MEMORANDUM FINAL

TO: Lawrence Irlam, Marcelo Grosso
Australian Energy Regulator

FROM: John Handley
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DATE: 20 October 2009

RE: Advice on Gamma in Relation to the 2010-2015 Qld/SA Electricity Distribution Determinations

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1. INTRODUCTION

In accordance with chapter 6 of the National Electricity Rules, the AER is currently in the process of making a distribution determination for the Queensland and South Australian electricity distribution network service providers. In this regard, you have sought advice on the following matters, which have been raised in the submissions, in relation to the valuation of imputation credits:

(i) The Payout Assumption Underlying the Officer (1994) Model

In a report for ETSA Utilities[1], Professor Officer states that his 1994 paper allows for either an assumption that imputation credits are paid out immediately or an assumption that the payout of credits is subject to delay (including an infinite delay, which is then equivalent to assuming that the credits are never paid out). For example:

> *"While it might be appropriate to assume all earnings are distributed in the year they are earned in a valuation because it can be assumed that earnings retentions are earning their cost of capital, the same cannot be said for the imputation tax credits which are a 'wasting asset', as discussed above. The standard valuation formulae and*

[1] Officer (2009).

imbedded assumptions, do not imply the credits are all paid out as they are earned. The value placed on the estimates of the credits ($\hat{\gamma}$) in the valuation should reflect any delay in their receipt (as well as the extent to which they can be utilised) ... The Officer (1994) paper implicitly assumes that the $\hat{\gamma}$ reflects the value of the credits at the time they are distributed which is consistent[4] with paying them out immediately or them being subject to significant (even infinite) delays.

...

[Footnote] 4: As I pointed out above the Officer (1994) paper never addressed the issue but this does not imply the paper's analysis is wrong."[2]

In a report for Energex and Ergon Energy[3], Synergies Economic Consulting (hereafter Synergies) raise a similar issue. For example:

"We have a number of fundamental concerns with this report [Handley (2009)], including issues of fact. For example, in relation to the distribution rate of 100%, Handley assumes that:

- *Officer's (1994) framework assumes a perpetuity and hence a 100% distribution rate. It is true that the framework is a perpetuity model however we dispute that this implies a 100% distribution rate – instead it implies a constant payout rate (that we observe is around 70%); and*

- *the assumption of 100% is also consistent with the Miller and Modigliani framework. While Miller and Modigliani allowed the payout ratio to vary to illustrate the irrelevance of dividends this is not an explicit assumption of their model."*[4]

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2 Officer (2009 p.3).
3 Synergies Economic Consulting (2009).
4 Synergies Economic Consulting (2009 p.3).

(ii) Updated Estimates From Tax Statistics

Using publicly available statistics sourced from the Australian Tax Office (ATO), Synergies present estimates of the franking credit distribution or payout ratio and the franking credit utilisation or redemption rate relevant to the estimation of gamma. They state that:

> *"The data is similar to that presented in Handley and Maheswaran (2008) but extends their statistical analysis and provides evidence that questions their conclusion. We believe that when properly interpreted, the 'upper bound' that the AER has sought to rely on based on tax statistics is materially lower".*[5]

In particular, they state:

> *"In 2007, of the total credits created, being the total amount of corporate tax paid of $58,189 million, only 58% was actually distributed and the balance was retained within the companies. Between 2003 and 2007, the proportion distributed varied between 58% and 77% with the average proportion distributed was 66%. This is broadly consistent with the findings of Hathaway and Officer (which was a distribution rate of around 71%). Obviously the payout was not 100% as asserted by Handley. The payout was consistent over time supporting the notion that credits are lost in perpetuity. The estimate of the payout of 66% is close to 71% and materially different from 100%.*
>
> *It is important to note that companies consistently only distribute a proportion of available credits. On average 34% of credits are retained by the company. Given the consistent nature of the payout, it appears that the credits retained are indefinite. The present value of the credits retained indefinitely must be zero. In other words, 34% of available credits have no value to shareholders."*[6]

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5 Synergies Economic Consulting (2009 p.6).

6 Synergies Economic Consulting (2009 p.6-7).

And further:

> *"In 2007, of the corporate tax paid, 58% was distributed and 24% was claimed as credits. For the period 2003 to 2007, the maximum proportion of corporate tax that could be considered to be a prepayment of personal tax is 24%. That proportion varied marginally between 20% and 24% with an average of 23%. Therefore, based on actual payout practices, the maximum possible amount that gamma could be on average is 23%. Even if the AER's assumed payout ratio of 100% is applied (although this is not accepted), the maximum possible upper amount for gamma would be 35%."*[7]

Similarly, Professor Officer suggests:

> *"The empirical evidence is more supportive of a long term average payout of about 70%, implying that at least 30% of the franking credits attributable to those earnings are without value"*[8]

2. THE PAYOUT ASSUMPTION UNDERLYING THE OFFICER (1994) MODEL

My comments are as follows:

- The Officer (1994) model assumes a perpetuity framework. This is clear from definitions (a), (b), (c), (d), (e), (f) and (g) used in the derivation of the various cost of capital formula set out in the paper.[9] Importantly, this should not be interpreted as a criticism of the model but rather is a recognition of its simplicity.

