

# A regulatory estimate of gamma under the National Gas Rules: Response to Draft Decision

*Report prepared for DBP*

13 May 2011

PO Box 29, Stanley Street Plaza  
South Bank QLD 4101  
Telephone +61 7 3844 0684  
Email [s.gray@sfgconsulting.com.au](mailto:s.gray@sfgconsulting.com.au)  
Internet [www.sfgconsulting.com.au](http://www.sfgconsulting.com.au)

**STRATEGIC FINANCE GROUP**  
S F G C O N S U L T I N G

Level 1, South Bank House  
Stanley Street Plaza  
South Bank QLD 4101  
AUSTRALIA

## Contents

<b>EXECUTIVE SUMMARY AND CONCLUSIONS</b> .....	<b>1</b>
Instructions and background .....	1
Conclusions on key issues .....	1
<b>1. FRAMEWORK FOR ESTIMATING GAMMA</b> .....	<b>3</b>
<b>2. ESTIMATING THE DISTRIBUTION RATE, <math>F</math></b> .....	<b>4</b>
Definition of distribution rate .....	4
Estimate in Draft Decision .....	4
Current AER and ACT view.....	4
Basis of conclusion in Draft Decision .....	5
Substantive issues in estimating the distribution rate .....	5
Evidence of value of retained credits .....	8
Other issues not addressed in Draft Decision .....	9
Conclusion.....	9
<b>3. ESTIMATING THE VALUE OF DISTRIBUTED CREDITS, THETA</b> .....	<b>11</b>
Position in Draft Decision .....	11
Dividend drop-off analysis .....	11
Aggregate tax statistics .....	12
Conclusion.....	14
<b>4. CONSISTENCY</b> .....	<b>16</b>
Summary of issue.....	16
Conclusion.....	17
<b>5. MARKET PRACTICE</b> .....	<b>18</b>
Market practice is to make no adjustment in relation to franking credits .....	18
Interpretation of survey evidence .....	18
Are practitioners using a different approach? .....	19
Conclusions .....	22
<b>6. OTHER ISSUES</b> .....	<b>23</b>
Do non-resident investors benefit from franking credits? .....	23
A simple cross-check for reasonableness.....	24
The role of gamma .....	24
Submissions not addressed in Draft Decision.....	25
<b>7. CONCLUSIONS</b> .....	<b>26</b>
<b>DECLARATION</b> .....	<b>27</b>
<b>REFERENCES</b> .....	<b>28</b>
<b>APPENDIX: CV OF PROFESSOR STEPHEN GRAY</b> .....	<b>30</b>

## Executive summary and conclusions

### Instructions and background

1. This report has been prepared by Professor Stephen Gray, Professor of Finance at the University of Queensland Business School and Managing Director of Strategic Finance Group: SFG Consulting, a corporate finance consultancy specialising in valuation, regulatory and litigation support advice. I have attached a copy of my CV as an appendix to this report.
2. I have been assisted in preparing this report by Mr David Costello of SFG Consulting, whose role was to check references and calculations. The report was authored by me.
3. For the purposes of preparing this report I was provided with a copy of the Federal Court guidelines *Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia* dated 5 May 2008. I have reviewed those guidelines and this report has been prepared consistently with the form of expert evidence required by those guidelines. In preparing this report, I have made all the inquiries that I believe are desirable and appropriate and no matters of significance that I regard as relevant have, to my knowledge, been withheld.
4. The Strategic Finance Group: SFG Consulting (SFG) has been engaged by DBNGP (WA) Transmission Pty Ltd (**DBP**) to provide a report in relation to the estimation of the gamma parameter under the National Gas Rules as part of the review of access arrangements for the Dampier to Bunbury Natural Gas Pipeline.
5. We have previously provided a report (**previous report**) regarding the estimation of the gamma parameter to the ERA's review. That report was dated 31 March 2010 and was titled *A regulatory estimate of gamma consistent with the National Gas Rules*.
6. The ERA's *Draft Decision on Proposed Revisions to the Access Arrangement for the Dampier to Bunbury Natural Gas Pipeline* (**Draft Decision**), dated 14 March 2011, addresses some of the issues set out in our previous report and proposes a regulatory estimate of the gamma parameter. In this report, we respond to the Draft Decision insofar as it relates to the estimation of the gamma parameter.

### Conclusions on key issues

7. Our main conclusions in this report are that:
  - a. Consistent with the conclusion in the draft Decision, gamma should be estimated as the product of two components: the distribution rate or franking credit "payout ratio" ( $F$ ) and the value of distributed credits ( $\theta$ ). That is, gamma is to be estimated as  $\gamma = F \times \theta$ ;
  - b. There is no basis for using an estimate other than 70% for the distribution rate. An estimate of the distribution rate of franking credits is available, it appears to be uncontroversial, and it should be used. If we know that the distribution rate is 70%, we should use a distribution rate of 70%. We should not assume that the distribution rate is, or should be, something different from what we can observe it to be;
  - c. To be consistent with the recent findings of the Australian Competition Tribunal, the Final Decision should:
    - i. Adopt a value of 0.35 as the best available dividend drop-off estimate of theta; and

- ii. Use the tax statistics figure only as an upper bound check on this market-data estimate and not as an independent estimate in its own right;
  - d. It is neither permissible nor appropriate to use different values for the same parameter in two places in the same WACC estimation for the reasons set out by the Australian Competition Tribunal in the *GasNet* case.<sup>1</sup> Consequently, the same estimate of the value of cash dividends should be used consistently throughout the WACC estimation process. If this consistency is imposed, the resulting estimate of theta is immaterially different from zero; and
  - e. It is generally accepted that market practitioners make no adjustment in relation to franking credits. This is consistent with theta, and consequently gamma, being set to zero. The Draft Decision argues that an alternative reason for practitioners making no adjustment is that they use an approach that does not require an estimate of gamma. If that is the case:
    - i. The regulator should look at the estimates from that alternative approach, at least as a cross-check for the estimates that it obtains using the regulatory approach; and
    - ii. In using the two-step regulatory approach, the regulator should ensure that the inclusion of the assumed value of franking credits in the first step, and the removal of the same assumed value of franking credits in the second step are consistent with each other.
8. For the reasons set out above, our conclusion is that an appropriate range for the point estimate of theta is 0 to 0.35. Multiplying the theta estimates by the distribution rate of 0.7 produces a range for gamma of 0 to 0.25. We note that a value at the lower end of this range is consistent with market practice and with the ERA's approach in estimating the required return on equity.

---

<sup>1</sup> Re GasNet Australia (Operations) Pty Ltd [2003] ACompT 6 (23 December 2003), Paragraphs 46-47.

## 1. Framework for estimating gamma

9. In its recent Draft Decision, the ERA concluded that gamma should be estimated as the product of two components: the distribution rate or franking credit “payout ratio” ( $F$ ) and the value of distributed credits ( $\theta$ ). That is, gamma is to be estimated as  $\gamma = F \times \theta$ :

It is widely accepted that the approach adopted by regulators across Australia to define the value of imputation credits, known as “gamma” ( $\gamma$ ), is in accordance with the Monkhouse definition. There are two components of gamma:

- the payout ratio ( $F$ ); and
- theta ( $\theta$ ).<sup>2</sup>

10. We agree with the ERA that this is the standard and appropriate way to estimate gamma. Consequently, estimates are required for the distribution rate or payout ratio ( $F$ ) and the value of distributed credits ( $\theta$ ). This appears to be an issue that is common ground among all of the parties.

---

<sup>2</sup> Draft Decision, Paragraph 661.

## 2. Estimating the distribution rate, *F*

### Definition of distribution rate

11. The distribution rate (or franking credit payout ratio) is the ratio of:
  - a. the total amount of franking credits that are distributed (or paid out) to shareholders during a particular period, to
  - b. the amount of franking credits that are created during that same period.
12. For example, if the average firm created \$100 of franking credits in a year and distributed \$70 of those to shareholders in that year, the distribution rate for that year would be 70%.

### Estimate in Draft Decision

13. The Draft Decision concludes that a distribution rate between 0.7 and 1.0 is an appropriate estimate. This conclusion is based entirely on reasoning from a series of decisions of the AER. In the Draft Decision, the discussion of the distribution rate is set out in Paragraphs 664 to 669. Every paragraph from 664 to 668 consists of a reference to a particular decision or conclusion of the AER. Referring only to the earlier conclusions of the AER, the ERA concludes that:

Based on the above analyses, the Authority considers that the payout ratio between 0.7 and 1.0 is appropriate.<sup>3</sup>

That is, the Draft Decision contains no analysis or consideration of the distribution rate other than references to the conclusions of the AER and is based entirely on the earlier conclusions of the AER.

### Current AER and ACT view

14. In proceedings before the Australian Competition Tribunal, the AER has recently revised its position on an appropriate estimate of the distribution rate. In those proceedings, the AER acknowledged that an estimate above 0.7 was unsupported and therefore that the distribution rate should be set to 0.7. In summarising the AER's position on this issue, the Tribunal stated that:

The AER accepts that on the material presently before the Tribunal, there is no empirical data that is capable of supporting an estimated distribution ratio higher than 0.7. The AER therefore accepts that it is open to the Tribunal to adopt a substitute distribution ratio of 0.7.<sup>4</sup>

15. The Tribunal then concluded and ordered that:

In light of these submissions and the material before the Tribunal, the tribunal concludes that the distribution ratio is 0.7 for the calculation of gamma.<sup>5</sup>

---

<sup>3</sup> Draft Decision, Paragraph 669.

