is defined and estimated in the different steps of the regulatory process will result in error.

8 In summary, the Federal Court's regulatory context approach to gamma and the AER's recognition that it is the market value of credits that is reflected in the share prices that are used to estimate the allowed return on equity are important new developments since the QCA has previously considered gamma. We agree that gamma should be interpreted in light of its role in the regulatory framework and we also agree that share prices reflect the market value of credits. However, we disagree with the AER's conclusion that the (inconsistent) face amount of the credits should be used in Step 2 of the regulatory framework. Our view is that the same interpretation and the same estimate of gamma (market value) must be used consistently throughout the regulatory framework.

Why is an estimate of gamma required?

9 To see why a consistent approach must be taken to gamma, it is useful to consider why it is necessary to estimate gamma at all. If the regulator had full confidence in its forward-looking estimates of the market risk premium (MRP), there would be no need to estimate gamma at all. For example, suppose the regulator had full faith in a one-stage dividend growth model¹ where an estimate of the prevailing required return on the market is given by solving:²

$$P_0 = \frac{Div_1 + \theta \times IC_1}{r_m - g}.$$

10 Rearranging this equation gives:

$$r_m = \frac{Div_1}{P_0} + \frac{\theta \times IC_1}{P_0} + g.$$

11 That is, the total required return on the market has three components:

- a. The return from dividends;
- b. The return from imputation credits; and

¹ We use a very simple one-stage model here for simplicity in making the relevant point. Precisely the same point could be made with a multi-stage model, but the mathematics would be more complicated.

² In this formula, theta (θ) represents the market value of credits that are distributed to equity holders, as a proportion of the face amount of those credits.

c. The return from capital gains.

- 12 In this formula, theta (θ) represents the market value of credits that are distributed to equity holders, as a proportion of the face amount of those credits. For example, suppose the current stock market index is 5000, expected dividends are 260, the expected face amount of imputation credits distributed is 100 and those credits are estimated to be valued at 60% of the face amount, and growth of 4.6% p.a. is expected. In this case, the implied return on the market would be:

$$\begin{aligned} r_m &= \frac{Div_1}{P_0} + \frac{\theta \times IC_1}{P_0} + g \\ &= \frac{260}{5000} + \frac{0.6 \times 100}{5000} + 4.6\% \\ &= 5.2\% + 1.2\% + 4.6\% = 11\%. \end{aligned}$$

- 13 Under the current regulatory framework, the forecasted dividends are “grossed-up” by adding the estimated value of imputation credits. This is the term involving θ above. The result is an estimate of the *total* required return on the market, part of which is the estimated return from imputation credits. In Step 2 of the regulatory approach, the estimated value of imputation credits is then deducted, leaving the allowed return on equity that flows into the revenue allowance.

- 14 In the above example, the regulatory allowed revenues will be sufficient to provide investors with a return of 9.8%, the remaining 1.2% being provided via imputation credits. In the context of this example, we refer to the 11% figure as the total required return on equity and the 9.8% figure as the regulatory allowed return on equity. The assumed value of imputation credits results in the allowed return on equity being 1.2% less – the credits are deemed to replace part of the return that would otherwise have been made available to investors.

- 15 The above example shows that, in the regulatory process, there is a degree of circularity in grossing-up to add the value of imputation credits and then later deducting the value of imputation credits.

- 16 A more direct approach would be to simply estimate the allowed return on equity (ex imputation credits) directly. This could be done by solving:

$$P_0 = \frac{Div_1}{r_m^* - g}.$$

- 17 Rearranging this equation gives:

$r_m^* = \frac{Div_1}{P_0} + g$. This ex-imputation estimate of the required return on equity could then be used directly to determine the allowed return on equity that flows into the revenue allowance. This can be done without an estimate of gamma at all.

- 18 In the example above, we have:

$$\begin{aligned} r_m^* &= \frac{Div_1}{P_0} + g \\ &= \frac{260}{5000} + 4.6\% \\ &= 5.2\% + 4.6\% = 9.8\%. \end{aligned}$$

- 19 In summary, if a regulator had full confidence in a prevailing (DGM) estimate of the MRP that required only current market data (as in the above example) there would be no need to estimate gamma at all. The regulator could directly estimate the return that equity holders would require from the firm (i.e., ex imputation credits) and set the regulatory allowance to enable the firm to pay that return. This would avoid the circularity of grossing-up to include the estimated value of credits in one step of the regulatory process and then removing the estimated value of credits in another.
- 20 However, regulators have indicated that they do not have full confidence in prevailing estimates of the MRP. Rather, material weight is applied to estimates based on the long-run average of historical excess stock market returns. This approach requires an estimate of gamma to allow such an average to be taken because part of the historical data period (pre-1987) occurred before imputation was introduced. For the pre-imputation period, the observed stock returns represent the entire return to equity holders, but in the post-imputation period they represent only part of the return – because equity holders also receive the benefit of imputation credits. Before a meaningful average can be taken, it is necessary to re-set all of the data to the same basis. This is done by “grossing up” the post-1987 data to add back the assumed value of imputation credits.
- 21 Consider the following simple example. Suppose that throughout a long historical period investors always require a total return on equity of 10% p.a. In the pre-imputation period, the stock market data would be expected to show an average return of 10%. But suppose that investors value imputation credits at 1.5% (where this is the market value, reflecting all value-relevant matters). In this case, the stock market data would be expected to show an average return of 8.5% over the post-imputation period – the other 1.5% coming in the form of imputation credits that are not included in the standard data bases. Thus, the approach is to add back (gross up) the 1.5% value of imputation credits so that the pre- and post-imputation data are on the same basis and can be sensibly averaged.
- 22 The result of this approach will then be an average of 10%, part of which is the return that investors obtain from imputation credits. The imputation component of the return (1.5%) is then removed in Step 2 of the regulatory approach leaving the 8.5% return that investors require from the firm. It is that 8.5% figure that then feeds into the regulatory calculation of the allowed revenues.

The same “value of imputation credits” must be used consistently throughout the regulatory framework

- 23 The AER now recognises that observed stock prices reflect the market value of credits – they reflect every consideration that investors make when determining how much value they obtain from a credit. The AER recognises that the reduction in the required return measured using stock market data, from 10% to 8.5% in the above example, will reflect the *market value* of credits. Consequently, the grossing-up must also reflect the same market value of credits. The whole point of the grossing-up step is to reverse the reduction in the required return. If that reduction is due to the market value of the credits, which the AER now recognises, the

Final

grossing-up must be on the same basis. Such internal consistency is an obvious necessity. However, the AER suggests that adding back the same market value of credits would amount to “double-counting.” But it is not double counting at all – if the observed equity return has been reduced by 1.5% in relation to the market value of credits, that same 1.5% must be added back when estimating the total required return on equity.

- 24 That is, the same market value of imputation credits must be used consistently throughout the regulatory process. It is clear, and the AER now recognises, that the stock market data that regulators use in the regulatory model will reflect the market value of credits. That same market value must therefore be used when grossing-up that stock market data to properly reverse that effect in the stock market data. The same market value again must then be subtracted when setting the allowed revenues in Step 2 of the regulatory approach. If a regulator uses a different definition and a different estimate of the “value of credits” from what investors have embedded into the stock market data that the regulator relies upon, the internal inconsistency will result in the regulatory model producing output that has no meaningful interpretation.

The relevance of “pre personal tax and pre personal costs”

- 25 In the above examples, all of the returns are expressed on a pre personal tax and pre personal costs basis. That is, the return is provided to investors, who are then individually responsible for paying any personal taxes or costs out of it. There is nothing special or unique about this – it is the standard approach used generally for finance and valuation tasks. Specifically, this is not, in any sense, a special approach for dividend imputation applications and it is certainly not unique to, and was not developed by, Officer (1994).³
- 26 Of course, the pre personal costs and taxes return will depend on the quantum of those personal costs and taxes. For example, suppose investors require a net return of 5% and must pay personal taxes and costs that amount to 2%. In that case, the required return, pre personal taxes and costs, will be 7%. That is, the quantum of personal taxes and costs that investors must bear is reflected in the pre personal tax and pre personal tax required return. In other words, that return includes compensation for the personal taxes and personal costs that relate to the return on equity. That is, because it is computed on a pre personal tax and pre personal costs basis, the allowed return on equity compensates investors for the personal taxes and personal costs that they will bear in relation to that return on equity. The AER now recognises this point.
- 27 It follows that imputation credits must also be considered on a pre personal tax and costs basis, such that investors are similarly compensated for the personal taxes and costs that they bear in relation to those credits. This is precisely the role of gamma.

³ Officer, R. R., 1994, The cost of capital of a company under an imputation system, *Accounting and Finance*, 34, 1, 1-17.

- 28 Consider a regulated firm with equity RAB of \$1,000 and allowed return on equity of 7%. In this case, the regulator would allow a return to equity holders of \$70, out of which those equity holders would have to pay any personal taxes and costs that are due, which we assume to be \$20 in this example. Now suppose that the regulator (in Step 2 of the regulatory approach) proposes to reduce that return to equity holders by \$10 because the regulator considers that equity holders (in aggregate) are able to redeem credits with a face amount of \$10. That is, equity holders redeem \$10 of credits and are then responsible for any personal taxes and costs that pertain to those credits. Clearly, this would only balance if the personal taxes and costs in relation to the return on equity were identical to the personal taxes and costs in relation to imputation credits.
- 29 But suppose the personal taxes and costs in relation to imputation credits were higher than for the allowed return on equity, such that investors were indifferent between redeeming \$10 of credits or receiving \$7.50 of allowed return on equity. That is, the \$10 of redeemed credits involves \$2.50 of additional personal taxes and costs beyond those that would apply to \$10 of allowed return on equity. In this case, the allowed return on equity should be reduced by \$7.50 in relation to the \$10 of credits that are available to be redeemed – because those two quantities have equivalent value to investors.
- 30 The AER’s position is that the (pre personal tax and pre personal costs) allowed return on equity already includes compensation for personal taxes and costs, so allowing compensation for personal taxes and costs in relation to imputation credits would amount to double counting. Consequently, the AER treats every dollar of credits available for redemption as being valued at the full face amount. Thus, in the example above, the allowed return on equity would be reduced by the full face amount of \$10 and shareholders would be under-compensated by \$2.50.
- 31 Where the AER has fallen into error here is that gamma does not reflect the same personal taxes and costs that are already compensated in the allowed return on equity. Rather, gamma only reflects personal taxes and costs above and beyond those that have already been included in the allowed return on equity. Thus, in the example above, the \$2.50 are *additional* costs that apply to \$10 of imputation credits beyond those that apply to \$10 of allowed return on equity.
- 32 The error arises from the fact that the AER’s reasoning on this point is too simplistic. It states that, because the allowed return on equity is stated on a pre personal tax and pre personal costs basis, imputation credits must be evaluated on the same basis, in which case any personal taxes or personal costs that pertain to imputation credits must be omitted from consideration. This leads the AER to treat every dollar of imputation credits available for redemption as being valued at the full face amount. The result is that the AER’s regulatory allowance provides:
- a. full compensation for all personal taxes and costs that pertain to the allowed return on equity; and
 - b. no compensation at all for the additional personal taxes and costs that apply to imputation credits,

which results in equity holders being systematically under-compensated.