- Since all cash flow streams, including associated imputation credits are assumed to be perpetuities then this is equivalent to assuming that 100% of the free cash flow and 100% of the associated imputation credits which are generated in each period, are fully distributed at the end of that period. By definition, a perpetuity means no growth and no growth means full

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7 Synergies Economic Consulting (2009 p.7).
8 Officer (2009 p.4).
9 See pages 5 – 8 of Officer (1994).

distribution at the end of each period … otherwise there would be growth.[10] In other words, it is assumed that no imputation credits are retained at the end of each period.

- Questions concerning delays in the payout of credits and the time value loss associated with retained imputation credits do not arise in the Officer (1994) model. In particular, there is no distinction in the Officer (1994) model between the value of a credit created and the value of a credit distributed, since all credits created in a period (by the payment of corporate tax) are assumed to be fully distributed at the end of that same period. Again, this is not a criticism of the model.

- Interpreting gamma in the Officer (1994) model to allow for a delay in the payout of credits would introduce an internal inconsistency into the model. Officer (1994) assumes all free cash flow is fully distributed at the end of each period and so it would be internally inconsistent to assume there is a full distribution of free cash flow but a less than full distribution of the imputation credits associated with that free cash flow.

- In practice, firms usually do not distribute 100% of the free cash flow and imputation credits generated each period. This is not in dispute. (What is in dispute, however, is the value to be attributed to any retained credits). There are numerous reasons why firms may not fully distribute 100% of the free cash flow and imputation credits generated in a given period, including the case where capital expenditure exceeds depreciation.[11]

- An important question is whether the Officer (1994) model extends to a non perpetuity setting. This has been considered by Monkhouse (1996),[12] who shows that the time value loss associated with the periodic retention of imputation credits can be taken into account by either: (i) directly modelling the assumed dividend policy and franking account

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[10] Strictly speaking, although the value of the firm grows at the cost of capital during each period, there is no growth from one ex-dividend date to the next.

[11] An implicit assumption of a perpetuity model is that the firm is in a "steady state" phase such that depreciation equals capital expenditure each period.

[12] In motivating his paper, Monkhouse (1996 p.186-187) states: *"And the literature demonstrates that the textbook WACC can, in certain circumstances, be applied in a classical tax system to finite-lived projects with non-uniform cash flows. It does not necessarily follow, however, that equations derived in an imputation tax system, under the assumption of constant in-perpetuity cash flows, can be applied to finite lived projects with a varying level of cash flows ... Officer has published extensively on the effect of the Australian dividend imputation tax system on a company's WACC. However, Officer's analysis and equations have been derived in the context of constant, in-perpetuity cash flows ... Unfortunately he offers no guidance as to how any non-uniform cash flows associated with a project of finite life are to be reconstituted into the equivalent constant in-perpetuity cash flows"*

balance over time (and thereby directly valuing the stream of distributed credits over time); or (ii) defining gamma as a weighted average of the value of a distributed credit and the value of a retained credit:

$$\gamma = F \times \theta + (1 - F) \times \psi \qquad (1)$$

where F is the proportion of credits generated in the period that are paid out in the period, θ is per dollar value of a distributed credit and ψ is the per dollar value of a retained imputation credit, where $\psi < \theta$ due to time value loss associated with retaining credits.[13]

- The above weighted average formulation of the value of gamma collapses to a simpler expression if one assumes that retained credits have zero value, i.e.:

$$\gamma = F \times \theta \qquad (2)$$

This is consistent with the views expressed in Officer (2009) and Synergies Economic Consulting (2009). In my previous advice,[14] I noted that it was for reasons of simplicity, that Monkhouse makes this assumption in order to derive (2).[15] It was further noted that an implication of (2) is that all credits retained at the end of each and every period, and not just those credits retained at the end of the last period, are assumed to be never paid out and so to have zero value.

- The extension of the Officer (1994) model by Monkhouse (1996) to a non perpetuity setting is the imputation tax system equivalent of the extension of the Miller and Modigliani (1961) model to a non perpetuity setting by Miles and Ezzell (1980), in the case of a classical tax system.

