Report prepared for the

Australian Energy Regulator

Further Issues Relating to the Estimation of Gamma

John C. Handley

University of Melbourne

Final

26 October 2010

1. INTRODUCTION

Pursuant to the National Electricity Rules, the Australian Energy Regulator (AER) is currently in the process of making distribution determinations for the Victorian electricity distribution network service providers (DNSPs) for 2011 – 2015.[1] One part of the determination concerns the valuation of imputation credits[2] (or gamma). The AER released its draft distribution determination for the Victorian DNSPs in June 2010 which included an estimate of 0.65 for gamma. The Victorian DNSPs submitted revised regulatory proposals for the 2011-15 regulatory control period on 21 July 2010, in which Jemena and United Energy proposed a gamma of 0.2 but SP AusNet, Citipower and Powercor proposed a gamma of 0.5. In support, the Victorian DNSPs have provided new reports from SFG Consulting (SFG) and Neville Hathaway/Capital Research,[3] while also referring to arguments and reports considered by the AER in previous reviews.

There are a number of key points of difference between the AER and the DNSPs in relation to the estimation of gamma – with some dating back to a debate between the AER and various network service providers which began when the AER undertook its review of the weighted average cost of capital (WACC) parameters in 2008 and 2009.[4] In this regard, the AER has sought further advice on the issues/arguments raised in the revised regulatory proposals submitted by the Victorian DNSPs.

In this report my comments on the various issues are organised as follows:

- The Definition of Gamma
- Using Dividend Drop-Off Studies in Estimating Theta
- Using Tax Statistics in Estimating Theta and Gamma
- Miscellaneous Issues
- Overall Conclusion on Gamma

A copy of my resume is attached at the end of this report

---

1 Citipower, Jemena, Powercor Australia, SP AusNet and United Energy.
2 The terms "imputation credit" and "franking credit" are used interchangeably in this report.
3 SFG Consulting (2010), Hathaway (2010a), Hathaway (2010b) and Hathaway (2010c).
4 Australian Energy Regulator (2008) and Australian Energy Regulator (2009).

2. THE DEFINITION OF GAMMA

2.1 How Should Gamma be Defined ?

There are three alternative but related approaches to defining gamma.

The first is the traditional approach in which the value of an imputation credit is equal to the product of a credit distribution or payout ratio – representing the proportion of credits generated that are distributed to shareholders, and a credit utilisation or redemption rate – representing the per dollar value of a distributed credit i.e.

$$\gamma = F \times \theta \tag{1}$$

where F is the distribution or payout ratio, θ (theta) is the per dollar value of a distributed credit and γ (gamma) is the value of a dollar of imputation credits.

The second is the Officer (1994) approach in which it is assumed that there is a 100% payout of imputation credits each period and so gamma is equal to the value of a distributed credit:

$$\gamma = \theta \tag{2}$$

where θ (theta) is defined as above.

The third is the Monkhouse (1996) approach which relaxes the assumption of 100% payout of imputation credits each period and incorporates the time value loss associated with the retention of imputation credits into the definition of gamma:

$$\gamma = F \times \theta + (1 - F) \times \psi \tag{3}$$

where F and θ are defined as above and ψ (psi) is the per dollar value of a retained imputation credit where $\psi < \theta$ due to time value loss associated with retaining credits. Equation (3) says that gamma may be interpreted as a weighted average of the value of

a distributed credit and the value of a retained credit. The difference between the value of a distributed credit θ and the value of a retained credit ψ is time value loss only, which in turn depends on the expected retention period, τ (tau) and the appropriate discount rate, δ (delta).

It is straightforward to show that equations (1) and (2) are special cases of equation (3). In particular, substituting $\psi = 0$ into (3) – which corresponds to an assumption that retained credits have no value (relative to the value of a distributed credit) – leads to (1). Similarly, substituting $\psi = \theta$ into (3) – which corresponds to an assumption that retained credits have full value (relative to the value of a distributed credit) – leads to (2). Note that the assumption of $\psi = \theta$ is equivalent to the assumption that $F = 1$.

Equations (1) and (2) therefore correspond to two possible extreme positions concerning the valuation of a retained credit (relative to the value of a distributed credit). This means that for a given value of theta, the traditional approach in (1) will likely understate gamma whereas the Officer (1994) approach in (2) will likely overstate gamma.

