

Report prepared for the  
Australian Energy Regulator

# **Further Advice on the Value of Imputation Credits**

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## **PREAMBLE**

The Australian Energy Regulator (AER) is currently undertaking regulatory determinations for the following service providers: TransGrid, TasNetworks, Directlink, Ausgrid, Endeavour Energy, Essential Energy, ActewAGL and Jemena. The AER published the draft decisions in late November 2014. Following the receipt of revised regulatory proposals in January and February 2015, the AER now seeks further expert advice on a number of matters in relation to the value of imputation (or franking) credits to inform its assessment of the rate of return for these service providers.

In particular, advice is sought in relation to the questions set out in the following pages of this report. These questions relate to eight “critical errors” that Directlink submits the draft decision makes in determining the value of imputation credits (gamma). In answering each question, I have been asked to have regard to any parts of Directlink’s revised proposal and SFG (2015) that I deem relevant, and to give particular attention to the specific parts of Directlink’s revised proposal and SFG (2015) identified in the question. In addition, I have been asked to provide advice on any other issues raised in Directlink’s revised proposal or SFG (2015) that I consider important.

## QUESTION 1

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**1. Directlink submits that the AER’s definition of the utilisation rate—the (before-personal-tax and before-personal-costs) utilisation value of imputation credits to investors in the market per dollar of imputation credits distributed—is conceptually incorrect and inconsistent with the requirements of the NER.**

**1.1. Do you consider that the AER’s definition is conceptually incorrect and/or inconsistent with the requirements of the NER? In answering this question, please give particular attention to paragraphs 48 to 52 of SFG (2015).**

No.

The proper definition of theta (and gamma) represents the key point of dispute between the AER and the service providers. It is also at the core of much of the surrounding debate concerning other matters – such as the proper approach to estimating theta (and gamma).

SFG argues that the utilisation or redemption rate interpretation of theta does not correspond to a market value (as in “worth to investors”) interpretation of theta. This is incorrect. As I will explain below, the problem with the SFG argument is that:

- (i) there is more than one possible definition of value; and
- (ii) the SFG definition of value is inconsistent with the Officer/Monkhouse WACC valuation framework upon which the current regulatory framework is based.

When used in everyday language, the meaning of the term “value” is generally well understood. However, in a cost of capital context, the term value is potentially

ambiguous. Value can be used to refer to a value before taxes or a value after taxes. It can refer to a value before costs or a value after costs. The term “rate of return” (or discount rate) is similarly potentially ambiguous. A return can be measured or defined before taxes or after taxes. A return can also be measured or defined before costs or after costs.

This is why it is very important to be absolutely precise about how the key inputs of a WACC analysis – cash flow and discount rate – are defined and to ensure that they are defined on the same basis.

The AER definition of theta does indeed correspond to a market value (as in “worth to investors”) interpretation of theta if value is taken here to mean the value of imputation credits before personal taxes and before personal costs. This interpretation is neither novel nor new. It comes directly from the seminal 1994 paper by Officer.

It is clear that the Officer WACC valuation framework is a before-personal-tax framework. It is also a before-personal-cost framework in the limited sense that, there is no explicit adjustment (deduction) made to the cash flows or the discount rate for either personal taxes or personal costs. For example, Officer defines the before-personal-tax return on equity each period by:

$$\hat{r}_t = \frac{\Delta P_t + d_t + \gamma C_t}{P_{t-1}} \quad (1)$$

where  $\Delta P_t$  is the capital gain for the period,  $d_t$  is the dividend paid during the period,  $C_t$  is the amount of imputation credits distributed during the period and  $P_{t-1}$  is the price at the start of the period.<sup>1</sup> Officer (1994) also shows that the vanilla WACC approach can be used to determine the market value of the firm by capitalizing the before-personal-tax cash flow at the corresponding before-personal-tax rate of return (discount rate):

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<sup>1</sup> See equation (15) in Officer (1994). Officer’s description is a bit more precise – he refers to this as the after-company-before-personal-tax return on equity but I will simply refer to this here as the before-personal-tax return on equity for brevity. Later on I will similarly refer to the after-company-before-personal-tax cash flow as the before-personal-tax cash flow.

$$V = \frac{X_O - T(X_O - X_D) + \gamma T(X_O - X_D)}{r_{iii}} \quad (2)$$

where

$$r_{iii} = r_E \frac{S}{V} + r_D \frac{D}{V} \quad (3)$$

is commonly called the vanilla WACC.<sup>2</sup> The important thing to note is that personal taxes and personal costs are not deducted from the capital gain and dividend components in (1) or from the operating cash flow component in (2) and so likewise personal taxes and personal costs are not deducted from the imputation credit component  $\gamma C_t$  in (1) or from the imputation credit component  $\gamma T(X_O - X_D)$  in (2).<sup>3</sup> In other words, the per dollar value of an imputation credit  $\gamma$  gamma should be measured prior to any personal tax on the credit and prior to any personal costs associated with the receipt of the credit.<sup>4</sup> This approach is also consistent with the standard approach to calculating a return in a classical tax system – you take the observed capital gain and the observed dividend without making any adjustment for personal taxes or personal costs associated with trading the share or receiving the dividend.