A starting point upper bound for gamma

- 33 This leads to the question of quantifying the effect of the additional personal taxes and costs that pertain to imputation credits above and beyond those that pertain to the allowed return on equity. The starting point here is to note that a credit can only have value if it is redeemed. Thus, the first task is to determine the proportion of credits that are redeemed.
- 34 The best and most direct estimate of the redemption proportion is obtained using Australian Taxation Office (ATO) tax statistics. The ATO publishes data on:
- a. Total credits created by the payment of corporate tax; and
 - b. Total credits redeemed via personal tax returns.
- 35 Hathaway (2013)⁴ showed that this data indicated a redemption rate of approximately 30% and the AER has updated that figure in subsequent determinations to 34%.⁵
- 36 If there were no additional personal taxes and costs that applied to imputation credits, the 34% of credits that were redeemed would be valued at the full face amount and gamma would be 0.34. Thus, the 34% redemption rate represents a starting point upper bound for gamma.
- 37 In Section 4.2 of this report, we note that the AER and QCA have both questioned the reliability of certain aspects of the ATO tax statistics. We note that no question has been raised about the reliability of the ATO's data in relation to corporate tax returns (credits created) or personal tax returns (credits redeemed), however it is difficult to derive and reconcile other items – items that are not required to compute the redemption rate. In our view, the fact that two data items are required for the calculation, and both are robust, means that the ATO estimate of the redemption rate can be relied upon. Thus, the upper bound for gamma is 34%.
- 38 The AER's preferred estimate of the redemption rate comes from the equity ownership approach, whereby the AER estimates the proportion of Australian shares owned by Australian residents and assumes that residents will redeem all credits that are available to them. In its most recent decisions, the AER's equity ownership estimates of the redemption rate vary between 0.28 and 0.47, with a mid-point of 0.375.⁶ We note that this is slightly above the ATO tax statistics estimate of 0.34. The reason for the difference is that the equity ownership estimate does not reflect the effects of the 45-day rule (which prevent resident investors from redeeming some of the credits distributed to them) or any other reason why a resident investor may not redeem all credits that they receive.

⁴ Hathaway, N., 2013, "Franking credit redemption ATO data 1988 to 2011," Capital Research, September.

⁵ AER, July 2017, AusNet Services Gas access arrangement 2018-2022: Draft Decision, Attachment 4, p. 4-15.

⁶ AER, July 2017, AusNet Services Gas access arrangement 2018-2022: Draft Decision, Attachment 4, p. 4-29.

39 As set out above, our view is that the ATO tax statistics provide a reliable and more direct estimate of the redemption rate and therefore should be used. That data currently indicates an upper bound for gamma of 0.34.

A point estimate below the upper bound

40 The final step is to determine the effect of any personal taxes and costs that apply to imputation credits, beyond those that apply to the allowed return on equity. This is done by comparing the market value of imputation credits to the market value of the return on equity allowance via a dividend drop-off analysis, as set out in Section 2 of this report. That analysis produces a gamma estimate of 0.25, which is below the upper bound of 0.34. That is, for every \$100 of credits created, the tax statistics tell us that \$66 are not redeemed and therefore have no value. The \$34 that are redeemed have a value of \$25. That is, the allowed return on equity should be reduced by \$25 in relation to the \$34 face amount of credits that are redeemed. That implies that each credit redeemed has a value of 74 cents in the dollar⁷ – the other 26 cents being personal costs that apply to imputation credits beyond those that apply to the allowed return on equity. The nature of those additional personal costs is set out in Section 2 of this report.

The effect on Aurizon Network's submission

41 The analysis above indicates that gamma should be interpreted in light of its role in setting regulatory allowances. The role of gamma is to determine the extent to which each dollar of imputation credits that is created will reduce the allowed return on equity that investors would otherwise receive. Thus, gamma must reflect:

- a. The extent to which some of the credits that are created will not be redeemed by investors and will therefore have no value; and
- b. The extent to which those credits that are redeemed may be valued at less than the full face amount due to additional personal costs that apply to imputation credits over and above those that apply to the allowed return on equity that the credits are replacing.

42 The market value approach that was the basis of Aurizon Network's UT5 submission on gamma is entirely consistent with this regulatory context. Our conclusion is that the recent developments summarised above confirm and strengthen the approach that Aurizon Network has taken in its UT5 submission.

An updated QCA estimate

43 Finally, even if the QCA determines that its current approach is to be maintained, the most recently available data should be used. In its Market Parameters Decision, the QCA stated that its 0.47 gamma was obtained as the product of:

⁷ 0.25 ÷ 0.34.

- a. A distribution rate of 0.84 based on an analysis of the distribution rates of the top 20 listed companies by market capitalisation; and
- b. An estimate of the utilisation rate of 0.56 based on equity ownership of Australian listed companies.⁸

44 In its recent AusNet Gas determination, the AER presents updated estimates of those two quantities, being 0.83 and 0.46 (range of 0.38 to 0.55), respectively.⁹ The product of those two estimates is 0.38. Thus, application of the Market Parameters approach to the current data produces a gamma of 0.38.

1.3 Summary of detailed submissions in this report

Background and context

45 In its submission to the QCA for UT5, Aurizon proposed that gamma should be interpreted in terms of the market value of imputation tax credits and that it should be estimated accordingly from the observed prices of traded securities – consistent with the QCA’s approach to all other WACC parameters.

46 The primary rationale for that submission rests on the role of gamma within the regulatory process. The regulator first estimates the *total* return required by equity holders and then deducts the estimated value of imputation credits. Thus, the allowed return on equity that would otherwise be available to equity holders is reduced by the estimated value of imputation credits. In this context, gamma must be interpreted in terms of the value of imputation credits relative to the value of the allowed return on equity that they are replacing. For example, \$100 of credits are created, \$34 of credits are redeemed, and those redeemed credits are valued at 74% relative to the allowed return on equity they are deemed to replace, gamma will be 0.25¹⁰ and the allowed return on equity should be reduced by \$25 in relation to the \$100 of credits that were created.

47 In previous decisions, the QCA has interpreted gamma in terms of the proportion of credits that are available for redemption. This approach assumes that every credit that is redeemed is considered by the investor to have a value equal to the allowed return on equity that it is replacing. That is, the relative value of credits is assumed rather than being estimated from market data.

48 Since Aurizon’s UT5 submission, the Federal Court has released its decision in the *PLAC-Ausgrid* appeal proceedings, wherein the AER had also adopted a “utilization” approach rather than a market value approach. In those proceedings, the Australian Competition Tribunal had ruled that the National Electricity Rules (NER) required the AER to estimate the market value of imputation credits. The Federal Court decided that the Tribunal had been too quick to focus on the word

⁸ QCA, 2014, Market Parameters Decision, p. 29.

⁹ AER, July 2017, AusNet Services Gas access arrangement 2018-2022: Draft Decision, Attachment 4, p. 4-29.

¹⁰ 0.34×0.74 .

“value” in the NER and had not properly considered the role of gamma within the regulatory framework.

49 This report demonstrates that, within the regulatory framework, gamma represents the value of imputation credits relative to the allowed return on equity. That is, applying the “regulatory context” test set out by the Federal Court affirms that gamma must be estimated in terms of the market value of credits relative to the allowed return on equity they are replacing. This interpretation, in turn, affirms the market value estimate of 0.25 in Aurizon Network’s UT5 submission.

The competing approaches for interpreting and estimating gamma

50 Two methods for interpreting and estimating gamma have been proposed:

- a. The *market value* approach posits that gamma should be estimated from the observed prices of traded securities in the same way that other WACC parameters are estimated. This approach produces an estimate of the extent to which investors value credits relative to the allowed return on equity that those credits will replace. It is an estimate of the allowed return on equity that investors would give up in order to receive a dollar of credits.
- b. The *redemption* or *utilisation* approach posits that gamma should be estimated as the proportion of credits that are available for investors to redeem. This approach considers the extent to which investors might value the credits they redeem at less than the full face amount to be irrelevant.

Gamma must be interpreted and estimated in a way that is consistent with its role in the regulatory framework

51 The Federal Court has held that the approach that is used to interpret and estimate gamma must be consistent with the role of gamma in the regulatory framework. We agree with that conclusion and consider that this construction of the exercise can only lead to a market value estimate of gamma that *does* take account of the evidence that investors value the credits that they redeem less than the full face amount. Thus, when a regulator reduces the allowed return on equity that a firm is able to provide to its investors, to reflect the assumed value of credits, the relevant standard must be a measure of how much investors value those credits relative to the allowed return on equity that the credits are deemed to replace.

The role of gamma in the regulatory framework

52 The regulatory framework operates in two steps:

- a. In the first step, the regulator estimates the *total* required return on equity. This estimate reflects personal taxes and personal costs that relate to the allowed equity returns. In this report, we use a simple example where the regulated firm has equity of \$1,000 and investors require a return on equity of 7%, of which 2% is

compensation for personal taxes and personal costs. That is, investors require a return of \$70, of which \$20 is to compensate them for the personal taxes and costs that they bear in relation to that allowed return on equity.

- b. In the second step, the regulator deducts “the value of imputation credits” and sets the allowed revenues so that the firm is able to pay the difference to investors as the allowed return on equity. For example, if the regulator estimates that the value of imputation credits is \$5, it will allow the firm to charge prices sufficient to provide a return on equity of \$65.

53 That is, gamma plays the role of determining the amount by which the allowed return on equity will be reduced to reflect the imputation credits that investors will receive. It is a form of relative valuation – the rate at which investors would exchange the allowed return on equity for imputation credits. Thus gamma must reflect the value of credits *relative to* the allowed return on equity those credits are replacing, rather than imposing an assumption that every credit that is available for redemption is valued at the full face amount.

54 There are a number of reasons why imputation credits are less valuable to investors than the full face amount, including:

- a. Some credits are distributed to non-residents who cannot redeem them and therefore do not value them at all;
- b. Some credits are distributed to resident investors who are prevented from redeeming them by the 45-day rule;
- c. Some credits are distributed to residents who simply fail to redeem them;
- d. Investors have to wait longer to receive any benefit from the credits – whereas dividends are available to investors immediately, the investor only receives a benefit from credits when their personal tax return is finalised after the end of the tax year;
- e. There is a compliance and administration cost involved in tracking and redeeming credits;
- f. Resident investors will rationally adjust their portfolios until the last dollar of credits they receive just offsets the cost they bear by concentrating their portfolio into franked dividend paying stocks and away from what would otherwise be optimal. Thus, the *net* benefit of the redeemed credits would, on average, be approximately half of the face amount.¹¹

¹¹ That is, in the absence of any other effects, the first additional credit redeemed would be valued at almost the full face amount because obtaining it would move the investor’s portfolio only slightly away from their optimal portfolio. The last credit redeemed would be valued just above zero as the investor would rationally continue to adjust their portfolio until the cost of moving further away from the optimal portfolio started to exceed the benefit of redeeming additional credits. Consequently, the

55 Anything that equally affects the value of imputation credits and the returns that the firm is allowed to provide to its equity holders will have no effect on the relative value between them, and therefore no effect on gamma. For example, investors pay personal tax on imputation credits at the same rate as on the returns they receive from the firm. If this were the only factor to consider, investors would value a dollar of imputation credits equal to a dollar of return from the firm because the same tax cost would be imposed on both. It is for this reason that the personal taxes that investors pay on the credits they receive does not appear in the above list.