<sup>4</sup> Australian Competition Tribunal [2010] ACompT 9, Paragraph 2.

<sup>5</sup> Australian Competition Tribunal [2010] ACompT 9, Paragraph 4.

16. We note that all of the AER decisions that are cited in Paragraphs 664 to 668 of the Draft Decision (and on which the ERA's Draft decision is based) pre-date the AER's December 2010 submission to the Tribunal and the subsequent order of the Tribunal.

17. Moreover, in its most recent draft decision on the matter, the AER concluded that:

the empirical evidence currently before the AER supports a value of the payout ratio of 70 per cent, which the AER has adopted as the best estimate possible under the current circumstances in accordance with r. 74(2) of the NGR.<sup>6</sup>

### **Basis of conclusion in Draft Decision**

18. Given that:

- a. The estimate of the distribution rate in the Draft Decision was based entirely on conclusions of the AER on the matter; and
- b. The view of the AER and the Australian Competition Tribunal is currently that the appropriate estimate is 0.7 and not a value higher than 0.7,

the reasoning in the Draft Decision is unsustainable and furthermore there is no valid basis for using an estimate of the distribution rate other than 0.7.

### **Substantive issues in estimating the distribution rate**

*Empirical distribution rate is 70%*

19. It appears to be common ground that the observed distribution rate is approximately 70%. This figure is based on estimates from two studies, Hathaway and Officer (2004) who report an estimate of 0.71 and Hathaway (2010) who reports an estimate of 0.69. Both of these studies use data provided by the Australian Taxation Office to measure the ratio of:

- a. the total amount of franking credits that are distributed (or paid out) to shareholders during a particular period, to
- b. the amount of franking credits that are created during that same period.

20. That is, these studies measure the actual distribution rate (exactly as defined) each year and report an average value of close to 0.7. This average distribution rate has been quite stable over the period since imputation was introduced into Australia. For example, the average figure over the most recent ten-year period reported by Hathaway (2010) is immaterially different from the earlier figure reported by Hathaway and Officer (2004).

21. Consequently, it is generally accepted that the actual practice of Australian firms is to distribute to shareholders approximately 70% of the franking credits that are created each year.

---

<sup>6</sup> Australian Energy Regulator, 2011, Draft Decision: Envestra Ltd Access arrangement proposal for the SA gas network, February, p. 109.

*Potential value of retained credits*

22. The Draft Decision recognises that the actual distribution rate, as set out above, is 0.7. However, it goes on to note that the AER had previously adopted a distribution rate of 1.0 on the basis of an *assumption* that the 30% of franking credits that are not distributed are just as valuable to shareholders as the 70% that are. The Draft Decision notes that this is an “assumption”<sup>7</sup> and that the value of 1.0 is “an assumed distribution rate.”<sup>8</sup> Moreover, the AER’s most recent decision on the matter notes that any value above 0.7 would have to be based on “theoretical grounds”<sup>9</sup> whereas “the empirical evidence currently before the AER supports a value of the payout ratio of 70%.”<sup>10</sup>
23. The basis for the AER’s previous assumption (that it currently does not rely on) about an appropriate estimate of the distribution rate being 1.0 is a report from its consultant, Handley (2010). In particular, Handley concludes that retained credits should be assumed to be just as valuable to investors as those that have been distributed.<sup>11</sup> The basis for this conclusion is that those credits that have been retained in one year will be distributed to investors soon after. In this case, the time value loss would be negligible and retained credits would be approximately as valuable to investors as those that have already been distributed.
24. Handley (p. 37) suggests that “investment bankers and or potential corporate raiders” will come up with some means to unlock the value of these retained credits. The AER (SA Final Decision, p. 151) has conjectured that this could be done via three means:
- a. Off-market buy-backs;
  - b. Dividend reinvestment plans; and
  - c. Special dividends.
25. But there are several problems with this view:
- a. All three of these mechanisms are *already* included in the 70% distribution rate. The 70% figure is the ratio of (i) the total amount of franking credits distributed via any means including those set out above, to (ii) the total amount of franking credits created;
  - b. In any event, the mechanisms set out above are small in the overall scheme of things. For example, less than 10 off-market buybacks occur in an average year;
  - c. The amount of “special” distributions for the average firm would be enormous. For the average Australian firm distributing \$70 of franking credits in a given year, an *additional* \$60 in special distributions would have to be made every second year just to keep the franking account balance from building up. This is an extraordinarily large amount of special distributions and there is no evidence that *any* firm has ever distributed anything like this amount of special dividends, much less that the *average* firm does this; and

---

<sup>7</sup> Draft Decision, Paragraph 664.

<sup>8</sup> Draft Decision, Paragraph 664.

<sup>9</sup> Envestra SA Draft Decision, p.109.

<sup>10</sup> Envestra SA Draft Decision, p.109.

<sup>11</sup> Handley (pp. 37-38) recognises that retained franking credits do exist in reality and that they are likely to be valued less than distributed credits, but then concludes that we should ignore this valuation differential when estimating gamma. That is, he concludes that gamma should be estimated either by assuming away the existence of retained credits or by recognizing that they exist and then assuming that they are just as valuable as distributed credits.



- d. The only available evidence on this issue suggests that firms are *not* able to routinely distribute all of their franking credits, but rather that franking account balances are growing to huge amounts over time as more and more credits are retained within the firm. Handley (p. 36) notes that at the end of 2007, no less than \$150 billion of unused retained franking credits were locked inside firms and McKenzie and Partington note (p. 27) that “the tendency has been for the total of franking account balances to rise through time.”
26. For even a dollar of retained credits to be distributed, 100% of the franking credits created in a given year would have to be distributed in that year. And this would then have to happen for the *average* firm *every* year. The fact that this has clearly *not* happened is evidence that retained franking credits are not routinely distributed *at all*.
27. It appears to be logically impossible for retained franking credits to be routinely distributed soon after their retention. In our view, there is no basis for the conclusion that retained credits are just as valuable as those that have already been distributed.
28. An estimate of the distribution rate of franking credits is available, it appears to be uncontroversial, and it should be used. If we know that the distribution rate is 70%, we should use a distribution rate of 70%. We should not assume that the distribution rate is, or should be, something different from what we can observe it to be. This is particularly the case given that the 70% estimate is the best estimate that is available and it has been arrived at on a reasonable basis.

*Looming government liability*

29. Suppose that Handley is correct and that investment bankers or corporate raiders do find a way to distribute retained franking credits quickly so that there is no loss of time value. If this occurs, the \$150 billion of retained credits will be quickly distributed to shareholders.
30. In 2008-09, the *total* taxation revenue for the entire Commonwealth Government was \$278 billion.<sup>12</sup> Consequently, if \$150 billion of tax credits are to be soon distributed to shareholders, the consequences for the Commonwealth Government budget are dire, at best. Yet no concerns have been voiced. The reason for this is a general understanding that, contrary to Handley’s assumptions and conclusions, the \$150 billion of tax credits will *not* be distributed any time soon.

*Time value loss in retained credits*

31. To see why retained credits must be routinely distributed in a timely way to have any substantial value, first note that, by way of example, money loses more than half of its value every seven years if the appropriate discount rate is 11%. That is:

$$\frac{1}{(1.11)^7} = 0.48.$$

---

<sup>12</sup> Australian Bureau of Statistics, Tax Revenue Summary, <http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/5506.0Main%20Features22008-09?opendocument&tabname=Summary&prodno=5506.0&issue=2008-09&num=&view=>, accessed 2/8/10.

32. If the discount rate is 5.71% (corresponding to the risk free rate filed by DBP), money loses a third of its value every seven years. In this regard, I note that McKenzie and Partington state (p. 25) that “clearly undistributed credits will be discounted relative to distributed credits.”
33. Retained franking credits would lose a substantial portion of their value if retained for seven or more years. Any assumption of them having a substantial value would, therefore, have to be based on an explanation of the mechanism by which they could be routinely distributed soon after their retention. This in turn requires an explanation of why we should expect the average firm to be able to do this in the future, when the evidence shows that it has not been able to do this in the past. Even the AER acknowledges that:

it is unlikely that there would be a significant payout of retained imputation credits in the immediate future.<sup>13</sup>

### **Evidence of value of retained credits**

34. The Draft Decision states that:

based on McKenzie and Partington’s advice to the AER, these two authors state that empirical evidence from Hubbard and Kemsley (2001), and Ricketts and Wilkinson (2008), supported the view that retained imputation credits have positive value.<sup>14</sup>

35. We first note that the AER no longer supports this view. In a recent judgment, the Australian Competition Tribunal referred to a submission from the AER that concedes that:

there is no empirical data that is capable of supporting an estimated distribution ratio higher than 0.7.<sup>15</sup>

36. This is consistent with the fact that the studies that formed the basis of the McKenzie and Partington advice have since been discredited. McKenzie and Partington state that:

There is empirical evidence to support the view that retained credits have a positive value. Harris, Hubbard and Kemsley (2001) find that in Australia retained earnings are valued at more than their face value, consistent with additional value arising from undistributed franking credits.<sup>16</sup>

37. Harris, Hubbard and Kemsley (2001) is one of a group of papers written by these co-authors using a technique that they have developed to estimate whether markets value retained earnings more or less than new equity. This empirical methodology is based on a modification to the Residual Income model of Ohlson (1995) that is developed in a series of papers beginning with Harris and Kemsley (1999) and including Collins and Kemsley (2000) and Harris, Hubbard and Kemsley (2001).