This is precisely the reason why Officer refers to gamma as the value of franking credits in some parts of the paper, and as the proportion of tax collected from the company which will be rebated against personal tax, in other parts of the paper. These two descriptions are equivalent when one interprets value to mean the value of imputation credits before personal tax and before personal costs.

SFG has failed to recognize the critical importance of this point. They continue to (incorrectly) assert that there is a difference between the concepts of value and utilisation for this purpose and in the process attempt to attribute Officer's dual

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<sup>2</sup> This is case B(iii) on page 7 of Officer (1994).

<sup>3</sup> Contrary to the suggestion by SFG (2015 para.52) there is no adjustment to traded stock prices to reverse the impact, if any, of personal costs or other “reasons why investors value shares the way they do”.

<sup>4</sup> Recall, there is no distinction between gamma and theta in the Officer (1994) perpetuity setting.

descriptions of gamma to poor drafting.<sup>5</sup> But none of this is necessary. There is no inconsistency or lack of clarity in the way Officer defines gamma – the issue that SFG attributes to poor drafting instead arises solely from the way SFG chooses to interpret gamma.

**1.2. Do you consider that the formulas in Officer (1994) support the estimation of the utilisation rate on an after-personal-tax and after-personal-costs basis? In answering this question, please give particular attention to paragraphs 124 to 135 of SFG (2015).**

No.

It is clear that SFG does not agree with the AER's definition of theta instead arguing that one needs to take account of the impact of personal taxes and various personal costs (including time delay, administrative costs, forgone diversification costs) in determining the value of imputation credits.<sup>6</sup> This is equivalent to suggesting that gamma should be interpreted as the value after personal tax and after personal costs. SFG also suggests these personal costs are relevant because they relate to imputation credits but do not relate to dividends and capital gains.<sup>7</sup>

Setting aside the important question as to whether these costs are even material or not, the key point is that the SFG interpretation of theta and gamma is inconsistent with the Officer framework and so does not represent what we actually want – the value of imputation credits before personal tax and before personal costs.

SFG's description of the regulatory framework is one where the regulator first determines the amount of dividends/capital gains that investors would require in the absence of imputation and then reduces this amount by the value investors receive from

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<sup>5</sup> For example, SFG (2015 para. 122-123)

<sup>6</sup> For example, SFG (2014 para. 65). Based on materiality, I see no merit in adjusting for time delay.

<sup>7</sup> SFG (2015 para. 50-51)

imputation credits.<sup>8</sup> I believe a simpler description is that the regulator determines the appropriate after-company-before-personal-tax rate of return. This return by definition consists of three components: capital gains, dividends and imputation credits – there is no “substitution” of dividends/capital gains for imputation credits as SFG suggests. The WACC analysis is undertaken on an after-company-before-personal-tax basis. This avoids having to model the structure of the personal tax system and having to estimate additional parameters which would arise in such a case.<sup>9</sup> This means that issues as to whether or not personal costs or personal taxes are symmetric (or “a wash” as SFG puts it) are not relevant because the current regulatory framework is one where cash flows and returns are determined on a before personal tax and before personal cost basis. The fact that personal taxes and personal costs are not explicitly included in the framework does not mean that investors are under-compensated as SFG claims.

SFG (2015 para. 124-135) also suggests that the mathematical formulae in Officer (1994) support a value interpretation of gamma but not a redemption value interpretation since: *“It is clear in this formula [para.127] that gamma represents ... the extent to which imputation credits increase the market value of equity”*. There is no dispute that the (market) value of credits are capitalised into stock prices – this is clear from equation (2) above. However, SFG fails to see that within Officer’s framework it is the before personal tax and before personal costs value of a credit – the redemption value – which is the item being capitalised.

Implications for estimating gamma and theta are discussed later under questions 4, 5 and 6.

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<sup>8</sup> SFG (2015 para. 48-51)

<sup>9</sup> For example, compare the before-personal-tax CAPM of Officer – equation (12) of Handley (2014) – with the after-personal-tax CAPM of Lally-van Zijl – equation (17) of Handley (2014).