56 The personal taxes and personal costs that apply to the allowed return on equity are already taken into account in the first step of the regulatory process above. That is, to the extent that investors will have to bear personal taxes or costs on the allowed return on equity, they will increase the return they require – their required return will already reflect the extent to which that return will be reduced by personal taxes or costs. Thus, the second step requires an estimate of gamma that reflects only those personal taxes and costs that apply only to imputation credits, making them less valuable relative to the allowed return on equity that those credits are deemed to replace. When we say “taken into account” we mean that these costs are reflected in the market value of the return on equity. No explicit adjustment has been made for them – rather these costs are simply embedded in the market value information, reflecting the return required by equity investors inclusive of the investors’ personal taxes and personal costs.

The QCA and AER approaches to gamma are relevantly the same

57 Although the recent set of litigation in relation to gamma has related to AER decisions made under the National Electricity and Gas Laws and Rules, the QCA has followed the AER’s approach to gamma in a number of key relevant respects. Thus, it is apprehended that the QCA may consider these cases to be relevant to QCA’s approach to gamma. In particular, the key issue in these cases has been the question of how the value of distributed credits (which the AER and QCA both refer to as the “utilisation rate”) should be interpreted and estimated.

The recent Federal Court decision

58 In relation to the Federal Court’s decision on the AER’s appeal from the *PLAC-Ausgrid* Tribunal,¹² our view is that:

- a. The Court has correctly identified that gamma must be interpreted and estimated in a way that is consistent with the regulatory framework in which it operates; and

average of the values of the additional credits redeemed would be approximately half of their face amount.

¹² Australian Energy Regulator v Australian Competition Tribunal (No2) [2017] FCAFC 79.

- b. The Court has also correctly identified that the regulatory framework requires returns to be derived on a “post-company tax and pre-personal tax and personal costs basis.”¹³ That is, the returns must be such that they are sufficient to cover any personal costs and personal taxes that relate to them. Thus, the \$70 in the example above is an estimate of the “pre-personal tax and pre-personal costs” allowed return on equity that investors would require. The \$20 of personal taxes and costs would then be paid out of that.

59 However, the fact that it would be wrong for gamma to reflect any personal taxes or costs that *equally* affect the allowed return on equity,¹⁴ does not imply that gamma should reflect *no* personal costs or taxes at all – even those that apply only to credits.

60 Disregarding any personal taxes and costs that apply only to credits would result in investors receiving no compensation at all in relation to them. Whereas investors are properly compensated for the personal taxes and costs that apply to the allowed return on equity, they would receive no compensation at all for the additional personal costs that apply only to imputation credits. The result would be an internally inconsistent implementation of the regulatory model whereby investors are properly compensated for all personal taxes and costs that apply to the allowed return on equity, but not compensated at all for the additional personal costs that apply to imputation credits. In our view, such an outcome would fail the Court’s “regulatory context” test of consistency within the regulatory framework.

The AER has provided two rationales for its “utilisation” approach to gamma

61 In its 2014 Market Parameters Decision, the QCA followed the approach to gamma that the AER was advocating at that time. This was the rationale that the regulatory model derives required cash flows before personal taxes and costs, and therefore WACC parameters (including gamma) should be estimated on that basis. It is undoubtedly the case that the allowed return on capital is indeed before personal taxes and costs – investors receive the allowed return and then they are responsible for paying any personal taxes or bearing any personal or other transactions costs out of that return.

62 However, this does not mean that personal taxes and costs are irrelevant. If personal taxes or costs increased, investors would increase the pre-personal taxes and costs return that they required.

63 Moreover, it is clear that all other WACC parameters are estimated in a way that reflects the extent to which personal taxes and costs affect the returns that investors require. For example, the risk-free rate is estimated with reference to

¹³ AER v ACT, 2017, Paragraph 751.

¹⁴ And which have therefore already been considered in the first step of the regulatory process.

traded prices of government bonds, where those prices reflect *all* considerations that investors make (including personal taxes and costs) when determining the net value of a government bond to them. Similarly, beta and market risk premium estimates are based on traded share prices, which reflect all considerations that investors make when determining the value they obtain from a particular share.

64 In its more recent submissions and determinations, the AER has made an important concession – that its return on equity calculations are indeed based on market values that *do* fully reflect personal taxes and costs, and indeed every consideration that investors make when determining the return on equity that they would require from the regulated firm.¹⁵

65 However, the key point at this stage is that, to date, the QCA has relied upon the AER’s original rationale, and the AER now proposes an entirely new rationale. Thus, it is important to be clear about whether:

- a. The QCA endorses the AER’s original rationale, which the AER’s recent submissions contradict, being that the regulatory model derives required cash flows without taking into account personal taxes and costs, and therefore WACC parameters (including gamma) should be estimated on that basis; or
- b. Return on equity calculations are indeed based on market values that do fully reflect personal taxes and costs, and indeed every consideration that investors make when determining the return on equity that they would require from the regulated firm – in which case a different rationale would be required to justify the “utilisation” approach to gamma.

66 In our view, the AER’s recent concession that its estimate of the required return on equity *does* include compensation for personal taxes and costs provides further support to Aurizon Network’s UT5 submission that compensation should also be provided for any additional personal taxes and costs that apply only to imputation credits. Otherwise, investors would be properly compensated for the personal taxes and costs that apply to the allowed return on equity, but they would not be compensated at all for any additional personal taxes and costs that apply only to imputation credits.

Estimation approaches

67 In Paragraph 54 above, we set out a number of reasons why investors in aggregate would value imputation credits less than the allowed return on equity they are deemed to replace. This then raises the question of which of those reasons are taken into account by the various estimation methods that have been proposed. In relation to those reasons:

¹⁵ See for example, *Victorian Distribution Businesses* Tribunal hearing transcript, p. 650. The AER made similar submissions to the Federal Court in the *SAPN* appeal proceedings. See also, AER, July 2017, AusNet Services Gas access arrangement 2018-2022: Draft Decision, Attachment 4, p. 4-133.

- a. The equity ownership approach uses Australian Bureau of Statistics data to produce an estimate of the proportion of Australian shares that are owned by resident investors. This provides a noisy estimate of the effect of (a) only – the fact that some credits are distributed to non-residents who obtain no value from them;
- b. ATO tax statistics provide a direct estimate of the proportion of credits that are redeemed – the ratio of redeemed credits (from personal tax returns) to created credits (which are equal to total corporate tax paid). This provides an estimate of the effects of (a)-(c) – a direct estimate of the proportion of credits that are *actually* redeemed from the Tax Office, including all reasons why a credit may not be redeemed; and
- c. The dividend drop-off approach estimates the market value of credits relative to allowed equity returns. This is done by comparing the fall in the market price of a share over the ex-dividend day with the dividend and credit that separate from the share. It estimates the extent to which the value of the credit was capitalised into the share price. This method provides a direct estimate of the extent to which investors value imputation credits relative to other forms of return. This estimate includes all of the effects set out in Paragraph 54, and any other reasons why investors would capitalise credits into the stock price at less than the full face amount.

68 Consequently:

- a. If one accepts that theta does properly represent the rate at which investors would exchange their allowed return on equity for imputation credits, dividend drop-off analysis would provide a direct estimate, ATO tax statistics would provide an upper bound, and the equity ownership estimate would be of little relevance because the ATO estimate provides a tighter upper bound.
- b. If one concludes that theta should be interpreted as the proportion of credits that are redeemed, the ATO approach would provide a direct estimate and the equity ownership approach would provide an upper bound (because it does not consider the effects of the 45-day rule or indeed *any* reason why investors would not redeem credits other than their ineligibility as foreign investors).

Conclusions and key questions for the QCA to consider

69 In Section 5 of this report, we summarise the new issues that have been raised by the recent Federal Court decision and by the AER's change of rationale in relation to the utilisation interpretation of gamma. We set out a series of questions for the QCA to consider and clearly address in its UT5 determination. In our view it would benefit stakeholders in the interests of regulatory transparency for the QCA to provide clear responses to those questions.

2 Market value or utilisation rate?

2.1 Two parameters to be estimated

70 In our previous report on gamma¹⁶ we noted that there is broad agreement between all regulators and experts that gamma (γ) should be estimated as the product of two parameters: $\gamma = F \times \theta$. The first parameter (F) is the distribution rate – the proportion of created imputation credits that are attached to dividends and distributed to shareholders. The second parameter (θ) is variously defined as “the value of distributed imputation credits” or as “the utilisation rate.” While there is dispute about how each component of gamma should be interpreted and estimated, there is broad agreement that gamma is to be estimated as the product of these two components.¹⁷

2.2 Interpretation of theta

71 Our previous report also noted¹⁸ that two different interpretations of the second parameter, theta, have been proposed:

- a. a *market value* interpretation; and
- b. a *redemption proportion* interpretation.

72 It logically follows that:

- a. If the *market value* interpretation is adopted, we should use estimation methods that are designed to estimate the market value of credits; and
- b. If the *redemption proportion* interpretation is adopted, we should use estimation methods that are designed to estimate the proportion of credits that are (or are likely to be) redeemed.

73 The evidence demonstrates that estimates of the market value of credits are materially lower than estimates of the proportion of credits that might be redeemed. (Of course, if the two approaches produced similar estimates, there would be no reason for any debate.)

74 Since Aurizon’s UT5 submission, the Federal Court has released its decision in the *PLAC-Ausgrid* appeal proceedings. The key component of the Federal Court Decision was the introduction of a “regulatory context” test whereby gamma must be interpreted (and estimated) in a way that is consistent with its role within the regulatory framework.

¹⁶ Frontier Economics, 2016, *Estimating gamma for regulatory purposes*, November, pp. 12-13.

¹⁷ See, for example, the QCA’s 2014 Market Parameters Decision, pp. 32; 89.

¹⁸ Frontier Economics, 2016, *Estimating gamma for regulatory purposes*, November, pp. 12-13.

75 We demonstrate below that, within the regulatory framework, gamma represents the value of imputation credits relative to the allowed return on equity they are deemed to replace. That is, applying the “regulatory context” test set out by the Federal Court affirms that gamma must be estimated in terms of the market value of credits relative to the allowed return on equity they are replacing. This interpretation, in turn, affirms the market value estimate of 0.25 in Aurizon Network’s UT5 submission.

2.3 A simple illustration

The value of credits relative to the allowed return on equity

76 In recent years there has been extensive litigation involving the interpretation of gamma across a number of overlapping cases. To create a simple framework for analysing the key issue of what gamma actually means, we begin with the following analogy.

77 Consider an accountant with a charge-out rate of \$50/hr who performs a task that takes exactly one hour, but which also incurs \$20 of costs for photocopying which are passed on to the client at cost. The accountant would invoice the client for \$70, which would cover the \$20 of costs and leave a \$50 net benefit. Now suppose that the client is a resident of Malaysia and proposes to pay part of the bill in the form of 30 units of Malaysian currency. In this case, the accountant would note that each unit of Malaysian currency can be converted into 35 Australian cents (after all relevant fees and charges), so the 30 units of Malaysian currency are equivalent in value to AUD \$10.50. Thus, the accountant would reduce the required payment of Australian dollars to \$59.50. That is, the accountant would be indifferent between receiving \$70 or \$59.50 plus 30 units of Malaysian currency.