The Officer (1994) approach strictly applies in a perpetuity setting. Clearly this is not realistic – it is just a theoretical simplification. In this regard, Monkhouse (1996) formally extends the Officer framework to a more realistic non-perpetuity setting involving the valuation of projects with uneven and or finite cash flows and less than full 100% payout of credits each period. It is well understood that in practice, firms do not regularly distribute all the franking credits generated in a period in that same period, but rather that some credits are distributed and some credits are retained each period.

It is clear that by allowing for less than a full distribution of imputation credits each period, the Monkhouse (1996) approach injects more realism into the modelling of imputation credits. But the benefit of this added realism comes at cost – the need to estimate an additional two parameters – the payout ratio F (which is relatively uncontroversial) and the value of a retained credit ψ (which is highly contentious). Specific issues dealing with the estimation of these two parameters are discussed later.

Now the view of the DNSPs is that the traditional approach – which can be thought of as a "truncated" Monkhouse (1996) approach – should be the preferred approach since it is more realistic and straightforward to implement.[5] In particular, based on 13 years of data sourced from the Australian Tax Office (ATO)[6] the DNSPs suggest that around 70% of credits are distributed (meaning we should set $F = 0.7$) and the remaining 30% of credits will never be distributed (meaning we should set $\psi = 0$). Substituting $\psi = 0$ and $F = 0.7$ into the Monkhouse (1996) definition of gamma, equation (3), gives:

$$\gamma = 0.7\theta \tag{4}$$

where θ (theta) is the per dollar value of a distributed credit.

It should be noted that the DNSPs estimate that retained imputation credits have no value is in reality more of an assumption than an estimate.

Further, the DNSPs claim that distinguishing between distributed credits and retained credits improves the realism of the model and so necessarily leads to a better estimate of gamma, should not be overplayed. The inherent weakness with this view is that it fails to properly take account of the substantial uncertainty surrounding the estimation of the value of a distributed credit (and too readily dismisses the substantial uncertainty surrounding the estimation of the value of a retained credit). We know on theoretical grounds that the value of a retained credit is less than the value of a distributed credit. Now if we had a reasonably precise estimate of theta then adjusting for the difference between the value of distributed credits and the value of retained credits would make more sense. But importantly, at the outset, the estimate of theta is subject to much uncertainty (despite the impression given by the DNSPs to the contrary) and so in my view it is not necessarily the case that the more realistic (and more complicated) Monkhouse (1996) approach leads to a better estimate of gamma compared to the simpler Officer (1994) approach – i.e. in my view, the estimate of theta is already imprecise and so it is not clear that any adjustment involved in applying the Monkhouse

[5] Jemena (2010 p.247). It is noted that there is a large degree of commonality in the arguments presented by the five Victorian DNSPs in their revised regulatory proposals and so for simplicity, I will usually provide references only to the Jemena proposal.

[6] According to Hathaway (2010c p.7): *"The ATO has been publishing data on retained credits as represented by the FAB of companies for 13 years now: 1996 -2008"*

(1996) model will improve the estimate of gamma compared to just taking the estimate of theta as our estimate of gamma. In a nutshell, the Monkhouse (1996) approach seeks to take account of a less than full payout of imputation credits each period (which accords with reality) whereas the Officer (1994) approach does not.

The importance of having due regard to the trade-off involved in choosing between a simple model and a more realistic but more complicated alternative model is further illustrated by comparing the Officer (1994) capital asset pricing model under the Australian imputation tax system to say, the Lally and van Zijl (2003) capital asset pricing model under the Australian imputation tax system. Officer (1994) posits the following capital asset pricing model (CAPM) for the Australian imputation tax system:

$$r_E = r_f + \beta_e \left(r_M - r_f \right) \tag{5}$$

where r_E is the expected grossed-up return on equity for the firm, r_M is the expected grossed-up rate of return on the market portfolio, r_f is the risk free rate and β_e is the equity beta of the firm. In other words, Officer (1994) considers what the standard (Sharpe-Lintner) CAPM would look like under the Australian imputation tax system and suggests that it would take the same form provided returns are grossed up to include the value of imputation credits.[7] In contrast, Lally and van Zijl (2003) extend the Officer (1994) CAPM to take account of the differential taxation of capital gains verses ordinary income that many investors face in reality. In other words, Lally and van Zijl (2003) add to the realism of the model but this also adds to the complexity of the model, as it leads to a CAPM which incorporates an additional two market wide tax parameters.[8] The key point is that whilst the Lally and van Zijl (2003) CAPM is arguably more realistic than the Officer (1994) CAPM, this additional realism comes at a cost of having to estimate two additional parameters – which by definition are subject to uncertainty – and so it is not necessarily the case that the more realistic model (of Lally and van-Zijl (2003)) will lead to a better outcome (compared to that provided by Officer (1994)).