---

<sup>13</sup> Envestra SA Draft Decision, p.109.

<sup>14</sup> Draft Decision, Paragraph 641.

<sup>15</sup> Australian Competition Tribunal [2010] ACompT 9, Paragraph 2.

<sup>16</sup> McKenzie and Partington, p. 25.

38. This empirical methodology has subsequently been discredited (correctly in our view) in a series of papers, including Hanlon, Myers, and Shevlin (2003) and Dhaliwal, Erickson, Frank and Banyi (2003), both of which are published in the top-ranked *Journal of Accounting and Economics*.
39. Hanlon et. al. conclude that “the model, tests, and results in Harris and Kemsley are non-diagnostic regarding dividend tax capitalization.” This means that the results say nothing at all about the extent to which dividend taxes or tax credits might be capitalised into stock prices. Specifically, whether or not dividend taxes or tax credits are capitalised into stock prices, and whether or not retained tax credits are materially valued by investors, the results obtained by the authors would be the same.
40. They explain the reason for this as follows:

...the HK empirical specification examines the relative weights on book value and net income as a function of the ratio of retained earnings to book value (REBV). We analytically examine the use of REBV in the Ohlson (1995) model and find it has no role in the determination of firm value, even in a world where shareholder-level taxes are fully capitalized.<sup>17</sup>

41. That is, even if shareholder level dividend taxes were fully capitalized into prices, the key variable that is the centre of the proposed methodology is irrelevant to firm value – the same results will be found whether or not tax credits are materially valued by investors. This means that the results that are cited in McKenzie and Partington are meaningless.
42. Hanlon et. al. also note that Dhaliwal et. al. (2003) reach similar conclusions – that the Harris et. al. test is “non-diagnostic with respect to dividend tax capitalization” and that the results reported in the Harris et. al. studies “are not robust to reasonable alternative design choices.”<sup>18</sup>

### **Other issues not addressed in Draft Decision**

43. Our earlier report contains a number of points in relation to the distribution rate that are not addressed in the Draft Decision. These points are listed and summarised in the Draft Decision, but are not addressed by the ERA. These points include:
- a. Officer (1994) does not assume a full distribution of franking credits. We noted that Officer (1994) includes a detailed worked example which clearly does not assume a full distribution of free cash flows. When Officer (1994) implements the framework of Officer (1994), he does not assume a payout ratio of 1.0; and
  - b. The same estimate of dividend payout should be used throughout the WACC estimation. The Draft Decision uses the actual observed empirical estimate of dividend payout when estimating market risk premium, but uses an assumed payout of 100% when estimating gamma.

### **Conclusion**

44. In our view, there is no basis for using an estimate other than 70% for the distribution rate. An estimate of the distribution rate of franking credits is available, it appears to be uncontroversial,

---

<sup>17</sup> Hanlon, Myers, and Shevlin (2003, p. 121).

<sup>18</sup> p. 121.

and it should be used. If we know that the distribution rate is 70%, we should use a distribution rate of 70%. We should not assume that the distribution rate is, or should be, something different from what we can observe it to be.

### 3. Estimating the value of distributed credits, theta

#### Position in Draft Decision

45. The Draft Decision concludes that:

Given the uncertainty about the estimates of the utilisation rate using dividend drop-off studies and tax studies, the Authority's position is to take a wide range of estimates of the utilisation rate. Overall, the Authority considers that a reasonable range for the value of theta is 0.37 to 0.81.<sup>19</sup>

#### Dividend drop-off analysis

46. The lower bound of the range for theta that was adopted by the ERA in the Draft Decision, 0.37, is based on a dividend drop-off analysis performed by SFG (2009). Dividend drop-off analysis is an empirical technique that is used to estimate the value of distributed franking credits (theta). Estimates are based on a comparison of (a) the stock price change over the ex-dividend date, with (b) the amount of dividends and franking credits paid by the relevant company. There are a number of variations of this methodology, but all involve a comparison of ex-day stock price changes with the respective dividend and franking credit.
47. In a submission to the AER's Review of WACC parameter estimates, SFG (2008) employed a range of variations of the drop-off methodology and reported that the point estimates of theta lay in the range of 0.2 to 0.35.
48. However, in its Draft Decision in that review, the AER concluded that no weight should be given to any drop-off estimate of theta other than one estimate from a single sub-period reported in the study by Beggs and Skeels (2006). Based on this conclusion by the AER, SFG was retained to estimate theta using an updated data set, and using only the Beggs and Skeels variation of the drop-off methodology. The estimate of 0.37 that is referred to in the Draft Decision is taken from that SFG (2009) study. In particular, the SFG (2009) study concluded that extending the data set to include more recent data, but otherwise applying the methodology exactly as in Beggs and Skeels (2006), produced a theta point estimate of 0.37. That study also concluded that when certain statistical adjustments were made in relation to a small number of outlier data points, in order to improve the stability and reliability of the resulting estimate, the best point estimate was 0.24. The SFG (2009) report concluded that 0.24, not 0.37, was the best and most reliable point estimate of theta from applying the Beggs and Skeels methodology to the updated data set.
49. The question of which estimate using the Beggs and Skeels method should be preferred has since become irrelevant. The Australian Competition Tribunal has recently addressed the issue of dividend drop-off analysis and has held that the Beggs and Skeels (2006) variation of the drop-off methodology should not be used and that the AER erred in relying on the Beggs and Skeels study to the exclusion of all other drop-off studies.<sup>20</sup> The Tribunal ordered SFG to conduct a "state-of-the-art" dividend drop-off analysis using a methodology that is agreed with the AER. The terms of reference for that study do not involve the Beggs and Skeels methodology. Rather, the terms of reference set out a range of variations of the drop-off methodology, including what the Tribunal has recently referred to as "the usual method of estimating the dividend drop-off

<sup>19</sup> Draft Decision, Paragraph 681.

<sup>20</sup> Australian Competition Tribunal, [2010] ACompT 7, Paragraphs 145-147.

model.”<sup>21</sup> The result of that study is a theta estimate of 0.35 and this estimate has been accepted by the Tribunal.

50. Consequently, our view is that the results of a dividend drop-off analysis that uses the methodology of Beggs and Skeels (2006) should not be relied upon. This includes the estimates presented in Beggs and Skeels (2006) and the updated estimates presented in SFG (2009) – on which the Draft Decision relies. We note that the SFG (2008) study presents estimates produced using variations of the drop-off methodology other than the Beggs and Skeels method and including the method that the Tribunal refers to as “the usual method.” That study concludes that an appropriate range for the point estimate of theta is 0.20 to 0.35. Moreover, the recent dividend drop-off analysis completed for, and accepted by, the Tribunal also reports an estimate of theta of 0.35. Consequently, we conclude that an appropriate upper bound for the dividend drop-off estimate of theta is 0.35.

### **Aggregate tax statistics**

#### *Approach and ERA conclusions*

51. The upper bound of the range that was adopted by the ERA in the Draft Decision, 0.81, is based on a study of aggregate tax statistics performed by Handley and Maheswaran (2008). The tax statistics approach is to estimate the ratio of (a) the total amount of franking credits redeemed in a given year, to (b) the total amount of franking credits that were created in a given year. That is, it is a measure of the extent to which franking credits are redeemed. The AER estimates this to be 0.74 based on the paper by Handley and Maheswaran (2008), but the ERA uses the estimate of 0.81 from the 2001-2004 sub-period.
52. We note that in the post-2000 period, Handley and Maheswaran do not *measure* the actual amount of franking credits that are redeemed, but rather *assume* that all franking credits distributed to residents will be redeemed.

#### *Tribunal findings and orders*

53. The Australian Competition Tribunal has recently addressed the use of tax statistics studies, holding that the results of such a study would be relevant, but that:

its relevance could only be related to the fact that it was an upper bound. No estimate that exceeded a genuine upper bound could be correct. Thus the appropriate way to use the tax statistics figure was as a check.<sup>22</sup>

54. The Tribunal has further held that:

the tax statistics figure did no more than confirm that the [dividend drop-off] figure was not to be ruled out as being too high, ie higher than the correct figure could possibly be,<sup>23</sup>

and that the AER had made “an error of logic”<sup>24</sup> in using the tax statistics figure as an *estimate* of theta.

---

<sup>21</sup> Australian Competition Tribunal, [2010] ACompT 7, Paragraphs 116.