## QUESTION 2

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**2. Directlink submits that the AER has erred in its use of equity ownership data.**

**2.1. Do you consider it reasonable to use equity ownership rates as direct evidence on the utilisation rate?**

Yes.

The equity ownership approach has strong conceptual support from the CAPM class of equilibrium asset pricing models.

**2.2. In your response to question 10 in Handley (2014), you advised that ‘[t]he equity ownership approach has strong conceptual support from the CAPM class of equilibrium asset pricing models’. You provided supporting discussion on this point in your responses to questions 7 to 10 in Handley (2014). Does SFG (2015), in particular paragraphs 80 to 107, give you cause to clarify or change any of your responses to questions 7 to 10 in Handley (2014)?**

No.

In my previous report I explain why the equity ownership approach has strong conceptual support from the CAPM class of equilibrium asset pricing models.<sup>10</sup> In particular, I show that:

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<sup>10</sup> Handley (2014 p.17-25)



- the Sharpe-CAPM framework can readily be extended to an imputation tax system by allowing for the payment of dividends and imputation credits on risky assets and the value of imputation credits to vary across different investors;
- the resultant CAPM equation corresponds to that suggested by Officer (1994);
- in equilibrium, theta represents a weighted average of individual investors' utilisation rates where the weights are based on investors' levels of wealth and risk aversion; and
- if for simplicity you assume that there are two classes of investor in the market – those who can fully utilize distributed imputation credits and those who cannot – and the average relative risk aversion of investors in each class is the same, then theta is equal to the proportion of the market held by the first class (being, domestic investors in the domestic market who can fully utilize distributed imputation credits).

SFG (2015) continues to disagree with this approach and in doing so, makes the following points (to which I add my reply):<sup>11</sup>

- (i) *“The AER now proposes to adopt an entirely different definition of theta. This new definition obviously requires some basis, and the AER proposes that their proposed redemption rate definition of theta is based on representative agent equilibrium asset pricing models.”*

The claim in (i) that this is a new definition of or conceptual basis for theta is not correct. I first suggested this approach in a 2008 report to the AER.<sup>12</sup>

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<sup>11</sup> SFG (2015 para. 80-107)

<sup>12</sup> See my response to question 4 later in this report.

- (ii) *“However, there are three problems with the AER’s approach in this regard:*
- a) Representative investor equilibrium asset pricing models do not imply that theta is equivalent to the redemption rate. Lally (2013 AER) has previously advised the AER of this;*
  - b) A representative investor equilibrium does not apply in the AER’s framework because there is no (sensible) market-clearing condition;*
  - c) In any event, the AER’s approach leads to an estimate of theta that is higher than the actual value to investors, in which case it leaves investors under-compensated.”*

The claim in (ii)(a) is not correct since it is based on an assumption by Lally which contradicts a key joint assumption in the CAPM (concerning the given set of assets in the market and the given set of investors who collectively hold those assets).

The claim in (ii)(c) is not correct since it is based on SFG’s incorrect interpretation of theta as previously discussed under question 1.

The claim in (ii)(b) – which appears to be SFG’s major criticism of this approach – is not correct since it is based on SFG’s incorrect assertion that the market clearing condition invoked in the CAPM class of equilibrium asset pricing models is based on an assumption that the  $m$  investors in the model invest all their wealth across the  $n$  assets in the model and nothing else.<sup>13</sup>

But the CAPM makes no such assumption – it is SFG who does.

An implication of SFG’s assertion is that one could validly use a “domestic” version of the CAPM say to price U.S. stocks only if you assume that investors in the U.S. stock market hold no other assets except U.S. stocks. Such an assumption would be clearly implausible.

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<sup>13</sup> SFG (2015 para. 89)

An alternative and less extreme assumption which is implicit in the use of a “domestic” version of the CAPM is that any assets outside the model and any investors outside the model are not relevant for determining the prices of the assets inside the model. This is equivalent to saying that the system is “closed” by definition – everything that matters is inside the model and anything outside the model does not matter – which means a standard market clearing condition can indeed be invoked and a valid equilibrium can be found.<sup>14</sup> There is nothing in the Copeland and Rosenberg statements quoted in SFG (2015) which is inconsistent with this approach.

- (iii) *“Specifically, Handley (2014) claims that the CAPM can be derived without a standard market clearing condition.”*

I have made no such claim.

The approach is based on the standard machinery of a pure exchange equilibrium including the standard market clearing condition.