- An assumption of never paying out retained imputation credits is inconsistent with the general valuation principle of full distribution implicit in the Miller and Modigliani (1961), Miles and Ezzell (1980) (and Officer (1994) frameworks). The standard classical tax system

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13 See equations (2.3) and (2.5) in Monkhouse (1996). It is noted that under this definition, gamma need not be less than one.

14 Handley (2009 p.7).

15 Monkhouse (1996 p.198).

valuation framework of Miller and Modigliani (1961) and Miles and Ezzell (1980) assumes there is either a 100% payout of free cash each period or, in the event of less than full distribution in one or more periods, there is a settling up at maturity, whereby any remaining retained cash flow is distributed at that time. In other words, the standard approach to valuation is to assume the eventual full distribution of free cash flow. Anything less is irrational.[16]

3. UPDATED ESTIMATES FROM TAX STATISTICS

My comments on Synergies' updated estimate of the credit utilisation rate are as follows:

- Using publicly available statistics sourced from the ATO, Handley and Maheswaran (2008) estimate that the imputation credit utilisation rate averaged 71% over the period 1990 to 2004.[17]

- Using publicly available statistics sourced from the ATO, Synergies estimate that the imputation credit utilisation rate averaged 35% over the period 2003 to 2007.[18] As a result, they question the validity of the Handley and Maheswaran (2008) results.

- In my opinion, the Synergies estimate is clearly implausibly low, particularly considering that imputation credits have been refundable to resident individuals, super funds and certain other entities since 1 July 2000.

- There is a critical difference in the methodology used by Synergies compared to that of Handley and Maheswaran (2008), and which can largely explain the different resultant estimates.

Handley and Maheswaran (2008) define the credit utilisation rate to be equal to the ratio of the (estimated) aggregate dollar amount of credits used by equity investors in Australian companies to reduce their personal taxes, to the (estimated) aggregate dollar amount of

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16 See Handley (2008) for further discussion of the importance to valuation of assuming a full distribution of free cash flow (in the context of a classical tax system).

17 See Table 4 in Handley and Maheswaran (2008).

18 See Table 1 in Synergies Economic Consulting (2009).

credits received by investors i.e. the utilisation rate is equal to the ratio of credits used to credits received.[19]

In comparison, Synergies define the credit utilisation rate to be equal to the ratio of credits used to credits distributed.[20] Importantly, they infer the aggregate dollar amount of credits distributed each year from the aggregate dollar amount of franked dividends paid during that year, as disclosed in the ATO statistics. For example, $79.2 billion in franked dividends were paid during 2007. Assuming these dividends were fully franked at a corporate tax rate of 30%, Synergies estimate the amount of credits distributed during 2007 to be equal to $\$79.2 \times {}^{0.3}\!/_{0.7} = \$33.9$ billion.

- There is, however, a fatal flaw with the Synergies approach. Specifically, they have failed to take into account the fact that the aggregate amount of franked dividends paid each year, as disclosed by the ATO, includes an unknown amount of double counting which arises as dividends are paid along chains of interposed entities within the same corporate group structure. This problem of double counting has previously been identified by both Handley and Maheswaran (2008) and Hathaway and Officer (2004), [21] and still remains, notwithstanding the introduction of the consolidation measures from 1 July 2002, pursuant to which corporate groups may (irrevocably) choose to be treated as a single entity for income tax purposes.

This means that the Synergies estimate of the amount of franked dividends paid each year and the corresponding estimate of the amount of imputation credits distributed each year are overstated by an unknown amount and accordingly, the Synergies estimate of the credit utilisation rate is understated by an unknown amount. In short, the Synergies estimates of credit utilisation rates are not reliable.

- This double counting problem is precisely the reason why Handley and Maheswaran (2008) designed their alternative methodology to derive their estimate of the imputation credit utilisation rate from official ATO tax statistics.

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19 Handley and Maheswaran (2008 p.85).

20 In their Table 1, Synergies use the term "Reclaimed Credits" for credits used and "Distributed Credits" for credits used.