<sup>22</sup> Australian Competition Tribunal, [2010] ACompT 7, Paragraph 91.

<sup>23</sup> Australian Competition Tribunal, [2010] ACompT 7, Paragraph 92.

<sup>24</sup> Australian Competition Tribunal, [2010] ACompT 7, Paragraph 93.

55. Consequently, we submit that, consistent with the findings of the Tribunal, tax statistics should only be used as an upper bound check on estimates of theta that are based on market data (such as dividend drop-off analyses). That is, the correct approach is to estimate theta using market data and then to check that the resulting estimate is not higher than the theoretical upper bound based on tax statistics.

*Reasons for Tribunal's findings*

56. The AER's consultant on this issue, Associate Professor Handley, suggests that tax statistics provide an *upper bound* for theta. He does not suggest that this approach provides an *estimate* of theta. He specifically notes that the tax statistics estimate:

may be interpreted as a reasonable upper bound estimate of the value of gamma<sup>25</sup>

where:

“upper bound” is used here as a (theoretical) maximum value.<sup>26</sup>

57. Handley has been clear on this point in his advice to the AER throughout the entire regulatory process. In the AER's WACC Parameter Roundtable Handley noted that the tax statistic estimate is:

Not our estimate of gamma, therefore we haven't said that's our estimate of gamma. In some ways, what you could do is you could certainly say that is perhaps an upper bound for what gamma is.<sup>27</sup>

58. Moreover, Handley and Maheswaran (2008) do not claim anywhere in their paper that the tax statistics approach provides an estimate of gamma (or theta) and the title of their paper (and the abstract) make it clear that the paper is about the efficacy of the imputation system (i.e., the extent to which franking credits are *used*) and not about how franking credits might be *valued* or about the impact that imputation might have on the corporate cost of capital.

59. Taking the AER/Handley estimate of 0.74 implies that, on average, 74% of the franking credits that are distributed to shareholders end up being redeemed. But this tells us nothing about the *value* of those franking credits to the shareholders that redeem them.

60. There are a number of reasons why even those shareholders who redeem franking credits would not value them at full face value. First, franking credits are taxed – the investor's taxable income is increased by the amount of the franking credit. Second, there is a time delay – whereas a dividend payment can be spent immediately, franking credits must be filed until the end of the financial year and then logged as part of the investor's personal tax return, with payment arriving after processing by the Australian Tax Office. Third, there is some inconvenience or cost (in terms of accounting fees) involved in redeeming franking credits. Fourth, the AER has relied<sup>28</sup> on the dividend drop-off estimates of Beggs and Skeels which indicate that cash dividends are

---

<sup>25</sup> Handley, p. 15.

<sup>26</sup> Handley, p. 15.

<sup>27</sup> AER Roundtable Transcript, p. 18.

<sup>28</sup> QLD Electricity Distribution Draft Decision.



valued at only 80% of face value. Logically, there can be no investor who values franking credits more than cash dividends.

61. Of course the point of all of this is simply that the tax statistics give us no indication at all of the *value* of franking credits to any investors. Investors would rationally redeem franking credits even if they were valued as low as 10 cents in the dollar – or less. Consequently, knowing how many franking credits are redeemed tells us nothing at all about their value. The only information this provides us is knowledge that the 26% of investors who do not redeem franking credits clearly value them at zero. It is for this reason that Handley himself has advised the AER that his tax statistics approach does not provide an estimate of gamma, but only an upper bound.
62. That is, Handley and Maheswaran (2006) and Handley’s reports to the AER<sup>29</sup> state that tax statistics do not provide “an estimate of gamma,” but rather an “upper bound for gamma.” The reason for this is that the tax statistics establish that 26% of shareholders do not value franking credits at all as they allow them to lapse without being redeemed.<sup>30</sup> The remaining 74% of shareholders presumably do value franking credits, but the tax statistics provide no indication of what this value might be. It could be 100 cents or 1 cent. Under the Handley approach, assuming 100 cents provides an upper bound of 0.74 and assuming 1 cent provides a lower bound of essentially zero. That is, the Handley approach simply narrows the range for theta to 0 to 0.74 – it provides no indication of the appropriate value from within that range.
63. To see this further, note that Handley considers it appropriate to take a weighted average of the value of franking credits to each investor. That is, if 74% of investors value their franking credits at 100% of face value and 26% value them at zero, the weighted average is  $0.74 \times 1 + 0.26 \times 0 = 0.74$ . But we would also see 74% of franking credits being redeemed if residents only valued them at 10 cents in the dollar, in which case the relevant estimate of theta using this approach would be  $0.74 \times 0.1 + 0.26 \times 0 = 0.074$ . It is for this reason that Handley is clear about redemption rates providing an *upper bound* and not an *estimate* of theta. The only thing the tax statistics can do is to narrow the range for theta to 0 to 0.74 – they provide no indication of the appropriate value from within that range.
64. In this regard, we note that the Draft Decision acknowledges that the tax statistics figure:

may be interpreted as a reasonable upper bound on the value of gamma,<sup>31</sup>

and that:

a tax statistics approach can produce an indication of the upper bound estimate of the utilisation rate.<sup>32</sup>

## Conclusion

65. To be consistent with the recent findings of the Australian Competition Tribunal, the Final Decision should:

<sup>29</sup> Most recently, for example, Handley’s report of 19 March 2010, p. 15.

<sup>30</sup> This point is about the proper *interpretation* of the Handley and Maheswaran estimates, so I take their reported estimates (as adopted by the AER) at face value here.

<sup>31</sup> Draft Decision, Paragraph 674.

<sup>32</sup> Draft Decision, Paragraph 675.



- a. Adopt a range of 0.20 to 0.35 as the best available dividend drop-off estimate of theta; and
- b. Use the tax statistics figure only as an upper bound check on the market data estimate and not as an independent estimate in its own right.

## 4. Consistency

### Summary of issue

66. In our previous report, we noted that in previous AER Decisions, inconsistent estimates of the value of cash dividends are used in two places in the AER's reasoning:
- a. The AER's empirical estimates of theta (and consequently gamma) are conditional on an estimated value of cash dividends of 75-80 cents per dollar (i.e., dividend drop-off analysis estimates a pair of estimates, theta *and* the value of cash dividends – the estimate of theta is conditional on the particular estimate of the value of cash dividends); whereas
  - b. The AER's estimate of the required return on equity using the CAPM is conditional on cash dividends being valued at 100 cents per dollar.

67. It is clear that both Handley (2008) and the AER have accepted that there is such an inconsistency:

Handley agrees with SFG that the empirical evidence from dividend drop-off studies – that cash dividends are less than fully valued – presents an apparent inconsistency with the standard CAPM.<sup>33</sup>

68. Moreover, Handley (2009, p.29) notes that the AER has:

- a. Relied upon US dividend yield studies to conclude that dividends are valued at 100 cents per dollar in supporting its use of the standard CAPM in one step of the WACC estimation exercise; and
- b. Relied upon drop-off studies to conclude that dividends are less than fully valued (75-80 cents per dollar) when estimating gamma.

69. Handley (2009, p.29) also notes that this “at first appears to be an inconsistency.” He then notes that the AER is “not concerned with” this inconsistency because it is using different estimates of the value of dividends in the two different steps of its WACC estimation exercise:

i.e. US dividend yield studies in relation to the CAPM and drop-off studies in relation to gamma.<sup>34</sup>

70. On this point, the Draft Decision summarises the Handley and AER views and concludes that:

Based on the above considerations, the Authority is of the view that there is no inconsistency when the estimates of the value of cash dividends are used differently: (i) 75-80 cents per dollar when theta (then gamma) is estimated and (ii) 100 cents per dollar when return on equity is estimated.<sup>35</sup>

71. It is difficult to interpret what the ERA means when it states that there is “no inconsistency” when, in the same sentence, it also states that a different value has been used for the same

<sup>33</sup> AER Review of WACC Parameters, Explanatory Statement, p. 335.

<sup>34</sup> Handley (2009, p. 29).

<sup>35</sup> Draft Decision, Paragraph 657.

parameter in two places in the WACC estimation. We interpret this conclusion in light of the Handley and AER views on the matter – that inconsistent estimates of the value of cash dividends have been used in two places in the WACC estimation, but that the ERA concludes that such an inconsistency is permissible or even appropriate.

### **Conclusion**

72. Our view is that it is neither permissible nor appropriate to use different values for the same parameter in two places in the same WACC estimation, for the reasons set out by the Australian Competition Tribunal in the *GasNet* case.<sup>36</sup> Consequently, the same estimate of the value of cash dividends should be used consistently throughout the WACC estimation process.

---

<sup>36</sup> Re GasNet Australia (Operations) Pty Ltd [2003] ACompT 6 (23 December 2003), Paragraphs 46-47.