- (iv) *“In the Handley scenario, investors do not maximise the expected utility and they do not hold mean-variance efficient portfolios. Thus, the Handley scenario violates the very basis of the CAPM.”*

This is not correct.

The approach is based on the standard machinery of a pure exchange equilibrium including that investors maximize the expected utility of their end of period wealth – where wealth by definition is based only on the  $n$  risky assets (and the risk free asset) included in the model – and results in investors holding mean-variance efficient portfolios.

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<sup>14</sup> If this assumption is considered unreasonable then one should bring the outside assets and outside investors into the model, for example, by using an international CAPM.

## QUESTION 3

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**3. Directlink submits that the AER has erred in its interpretation of equity ownership data.**

**3.1. In determining a range or point estimate for the utilisation rate from equity ownership data, do you consider it reasonable to rely on historical movements in equity ownership in addition to the most recent point estimate?**

Yes – for reasons discussed under question 3.3 below.

**3.2. In determining a range or point estimate for the utilisation rate from equity ownership data, do you consider it reasonable to rely on both (i) the domestic ownership share (figures 4-2 and 4-3 in the draft decision) and (ii) the refined domestic ownership share (figures 4-4 and 4-5 in the draft decision)?**

Yes – but the refined share should (subject to the limitations in the data) be more relevant by construction.

**3.3. In section A.11 of the draft decision, the AER considers that a reasonable estimate for the utilisation rate from the equity ownership approach is between:**

- **0.55 and 0.7, if all equity is considered, and**

- **0.4 and 0.6, if only listed equity is considered.**

**Do you consider that these ranges are supported by the evidence presented in section A.11 of the draft decision? If not, please identify ranges for (i) all equity and (ii) listed equity only that you consider are supported by the evidence.**

Yes.

SFG suggests that only the most recent estimates of domestic equity ownership – 0.44 based on the refined share of listed equity and 0.58 based on the refined share of all equity – are relevant when using the equity ownership approach to estimate theta.

In contrast, the AER prefers to examine the data over a longer historic time period from which a range of estimates has been determined – 0.4 to 0.6 based on listed equity and 0.55 to 0.7 based on all equity. I note the SFG estimates fall within the AER ranges.

Referring to the refined data, it is apparent that there is substantial volatility in the reported ABS estimates over time. There are also residual issues with the ABS data.<sup>15</sup> This suggests that more than just the most recent estimates should be taken into consideration, although the length of period to be considered is open to judgment.<sup>16</sup> Examination of the refined share of listed equity in Figure 2 of SFG (2015) suggests to me that a range of 0.4 to 0.55 may be more appropriate – but I do not consider this to be materially different to that used by the AER. Similarly, examination of the refined share of total equity in Figure 3 of SFG (2015) suggests to me that a range of 0.55 to 0.65 may be more appropriate – but again, I do not consider this to be materially different to that used by the AER.

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<sup>15</sup> For example, the ABS states that most of the financial data is derived from statistical surveys conducted by the ABS (and from information collected by APRA). The “quality” of the survey data is unlikely to be constant over time.

<sup>16</sup> For this purpose I have looked at the period starting in the early 1990s and also just the period starting around 2001.

## QUESTION 4

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**4. Directlink submits that the AER has erred in its use of redemption rates from tax statistics.**

**4.1. Do you consider that it is reasonable to use tax statistics as direct evidence on the utilisation rate?**

Yes.

I have long argued that estimates of redemption rates from tax statistics are relevant in estimating theta and gamma. For example, in a 2008 report I wrote:

*“The use of redemption or utilisation rates as a means of estimating the value of franking credits is driven by conceptual considerations. Depending on tax status and domicile, franking credits are used by investors to reduce their personal taxes. It is this reduction in personal taxes, if any, which is the ultimate source of value to an investor.*

*The extent to which observed stock prices reflect the value of franking credits can only be determined empirically. Alternatively, theory tells us that in equilibrium  $\gamma$  represents a complex weighted average of the values of franking credits across all investors in the market.”*

...

*Notwithstanding this represents a simple average of utilisation rates across investors rather than a (complex) weighted average and assuming the set of investors is indicative of the set of investors in the domestic market portfolio,*

*this estimate may be interpreted as a reasonable upper bound on the value of gamma.”<sup>17</sup>*

In contrast, SFG has long argued that estimates of redemption rates from tax statistics are not relevant in estimating theta and gamma. For example in its most recent report, SFG states:

*“If theta is to be defined as the value (as in worth to investors) of imputation credits, the redemption rate estimates cannot be used to estimate theta. They can, at best, be used to provide an upper bound for theta ...*

*By contrast, if theta is to be redefined as the redemption rate, then studies that estimate the redemption rate would (tautologically) provide an appropriate estimate of theta”.*<sup>18</sup>

The key issue is whether estimates of the redemption rate from tax statistics can be used as point estimates of theta. The answer is yes, for reasons explained under question 1 above. Such a view is also supported by the above SFG statement.