21 Handley and Maheswaran (2008 p.88) and Hathaway and Officer (2004 p.11).

- There are two other differences in the methodology used by Synergies compared to that of Handley and Maheswaran (2008) which are worth noting. First, Synergies ignores non resident shareholders in Australian companies whereas Handley and Maheswaran (2008) explicitly take them into account. However, this is unlikely to lead to any material difference since the credit utilisation rate attributable to non resident investors is small.[22] Second, in estimating credits used by funds, Synergies have solely used credits received directly in the form of franked dividends but have not included credits received indirectly as part of a distribution from a partnership or trust. This explains the difference in the estimates for the two overlapping years of 2003 and 2004.[23]

My comments on Synergies' updated estimate of the credit distribution rate (and value of retained imputation credits) are as follows:

- Using publicly available statistics sourced from the ATO, Synergies estimate that the imputation credit distribution rate averaged 66% over the period 2003 to 2007, based on a comparison of (estimated) credits distributed to net tax paid.[24]

- A more direct approach, similar to one used by Hathaway and Officer (2004), is to estimate the credit distribution rate based on a comparison of the change in the aggregate franking account balance to aggregate net tax paid.[25] In particular, the ATO reports that the aggregate franking account balance increased by $69.3 billion, from $79.1 billion at the start of the 2003 tax year to $148.4 billion at the end of the 2007 tax year. Since the aggregate net tax paid over 2003 – 2007 totalled $215.3 billion, then this represents an average distribution rate of 68% over the period.[26] This is consistent with the results of Synergies and Hathaway and Officer (2004).

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22 See Table 4 in Handley and Maheswaran (2008).

23 In their Table 1, Synergies estimates the credits claimed by Funds in 2003 and 2004 to be $1.1 billion and $1.6 billion respectively. In comparison, in their Table 4, Handley and Maheswaran (2008) estimate the amounts to be $1.7 billion and $2.4 billion respectively. These amounts can be reconciled by the Item "Refundable Franking Credits" in the Calculation Statement of the Fund's tax return and, for example, page 21 of the Fund Income Tax and Regulatory Return 2004 Instructions.

24 See Table 1 in Synergies Economic Consulting (2009).

25 See Hathaway and Officer (2004 p.11).

26 Data has been sourced from Table 6: Company Tax, Selected Items for Income Years 1979-80 to 2006-07 in (the most recent edition of) the ATO publication, Taxation Statistics.2006-07. The opening franking account balance of $79.1 billion represents a conversion of the reported balance of $185.4 billion at the end of the 2002 tax year to a tax paid basis (using a corporate tax rate of 30%), in accordance with the introduction of

- It is again repeated that the practice that firms usually do not distribute 100% of the free cash flow and imputation credits generated each period is not in dispute.

- What is in dispute, however, is the conclusion then drawn by Synergies and Professor Officer that this evidence supports the view that around 30% of credits are retained indefinitely and so have zero value. To assume that retained credits will never be paid out is an extreme assumption. Never is a very long time. In effect, the suggestion is that one should extrapolate a trend, based on only twenty years of observations, into the future for an indefinite period of time.

- The assumption that some proportion of credits generated each period are never paid out, requires the dual implicit assumption that some proportion of free cash flow generated each period are similarly never paid out. Whilst the value of retained credits is subject to time decay, the value of retained cash flow is not subject to time decay provided one makes the additional assumption that the retained free cash flow is reinvested at the firm's cost of capital. In my opinion, despite the criticism, an assumption of full distribution of credits each period is no more extreme than is assuming that retained cash can be reinvested at the cost of capital in perpetuity.

- According to the ATO, the aggregate balance of retained imputation credits at the end of June 2007 totalled almost $150 billion. Assuming that retained credits are never paid out is tantamount to assuming that these credits are worthless.

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the simplified imputation system from 1 July 2002. It is noted that the ATO advises that the statistics for the 2006–07 income year were sourced from 2007 company income tax returns processed by 31 October 2008 and accordingly they are not necessarily complete. Further, the reported statistics may not match the statistics reported in previous editions of taxation statistics because the statistics for all income years are updated as each new edition is released.

4. CONCLUSION

Valuation is inherently imprecise and accordingly requires the exercise of professional judgement and the making of appropriate assumptions. The current issue of debate centres on the value of a retained imputation credit (relative to the value of a distributed imputation credit). In my opinion, it is totally unreasonable to effectively assume that the current $150 billion in accumulated franking credits has no value. This is extreme.

In summary, nothing in the reports from Professor Officer or Synergies causes me to change my view concerning the appropriate approach to valuing imputation credits. For convenience, I repeat the conclusion on this matter from my previous advice:

> *"However, whilst the traditional approach arguably injects more realism into the modelling of imputation credits, this is accompanied by a non-trivial requirement to estimate a further three parameters – each of which is subject to substantial uncertainty – and the effect of which is likely to be second order. Accordingly, in my view the best approach is to follow the simpler Officer (1994) framework and define gamma as the value of a distributed imputation credit."*[27]

Finally, in relation to the Synergies study, their updated estimate of the franking credit distribution rate is reasonable, however, their updated estimate of the franking credit utilisation rate should not be relied on, due to the presence a serious flaw in estimation methodology.

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[27] Handley (2009 p.9).

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