[7] See equation (18) in Officer (1994).

[8] See equations (9) and (10) in Lally and van Zijl (2003).

2.2 What is the Appropriate Payout Ratio for Estimating Gamma?

In the Monkhouse (1996) definition of gamma, F is defined as the proportion of credits generated in the period that are paid out in that same period.[9]

The DNSPs present empirical evidence based on movements in the aggregate Franking Account Balance (FAB) data sourced from the ATO which shows that the franking credit distribution rate averaged around 70% over the 13 year period from 1996 to 2008.[10] There is nothing controversial here and for the purposes of the Monkhouse (1996) definition of gamma, an assumption of $F = 0.7$ appears reasonable. The DNSPs also note that this represents a "long run average payout" ratio rather than the average proportion of credits generated in a period that are paid out in that same period, which appears to suggest that the credits distributed each period consist of a mixture of credits generated in that period and credits generated in an earlier period and previously retained. Whilst this may be true, it is not possible to precisely identify the split between current and retained credits paid out each period since firms generally do not track the timing of when an individual credit is generated and when it is paid out. Rather, firms simply account for a pool of credits in its FAB.[11] Interestingly, any attempt to do this would be complicated by having to make assumptions which typically arise when one seeks to account for movements in an inventory of a homogeneous product.[12] Nonetheless, the distinction between whether the 70% payout each period consists solely of credits generated in that period or consists of a mixture of credits generated in that period and credits generated from earlier periods is not particularly relevant. The important point is that the evidence shows that a net 30% of credits were not distributed over the 1996-2008 period.

The DNSPs also note that the observed 70% distribution ratio includes distributions not only by way of the payment of franked dividends but also all other methods currently used by firms to distribute franking credits to their shareholders, including off-market

---

9 Monkhouse (1996 p.192).

10 Jemena (2010 p.255) and Hathaway (2010c p.7)

11 One exception to this arose when firms were required to maintain three franking account balances to account for Class A, Class B and Class C franking credits which corresponded to different tax regimes.

12 For example, possible approaches for accounting for credits would include the LIFO – last-in-first-out method and the FIFO – first-in-first-out method.

share buy-backs and special dividends.[13] This point is well understood and is not new since the estimated distribution rate has been based on observed movements in the FAB and the FAB records all distributions of credits.

2.3 What Does the Empirical Evidence Show in Relation to the Value of a Retained Credit ?

It is important to be very clear about what the empirical evidence shows and does not show.

The evidence based on FAB data sourced from the ATO shows that the franking credit distribution rate averaged around 70% over the 13 year period from 1996 to 2008 and therefore, that a net 30% of credits were not distributed over the 1996 to 2008.

The evidence does not show that 30% of credits will never be paid out and the evidence does not show that retained credits have zero value, despite the DNSPs giving the impression that to the contrary.

The key point is that the evidence documents a build up of 30% of credits over the last 13 years. Statistically speaking, this represents a very small sample upon which to base an estimate of future distribution activity. Notwithstanding, the DNSPs suggest it is straightforward to jump to the conclusion that this build up of credits will continue forever in perpetuity. But this is a very strong assumption. Not only are the DNSPs suggesting that the current balance of approximately $170 billion in retained franking credits[14] will never be paid out (and so are worthless) but in addition, the DNSPs are suggesting that 30% of the franking credits generated next year, and 30% of the credits generated the year after and 30% of the credits generated each and every year thereafter forever will never be paid out and so are worthless. This is a huge amount of imputation credits to assume has no value.

In fact, there is currently no empirical evidence concerning the value of a retained credit.