An unfortunate side issue relates to my previous use of the term “upper bound”. The point of using the term was this: we cannot be sure what is the value of imputation credits reflected in market prices, but we know that it should not exceed its redemption value, since this, by definition, represents the ultimate source of value of a credit.<sup>19</sup> With hindsight, using “upper bound” in this context was unnecessary and confusing.

In any event, this does not mean that estimates of theta from other approaches cannot exceed estimates from tax statistics since all estimates are considered to be imprecise.

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<sup>17</sup> Handley (2008 p.8)

<sup>18</sup> SFG (2015 para. 71-72)

<sup>19</sup> SFG (2015 para. 121) refers to some earlier comments of mine in a 2008 AER Roundtable Transcript as saying that I consider estimates of the redemption rate to be an “upper bound” for but not a point estimate of the value of gamma. But there is no problem here. The redemption rate is based on distributed imputation credits (not generated imputation credits) and so the redemption rate can be used as a point estimate of theta but not a point estimate of gamma (assuming a less than 100% payout of credits).

## QUESTION 5

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**5. Directlink submits that the AER has erred in its consideration of factors that can affect market value studies, such as differential personal taxes and risk.**

**5.1. In your response to question 18 in Handley (2014), you advised that the estimate of theta from SFG's dividend drop off study should be grossed up by the coefficient on dividends (delta). Does SFG (2015), in particular paragraphs 189 to 193, give you cause to clarify or change this aspect of your response to question 18?**

No.

SFG suggests that the AER's definition of theta would rule out the use of market value studies as a basis for estimating theta.<sup>20</sup> In contrast, I suggest market value studies can still be used provided we first back-out the impact of other factors which affect the drop-off (and hence affect the estimate of theta) such as differential personal taxes and risk. A delta coefficient not equal to one is a sign that these other factors are at work rather than an indication that shareholders do not value dividends as highly.

To be clear the gross-up adjustment to the regression coefficient (which SFG refers to as a scaling adjustment) is motivated by the need to estimate theta before personal tax and before personal costs. It is an indirect adjustment in the sense that we infer the collective impact of these other factors from the delta coefficient, rather than explicitly including these factors in the regression model.

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<sup>20</sup> SFG (2015 para. 174)



SFG's argument that the gross-up/scaling adjustment creates an inconsistency with other parts of the WACC estimation process<sup>21</sup> is not correct for reasons explained in my previous reports.<sup>22</sup>

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<sup>21</sup>SFG (2015 para. 192-193)

<sup>22</sup>For example, Handley (2014 p. 48)

## QUESTION 6

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**6. Directlink submits that the AER has erred in its interpretation of market value studies.**

**6.1. Do you consider that the AER's approach to considering the evidence from implied market value studies in the draft decision is reasonable?**

Yes

The AER is of the view that dividend drop-off studies should not be relied upon to the exclusion of other implied market value studies and more than one dividend drop-off study may be relied upon. I note that this conclusion is supported by advice from McKenzie and Partington.

I have previously suggested that dividend drop off studies are the most relevant within the class of implied market value studies.<sup>23</sup> This is not to say that other studies involving hybrid securities, futures contracts and simultaneous share trades should not be used. Rather the utility of all market value studies (including dividend drop-off studies) is reduced by residual concerns about the impact of other factors (such as taxes, risk and transactions costs) on the implied estimates of theta and whether the set of security prices involved in the studies reflect the value of imputation credits to just a subset of investors who trade around the particular event rather than the value of imputation credits to (long term) providers of equity capital as a whole. It is reasonable for the AER to give effect to these limitations among others by reducing the level of reliance it places on the resultant estimates. I note that SFG goes even further to suggest:

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<sup>23</sup>Handley (2014 p.31)

*“If the AER is right about theta representing the redemption rate and not the value of distributed imputation credit, then studies that estimate the value of distributed credits would not be relevant at all – those studies would provide estimates of the wrong thing.”<sup>24</sup>*

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<sup>24</sup>SFG (2015 para. 174)

## QUESTION 7

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**7. Directlink submits that the AER has erred in (partly) relying on an estimate of the distribution rate for listed equity only.**

**7.1. Do you consider reasonable the draft decision's partial reliance on a distribution rate for listed equity only?**

Yes

The cumulative payout approach to estimating the distribution rate is uncontroversial. Whilst there is no good reason to only consider the full set of all companies (public and private) for this purpose, there is one very good and obvious reason why we should also consider the full (not partial)<sup>25</sup> set of public companies only – public companies and private companies are financed in entirely different ways and it is the former rather than the latter which is more likely to be representative of the Australian domestic market for (public) equity funds.