78 Now consider the regulatory setting where a business has \$1,000 of equity capital. Suppose that investors require a return on equity of 7%, of which 2% is to cover the effects of personal taxes and personal costs that they would incur. In this case, the business would be allowed to charge prices so that it was able to provide a \$70 return on equity to its shareholders, \$20 of which would cover shareholder level taxes and costs, leaving \$50 of net benefit.

79 Now suppose that the firm’s shareholders will also be provided with \$30 (face amount) of imputation credits. Under the regulatory framework, the allowed revenues will be reduced by the “value” of those credits. This means that the allowed return on equity provided to the shareholders will be reduced by the estimated value of the credits. Thus, what is required is an estimate of the relative value of imputation credits on the one hand and the allowed return on equity on the other. For example, if investors in aggregate value the receipt of a dollar of credits equal to the receipt of 35 cents of return on equity, the relative valuation is 0.35 and investors would be left whole if their allowed return on equity was reduced by \$10.50 in relation to the \$30 of credits that they will receive.

80 In the regulatory setting, theta represents this relative valuation. It encapsulates all of the reasons why imputation credits have a different value to investors in aggregate relative to the allowed return on equity. Importantly, theta does not

encapsulate any factors that are in common – because those common factors have already been taken into account, including them again in the theta estimate would amount to double-counting.

Why are credits less valuable than allowed equity returns?

81 However, there are a number of reasons why imputation credits are less valuable to investors than dividends or capital gains, including:

- a. Some credits are distributed to non-residents who cannot redeem them and therefore do not value them at all;
- b. Some credits are distributed to resident investors who are prevented from redeeming them by the 45-day rule;
- c. Some credits are distributed to residents who simply fail to redeem them;
- d. Investors have to wait longer to receive any benefit from the credits – whereas dividends are available to investors immediately, the investor only receives a benefit from credits when their personal tax return is finalised after the end of the tax year;
- e. There is a compliance and administration cost involved in tracking and redeeming credits;
- f. Resident investors will rationally adjust their portfolios until the last dollar of credits they receive just offsets the cost they bear by concentrating their portfolio into franked dividend paying stocks and away from what would otherwise be optimal. Thus, the *net* benefit of the redeemed credits would, on average, be approximately half of the face amount.

82 For all of these reasons, and possibly others, the value to investors of imputation credits is lower than the value of the equity returns that the regulator allows the firm to provide. Theta represents the extent of this difference – the relative valuation, or ratio of the value of the credits that investors receive to the value of the allowed return on equity that they must give up under the regulatory model. That is, theta reflects the additional personal costs that apply only to imputation credits and not to the allowed return on equity.

83 In our view, theta should be estimated in a way that captures *all* of the reasons why credits are less valuable than the allowed return on equity, and we show below that the market value approach does exactly that. By contrast, a redemption rate approach reflects the fact that some credits are distributed to non-residents (item (a) in the list above) but none of the other reasons why credits are less valuable to investors.

2.3.1 The February 2016 *PLAC-Ausgrid* decision of the Australian Competition Tribunal

84 In our previous report,¹⁹ we noted that the specific issue of whether theta should be interpreted as the *value* that distributed credits have to investors (relative to the value of the allowed return on equity) or as the *proportion* of credits that are available for redemption was the subject of a merits review appeal brought by several NSW electricity networks. The regulatory framework used by the AER is relevantly the same as that used by the QCA. Both are based on the work of Officer (1994)²⁰ which demonstrates that, in a dividend imputation tax system, the value of imputation credits forms part of the return to equity holders.

85 In the *PLAC-Ausgrid* case, the NSW network businesses submitted that theta should be estimated in a way that captures *all* of the reasons why credits are less valuable than allowed equity returns,²¹ whereas the AER submitted that theta should be estimated in a way that reflects only the fact that some credits are distributed to non-residents who obtain no value from them.²²

86 In the *PLAC-Ausgrid* case,²³ the Tribunal held that gamma must be interpreted as the value of credits (i.e., reflecting *all* of the reasons why credits are less valuable than allowed equity returns) to investors and not simply as the proportion of credits that might be available for redemption:

We consider that, by placing most reliance on the equity ownership approach and effectively defining the utilisation rate as the proportion of distributed imputation credits available for redemption, the AER has adopted a conceptual approach to gamma that redefines it as the value of imputation credits that are available for redemption. This is inconsistent with the concept of gamma in the Officer Framework for the WACC.²⁴

...the Tribunal does not accept the AER's approach that imputation credits are valued at their claimable amount or face value (as it said in the Final Decisions: the measure is what can be claimed). The value is not what can be claimed or utilised.²⁵

2.3.2 The May 2017 decision of the Federal Court of Australia

87 The AER appealed the Tribunal's decision in the *PLAC-Ausgrid* case to the Federal Court, which held that the AER's Ground 17, in relation to gamma, was made

¹⁹ Frontier Economics, 2016, *Estimating gamma for regulatory purposes*, November, pp. 16-18.

²⁰ Officer, R. R., 1994, The cost of capital of a company under an imputation system, *Accounting and Finance*, 34, 1, 1-17.

²¹ That is, all of the reasons set out in Paragraph 81 above.

²² That is, only reason (a) in Paragraph 81 above.

²³ Applications by Public Interest Advocacy Service Ltd and Ausgrid Distribution [2016] ACompT 1 (26 February 2016).

²⁴ *PLAC-Ausgrid*, Paragraph 1100.

²⁵ *PLAC-Ausgrid*, Paragraph 1081.

out.²⁶ The Court held that the Tribunal had erred in its interpretation of r 6.5.3 of the NER, which states that “gamma is the value of imputation credits.” The court stated that the word “value” should not be interpreted in isolation and that gamma must be interpreted and estimated in a way that is consistent with the regulatory framework in which it operates:

In our opinion, the expression “the value of imputation credits” is to be construed as a whole, in its context and having regard to the subject matter of the exercise. It would be an error to limit attention to the word “value” and give it a meaning in isolation. In essence, we think this is what the Tribunal did. The Tribunal thereby misunderstood the function of imputation credits under the Rules in relation to the return on capital and the tax building block.²⁷

88 In making its decision, the Court did not hold that the AER’s approach to the determination of gamma was the correct approach. Rather it determined that the Tribunal had erred in its focus on the word “value” that appears in the National Electricity Rules, giving too little weight to the role and purpose of gamma within the regulatory framework. It is for the AER to now consider how gamma should be determined in the context of the Court’s decision. We comment further below on how the AER has recently considered this matter.

89 That is, the Federal Court has introduced a “regulatory context” test whereby gamma must be interpreted (and estimated) in a way that is consistent with its role within the regulatory framework. Within the regulatory framework, the role of gamma is to reduce the allowed return on equity that could otherwise be paid to equity holders in relation to the estimated value of imputation credits that they receive. Thus, within the regulatory framework, gamma must represent the value of imputation credits relative to the value of the allowed return on equity that those credits are replacing.

90 We note that the list set out in Paragraph 81 above are things that apply to credits only, and will therefore affect the value of credits *relative to* the allowed return on equity. This is what should be reflected in the estimate of theta.

91 The Court’s decision gives rise to two questions of fact:

- a. Whether other WACC parameters are estimated using market values that already incorporate investors’ tax positions and transaction costs; and
- b. Whether consistency with the regulatory WACC framework requires an estimate of gamma that reflects all of the reasons why investors would value credits less than the full face amount, or only the extent to which non-residents are unable to redeem credits.

We consider these two questions in more detail in the following sections.

²⁶ Australian Energy Regulator v Australian Competition Tribunal (No2) [2017] FCAFC 79, Paragraph 757.

²⁷ AER v ACT, 2017, Paragraph 751.

2.4 Are other WACC parameters market value estimates?

92 In this section, we consider the AER's recent views on whether the WACC parameters reflect market values and how that applies to the determination of gamma. We explain that other WACC parameters *are* market value estimates that *do* reflect the effects of personal taxes, personal costs, and every other consideration that investors make when determining how much they would be prepared to pay for stocks or bonds. Indeed, as we note below, in subsequent cases the AER itself now recognises that other WACC parameters *are* market value estimates that *do* reflect the effects of personal taxes and personal costs. This would seem to make the court's finding on this point difficult to reconcile.

93 For example, in the recent *Victorian Distribution Businesses* Tribunal hearing, the AER conceded that other WACC parameters *are* market values that *do* reflect the effects of personal taxes and personal costs. The AER submitted that:

Obviously, the amount of dividends is observed as well but they're observed at their dollar value, but the market values are the asset prices, and they do – that's quite right, that they already incorporate the effects of the differences in investors' tax positions and transaction costs.²⁸

and that:

...those matters are incorporated into the asset prices and, therefore, they are incorporated into the allowed rate of return and, therefore, they are incorporated into the allowed revenues for the service provider...these personal costs, personal valuation matters will be reflected in the return on equity, will be included in the allowed revenues.²⁹

94 Similarly, in its recent AusNet Gas draft decision the AER again suggests that any personal taxes or costs that result in imputation credits being valued by investors at less than the full face amount will already be captured by the AER's estimate of the required return on equity:

Consistent with the post-company tax framework in the rules, the AER values redeemed imputation credits at their full face value on a pre-personal cost/tax basis. To the extent investors value redeemed imputation credits at less than their face value due to personal cost, this will be picked up in the market value of the stock which drives the difference between the pre and post personal cost return on equity.³⁰

95 In the remainder of this section, we explain how other WACC parameters are estimated in a way that reflects the effects of any personal taxes and costs. In general, investors will consider any personal taxes and costs when determining how much to pay for an asset, in which case market prices reflect personal taxes and

²⁸ *Vic DB* Tribunal hearing transcript, p. 650.

²⁹ *Vic DB* Tribunal hearing transcript, p. 650.

³⁰ AER, July 2017, AusNet Services Gas access arrangement 2018-2022: Draft Decision, Attachment 4, p. 4-133.

costs. The resulting estimates of required return are such that investors are responsible for paying any personal taxes and costs out of that return.

Risk-free rate

96 The first WACC parameter we consider is the risk-free rate, which is estimated as the yield on government bonds. The yield is computed as the discount rate that equates the present value of the cash flows to be received by the bond holder with the prevailing market price of the bond.

97 The market price of the bond will obviously reflect all of the considerations that investors make when determining the value of the bond to them, including the expected impact of any personal taxes associated with investing in the bond, and any expected personal or transactions costs incurred by the bond holder when investing in the bond.

98 Thus, the risk-free rate that is derived, and used in the WACC calculation, will include compensation that investors require in relation to personal taxes and personal costs – and every other consideration that investors make when considering how much they would be prepared to pay for a government bond.

Return on debt

99 The return on debt is computed in the same way as the risk-free rate, except that corporate bonds are used instead of government bonds.

100 Again, the market price of the bond will obviously reflect all of the considerations that investors make when determining the value of the bond to them, including the impact of any personal taxes and any personal or transactions costs.