## 5. Market practice

### Market practice is to make no adjustment in relation to franking credits

73. In our earlier report, we summarised the relevant evidence about market practice as follows:
- a. The great majority of independent expert valuation reports make no adjustment at all to either cash flows or discount rates to reflect any assumed value of franking credits (Lonergan, 2001; KPMG, 2005);
  - b. The great majority of CFOs of major Australian companies (who between them account for more than 85% of the equity capital of listed Australian firms) make no adjustment at all to either cash flows or discount rates to reflect any assumed value of franking credits (Truong, Partington and Peat, 2008); and
  - c. Published Queensland Government Treasury valuation principles require government entities to make no adjustment at all to either cash flows or discount rates to reflect any assumed value of franking credits (OGOC, 2006).
74. We also noted that credit rating agencies such as Moody's and Standard and Poor's also make no adjustments in relation to franking credits to any quantitative metric that they compute when developing credit ratings for Australian firms.
75. It is generally accepted that market practitioners make no adjustment in relation to franking credits when estimating WACC or firm values. For example, Handley explicitly states that:

there is no disagreement concerning what experts do.<sup>37</sup>

### Interpretation of survey evidence

76. On the issue of survey evidence, the Draft Decision concludes that:
- McKenzie and Partington advised that the 2008 Truong, Partington and Peat study found that the majority of firms do not account for the value of imputation credits because it is too difficult to do so.<sup>38</sup>
77. First, it is important not to lose sight of the big picture in relation to this issue. There is broad agreement that no adjustments are made in relation to franking credits in practice, yet the Draft Decision proposes to make a very big adjustment.
78. Second, it follows (logically) that practitioners must be of the view that making no adjustment in relation to franking credits produces superior results to those that would be obtained if they were to attempt to make some sort of adjustment.
79. Finally, note that the two leading survey responses are that:
- a. Different shareholders value franking credits differently and the net effect of this is that no adjustment should be made in relation to imputation; and

---

<sup>37</sup> Handley Report, p. 3.

<sup>38</sup> Draft Decision, Paragraph 637.

- b. Any adjustment for imputation would have a very small impact on the results.

### Are practitioners using a different approach?

80. The Draft Decision refers to advice to the AER from its consultant on this issue, Associate Professor Handley:

Handley states that, under the conventional approach to valuation (i.e. no imputation credits), Australian firms and independent valuation practitioners recognise that there is no explicit recognition of the value of imputation credits in either the cash flows or in the discount rate.<sup>39</sup>

81. The issue here is whether Australian firms are using a different approach to estimate WACC – one that does not require them to estimate gamma at all.
82. The first point to note in this regard is that it is an overstatement to suggest that Handley *states* that Australian firms *do* use such a different approach. There is no evidence to suggest that this is the case. Rather Handley *conjectures* that Australian firms *may* be using a different approach.
83. Having said this, it is likely that Australian firms *are* using an approach that does not require an estimate of gamma.

#### *Regulatory approach*

84. Handley (2010) explains that the AER's approach is to estimate the cost of equity using the CAPM:

$$r_e = r_f + \beta_e \times MRP$$

where the AER's estimates of  $\beta_e$  and  $MRP$  include the impact of imputation.

85. He then notes (p.7) that when estimating WACC, the effects of imputation must be removed by applying an adjustment factor:<sup>40</sup>

$$r_e^* = r_e \left[ \frac{1-T}{1-T(1-\gamma)} \right]$$

86. In this equation,  $r_e$  represents the total return required by shareholders and  $\left[ \frac{1-T}{1-T(1-\gamma)} \right]$  is the proportion of that return that must be provided by the firm, the remainder being assumed to come in the form of franking credits. Using the ERA's estimates of  $T = 0.30$  and  $\gamma = 0.53$ , 19% of the return to equity comes in the form of franking credits.

<sup>39</sup> Draft Decision, Paragraph 638.

<sup>40</sup> Handley also notes that this adjustment can be made to the cash flows (via the tax wedge) rather than applied to the discount rate, but the point remains the same and the explanation is easier if applied to the discount rates. I agree that this important issue can be most clearly explained in this way and follow Handley in this regard.

87. That is, ultimately the AER requires an estimate of  $r_e^*$ , which Handley calls (p. 7) the *conventional cost of equity*. It then uses two steps to compute  $r_e^*$ . In the first step it uses the CAPM to estimate  $r_e$ , which Handley calls (p. 7) the grossed-up cost of equity. It then applies the adjustment factor of  $\left[ \frac{1-T}{1-T(1-\gamma)} \right]$  as set out on p. 7 (Equation 1) of the Handley Report.

*Practitioner/conventional approach*

88. Handley argues (pp. 8-9) that practitioners may be using what he refers to the *conventional approach*, which is to estimate  $r_e^*$  directly, in a way that does not require any estimate of gamma. He concludes that:

The conventional measure of the cost of equity may be estimated using the Sharpe CAPM in the normal way i.e. using returns based on dividends and capital gains only (and so does not require an estimation of gamma).<sup>41</sup>

89. The implementation of this approach is as follows:

$$r_e^* = r_f + \beta_e \times MRP^*$$

where  $MRP^*$  is “based on dividends and capital gains only” – it is an estimate of the market risk premium as it would be in the absence of imputation. The estimate of the risk free rate and equity beta are independent of whether imputation is included or excluded.

*Comparison of two approaches*

90. We note that the regulatory and practitioner approaches both seek to estimate what Handley calls the “conventional cost of equity,”  $r_e^*$ . This is the return that shareholders require, net of the value of imputation franking credits, and is a quantity that is needed when estimating WACC.
91. The practitioner approach estimates this conventional cost of equity directly using the standard CAPM where the estimate of MRP is based on dividends and capital gains only and does not reflect any value for franking credits.
92. The regulatory approach estimates the same quantity, but applies two steps. First the estimate of MRP is grossed-up to include the assumed value of franking credits, then the resulting figure is adjusted down to remove the effects of franking credits.

*Implementation of practitioner approach*

93. Implementation of the practitioner approach requires an estimate of market risk premium from dividends and capital gains only (i.e., in the absence of any assumed value of franking credits). In this regard, we note that the Draft Decision adopts a value of 6.0% for the market risk premium including franking credits on the basis that gamma is set to 0.53. What is required for the

<sup>41</sup> Handley, p. 9.

practitioner approach is an estimate of MRP excluding the value of franking credits. The relevant information in the Draft Decision is in Table 42.<sup>42</sup> That table shows that:

- a. The average historical excess return from 1958-2008 (the period for which the data is most reliable) is 6.1% including the value of franking credits where gamma is set to 0.5 (Column 3 of the table); and
- b. The average historical excess return from 1958-2008 excluding the value of franking credits (Column 1 of the Table) is 0.4% lower than the value in Column 3 where franking credits are valued with gamma set to 0.5.

94. That is, the ERA's grossing-up of the MRP estimate to reflect the assumed value of franking credits is in the order of 0.4%. Consequently, if the AER were to implement the practitioner approach, it would use the same estimates of risk-free rate and equity beta, but an MRP estimate that is 0.4% lower.<sup>43</sup> Using the parameter estimates from the Draft Decision, the practitioner estimate of the conventional cost of equity would be:

$$\begin{aligned} r_e^* &= r_f + \beta_e \times MRP^* \\ &= 5.46\% + 0.8 \times 5.7\% = 9.94\%. \end{aligned}$$

#### *Implementation of regulatory approach*

95. The regulatory approach first grosses-up the MRP estimate to include the assumed value of franking credits:

$$\begin{aligned} r_e &= r_f + \beta_e \times MRP \\ &= 5.46\% + 0.8 \times 6\% = 10.26\%. \end{aligned}$$

96. In the second step, the assumed value of franking credits is then removed by applying the adjustment factor:

$$\begin{aligned} r_e^* &= r_e \left[ \frac{1-T}{1-T(1-\gamma)} \right] \\ &= 10.26\% \left[ \frac{1-0.3}{1-0.3(1-0.53)} \right] = 8.4\%. \end{aligned}$$

97. Under the regulatory approach, the two steps should exactly offset one another – the assumed value of franking credits is included in the first step and then removed in the second. Using the values from the Draft Decision, however, they do not. The inclusion of the assumed value of franking credits increases the estimated return by 0.32%, but the removal of the assumed value of franking credits reduces the estimated return by 1.9%.
98. That is, there is an inconsistency between the way the Draft Decision includes the assumed value of franking credits in the first step, and then removes the same assumed value of franking credits

<sup>42</sup> Draft decision, Paragraph 733.

<sup>43</sup> Note that these comments should not be regarded as an endorsement of the MRP estimates in the Draft Decision, or of the conclusion that the turmoil associated with the GFC now has zero impact on risk premiums in financial markets, or of the use of an historical sample period that ends in 2008. Rather the point being made here is that the ERA's grossing up of the MRP estimate in relation to franking credits is in the order of 0.4%.

in the second step. The primary reason for this inconsistency is that the assumed value of franking credits in Step 1 is based on the actual distribution rate of 70% whereas the downward adjustment in Step 2 is based on a higher assumed distribution rate.

### **Conclusions**

99. It is generally accepted that market practitioners make no adjustment in relation to franking credits.
100. The Draft Decision argues that one possible reason for them making no adjustment is that they use an approach that does not require an estimate of gamma. If that is the case, it would seem that:
  - a. The regulator should look at the estimates from that alternative approach, at least as a cross-check for the estimates that it obtains using the regulatory approach, and
  - b. In using the two-step regulatory approach, the regulator should ensure that the inclusion of the assumed value of franking credits in the first step, and the removal of the same assumed value of franking credits in the second step are consistent with each other.