---

13 Jemena (2010 p.252) and Hathaway (2010c p.9-10).

14 See Company Tax Table 6 in Australian Taxation Office (2010).

It is clear that franking credits have value when they are distributed and so retained credits have value to the extent that they will eventually be distributed. An important question concerns whether and to what extent observed stock prices reflect the value of retained credits. In other words, to what extent do investors build in an expectation that retained credits will be distributed – and there are two dimensions to consider here: the amount of retained credits that are distributed and the timing of the distribution. In a given period, the observed (after-company-before-personal tax) return on a stock consists of three components: capital gains, dividends and the value of distributed franking credits. The extent to which the market values retained franking credits will be reflected in the observed capital gain – but unfortunately there is no known method that can be used to decompose the observed capital gain into one part due to retained franking credits and one part due to all other factors. In short, this means that we do not know what the market value of a retained imputation credit actually is.

It is worthwhile to make one final point on the DNSPs use of the evidence based on the FAB data sourced from the ATO. The DNSPs conclude that a trend (in this case, the 70% payout) that has been observed over a 13 year period will continue indefinitely into the future. They strongly argue that this is the only logical conclusion to make. But the future is uncertain and the past is not always a good predictor of the future. A good example concerns the dividend policy of Microsoft in the US. Microsoft was founded in 1975 and adopted a policy of not paying any cash dividends. In its 2002 Annual Report, Microsoft stated that the company has not paid cash dividends on its common stock,[15] which meant that Microsoft had not paid a dividend for a period of 27 years. Accounting regulations required Microsoft to account for its employee stock options which were valued using the Black-Scholes option pricing model.[16] An important input in the Black-Scholes model is the amount of dividends expected to be paid on the underlying stock (in this case, Microsoft stock) over the life of the options. For this purpose Microsoft states that it was assumed that no dividends would be paid over the life of the options (a period of 6-7 years on average). Was this a reasonable assumption to make? One may argue that at the time, there was historical evidence which showed that Microsoft had not paid a dividend over the previous 27 years. But did this also show that Microsoft would not pay a dividend over the next 6 – 7 years? Going even

15 For example, see Item 5 in Microsoft (2002).
16 See Note 15 in Microsoft (2002).

further, would one also conclude that at the time the evidence suggested that Microsoft would never pay a cash dividend? In either case, one would be proved wrong. Ultimately, Microsoft paid its first dividend in January 2003 and has paid a dividend each year since then. [17]

To repeat the point: whilst there is empirical evidence concerning the historical distribution rate of franking credits there is no empirical evidence concerning the value of a retained franking credit.

2.4 What is the Value of a Retained Franking Credit ?

As discussed above, the short answer is that we don't know and further that there is no current methodology which will likely give us a reasonable estimate at this time.

What we do know is that the true value of a retained credit ψ (psi) is somewhere between 0% and 100% of the value of a distributed credit θ (theta). If on balance one assumes that the value of a retained credit is 50% of the value of a distributed credit then substituting $\psi = 0.5\theta$ and $F = 0.7$ into the Monkhouse (1996) definition of gamma in equation (3) gives:

$$\gamma = 0.7 \times \theta + (1 - 0.7) \times 0.5\theta = 0.85\theta \qquad (6)$$

In other words, on balance the whole argument concerning the appropriate payout ratio translates into an argument concerning whether one should make a 15% adjustment to the estimated value of θ (theta) in determining gamma. In my view, given the inherent imprecision in the estimate of theta, any adjustment of this magnitude is likely to be spurious.[18]

---

17 See http://www.microsoft.com/investor/Stock/StockSplit/default.aspx

18 The two main approaches to estimating theta: (i) dividend drop-off studies and (ii) taxation statistics are both subject to uncertainties and limitations which means that precision of this order is just not there. For example, in relation to theta estimates based on dividend drop-off studies, the discussion in the last paragraph of section 3.2 below illustrates the spurious nature of such an adjustment.

2.5 A Comment on the Officer (1994) Model

It is important to recognize what the Officer (1994) model is and what it is not.

The Officer (1994) model is a strict perpetuity model. Fact. This means that Officer (1994) assumes that 100% of the cash flow and 100% of the franking credits generated each period are distributed in that same period. The issue of retained franking credits (and the modelling complications which follow) simply does not arise. Fact.

This also means that on theoretical grounds, the Officer (1994) model has no application outside a perpetuity setting and therefore no application to a more realistic non perpetuity setting.[19] Fact. But this does not mean that the Officer (1994) model is not important. On the contrary, the Officer (1994) model provides the theoretical starting point for more complicated models which take account of selected market realities. In this regard, a particularly important contribution is provided by Monkhouse (1996) who extends the Officer framework to a non perpetuity setting which allows for both uneven cash flows and a finite time horizon. The extension however comes at a cost – the need to deal with retained franking credits.