101 Thus, the return on debt that is derived, and used in the WACC calculation, will include compensation that investors require in relation to personal taxes and personal costs – and every other consideration that investors make when considering how much they would be prepared to pay for a corporate bond.

Market risk premium – dividend growth model estimate

102 One set of evidence that the QCA considers when estimating the market risk premium (MRP) is dividend growth model estimates – the Cornell approach. Just as for the bond yields above, the implied return on the market portfolio is computed as the discount rate that equates the present value of the cash flows (in this case, dividends) to be received with the prevailing market price of the portfolio of shares.

103 The market price of shares will obviously reflect all of the considerations that investors make when determining the value of the shares to them, including the impact of any personal taxes and any personal or transactions costs.

104 Thus, the MRP that is derived will include compensation that investors require in relation to personal taxes and personal costs – and every other consideration that investors make when considering how much they would be prepared to pay for shares.

Market risk premium – historical excess returns

105 When estimating the MRP, the QCA also considers evidence from historical excess
 106 returns. This evidence is based on the annual returns of a broad portfolio of
 shares, calculated from the observed market prices of those shares. The idea
 behind this method is that the price that investors would be prepared to pay to buy
 shares today is the present value of the expected dividend over the next year and
 the expected sale price at the end of the year:

$$S_t = \frac{E[DIV_{t+1}] + E[S_{t+1}]}{1 + r_{m,t}}.$$

106 This is precisely the same as for the parameters above – the implied return on the
 market portfolio is computed as the discount rate that equates the present value of
 the cash flows to be received (in this case, from dividends and the sale of the share
 a year later) with the prevailing market price of the portfolio of shares.

107 As above, the current share price will reflect all of the considerations that investors
 make when determining the value of the shares to them, including the impact of
 any personal taxes and any personal or transactions costs.

108 Thus, the market return that is derived will include compensation that investors
 require in relation to personal taxes and personal costs – and every other
 consideration that investors make when considering how much they would be
 prepared to pay for shares.

Equity beta

109 The QCA estimates equity beta from a regression analysis of stock returns (for
 domestic comparator firms) on returns from a broad market index. As explained
 above, the returns, which are derived from observed market prices, will reflect all
 of the considerations that investors make when determining the value of the shares
 to them, including the impact of any personal taxes and any personal or
 transactions costs.

110 Thus, the equity beta will also reflect any compensation that investors require in
 relation to personal taxes and personal costs – and every other consideration that
 investors make when considering how much they would be prepared to pay for
 shares.

Conclusion

111 In our view, the evidence set out above clearly supports the contention that other
 WACC parameters *are* market value estimates that *do* reflect the effects of personal
 taxes, personal costs, and every other consideration that investors make when
 determining how much they would be prepared to pay for stocks or bonds. This
 is because they are all derived from the observed prices of traded securities. It then
 follows that the estimates of the required return on equity and debt are estimates
 that include the compensation that investors require in relation to personal taxes
 and personal costs.

- 112 That is, the AER recognises that its estimate of the required return on equity reflects the market value of credits to investors – investors will reduce the return on equity that they would otherwise have required by their valuation of credits. Having recognised this principle, instead of adding back that same market value of credits to obtain an internally consistent estimate of the total required return, the AER has proposed to add back the face amount of the credits. Thus, the result is a return on equity that has been reduced by one measure of “the value of imputation credits” and then grossed back up by an entirely different measure. The resulting blend has no meaningful economic interpretation or use and is internally inconsistent.
- 113 We agree that the estimate of the required return on equity has been reduced by the market value of imputation credits where that value reflects all considerations that investors would make, including personal taxes and costs. It follows from this that the *same* market value of imputation credits must be added back to obtain an appropriate estimate of the total required return on equity and the same market value must be used consistently throughout the regulatory process – the key element of the Federal Court decision.

2.5 Are market value or “utilisation” estimates consistent with the regulatory framework?

Analysis

- 114 In this section, we consider the question of whether consistency with the regulatory WACC framework requires:
- a. a market value estimate of gamma that reflects all of the reasons why investors value credits less than the full face amount; or
 - b. a utilisation estimate of gamma that reflects only the extent to which non-residents are unable to redeem credits.

- 115 In our view, the best way to consider this question is in the context of Dr Lally’s reports for the AER and QCA. Our earlier report³¹ noted that Lally (2015 QCA) Equation (1) shows that what is relevant is the extent to which imputation credits are capitalised into the stock price:

$$S_0 = \frac{DIV_1 + \theta \times IC_1 + S_1}{1 + R_e}.$$

- 116 This equation shows that the price of a stock at the beginning of the year is equal to the present value of:
- a. Dividends paid during the year;

³¹ Frontier Economics, 2016, *Estimating gamma for regulatory purposes*, November, pp.16; 26.

- b. Theta times the face amount of imputation credits distributed during the year; and
- c. The stock price at the end of the year.

117 As set out above, the discount rate (R_e) includes the compensation that investors require in relation to personal taxes and personal costs on the allowed return on equity. That is, R_e is the discount rate that capitalises the face amount of dividends and the future stock price into the current stock price. In the example above, R_e is the 7% required return that includes the 2% compensation that investors require in relation to any personal taxes and personal costs.

118 Of course, we cannot simply capitalise the face amount of imputation credits using the same discount rate because credits are clearly less valuable to aggregate investors relative to other components of return. This is where theta comes in – it reflects the extent to which imputation credits are relatively less valuable to investors.

119 A list of reasons why investors value credits less than other forms of return is set out in Paragraph 81 above. One of those reasons is the fact that some credits are distributed to non-residents who do not value them at all, but there are many other reasons. In summary, theta is a relative valuation term – it will reflect only those reasons that cause credits to be less valuable relative to other forms of return.

120 In our view, theta should be estimated in a way that captures *all* of the reasons why credits are less valuable than the return on equity that the regulator allows the firm to provide to its equity holders, and we show below that the market value estimation approach does exactly that. By contrast, the redemption rate approach adopted by the AER and QCA reflects only the fact that some credits are distributed to non-residents but none of the other reasons why credits are less valuable to investors.

Consistency with dividend drop-off analysis

121 To show that dividend drop-off analysis properly estimates theta as the *relative* value of credits, we note that Dr Lally's formula can be rearranged slightly as follows:

$$S_0(1 + R_e) - S_1 = DIV_1 + \theta \times IC_1.$$

122 Dividing all terms by the current stock price gives:

$$\frac{S_0(1 + R_e) - S_1}{S_0} = \frac{DIV_1}{S_0} + \theta \frac{IC_1}{S_0}.$$

123 This expression is entirely consistent with dividend drop-off regression analysis, which is performed as follows:

$$\frac{S_0(1 + R_e) - S_1}{S_0} = \delta \frac{DIV_1}{S_0} + \theta \frac{IC_1}{S_0} + \varepsilon.$$

124 That is, in a dividend drop-off analysis, theta estimates the value of credits on a relative basis – exactly as required.

125 Aurizon Network’s UT5 submission used an estimate of theta that is based on the most recently available dividend drop-off analysis. We note that an academic version of that study has since been accepted for publication in a highly-ranked peer-reviewed international journal.³² The resulting estimate of theta of 0.35, which leads to a gamma of 0.25, indicates that the aggregated effect of the personal costs set out in Paragraph 81 are material.

Conclusion

126 In the regulatory WACC framework, and within the PTRM, the return on equity (R_e) includes the compensation that investors require to cover the personal taxes and personal costs that relate to the allowed return on equity. It does not cover the additional reasons why imputation credits are relatively less valuable to investors. That is the role of theta (which recognises the extent to which distributed credits are less valuable than the allowed returns on equity) and ultimately gamma (which also recognises that some of the credits that are created will not be distributed to investors).

127 The regulatory framework serves to reduce the allowed return on equity for the assumed value of imputation credits. For investors to end up with appropriate compensation, it is essential that an appropriate relative valuation is used. What is required is an estimate of the ratio of the extent to which investors value imputation credits relative to the extent to which they value allowed equity returns. This provides the proper indication of the equity return investors would give up in order to obtain an imputation credit. This ratio is precisely what is estimated by dividend drop-off analysis.

2.6 The October 2016 SAPN Tribunal decision

128 We note that the *SAPN* Tribunal has also held that it is open to the AER to adopt the redemption rate interpretation for theta.³³ The reason for this finding was based around that Tribunal’s independent development of a distinction between “average investor” and “marginal investor” theoretical frameworks, which appears to be quite orthogonal to the issue at hand. In particular, neither the AER nor SAPN had made submissions on that point, and the AER’s decision was not based on a distinction between average and marginal investors.

129 On this point, in the hearing before the Victorian Distribution Businesses (*Vic DB*) Tribunal, Counsel for the AER agreed with the proposition that:

³² Cannavan, D. and S. Gray, 2017, Dividend drop-off estimates of the value of dividend imputation tax credits, *Pacific Basin Finance Journal*, forthcoming. The Pacific Basin Finance Journal (PBFJ) is an A-ranked international journal on the Australian Business Deans Journal List, the main indicator of journal quality used in Australian business schools. PBFJ has a higher citation rate than other A-ranked finance journals.

³³ Application by SA Power Networks [2016] ACompT 11, Paragraph 196.

...the discussion in SAPN about the distinctions between marginal and average investors is not of much assistance to us³⁴

and also agreed with the proposition that:

...you seem to be relying rather a lot on the conclusions in SAPN, and not too much on the reasoning that gets them³⁵

and concluded that:

...the primary reasoning of the AER is not dependent upon that analysis, and I don't make any submissions about that analysis.³⁶

130 Moreover, in its recent decisions the AER does not rely on the average vs. marginal investor distinction that was developed by the *SAPN* Tribunal. Consequently, it seems that the approach of the *SAPN* Tribunal is now redundant, so we do not consider it further in this report. Rather, it seems that there is now broad agreement (including by us) that the key issue is not around the theoretical excursion that was embarked upon by the *SAPN* Tribunal, but around the question of which estimate of theta is properly consistent with its role within the regulatory framework.

131 Similarly, in a report commissioned by the AER, Lally (2017) reviews a recent Frontier Economics report and concludes that:

Frontier (2016, section 1.3) presents an example to demonstrate the point that equilibrium prices are determined by all investors. This example was intended to rebut the claim by the ACT (2016) that, in respect of gamma, there is a choice between an average investor perspective and a marginal investor perspective. I fully concur with Frontier's example and the point being demonstrated.³⁷

2.7 Final conclusions and implications

132 In our view, the answers to the two key questions that arise from the recent Federal Court judgment are as follows:

- a. Any suggestion that other WACC parameters are anything other than market value estimates that *do* reflect the effects of personal taxes, personal costs, and every other consideration that investors make when determining how much they would be prepared to pay for stocks or bonds is clearly wrong. This is because other WACC parameters are all derived from the observed prices of traded securities. It then follows that the estimates of the required return on equity and debt are estimates that include the compensation that investors require in relation to personal taxes and personal costs; and

³⁴ *Vic DB* Transcript, p. 653.

³⁵ *Vic DB* Transcript, p. 653.

³⁶ *Vic DB* Transcript, p. 654.