## 6. Other issues

101. This section sets out a number of residual issues.

### **Do non-resident investors benefit from franking credits?**

102. The Draft Decision make the “general observation” that:

imputation credits are likely to have some value to non-resident investors, even though it is likely to be less than the value of imputation credits to domestic investors. In addition, non-resident investors can sell shares to domestic investors who are able to utilise imputation credits. Moreover, there may be other tax agreements with foreign countries that may enable the utilisation of imputation credits by non-resident investors.<sup>44</sup>

103. The argument that non-resident investors obtain some value from franking credits because they can sell shares to domestic investors who do value franking credits has long been recognised as a flawed argument.

104. To see why, first consider a long-term buy-and-hold investor. For example, global index funds have to hold shares in Australian firms that are in the relevant index. These investors hold shares permanently and never sell them to resident investors and so never realise any value from franking credits.

105. Next consider a non-resident investor who holds shares in an Australian company and then sells them, reinvesting the proceeds in another Australian company. In this case, the sale price of the shares would reflect any capitalised value of franking credits, but the purchase price of the new shares would similarly reflect any capitalised value of franking credits. That is, the benefit of selling shares where the price reflects some value in relation to franking credits is exactly offset by the requirement to pay more for the new shares.

106. Finally, consider a non-resident investor who holds shares in an Australian company and then sells them to a resident investor, taking the proceeds outside Australia never to return. This seems to be the situation that the ERA has in mind in the Draft Decision. It is not clear that this special group of investors has any relevance to the long-term cost of equity of Australian firms. But even if they do, it is clear that even this group does not benefit from franking credits. To the extent that franking credits are capitalised into stock prices, that occurs equally when buying and selling the stock – which is a wash. This is the same whether franking credits are capitalised at 0%, 50% or 100% of their face value, and it is irrelevant. What is relevant to regulatory cost of capital estimates is the value that investors receive from franking credits *while they own the stock*. The regulatory adjustment in relation to franking credits is in terms of the return that investors receive from the franking credits that are distributed to them while they own the stock. The rate at which franking credits may or may not be capitalised into stock prices has no bearing at all on the one relevant issue – the return that investors receive from the franking credits that are distributed to them while they own the stock.

107. The Draft Decision also suggests that “there may be other tax agreements with foreign countries that may enable the utilisation of imputation credits by non-resident investors.”<sup>45</sup> However,

<sup>44</sup> Draft Decision, Paragraph 658.

<sup>45</sup> Draft Decision, Paragraph 658.

neither the Draft Decision itself, nor the reference to the AER's Queensland Distribution Determination that is used to support this point, provide any evidence or even any examples. Consequently, this is conjecture and in the absence of supporting evidence, provides no basis for an estimate of gamma.<sup>46</sup>

108. Our conclusion on this issue is that there is no evidence that non-resident investors obtain any benefit from franking credits.

### **A simple cross-check for reasonableness**

109. The Draft Decision concludes that the required amount of equity capital could be raised by the benchmark firm if it were to offer investors an expected return of 10.26% p.a. This equity would be provided by domestic and non-resident investors in some proportion. The 10.26% return includes that part of the return that is assumed to come in the form of franking credits. As set out in Paragraph 90 above, the return from dividends and capital gains amounts to 8.4%, with the balance assumed to come in the form of franking credits.
110. That is, the parameter estimates in the Draft Decision imply that non-resident equity can be attracted to the benchmark firm by offering non-resident investors a return of 8.4%. This is the return to equity net of the component that is assumed to be paid in the form of franking credits – because non-resident investors cannot redeem any franking credits that are distributed to them.
111. The Draft Decision also concludes that the return that must be offered to debt holders is 8.71%.
112. In our view, it is unreasonable to suggest that non-resident equity could be attracted by offering a return of 8.4% when those same investors can receive a return of 8.71% on fixed-rate investment-grade debt in the same firm.
113. This is another key cross-check for economic reasonableness that should be applied to determine whether the AER's process for estimating parameters and processing them into an estimate of the required return on equity has produced an outcome that is economically reasonable and consistent with the prevailing conditions in the market. It is clearly unreasonable to suggest that any group of investors could be attracted to commit equity to a firm by offering a return that is less than the return that those same investors can receive on fixed-rate investment-grade debt in the same firm.

### **The role of gamma**

114. The Draft decision suggests that:

A low value of gamma implies that shareholders do not obtain much relief from corporate taxation through imputation credits and therefore require a higher pre-tax income in order to justify investment.<sup>47</sup>

115. This seems to confuse the role of gamma. A low value of gamma means that franking credits have little impact on the corporate cost of capital and that share prices are not materially affected by franking credits. The consequence of this is that resident shareholders benefit greatly from franking credits – as was the original intention of the legislation that introduced the imputation system.

---

<sup>46</sup> Of course, relevant evidence on this issue would have to establish not only that non-residents are able to redeem franking credits, but also that doing so would create a material benefit for them.

<sup>47</sup> Draft decision, Paragraph 662.

116. The introduction of the imputation system results in the government collecting less tax than would otherwise be the case. This raises the question of who benefits from the reduction in tax collected – corporations or shareholders? If gamma takes a low value, the benefit of imputation rests largely with shareholders. If gamma takes a high value, the benefit of imputation rests largely with corporations as a high value of gamma implies that the corporate cost of capital is lower and stock prices are increased due to the capitalisation of franking credits.

**Submissions not addressed in Draft Decision**

117. Our previous report contained a considerable number of submissions. The Draft Decision responded to a number of these submissions and our reply on these issues is set out in this report. A number of the submissions in our previous report were not addressed in the Draft Decision. In this regard we note that Appendix 3 of the Draft Decision sets out a summary of the submissions from our previous report, but does not address any of them.

## 7. Conclusions

118. Our main conclusions are:
- a. The best dividend drop-off estimate of theta that is available to the ERA is the SFG (2008) range of 0.20 to 0.35;
  - b. The Handley and Maheswaran (2008) tax statistics figures can only be used as an upper bound and not as a point estimate of theta;
  - c. The best estimate of the distribution rate is 0.7;
  - d. The product of the highest available dividend drop-off estimate of 0.35 and the distribution rate of 0.7 is 0.25, which is an estimate of the highest value of *gamma* based on the dividend drop-off analysis of market data;
  - e. Dividend drop-off analysis produces a *pair* of estimates. The theta estimate of 0.35 is conditional on an estimate of 0.85 for the value of cash dividends;
  - f. If the dividend drop-off estimate of 0.35 is used as the basis for an estimate of theta (and consequently gamma), consistency requires that a value of cash dividends of 0.85 be used throughout the WACC estimation. It would be inconsistent to adopt an estimate of 0.85 when estimating gamma, but an estimate of 1.0 – for the same parameter – when estimating the required return on equity;
  - g. The SFG (2008) study shows that a number of pairs of (cash dividends, theta) estimates fit the data equally well in a statistical sense. For example, the pair (1,0) fits the data as well as the (0.85, 0.35) estimate. Either of these could be used, but having made a choice, that choice must be used consistently throughout the WACC estimation process. In particular, if the value of cash dividends is to be set to 1 (as the ERA does when estimating the required return on equity), the corresponding estimate of theta is 0;
  - h. The dominant market practice is to make no adjustment for the value of franking credits when estimating WACC; which is consistent with practitioners setting gamma to 0.
119. For the reasons set out above, our conclusion is that an appropriate range for the point estimate of gamma is 0 to 0.25. We note that a value at the lower end of this range is consistent with market practice and with the ERA's approach in estimating the required return on equity. If a value toward the top end of the range is to be used, the corresponding 0.85 value of cash dividends must be used throughout the WACC estimation process.

## Declaration

120. In preparing this report, I have made all the enquiries that I believe are desirable and appropriate and no matters of significance that I regard as relevant have, to my knowledge, been withheld from the Court.



---

Professor Stephen Gray  
13 May, 2011.