As I have noted in the past, the extension of the Officer (1994) model by Monkhouse (1996) to a non perpetuity setting in the case of an imputation tax system, is equivalent to the extension of the Miller and Modigliani (1961) model by Miles and Ezzell (1980) to a non perpetuity setting in the case of a classical tax system. Specifically, Miles and Ezzell (1980) specify the conditions under which the Miller and Modigliani (1961) classical tax system based valuation framework extends to a non perpetuity setting and similarly, Monkhouse (1996) specifies the conditions under which the Officer (1994) imputation tax system based valuation framework extends to a non perpetuity setting.

Extensions for other market realities have been developed by Lally and van Zijl (2003) and Dempsey and Partington (2008) among others.

[19] It is for this reason that I have previously argued that the McKelly Corporation example which appears in the appendix to Officer (1994) is in fact inconsistent with the model that he develops in the rest of the paper.

In my view, the beauty of the Officer (1994) model is its simplicity whereby complications associated with retained imputation credits (and complications associated with differential tax rates of capital gains and ordinary income) are avoided.

2.6 Hathaway's Extension of the Officer Model for a World with Growth

The DNSPs suggest that the AER and its consultants are under the misapprehension that the Officer (1994) framework cannot cope with growth in a non perpetuity setting and therefore this is the root justification behind their claim that one should assume a full payout of imputation credits for the purposes of estimating gamma.[20] The DNSPs support their argument by reference to Hathaway (2010c) who develops and presents a set of weighted average cost of capital formulae which apply in an imputation tax setting and allows for growth.

The above discussion concerning the Officer (1994) model and the preference for the Officer (1994) definition of gamma, on the grounds of simplicity, should make it clear that the AER and its consultants are under no such misapprehension.

Further, it should be noted that the model developed by Hathaway (2010c) is completely unnecessary and provides nothing new – Monkhouse (1996) has already specified the conditions under which the Officer (1994) model extends to a non perpetuity setting.

[20] Jemena (2010 p.253). See also Hathaway (2010c p.5).

3. USING DIVIDEND DROP-OFF STUDIES IN ESTIMATING THETA

3.1 How Should Theta Be Estimated ?

Theta θ represents the per dollar value of a distributed franking credit. By definition theta cannot be less than zero or more than one. The two main approaches to estimating theta are based on: (i) dividend drop-off studies and (ii) taxation statistics.

The DNSPs suggest that theta should only be estimated using dividend drop-off studies and further give the impression that this is a reasonably straightforward exercise to undertake.[21] There are however a number of issues associated with using dividend drop-off studies to estimate theta which are discussed below. A number of issues associated with using tax statistics to estimate theta are discussed later in section 4.

3.2 The Interpretation Issue

Dividend drop-off studies are regression based and involve three main steps: (i) you construct an appropriate data set, (ii) you run an appropriate regression; and (iii) you interpret the results of the regression to infer the value of a distributed franking credit. Steps (i) and (ii) are subject to a range of econometric issues which are discussed elsewhere.[22]

The focus here concerns a critical issue which effects step (iii) – specifically how the results of the regression should be interpreted.

In general terms, the regression approach involves examining stock price changes on ex-dividend days and relating the observed change to the value of the item that is to be distributed to shareholders – in this case, the value of the cash dividend and attached franking credits.[23] In an ideal economy characterized by no transactions costs or differential taxes, no information asymmetries, competitive price-taking and rational behaviour, the share price is expected to drop on the ex-dividend date by the value of

[21] Jemena (2010 p.256).
[22] McKenzie and Partington (2010).
[23] Technically, the (franked) dividend is paid a short time later (on the dividend payment date), but the impact on the underlying stock price occurs on the ex-dividend date.

the distribution – from which one could then readily infer the value of a distributed credit.

If however, in accordance with empirical evidence, one allows for the presence of differential personal taxes on dividends compared to capital gains and the risk involved in trading around the ex-dividend date, then interpreting the results from dividend drop-off studies is much more complicated. In particular, the regression coefficients from dividend drop-off studies now not only reflect the value of a dollar of franking credits and the value of a dollar of cash dividend but also reflect the impact of the differential personal taxes and risk. This means that multiple interpretations of the value of a distributed credit are possible depending upon what is assumed about differential personal taxes and risk.