³⁷ Lally, M., Review of Frontier report on Gamma, 13 June, p. 2.

- b. Under the regulatory WACC framework and PTRM, theta is an estimate of the ratio of the extent to which investors value imputation credits relative to the extent to which they value allowed equity returns. This provides the proper indication of the amount of equity returns investors would give up in order to obtain an imputation credit. Only if theta is interpreted and estimated in this way will investors be appropriately compensated.

133 The main implication of these answers is that theta should be estimated using dividend drop-off analysis. As noted above, that method provides a direct estimate of the extent to which investors value imputation credits relative to the extent to which they value the allowed equity returns that those credits are deemed to replace.

3 Two rationales for the utilisation rate

3.1 Overview

134 Although the recent set of litigation in relation to gamma has related to AER
 135 decisions, the QCA has followed the AER in key relevant respects. Thus, the QCA
 136 may consider these cases to be relevant to its approach to gamma. In particular,
 137 the key issue in these cases has been the question of how the value of distributed
 138 credits (which the AER and QCA both refer to as the “utilisation rate”) should be
 139 interpreted and estimated.

135 In its 2014 Market Parameters decision, the QCA stated that:

The QCA agrees with the AER's interpretation of the utilisation rate.³⁸

136 Moreover, the QCA also uses the same primary method as the AER to estimate
 137 the utilisation rate – the equity ownership approach:

The QCA prefers an estimate of the utilisation rate of 0.56 based on equity
 138 ownership of Australian listed companies.³⁹

137 Thus, the recent litigation involving the AER is of relevance to the QCA's
 138 approach to gamma as set out in the Market Parameters Decision.

138 In this section, we note that the AER has provided two mutually exclusive
 139 rationales for interpreting and estimating theta as a utilisation/redemption rate,
 140 rather than as an estimate of investors' relative valuation between credits and
 141 dividends or capital gains. In particular:

- a. The AER's first rationale was that the first step of the regulatory framework estimates the before-personal-tax and before-personal-costs return on equity that investors would require in the absence of any imputation credits, so the second step of the process must subtract the before-personal-tax and before-personal-costs value of imputation credits. Thus, any additional personal costs that apply only to imputation credits (making them relatively less valuable than allowed equity returns) are not considered. This was the line of argument run by the AER before the *PLAC-Ausgrid* Tribunal.
- b. The AER's second rationale is that the additional personal costs that apply only to imputation credits *are* relevant, but they have already been taken into account in the return on equity, so to also take them into account when estimating the value of imputation credits would amount to double counting. This is the line of argument run by the AER before the *Vic DB* Tribunal in November 2016 and in the appeal of the *SAPN* proceedings to the Federal Court in June 2017. This approach also appears in recent

³⁸ QCA, 2014, Market parameters decision, p. 102.

³⁹ QCA, 2014, Market parameters decision, p. 29.

AER decisions. See, for example, the AusNet Gas Draft Determination on gamma.⁴⁰

139 Clearly, these two rationales are mutually exclusive. The additional personal costs that affect the market value of credits cannot be simultaneously irrelevant and already taken into account. The AER currently relies on Rationale 2.

140 This is an important consideration because:

- a. Rationale 2 was not raised before the Federal Court, which considered only Rationale 1. If Rationale 2 applies, which appears to be the AER's approach in its decisions and submissions over the last year, it must be the case that Rationale 1 does not apply, so the AER appears to have moved past the Federal Court's consideration of gamma; and
- b. In its Market Parameters Decision, the QCA's consideration of gamma was based on Rationale 1.

141 Our view is that Rationale 2 is correct insofar as it accepts that the estimated return on equity will reflect the market value of imputation credits, but that the AER has misapplied that fact in concluding that the same market value of credits should not be used consistently throughout the regulatory process. As set out above, we consider that theta is an estimate of the ratio of the extent to which investors value imputation credits relative to the extent to which they value allowed equity returns. If that is right, *all* of the reasons why credits are less valuable than allowed equity returns would have to be considered, not just the extent to which credits are distributed to non-resident investors.

142 That is, if the "utilisation" interpretation of theta is wrong, the reason for proposing it is moot. However, if the utilisation interpretation of theta is proposed, it would be necessary to clearly state the rationale on which that proposal is based.

3.2 Rationale 1: A pre-personal-tax and pre-personal costs regulatory framework

143 In its Ausgrid Final Decision the AER sets out the rationale for its utilisation approach to estimating theta as follows:

...to be consistent with the Officer framework (and therefore the building block framework in the NER/NGR) the utilisation rate should reflect the before-personal-tax and before-personal-costs value of imputation credits to investors. On a before-personal-tax and before-personal-costs basis, an investor that is

⁴⁰ AER, July 2017, AusNet Services Gas access arrangement 2018-2022: Draft Decision, Attachment 4, p. 4-133.

eligible to fully utilise imputation credits should value each dollar of imputation credits received at one dollar (that is, have a utilisation rate of 1).⁴¹

144 It was this rationale – that the value of imputation credits must be estimated on a pre-personal-tax and pre-personal cost basis to be consistent with the regulatory framework in which it is used – that formed the basis of the Court’s judgment in the *PLAC-Ausgrid* appeal. The court held that:

We accept the AER’s submission that the Rules require consistency in the way the relevant building blocks interact, that is, a post-company tax and pre-personal tax and personal costs basis...we accept the AER’s submission the Tribunal’s approach to gamma was underpinned by a misunderstanding on its part about how return to investors was conceptualised in a WACC framework.⁴²

145 For the reasons set out above, our view is that the fact that it would be wrong for theta to reflect any personal taxes or costs that *equally* affect allowed equity returns does not imply that theta should reflect *no* personal costs or taxes at all – even those that apply only to credits. This leaves a hole in the regulatory allowance whereby the additional personal costs that apply to imputation credits are uncompensated.

3.3 Rationale 2: Personal taxes and personal costs are relevant, but the allowed return on equity has already taken them into account

The allowed return on equity only reflects some personal taxes and personal costs

146 In the *Vic DB* Tribunal hearing, the AER introduced a new rationale for its “utilisation” approach to theta. This rationale appears to recognise that other WACC parameters *do* reflect the effects of personal taxes and personal costs. It posits that personal taxes and personal costs *are* relevant (including those that apply to credits), but they have already been taken into account in the return on equity, so to also take them into account when estimating the value of imputation credits would amount to double counting.

147 Counsel for the AER began the explanation of this rationale as follows:

Obviously, the amount of dividends is observed as well but they’re observed at their dollar value, but the market values are the asset prices, and they do – that’s quite right, that they already incorporate the effects of the differences in investors’ tax positions and transaction costs.⁴³

148 We agree entirely with this statement. As we have set out above, the return on equity that the AER estimates will reflect the personal taxes and personal costs that pertain to that allowed return on equity. For example, if the AER estimates a

⁴¹ Ausgrid Final Decision, April 2015, Attachment 4, pp. 44-45.

⁴² AER v ACT, Paragraphs 752, 755.

⁴³ *Vic DB* Tribunal hearing transcript, p. 650.

required return on equity of 7%, that return includes any compensation required to cover the effects of personal taxes and personal costs.

149 For example, if there were no personal taxes or personal costs, investors may have required a return of only 5%. In this case, the additional 2% is compensation to cover the effects of personal taxes and personal costs. If a regulated business had \$1,000 of equity capital, it would be allowed to charge prices so that it was able to provide a \$70 allowed return on equity to its shareholders, of which \$20 (the additional 2% return) is to compensate investors for the personal taxes and personal costs that relate to that allowed return on equity.

150 The AER's submission then continued as follows:

But that's where we depart with the applicants because those matters are incorporated into the asset prices and, therefore, they are incorporated into the allowed rate of return and, therefore, they are incorporated into the allowed revenues for the service provider...these personal costs, personal valuation matters will be reflected in the return on equity, will be included in the allowed revenues, to then undertake an exercise of seeking to value imputation credits in the allowance for company tax to reduce it by these matters, does bring about an inconsistency in the logic of the post-company tax model and, effectively, provides a second form of compensation for precisely the same costs.⁴⁴

151 In our view, this submission fundamentally misunderstands the role of theta. Theta represents the rate at which investors would be willing to give up allowed equity returns in order to receive imputation credits. It does *not* double count any compensation in relation to personal taxes and personal costs. Theta represents only the extent to which the personal costs in relation to credits *exceed* those in relation to allowed equity returns. It represents only the *additional* costs. Any suggestion that it double counts the *same* costs is simply wrong.

152 That is, the AER appears to have committed a logical fallacy. Having correctly identified that it would be wrong for theta to reflect any personal taxes or costs that have *already* been taken into account in the return on equity, the AER then concludes that theta should reflect *no* personal costs or taxes at all – even those that have not yet been taken into account in the allowed return on equity.

153 For example, as explained in Paragraph 55 above, the effect of personal taxes has already been taken into account in the allowed return on equity, so it would be wrong to again take it into account when estimating the value of imputation credits. This is precisely why theta must represent only those matters that are unique to imputation credits and which have not yet been taken into account when the AER estimates the allowed return on equity.

The incorporation of the market value of credits

154 In its submissions to the Court in relation to the appeal of the *SAPN* Tribunal's decision, the AER appears to submit that even the personal costs that relate only

⁴⁴ *Vic DB* Tribunal hearing transcript, p. 650.

to imputation credits (over and above those that relate to allowed equity returns) are already incorporated into the allowed return on equity.

155 Our understanding of the AER's argument is as follows. Suppose that, in the absence of imputation, investors would require a return on equity of 7%. As set out above, this would include the compensation that investors require to cover the personal taxes and costs that apply to that allowed return. Now suppose that, in line with our earlier example, that:

- a. Imputation credits with a face amount of 1% are distributed to investors;
- b. 55% of those credits are distributed to resident investors; and
- c. Investors in aggregate value imputation credits at 35% of the value of the face amount. (That is, for the reasons set out in Paragraph 81 above, investors would only be prepared to give up \$35 of allowed return on equity to receive the \$55 of imputation credits that is distributed to resident investors.)

156 In this case, investors will reduce their requirement for allowed equity returns by 0.35% to a level of 6.65%. Thus, when the AER uses market data to estimate the required return on equity, they will see that the market requires an allowed return on equity of 6.65%. This 6.65% reflects the personal costs that apply only to imputation credits – if those personal costs were lower, the credits would be relatively more valuable and investors would require a lower allowed return on equity.