## References

- Australian Bureau of Statistics, Tax Revenue Summary,  
<http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/5506.0Main%20Features22008-09?opendocument&tabname=Summary&prodno=5506.0&issue=2008-09&num=&view=>, accessed 2/8/10.
- Australian Competition Tribunal, [2010] Application by Energex Limited (No 2), ACompT 7.
- Australian Competition Tribunal, [2010] Application by Energex Limited (Distribution ratio (Gamma)) (No 3), ACompT 9.
- Australian Energy Regulator, (2009), “South Australia draft distribution determination 2010-11 to 2014-15.”
- Australian Energy Regulator, (2010), “Queensland final distribution determination 2010-11 to 2014-15.”
- Australian Energy Regulator (2008), “Electricity transmission and distribution network service providers – Review of the weighted-average cost of capital (WACC) parameters: Explanatory statement,” December, [www.aer.gov.au/content/index.phtml/itemId/722190](http://www.aer.gov.au/content/index.phtml/itemId/722190).
- Australian Energy Regulator (2009), “Electricity transmission and distribution network service providers – Review of the weighted-average cost of capital (WACC) parameters: Final Decision,” May, [www.aer.gov.au](http://www.aer.gov.au).
- Australian Energy Regulator (2008), “Electricity transmission and distribution network service providers – Review of the weighted-average cost of capital (WACC) parameters: Transcript of Expert Roundtable,” December, [www.aer.gov.au](http://www.aer.gov.au).
- Australian Energy Regulator, (2011), Draft Decision: Envestra Ltd Access arrangement proposal for the SA gas network, February.
- Beggs, D. J. and Skeels, C.L., (2006), “Market arbitrage of cash dividends and franking credits,” *Economic Record*, 82 (258), 239 – 252.
- Collins, J., and D. Kemsley, (2000), “Capital gains and dividend taxes in firm valuation: evidence of triple taxation,” *The Accounting Review*, 75, 405–427.
- Dhaliwal, D., M. Erickson, M. M. Frank, and M. Bany, (2003), “Are shareholder dividend taxes on corporate retained earnings impounded in equity prices?: Additional evidence and analysis,” *Journal of Accounting and Economics* 35, 179–200.
- Handley (2008), *A note on the value of imputation credits*, December, [www.aer.gov.au/content/index.phtml/itemId/722190](http://www.aer.gov.au/content/index.phtml/itemId/722190).
- Handley (2009), *Further comments on the value of imputation credits*, April, [www.aer.gov.au](http://www.aer.gov.au).
- Handley, J. C. and K. Maheswaran (2008), “A measure of the efficacy of the Australian imputation tax system”, *Economic Record*, 84 (264), 82 – 94.

- Hanlon, M., J. N. Myers and T. Shevlin, (2003), “Dividend taxes and firm valuation: a re-examination,” *Journal of Accounting and Economics*, 84, 264, 82-94
- Harris, T., and D. Kemsley, (1999), “Dividend taxation in firm valuation: new evidence,” *Journal of Accounting Research*, 17, 275–291.
- Harris, T., T. Hubbard, and D. Kemsley, (2001), “The share price effects of dividend taxes and tax imputation credits,” *Journal of Public Economics*, 35, 119–153.
- Hathaway, N. and R.R. Officer, (2004), *The value of imputation tax credits – Update 2004*, Capital Research Pty Ltd, November 2004.
- Hathaway, N., (2010), *Imputation Credit Redemption – ATO data 1988 - 2008*, Capital Research Pty Ltd, November 2010.
- KPMG, (2005), “The Victorian Electricity Distribution Businesses Cost of Capital - Market practice in relation to imputation credits Victorian Electricity Distribution Price Review 2006 – 10.”
- Officer, R. R., (1994), “The Cost of Capital of a Company Under an Imputation Tax System,” *Accounting and Finance*, 34(1), 1-17.
- Ohlson, J., (1995), “Earnings, book values, and dividends in equity valuation,” *Journal of Accounting and Economics*, 12, 661–687.
- Lonergan, W., (2001), “The Disappearing Returns: Why Imputation Has Not Reduced the Cost of Capital,” *JASSA*, Autumn 1, 1-17.
- National Gas Rules, Version 2, <http://www.aemc.gov.au/>.
- Queensland Government Treasury, 2006, “Government owned corporations – Cost of capital guidelines,” [www.ogoc.qld.gov.au](http://www.ogoc.qld.gov.au).
- SFG, (2008), “The impact of franking credits on the cost of capital of Australian firms,” 16 September, submission to AER Review of WACC Parameters.
- SFG, (2010), “Response to AER Draft Determination in Relation to Gamma, submission to AER SA Distribution Determination 2010-11 to 2014-15, 13 January.
- Strategic Finance Group, (2010), “A regulatory estimate of gamma consistent with the National Gas Rules,” *Submission to ERA on behalf of DBP*, March.
- Truong, G., G. Partington and M. Peat, (2008), Cost of Capital Estimation & Capital Budgeting Practice in Australia, *Australian Journal of Management*, 33 (1), 95 – 121.

## Appendix: CV of Professor Stephen Gray



## **Stephen F. Gray**

University of Queensland  
Business School  
Brisbane 4072  
AUSTRALIA  
Office: +61-7-3346 8032  
Email: s.gray@business.uq.edu.au

### **Academic Qualifications**

- 1995** Ph.D. (Finance), Graduate School of Business, Stanford University.  
Dissertation Title: Essays in Empirical Finance  
Committee Chairman: Ken Singleton
- 1989** LL.B. (Hons), Bachelor of Laws with Honours, University of Queensland.
- 1986** B.Com. (Hons), Bachelor of Commerce with Honours, University of Queensland.

### **Employment History**

- 2000-Present** Professor of Finance, UQ Business School, University of Queensland.
- 1997-2000** Associate Professor of Finance, Department of Commerce, University of Queensland and Research Associate Professor of Finance, Fuqua School of Business, Duke University.
- 1994-1997** Assistant Professor of Finance, Fuqua School of Business, Duke University.
- 1990-1993** Research Assistant, Graduate School of Business, Stanford University.
- 1988-1990** Assistant Professor of Finance, Department of Commerce, University of Queensland.
- 1987** Specialist Tutor in Finance, Queensland University of Technology.
- 1986** Teaching Assistant in Finance, Department of Commerce, University of Queensland.

### **Academic Awards**

- 2006 Outstanding Professor Award, Global Executive MBA, Fuqua School of Business, Duke University.
- 2002 Journal of Financial Economics, All-Star Paper Award, for Modeling the Conditional Distribution of Interest Rates as a Regime-Switching Process, JFE, 1996, 42, 27-62.
- 2002 Australian University Teaching Award – Business (a national award for all university instructors in all disciplines).
- 2000 University of Queensland Award for Excellence in Teaching (a University-wide award).
- 1999 Outstanding Professor Award, Global Executive MBA, Fuqua School of Business, Duke University.
- 1999 KPMG Teaching Prize, Department of Commerce, University of Queensland.
- 1998 Faculty Teaching Prize (Business, Economics, and Law), University of Queensland.
- 1991 Jaedicke Fellow in Finance, Doctoral Program, Graduate School of Business, Stanford University.
- 1989 Touche Ross Teaching Prize, Department of Commerce, University of Queensland.
- 1986 University Medal in Commerce, University of Queensland.

### **Large Grants (over \$100, 000)**

- Australian Research Council Linkage Grant, 2008—2010, Managing Asymmetry Risk (\$320,000), with T. Brailsford, J.Alcock, and Tactical Global Management.
- Intelligent Grid Cluster, Distributed Energy – CSIRO Energy Transformed Flagship Collaboration Cluster Grant, 2008-2010 (\$552,000)
- Australian Research Council Research Infrastructure Block Grant, 2007—2008, Australian Financial Information Database (\$279,754).
- Australian Research Council Discovery Grant, 2006—2008, Capital Management in a Stochastic Earnings Environment (\$270,000).
- Australian Research Council Discovery Grant, 2005—2007, Australian Cost of Equity.
- Australian Research Council Discovery Grant, 2002—2004, Quantification Issues in Corporate Valuation, the Cost of Capital, and Optimal Capital Structure.

- Australian Research Council Strategic Partnership Grant, 1997—2000, Electricity Contracts and Securities in a Deregulated Market: Valuation and Risk Management for Market Participants.

### **Current Research Interests**

Benchmark returns and the cost of capital. Corporate Finance. Capital structure. Real and strategic options and corporate valuation. Financial and credit risk management. Empirical finance and asset pricing.