**7.2. Giving particular attention to paragraphs 209 to 224 of SFG (2015), do you consider that the distribution rate estimate of 0.8 for listed equity only is 'over-stated to the extent that foreign-sourced income enables large public companies to distribute a higher proportion of imputation credits because the benchmark efficient entity has no access to foreign-sourced income'?**

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<sup>25</sup>SFG (2015 para. 214-215) suggests the top twenty public companies should be excluded from the sample.

No

SFG argues that the estimate of the distribution rate based on data for public companies only<sup>26</sup> is overstated to the extent that foreign sourced income enables large public companies to distribute a higher proportion of imputation credits. The analysis used by SFG is however incomplete and oversimplified to support such a strong conclusion. There are many factors which determine the financing and dividend policies of multinational firms relative to domestic firms. One cannot simply assume (as SFG has done) that both types of firms would seek to pay the same dollar amount of dividends out of the same dollar amount of profits irrespective of its source.

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<sup>26</sup> It is noted that the AER refers to this as data for listed companies only, a description which although not strictly correct – the ATO definition of a public company includes but is not limited to listed companies – is nonetheless suitable for the purpose.

## QUESTION 8

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**8. Directlink submits that the AER has erred in overestimating the value of imputation credits (gamma).**

**8.1. Do you consider that the AER's ultimate conclusion as to the value of imputation credits (gamma) (i.e. 0.4) is inconsistent with the evidence presented in the draft decision?**

No

There are no other issues raised in Directlink's revised proposal or SFG (2015) that require comment.

## ADDENDUM: ADDITIONAL QUESTIONS ON THE VALUE OF IMPUTATION CREDITS

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In addition to the questions addressed in the main body of this report, the AER seeks a response to the following questions relating to my views and the views of the service providers' consultant, SFG, on a number of specific matters.

**A1. Do you agree with SFG 2015 (at paragraph 25, 172) that theta should be defined (and thus estimated) *either* as the value of distributed credits *or* the proportion of distributed credits that is likely to be redeemed by investors? If so, which of these approaches is to be preferred? If not, what are the problems with defining theta in accordance with only one of these approaches? Is there any overlap between these two approaches to estimating theta?**

No.

There is no either-or decision to be made here. The value of distributed credits and the proportion of credits redeemed<sup>27</sup> are the same thing when one uses the proper definition of "value" in relation to theta (and gamma). Specifically, theta is the value of a dollar of distributed credits before personal taxes and before personal costs. In this case, the value of the credits and the proportion of the credits redeemed are one and the same thing. This is why Officer (1994) uses both descriptions interchangeably when referring to gamma in his seminal paper.

In contrast, SFG incorrectly defines theta as the value of a dollar of distributed credits after personal taxes and after personal costs. In this case, the value of the credits and the proportion of the credits redeemed are not the same thing because the former is expressed on an after-personal-tax and after-personal-costs basis whilst the latter is expressed on a before-personal-tax and before-personal costs basis. This is

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<sup>27</sup> This is also referred to as the redemption value or utilisation value of credits.

why SFG argues there are two alternative definitions of theta. SFG attempts to reconcile its view with that of Officer (1994) by attributing Officer's (1994) use of both descriptions to poor drafting.

To illustrate the different approaches, assume a firm pays a fully franked dividend of \$70 cash plus \$30 of imputation credits to a resident individual shareholder, the corporate tax rate is 30% and the personal tax rate is also 30%. The amount of imputation credits distributed to the shareholder is \$30. Also assume the shareholder can fully redeem (utilise) the credits – this means the full \$30 of credits can be used by the shareholder to reduce his personal taxes. The credits received are taxable in the shareholder's hands and so the value of the credits to the shareholder before personal tax (\$30) differs from the value of the credits after personal tax (\$21).<sup>28</sup> Also assume the shareholder incurs (personal) administrative costs of say \$1 in relation to the franked dividend.

Under the AER approach, theta is equal to the value of distributed credits before personal tax and before personal costs (\$30) divided by the amount of credits distributed (\$30) i.e.  $\theta = 1.00$ . Theta is also equal to the proportion of credits redeemed by the shareholder, which also gives  $\theta = 1.00$  since the \$30 of credits is used to reduce \$30 of the shareholder's personal taxes.<sup>29</sup>

Under the SFG approach, theta is equal to the value of distributed credits after personal tax and after personal costs (\$20) divided by the amount of credits distributed (\$30) i.e.  $\theta = 0.67$ , and which is not equal to the proportion of credits redeemed.