157 The AER uses data from 1883 to estimate the required return on equity. For the period up to 1987 there were no imputation credits, so there was no reduction in the required return on equity in relation to the value investors receive from imputation credits. Thus, in our numerical example, the estimate of the required return on equity will be 7% for the period up to 1987 and 6.65% for the period after 1987. These figures cannot be averaged because they are estimates of different things – the 7% figure reflects the total required return on equity and the 6.65% figure is net of the value of imputation credits. It is for this reason that the regulatory framework requires, via a process known as “grossing up,” that the value of any imputation credits must be added back to the return from dividends and capital gains to produce an estimate of the total return on equity. In this case $6.65\% + 0.35\% = 7\%$ for the post-1987 period. Now the estimates from both sub-periods are comparable and they can be assessed together. The AER explains this point in its submissions in relation to the SAPN appeal:

The return on equity must be grossed up by the value of distributed imputation credits. The increase reflects the fact that the return on equity is estimated from observed returns in the market (the returns comprise dividends and capital gains and are divided by the stock price to derive a rate of return). However, the observed returns in the market reflect the payment of a proportion of personal taxes at the company level - under an imputation system, the returns received by equity investors include three components: capital gains, dividends and imputation credits. Imputation credits are personal tax paid at the company level. Asset prices (and the resulting “market observed” return on equity) will reflect the value of those three components of return. In other words, asset prices will

be higher, and the resulting rate of return on equity that is observed from those asset prices will be lower, in the presence of imputation credits than without them. To derive a nominal vanilla return on equity, that is, on a post company tax pre personal tax basis, an adjustment must be made to the return on equity to take account of the effect of imputation credits. That is done by grossing up the return on equity by the value of imputation credits. The grossed up return on equity is then a rate of return on a post company tax pre personal tax basis. Under the NER, that adjustment is made in accordance with cl 6.5.2(d)(2).⁴⁵

158 The AER now accepts that the reduction in the allowed return that investors require (0.35% in the example above) reflects all of the personal costs that cause investors to value credits less than the allowed equity returns that they are replacing:

The observed returns in the market in terms of asset prices are assumed to reflect the full range of personal taxes and personal costs that affect investors' valuations of the asset. In other words, to the extent that personal taxes and personal costs associated with returns on the asset (capital gains, dividends and imputation credits) diminish the value of an equity investment, that will be reflected in the asset price and thereby reflected in the resulting return on equity. The resulting (and required) return will be higher as a result.⁴⁶

159 Consequently, it must be the very same market value of credits that is added back in the grossing-up step of the regulatory process. If anything other than the same market value of credits is added back, the result will be meaningless – it certainly will not produce an estimate of the (7%) total required return on equity that is commensurate with the pre-1987 data.

160 However, the AER has submitted that because the (0.35%) reduction in the market's required return reflects the market value of credits, using the same market value of credits in the grossing-up step of the regulatory process would amount to double counting:

...the AER adjusts the return on equity estimated from the market by the amount of personal tax paid at the company level, ie the value of distributed imputation credits. It would be incorrect to use the "market" value of imputation credits to make that adjustment because the "market observed" return on equity already incorporates the effects of any personal costs (time value of money, transaction costs etc). The AER adopts the same approach to the allowance for company tax.⁴⁷

161 In our view, this is exactly wrong. It is precisely *because* the reduction in the market's required return on equity reflects the market value of credits that the same market value of credits *must* be used in the grossing-up step of the regulatory process.

162 The correct approach is as follows:

⁴⁵ AER submissions in relation to SAPN appeal, Paragraph 32(c).

⁴⁶ AER submissions in relation to SAPN appeal, Paragraph 32(e).

⁴⁷ AER submissions in relation to SAPN appeal, Paragraph 32(g).

- a. Estimate the total required return on equity from the pre-1987 data as 7%.
- b. Estimate the total required return on equity from the post-1987 data as 6.65% and gross-up for the market value of credits of 0.35% to obtain a grossed-up estimate of 7%.
- c. Average the estimates over the two periods, as like with like, to produce an average estimate of 7%.
- d. Deduct the market value of credits of 0.35% and set the allowed return on equity to 6.65%.

163 By contrast, the AER's proposed approach, which results in investors being under-compensated, is as follows:

- a. Estimate the total required return on equity from the pre-1987 data as 7%.
- b. Estimate the total required return on equity from the post-1987 data as 6.65% and gross-up for the proportion of credits distributed to resident investors of 0.55% to obtain a grossed-up estimate of 7.2%.
- c. Average the estimates over the two periods to produce an average estimate of 7.04%.⁴⁸
- d. Deduct the proportion of credits of distributed to residents of 0.55% and allow revenues to provide an allowed return on equity of 6.49%, which is less than the 6.65% return that they require.

164 The result is an internally inconsistent implementation of the regulatory model whereby investors are properly compensated for all personal taxes and costs that apply to allowed equity returns, but not compensated at all for the additional personal costs that apply to imputation credits.

3.4 The QCA's rationale for a "utilisation" approach to gamma

165 As noted above, in its 2014 Market Parameters decision, the QCA followed the rationale that the AER had adopted at that time.

166 In the Market Parameters decision, the QCA also states that its conceptual "utilisation" definition of gamma relies on the theoretical model developed by Lally and van Zijl (2003):

Relevantly, the definition applied by the QCA is also consistent with the formal definition derived in the models of Monkhouse (1993) and Lally and van Zijl (2003). In the latter two studies, the value of imputation credits is derived as a weighted average across investors in the defined market with the weights

⁴⁸ There are 105 years of data prior to imputation and 29 years post imputation.

reflecting both their investment in risky assets and their degree of risk aversion (Lally and van Zijl, 2003; AER 2013d: 166).⁴⁹

167 and that:

Two groups of investors are recognised — domestic and foreign.⁵⁰

168 However, Lally and van Zijl (2003) specifically state that their model assumes away all foreign investors. They state that they:

...assume that national share markets are fully segmented. Consequently the utilisation rate should be 1 other than for the market weight of Australian investors unable to use the credits,⁵¹

and:

Since national capital markets are assumed to be segregated, it would be inconsistent to recognise foreign investors. Accordingly, we omit them from consideration.⁵²

169 But of course foreign investors *do* exist in Australian equity markets and their trading *does* have an effect on equilibrium prices. To assume them away to simplify the theoretical analysis would result in outcomes that do not accord with real world realities.

170 In summary:

- a. The QCA has stated that its approach to gamma follows the AER's previous rationale, from which the AER has now departed; and
- b. The QCA also relies on the theoretical model of Lally and van Zijl (2003), who do not consider the existence of foreign investors.

171 In our view, this raises real questions about the foundations for the QCA's utilisation approach to gamma. It would be beneficial for the QCA to clarify the basis for its approach to gamma at the time of each decision.

⁴⁹ QCA, 2014, Market Parameters Decision, p. 93.

⁵⁰ QCA, 2014, Market Parameters Decision, p. 93.

⁵¹ Lally and van Zijl (2003), p. 197.

⁵² Lally and van Zijl (2003), pp. 197-198.

4 The interpretation of redemption rate estimates

4.1 Point estimates or upper bounds?

172 In the sections above, we have demonstrated that, in the context of the regulatory framework, θ represents the extent to which investors would reduce their required return on equity in relation to the imputation credits that they receive. In Paragraph 81 above, we set out a number of reasons why investors in aggregate would value imputation credits less than allowed equity returns. In relation to those reasons:

- a. The equity ownership approach provides a noisy estimate of the effect of (a) only – the fact that some credits are distributed to non-residents who obtain no value from them;
- b. ATO tax statistics provide an estimate of the effects of (a)-(c) – that approach produces a direct estimate of the proportion of credits that are *actually* redeemed from the Tax Office; and
- c. The dividend drop-off approach provides a direct estimate of the extent to which investors value imputation credits relative allowed equity returns. This estimate includes of all of the effects set out in Paragraph 81, and any other reasons why investors would value credits less than allowed equity returns.

173 Consequently, if one accepts that θ does properly represent the rate at which investors would exchange allowed equity returns for imputation credits, dividend drop-off analysis would provide a direct estimate and the other approaches would only serve as upper bounds – because they include the effects of only a sub-set of the reasons why investors would value credits less than allowed equity returns.

174 However, if one concludes (contrary to the analysis above) that θ should be interpreted as the proportion of credits that are redeemed, the ATO approach would provide a direct estimate, the dividend drop-off approach would provide a lower bound (as it includes the effects of additional factors) and the equity ownership approach would provide an upper bound (because it does not consider the effects of the 45-day rule or indeed *any* reason why investors would not redeem credits other than their ineligibility as foreign investors).

4.2 The reliability of ATO tax statistics

175 The Market Parameters Decision questioned the reliability of ATO tax statistics.⁵³ The AER has also questioned the reliability of this evidence.⁵⁴ The issue is as follows:

- a. Each year a certain amount of credits are created, some of those are distributed to shareholders, and some of those distributed credits are redeemed by shareholders.
- b. The ATO provides data on the quantum of credits that are created each year and on the quantum of credits that are redeemed each year. There has never been any dispute about either of these items.
- c. The ATO does not provide direct data on the number of credits that are distributed each year – so that quantity has to be derived. Two approaches have been proposed:
 - i. The franking account balance (FAB) approach – whereby the amount of distributed credits is derived as the sum of all credits created less those that are retained by firms as reported in the firms’ franking account balances;⁵⁵ and
 - ii. The dividend approach – whereby the amount of distributed credits is estimated by tracking dividend payments and making assumptions about the flow of dividends between companies, trusts and life offices.
- d. The FAB and dividend approaches produce different estimates of the amount of credits that are distributed each year.

176 The difference between the FAB and dividend estimates of the amount of credits distributed was first identified by Hathaway (2013).⁵⁶ His estimates are summarised in Figure 1 below.

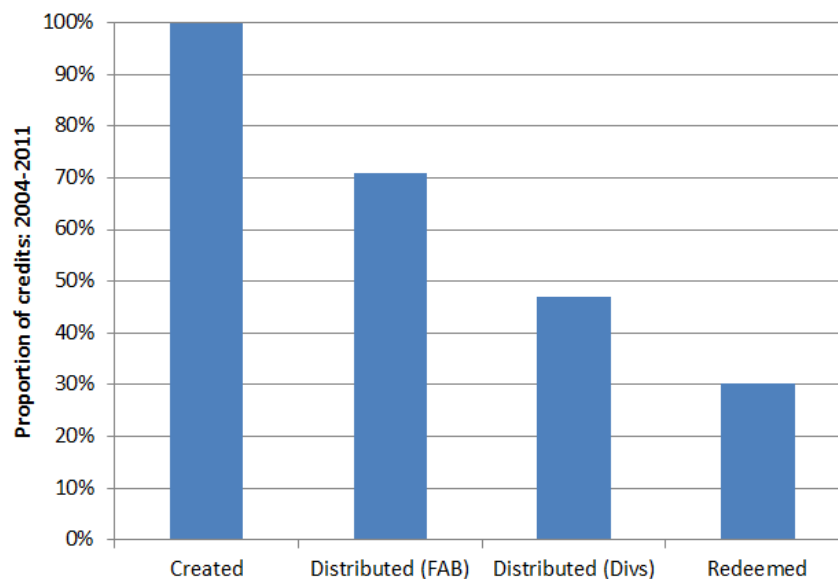
⁵³ QCA, 2014, Market Parameters Decision, p. 92.

⁵⁴ CitiPower Final Decision, Attachment 4, p. 13.

⁵⁵ A firm’s ‘franking account balance’ is a record of the face amount of imputation credits the firm has available for distribution.

⁵⁶ Hathaway, N., 2013, “Franking credit redemption ATO data 1988 to 2011,” Capital Research, September.

Figure 1: Summary of ATO tax statistics



Source: Hathaway (2013), p. 9.

177 Figure 1 shows that the FAB method indicates that 71% of created credits are distributed, whereas the dividend method produces a distribution rate of 47%.