### **Publications**

- Chan, K-F., R. Brooks, S. Treepongkaruna and S. Gray, (2011), “Do Trading Hours Affect Volatility Links in the Foreign Exchange Market?” *Australian Journal of Management*, forthcoming.
- Chan, K-F., R. Brooks, S. Treepongkaruna and S. Gray, (2010), “Asset market linkages: Evidence from financial, commodity and real estate assets,” *Journal of Banking and Finance*, forthcoming.
- Parmenter, B, A. Breckenridge, and S. Gray, (2010), ‘Economic Analysis of the Government’s Recent Mining Tax Proposals’, *Economic Papers: A Journal of Economics and Policy*, 29(3), September, 279-91.
- Gray, S., C. Gaunt and Y. Wu, (2010), “A comparison of alternative bankruptcy prediction models,” *Journal of Contemporary Accounting and Economics*, 6, 1, 34-45.
- Feuerherdt, C., S. Gray and J. Hall, (2010), “The Value of Imputation Tax Credits on Australian Hybrid Securities,” *International Review of Finance*, 10, 3, 365-401.
- Gray, S., J. Hall, D. Klease and A. McCrystal, (2009), “Bias, stability and predictive ability in the measurement of systematic risk,” *Accounting Research Journal*, 22, 3, 220-236.
- Treepongkaruna, S. and S. Gray, (2009), “Information volatility links in the foreign exchange market,” *Accounting and Finance*, 49, 2, 385-405.
- Costello, D., S. Gray, and A. McCrystal, (2008), “The diversification benefits of Australian equities,” *JASSA*, 2008, 4, 31-35.
- Gray, S. and J. Hall, (2008), “The Relationship Between Franking Credits and the Market Risk Premium: A Reply,” *Accounting and Finance*, 48, 1, 133-142.
- Gray, S., A. Mirkovic and V. Rangunathan, (2006), “The Determinants of Credit Ratings: Australian Evidence,” *Australian Journal of Management*, 31(2), 333-354.
- Choy, E., S. Gray and V. Rangunathan, (2006), “The Effect of Credit Rating Changes on Australian Stock Returns,” *Accounting and Finance*, 46(5), 755-769.
- Gray, S. and J. Hall, (2006), “The Relationship Between Franking Credits and the Market Risk Premium,” *Accounting and Finance*, 46(3), 405-428.
- Gray, S. and S. Treepongkaruna, (2006), “Are there non-linearities in short-term interest rates?” *Accounting and Finance*, 46(1), 149-167.
- Gray, P., S. Gray and T. Roche, (2005), “A Note on the Efficiency in Football Betting Markets: The Economic Significance of Trading Strategies,” *Accounting and Finance*, 45(2) 269-281.
- Duffie, D., S. Gray and P. Hoang, (2004), “Volatility in Energy Prices. In V. Kaminski,” (Ed.), *Managing Energy Price Risk: The New Challenges and Solutions* (3rd ed.). London: Risk Books.
- Cannavan, D., F. Finn and S. Gray, (2004), “The Value of Dividend Imputation Tax Credits in Australia,” *Journal of Financial Economics*, 73, 167-197.
- Gray, S. and S. Treepongkaruna, (2003), “Valuing Interest Rate Derivatives Using a Monte-Carlo Approach,” *Accounting and Finance*, 43(2), 231-259.
- Gray, S., T. Smith and R. Whaley, (2003), “Stock Splits: Implications for Investor Trading Costs,” *Journal of Empirical Finance*, 10, 271-303.
- Gray, S. and S. Treepongkaruna, (2003), “On the Robustness of Short-term Interest Rate Models,” *Accounting and Finance*, 43(1), 87-121.

- Gray, S. and S. Treepongkaruna, (2002), "How to Value Interest Rate Derivatives in a No-Arbitrage Setting," *Accounting Research Journal* (15), 1.
- Gray, P. and S. Gray, (2001), "A Framework for Valuing Derivative Securities," *Financial Markets Institutions & Instruments*, 10(5), 253-276.
- Gray, P. and S. Gray, (2001), "Option Pricing: A Synthesis of Alternate Approaches," *Accounting Research Journal*, 14(1), 75-83.
- Dahlquist, M. and S. Gray, (2000), "Regime-Switching and Interest Rates in the European Monetary System," *Journal of International Economics*, 50(2), 399-419.
- Bollen, N., S. Gray and R. Whaley, (2000), "Regime-Switching in Foreign Exchange Rates: Evidence from Currency Options," *Journal of Econometrics*, 94, 239-276.
- Duffie, D., S. Gray and P. Hoang, (1999), "Volatility in Energy Prices. In R. Jameson," (Ed.), *Managing Energy Price Risk* (2nd ed.). London: Risk Publications.
- Gray, S. and R. Whaley, (1999), "Reset Put Options: Valuation, Risk Characteristics, and an Example," *Australian Journal of Management*, 24(1), 1-21.
- Bekaert, G. and S. Gray, (1998), "Target Zones and Exchange Rates: An Empirical Investigation," *Journal of International Economics*, 45(1), 1-35.
- Gray, S. and R. Whaley, (1997), "Valuing S&P 500 Bear Market Warrants with a Periodic Reset," *Journal of Derivatives*, 5(1), 99-106.
- Gray, S. and P. Gray, (1997), "Testing Market Efficiency: Evidence from the NFL Sports Betting Market," *The Journal of Finance*, 52(4), 1725-1737.
- Gray, S. (1996), "Modeling the Conditional Distribution of Interest Rates as a Regime- Switching Process," *Journal of Financial Economics*, 42, 27-62.
- Gray, S. (1996), "Regime-Switching in Australian Interest Rates," *Accounting and Finance*, 36(1), 65-88.
- Brailsford, T., S. Easton, P. Gray and S. Gray, (1995), "The Efficiency of Australian Football Betting Markets," *Australian Journal of Management*, 20(2), 167-196.
- Duffie, D. and S. Gray, (1995), "Volatility in Energy Prices," In R. Jameson (Ed.), *Managing Energy Price Risk*, London: Risk Publications.
- Gray, S. and A. Lynch, (1990), "An Alternative Explanation of the January Anomaly," *Accounting Research Journal*, 3(1), 19-27.
- Gray, S. (1989), "Put Call Parity: An Extension of Boundary Conditions," *Australian Journal of Management*, 14(2), 151-170.
- Gray, S. (1988), "The Straddle and the Efficiency of the Australian Exchange Traded Options Market," *Accounting Research Journal*, 1(2), 15-27.

### **Teaching**

Fuqua School of Business, Duke University, Student Evaluations (0-7 scale):

- Financial Management (MBA Core): Average 6.5 over 7 years.
- Advanced Derivatives: Average 6.6 over 4 years.
- Empirical Issues in Asset Pricing: Ph.D. Class

1999, 2006 Outstanding Professor Award, Global Executive MBA, Fuqua School of Business, Duke University.

UQ Business School, University of Queensland, Student Evaluations (0-7 scale):

- Finance (MBA Core): Average 6.6 over 10 years.
- Corporate Finance Honours: Average 6.9 over 10 years.

2002 Australian University Teaching Award – Business (a national award for all university instructors in all disciplines).

- 2000 University of Queensland Award for Excellence in Teaching.
- 1999 Department of Commerce KPMG Teaching Prize, University of Queensland.
- 1998 Faculty Teaching Prize, Faculty of Business Economics and Law, University of Queensland.
- 1998 Commendation for Excellence in Teaching, University-wide Teaching Awards, University of Queensland.
- 1989 Touche Ross Teaching Prize, Department of Commerce, University of Queensland.

### **Board Positions**

- 2002 - Present: Director, Financial Management Association of Australia Ltd.
- 2003 - Present: Director, Moreton Bay Boys College Ltd. (Chairman since 2007).
- 2002 - 2007: External Risk Advisor to Board of Enertrade (Queensland Power Trading Corporation Ltd.)

### **Consulting**

Managing Director, Strategic Finance Group: [www.sfgconsulting.com.au](http://www.sfgconsulting.com.au).

Consulting interests and specialties, with recent examples, include:

- **Corporate finance**
  - ⇒ **Listed multi-business corporation:** Detailed financial modeling of each business unit, analysis of corporate strategy, estimation of effects of alternate strategies, development of capital allocation framework.
- **Capital management and optimal capital structure**
  - ⇒ **State-owned electricity generator:** Built detailed financial model to analyze effects of increased leverage on cost of capital, entity value, credit rating, and stability of dividends. Debt of \$500 million issued.
- **Cost of capital**
  - ⇒ **Cost of Capital in the Public Sector:** Provided advice to a government enterprise on how to estimate an appropriate cost of capital and benchmark return for Government-owned enterprises. Appearance as **expert witness** in legal proceedings that followed a regulatory determination.
  - ⇒ **Expert Witness:** Produced a written report and provided court testimony on issues relating to the cost of capital of a cable TV business.
  - ⇒ **Regulatory Cost of Capital:** Extensive work for regulators and regulated entities on all matters relating to estimation of weighted-average cost of capital.
- **Valuation**
  - ⇒ **Expert Witness:** Produced a written report and provided court testimony. The issue was whether, during a takeover offer, the shares of the bidding firm were affected by a liquidity premium due to its incorporation in the major stock market index.
  - ⇒ **Expert Witness:** Produced a written report and provided court testimony in relation to valuation issues involving an integrated mine and refinery.
- **Capital Raising**
  - ⇒ Produced comprehensive valuation models in the context of capital raisings for a range of businesses in a range of industries including manufacturing, film production, and biotechnology.
- **Asset pricing and empirical finance**
  - ⇒ **Expert Witness:** Produced a written report on whether the client's arbitrage-driven trading strategy caused undue movements in the prices of certain shares.
- **Application of econometric techniques to applied problems in finance**
  - ⇒ **Debt Structure Review:** Provided advice to a large City Council on restructuring their debt portfolio. The issues involved optimisation of a range of performance measures for each business unit in the Council while simultaneously minimizing the volatility of the Council's equity in each business unit.

- ⇒ **Superannuation Fund Performance Benchmarking:** Conducted an analysis of the techniques used by a large superannuation fund to benchmark its performance against competing funds.
- **Valuation of derivative securities**
  - ⇒ **Stochastic Volatility Models in Interest Rate Futures Markets:** Estimated and implemented a number of models designed to predict volatility in interest rate futures markets.
- **Application of option-pricing techniques to real project evaluation**
  - ⇒ **Real Option Valuation:** Developed a framework for valuing an option on a large office building. Acted as arbitrator between the various parties involved and reached a consensus valuation.
  - ⇒ **Real Option Valuation:** Used real options framework in the valuation of a bio-tech company in the context of an M&A transaction.