It is the AER approach which is consistent with the Officer/Monkhouse WACC valuation framework upon which the current regulatory framework is based.

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<sup>28</sup> This amount represents the personal tax saved that would otherwise have been paid on the \$70 dividend in the absence of receiving the imputation credit.

<sup>29</sup> The shareholder includes the grossed-up dividend of  $\$70 + \$30 = \$100$  in his taxable income on which \$30 in personal tax is payable, assuming a personal tax rate of 30%. The imputation credit of \$30 is then used to offset this amount such that no personal tax is (directly) payable by the shareholder.



**A2. Do you agree with the SFG 2015 description of the AER's approach to estimating theta and thus gamma (at paragraphs 38(b), 42, 53 and 58)?**

No.

SFG's description suggests that estimates of the redemption rate do not represent estimates of the value of credits. As explained under question A1 they are the same thing when value is properly defined. The SFG claim that value and redemption rate are materially different is therefore not correct.

SFG also suggests that market value studies cannot be used to estimate theta under the AER approach. This is not correct. Market value studies can still be used provided we first back-out the impact of other factors which affect the drop-off (and hence affect the estimate of theta) such as differential personal taxes and risk.

In my opinion, all estimates of theta and gamma should be considered to be imprecise.

**A3. How does the AER's approach to theta take account of the rate of redemption of imputation credits? Do you agree with the AER's approach in this regard?**

Yes.

The AER's definition of theta is consistent with the Officer/Monkhouse WACC valuation framework and so correctly takes into account the rate of redemption of imputation credits.

**A4. Do you consider that the AER's consideration of personal costs in estimating theta is appropriate? In answering this question, please give particular attention to paragraphs 48 to 52 of SFG (2015).**

Yes.

The AER's consideration of personal costs in estimating theta is consistent with the Officer/Monkhouse WACC valuation framework. It is a before-personal-tax framework in the sense that the analysis explicitly takes into account company taxes but not personal taxes. This avoids having to model the structure of the personal tax system and having to estimate additional parameters which would arise in such a case. It is also a before-personal-costs framework in the limited sense that there is no explicit adjustment (deduction) made to the cash flows or the discount rate for personal costs – whatever these costs may be. In any event, it is not clear to me that the personal costs that SFG refers to are even material.

SFG's discussion concerning the symmetry or otherwise of personal costs and personal taxes is therefore not relevant because the current regulatory framework is one where cash flows and returns are determined on a before-personal-tax and before-personal-cost basis which means investors are appropriately compensated on a before-personal-tax and before-personal-cost basis.

An alternative to the Officer/Monkhouse WACC valuation framework would be to determine compensation on an after-personal-tax and after-personal cost basis – by using cash flows and returns defined after personal taxes and after personal costs. In my opinion, this would substantially complicate the framework with no clear benefit from doing so.

**A5. Do you agree with the rationale for approaching theta set out at paragraphs 73 to 76 of SFG 2015? How, if at all, is this rationale advanced in the AER's approach to determining theta?**

No.

The problem with the SFG discussion is in comparing the redemption value of credits (which is expressed on a before-personal-tax and before-personal-costs basis) with the SFG definition of value (which is expressed on an after-personal-tax and after-personal-costs basis). In other words, SFG is not comparing apples with apples.

The claim of under-compensation disappears when one uses the correct definition of value. In SFG's example, the after-personal-tax and after-personal-costs value of the credits may indeed be \$10 but the before-personal-tax and before-personal-costs value of the credits is \$15 which means

... investors would receive an allowed regulatory return of \$85 from the firm and imputation credits that were worth \$15 to them – a total of \$100 . This is equal to the \$100 total return that the regulator has estimated to represent the efficient financing cost before personal taxes and before personal costs.

**A6. Have your views on the role of the equity ownership approach and tax statistics in estimating theta changed over time? Please have particular regard to SFG 2015 at paragraphs 117 to 121.**

No.

I have long argued that estimates of redemption rates from tax statistics are relevant in estimating theta and gamma. In a report for the AER in 2008, I wrote that the use of redemption rates as a means of estimating the value of credits is driven by conceptual considerations and that according to the theory, the equilibrium value of a dollar of distributed credits represents a complex weighted average of the values of franking credits across all investors in the market. (This also forms the basis for using the equity ownership approach).