178 Under the QCA's contention that theta should be interpreted as the proportion of distributed credits that are redeemed, the ATO tax statistics can be used to estimate theta, and consequently gamma. Under this approach:

$$\gamma = F \times \theta = \frac{\text{Credits Distributed}}{\text{Credits Created}} \times \frac{\text{Credits Redeemed}}{\text{Credits Distributed}}$$

179 Note that the amount of credits distributed cancels out, so we are left with:

$$\gamma = \frac{\text{Credits Redeemed}}{\text{Credits Created}}$$

180 In this case, there is no issue with the measurement of either term, so no reason to consider the estimate to be unreliable. Hathaway (2013) recognises this point and reports that the proportion of credits redeemed to credits created is 30%.⁵⁷ He notes that Credits Redeemed is \$127.6 million and that Company Tax Paid is \$421.5 million, producing a ratio of 30%. He concludes that:

This overall approach is reasonable as the tax statistics are unlikely to be in major error for amounts of tax paid and the amounts of tax credits claimed.⁵⁸

181 Moreover, it is clear from Figure 1 above that the same outcome would be obtained whether one adopted the FAB approach:

$$\gamma = F \times \theta = \frac{\text{Credits Distributed}}{\text{Credits Created}} \times \frac{\text{Credits Redeemed}}{\text{Credits Distributed}} = \frac{71}{100} \times \frac{30}{71} = 0.30$$

⁵⁷ Hathaway (2013), Paragraph 99.

⁵⁸ Hathaway (2013), Paragraph 100.

or whether one adopted the dividend approach:

$$\gamma = F \times \theta = \frac{\text{Credits Distributed}}{\text{Credits Created}} \times \frac{\text{Credits Redeemed}}{\text{Credits Distributed}} = \frac{47}{100} \times \frac{30}{47} = 0.30.$$

182 In its October 2015 Final Decisions, the AER recognised that it must adopt the same estimate of credits distributed in the two places it appears in the above equation.⁵⁹ The AER favoured the FAB method and adopted a gamma estimate of 0.31 based on that approach,⁶⁰ and would clearly have arrived at the same estimate of gamma if it had used the dividend approach in both places in the above equation. The AER has since updated that estimate to 0.34.⁶¹

183 As set out above, if it is accepted that theta properly represents the value of credits relative to the value of allowed equity returns, the ATO tax statistics will only produce an upper bound, which implies that $\gamma < 0.34$.

184 The fact that it is generally accepted that there are two different estimates of the amount of credits distributed does not mean that the ATO data should be abandoned entirely. The 0.34 upper bound does not require an estimate of the amount of credits distributed. It is a ratio of redeemed credits to created credits, and there has been no question raised about the reliability of either of these quantities.

185 Whereas the ATO has no direct reason to monitor the number of “Credits Distributed” in a given year, it would be extraordinary to suggest that either:

- a. The ATO does not know how much corporate tax was paid in a given year, this being the “Credits Created” figure; or that
- b. The ATO does not know how many credits were redeemed from them in a given year, this being the “Credits Redeemed” figure.

186 In our view, the 0.34 figure is relevant evidence that is unaffected by any concerns about the estimate of the quantum of distributed credits. The issues raised about the unreliability of tax statistics are not relevant to the calculation of the 0.34 figure, which is independent of the estimate of the quantum of credits distributed (which is the only figure about which concerns have been raised).

4.3 The role of the equity ownership estimate

187 The equity ownership approach provides an upper bound for the proportion of credits that are redeemed. Whereas the ATO data provides a direct estimate of the proportion of credits that are actually redeemed from the Tax Office, the equity ownership approach (at best) captures the effect of non-residents, but no other

⁵⁹ See, for example, SAPN Final Decision, Attachment 4, p. 18.

⁶⁰ See, for example, SAPN Final Decision, Attachment 4, p. 18.

⁶¹ AER, July 2017, AusNet Services Gas access arrangement 2018-2022: Draft Decision, Attachment 4, p. 4-15.

reason why credits might not be redeemed. That is, if any credit is not redeemed for any reason other than it being distributed to a non-resident, the equity ownership estimate will be overstated. Consequently, it should be interpreted as an upper bound for the redemption rate.

188 In summary:

- a. If one accepts that θ does properly represent the value of credits relative to allowed equity returns, dividend drop-off analysis would provide a direct estimate, ATO tax statistics would provide an upper bound, and the equity ownership estimate would be of little relevance because the ATO estimate provides a tighter upper bound.
- b. If one concludes that θ should be interpreted as the proportion of credits that are redeemed, the ATO approach would provide a direct estimate and the equity ownership approach would provide an upper bound (because it does not consider the effects of the 45-day rule or indeed *any* reason why investors would not redeem credits other than their ineligibility as foreign investors).

5 Conclusions and key questions for the QCA to consider

189 Since Aurizon’s UT5 submission, the Federal Court has released its decision in the *PLAC-Ausgrid* appeal proceedings, wherein the AER had also adopted a “utilization” approach rather than a market value approach. In those proceedings, the Australian Competition Tribunal had ruled that the National Electricity Rules (NER) required the AER to estimate the market value of imputation credits. The Federal Court decided that the Tribunal had been too quick to focus on the word “value” in the NER and had not properly considered the role of gamma within the regulatory framework. In making its decision, the Court did not hold that the AER’s approach to the determination of gamma was the correct approach. Rather it determined that the Tribunal had erred in its focus on the word “value” that appears in the National Electricity Rules, giving too little weight to the role and purpose of gamma within the regulatory framework. It is for the AER to now consider how gamma should be determined in the context of the Court’s decision. We comment further below on how the AER has recently considered this matter.

190 This report demonstrates that, within the regulatory framework, gamma represents the value of imputation credits relative to allowed equity returns. That is, applying the “regulatory context” test set out by the Federal Court affirms that gamma must be estimated in terms of the market value of credits relative to the allowed return on equity they are replacing. This interpretation, in turn, affirms the market value estimate of 0.25 in Aurizon’s submission.

191 This report raises a number of questions for the QCA to consider and clearly address in its UT5 determination. In our view it would benefit stakeholders in the interests of regulatory transparency for the QCA to provide clear responses to the following questions:

- a. Does the QCA agree that its allowed return on equity includes compensation that investors require for the personal taxes and personal costs that apply to that allowed return on equity?

In our view it clearly does – investors set their overall required return after considering what proportion of that return they will lose in personal taxes and costs.

- b. Does the QCA consider that its allowed return on equity should also include compensation for any additional personal costs that apply to imputation credits (beyond those which apply to the allowed return on equity)?

- i. If not, why not?
- ii. If so, where in the regulatory model is such compensation accounted for?

In our view, in the same way that the allowed return on equity includes compensation for personal costs and taxes in relation to those allowed equity returns, it should also include compensation for any additional personal taxes or costs that apply to imputation credits.

- c. If investors reduce the allowed return on equity that they would otherwise require by the market value of imputation credits (i.e., reflecting any additional personal costs that apply only to imputation credits), and if the QCA then applies a different definition of value in the grossing-up step, how should the resulting figure be interpreted? In particular, can total return on equity estimates computed in this way for post-1987 data be averaged with return on equity estimates from pre-1987 data as like with like?

In our view, investors in the post-imputation period will reduce their requirement for allowed equity returns by the market value of credits. If the QCA added back the market value of credits in its grossing-up step, the resulting total return on equity would be comparable to the pre-imputation period. If the QCA added back any other definition of value in its grossing-up step, it would obtain something other than the total required return on equity and the resulting figure could not be aggregated with the pre-imputation period estimates of the total return on equity.

- d. Does the QCA:
- i. Continue to endorse the AER's original rationale, which the AER's recent submissions contradict, being that the regulatory model derives required cash flows before personal taxes and costs, and therefore WACC parameters (including gamma) should be estimated on that basis; or
 - ii. Now accept, as the AER does, that return on equity calculations are indeed based on market values that do fully reflect personal taxes and costs, and indeed every consideration that investors make when determining the return on equity that they would require from the regulated firm – in which case a different rationale is required to justify the “utilisation” approach to gamma?

In our view, there is no reasonable argument against the proposition that the regulatory estimates of the required return on equity include compensation for personal costs and taxes. To the extent that personal taxes and costs are higher, asset prices will be lower and required returns estimated from financial market data will be higher.

- e. Does the QCA maintain the same basis for its approach to gamma in light of the fact that:
- i. The QCA has previously stated that its approach to gamma follows the AER's previous rationale, from which the AER has now departed; and

- ii. The QCA also relies on the theoretical model of Lally and van Zijl (2003), who do not consider the existence of foreign investors?

In our view, any argument that is based on the proposition that the regulatory estimates of the required return on equity do not include compensation for personal costs and taxes is unreasonable. We note that the AER itself has departed from that rationale.

We also consider that setting regulatory allowances on the basis that there are no foreign investors in the Australian market is also unreasonable.

6 Appendix: Numerical example

192 Consider a regulated firm with \$10 billion of assets in place. The regulator estimates that the required return on equity is 8%, the required return on debt is 5%, the proportion of debt financing is 60%, and the corporate tax rate is 30%. The regulator estimates the vanilla WACC and then sets allowed cash flows accordingly. Suppose the regulator sets gamma to 0.47, but the true value of imputation credits is only 25% of the face amount. To what extent are the equity holders undercompensated?

193 The vanilla WACC is:

$$\begin{aligned} WACC_3 &= r_e^L \frac{E}{V} + r_d \frac{D}{V} \\ &= 8\% \times 0.4 + 5\% \times 0.6 = 6.2\%. \end{aligned}$$

194 The total allowed return is:

$$6.2\% \times 10 \text{ billion} = 620 \text{ million.}$$

195 Within the regulatory model, the cash flow that corresponds to the vanilla WACC is given by:

$$C - (C - r_d D)\tau(1 - \gamma) = 620$$

so

$$C - (C - 5\% \times 6 \text{ billion})0.3(1 - 0.25) = 620 \text{ million}$$

in which case $C = 712.90$. Thus, to properly compensate the equity holders, the firm would have to charge its customers prices so that it generates a pre-tax profit of 712.90 million. This would then be distributed as follows:

A	Pre-tax profit	712.90
B	Interest	300.00
C=A-B	Taxable income	412.90
D=0.3x C	Tax paid	123.87
E=A-B-D	Dividend paid	289.03
F=0.25xD	Value of credits	30.97
G=E+F	Total return to equity	320.00

196 The equity holders would then have a return of $320/4,000 = 8\%$, as required.

197 But suppose the regulator sets gamma to 0.47. In that case, the total allowed pre-tax profit would be set so that:

$$C - (C - 5\% \times 6 \text{ billion})0.3(1 - 0.4) = 620 \text{ million}$$

in which case $C = 680.50$. Thus, the allowance would be as follows:

A	Pre-tax profit	680.50
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B	Interest	300.00
C=A-B	Taxable income	380.50
D=0.3xC	Tax paid	114.15
E=A-B-D	Dividend paid	266.35
F=0.25xD	Value of credits	28.54
G=E+F	Total return to equity	294.89

198 The equity holders would be undercompensated by $320-294.89=25.11$. The return to equity holders would be $294.89/4,000 = 7.37\%$.