I have previously described estimates based on tax statistics as representing an “upper bound” for theta. With hindsight this has unfortunately led to confusion in being taken to suggest that estimates of the redemption rate are not estimates of theta. To be clear, estimates of the redemption rate from tax statistics or equity ownership data can be used as point estimates of theta. My intention was to highlight that we cannot be sure what is the value of imputation credits reflected in market prices – which is relevant to implied market value studies – but we know that it should not exceed its redemption value.

**A7.Are you aware of any data on the extent to which imputation credits have been denied pursuant to the 45-day holding rule?**

No.

In a report for the AER in 2010, I wrote that I believe the impact of the 45 day rule is likely to be small. I also referred to the study by Handley and Maheswaran (2008) “as a guide” which estimated the utilisation rate for resident individuals over the period 1998 – 2000 at 89% – 94% but suggested this could not be interpreted as measuring the impact of the 45 day rule since credits were not refundable at that time – a rule which also reduced the utilisation rate.

I am not aware of any data concerning the 45 day rule post the 2001 tax year, being the period when both credits are refundable and the 45 day rule applies. In any event, I do not consider this to be an important issue. It is reasonable to expect that the impact of the 45 day rule would automatically be built into estimates of theta coming from implied market value studies and tax statistic studies. In addition, I see no merit in adjusting estimates of theta from equity ownership studies since this amounts to looking for a level of precision which is not warranted by what is already imprecise data.

**A8.Do you consider that the AER’s approach to SFG’s dividend drop-off study is reasonable? Do you agree with the comments at SFG 2015 paragraphs 186-195?**

Yes – the AER’s approach to SFG’s dividend drop-off study is reasonable.

No – I do not agree with the comments by SFG.

It is well understood that the drop-off in the stock price on the ex-dividend date reflects the value of the thing being distributed – in this case, the value of the dividend and the value of the attached imputation credit. There is, however, a

substantial literature (theoretical and empirical) which suggests the drop-off may also reflect a number of other factors including differential personal taxes and risk. The SFG dividend drop-off study produces a delta coefficient of 0.85 to 0.90 which represents the estimated value of cash dividends (as a proportion of their face value). SFG interprets this as evidence that shareholders do not value dividends as highly. But one would expect a delta coefficient of 1.00 in the absence of other factors, since by definition the (after-company-before-personal-tax) value of one dollar of dividends is one dollar. So in contrast to SFG, the AER interprets this as evidence that other factors such as differential personal taxes and risk are reflected in the estimates. This means that the theta coefficient of 0.35 does not represent the estimated value of imputation credits (as a proportion of their face value) but also reflects the impact of other factors such as differential personal taxes and risk.

The AER's gross-up adjustment<sup>30</sup> to the theta coefficient from SFG's dividend drop-off study is therefore necessary to remove the impact of these other factors. Recall, the item to be estimated is the value of credits before personal taxes and before personal costs not the value of credits after the impact of other factors such as differential personal taxes and risk. It is an indirect adjustment in the sense that we infer the collective impact of these other factors from the delta coefficient, rather than explicitly including these factors in the regression model.

The adjustment does not lead to perverse outcomes as SFG claims, since the lower delta coefficient reflects taxes and costs associated with trading around the ex-dividend date for which compensation is not required.

The adjustment is not inconsistent with the regulatory process as SFG claims. On the contrary, an inconsistency would arise if no adjustment was made since the estimate of theta from the SFG dividend drop-off study would then not represent the value of credits before personal taxes and before personal costs.

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<sup>30</sup> SFG refers to this as a scaling adjustment.

**A9. Do you consider that the AER's approach to estimating gamma results in investors being under-compensated or over-compensated? (Please have regard to SFG 2015 paragraphs 108 to 110).**

No.

SFG's description of the regulatory framework is one where the regulator first determines the amount of dividends/capital gains that investors would require in the absence of imputation and then reduces this amount by the value investors receive from imputation credits. I believe a simpler description is that the regulator determines the appropriate after-company-before-personal-tax rate of return. This return by definition consists of three components: capital gains, dividends and imputation credits – there is no “substitution” of dividends/capital gains for imputation credits as SFG suggests.

In line with the answer to question A5 above, there is no under-compensation as the regulator takes into account the appropriate value of credits in setting the allowed revenues.

## REFERENCES

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## Expert Witness Compliance Declaration

I have read the Guidelines for Expert Witnesses in proceedings in the Federal Court of Australia and this report has been prepared in accordance with those guidelines. As required by the guidelines I have made all the inquiries that I believe are desirable and appropriate. No matters of significance that I regard as relevant have, to my knowledge, been withheld.

Signed



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John Handley

16 April 2015