Accordingly, caution needs to be exercised in using dividend drop-off studies as a basis for estimating theta. In particular, any estimate of theta is conditional on what one assumes are appropriate values for the differential tax parameter and the risk parameter. It is only if there are no differential taxes and no risk involved in trading around the ex-dividend date, or one assumes them away, that the regression coefficients can validly be interpreted in such a way as to give a clean estimate of the value of theta.

In short, estimating theta from dividend drop-off studies is not as straightforward as the DNSPs suggest. Rather the estimates from such regression based studies are subject to much uncertainty – and it is important to recognise here that the nature of this uncertainty relates not to econometric issues associated with the regression but rather with how the output of the regression should be interpreted. In other words, the estimate of theta is imprecise because one cannot be exactly sure of what it is that is being measured.

The extent of this uncertainty is well illustrated in the earlier analysis conducted by SFG who presents a joint confidence region for the pairs of estimates (for the value of cash dividends and the value of franking credits) from its dividend drop-off study.[24] Depending on whether one assumes cash dividends are valued at 100 cents in the dollar

[24] See SFG Consulting (2009a) and Appendix I in Skeels (2009).

or cash dividends are valued at less than 100 cents in the dollar (equivalently, what one assumes concerning the impact of differential taxes and risk), the resulting SFG joint confidence region suggests that there is a very wide range for plausible estimates of the value of a distributed franking credit (theta)[25].[26] Further, in light of the discussion in section 2 above, it should also be noted that any suggested adjustment to the estimated value of theta for the purposes of taking account of a less than a full payout of franking credits will likely fall within the joint confidence region and so, in my view, is not warranted.

3.3 The Consistency Issue

The above discussion concerning the interpretative difficulties surrounding dividend drop-off studies leads one to ask whether there is some other basis on which you can distinguish among the various possible estimates coming from the dividend drop-off studies. In this regard, the key issue again concerns the impact of differential personal taxes and risk involved in trading around the ex-dividend date.

I have previously argued and documented that the weight of empirical evidence supports the notion that differential taxes and risk effects ex-dividend day pricing and therefore the AER should take these factors into account when using the results of dividend drop-off studies to estimate theta. Whilst SFG continues to disagree with this interpretation, SFG also argues that such a position is inconsistent with the AER's use of the standard CAPM to estimate the cost of equity – which assumes no differential taxes.[27]

To be clear there is no disagreement with SFG's observation that there appears to be an inconsistent treatment of differential taxes in two places – one in estimating theta and one in estimating the cost of equity. Where there is disagreement (and it is

---

25 SFG Consulting (2009 p.42-43).

26 In an earlier report I suggested SFG's joint confidence interval suggests that, if dividend drop-off studies are used, "the usual criterion of statistical significance cannot discriminate" between an estimated value of theta of 0.08 and an estimated value of theta of around 0.78. SFG has noted that the estimated theta of 0.78 is associated with an estimated value of cash dividends of 72 cents in the dollar and so is infeasible. Whilst I agree that the (0.72, 0.78) pair is not a sensible choice, the purpose of my comment was simply to point out the wide range of values of theta which are statistically indistinguishable from each other.

27 SFG Consulting (2010 p.23).

acknowledged that it is unlikely that agreement on this point will be reached) is in relation to the perceived importance of this inconsistency. SFG argues that the inconsistency is critical and therefore the AER's position is untenable. In contrast, it is my view that the inconsistency is not one of any substance (and therefore is not one that needs to be corrected) once it is understood that the AER is relying on the appropriate empirical evidence in the appropriate context – i.e. the empirical evidence suggests that differential taxes are important in interpreting dividend drop-off studies (and so this is what the AER does) but the empirical evidence also suggests that differential taxes are not important in using the CAPM to estimate the cost of equity (and so this is what the AER does). In this regard, it should also be noted that there is no formal theoretical link between the two models but rather the final estimate of gamma (which in part comes from dividend drop off studies) is simply used as an exogenous input in the CAPM to estimate the cost of equity.

In summary, there is nothing new in the inconsistency that SFG refers to but more importantly, the inconsistency is apparent but not real.

4. USING TAX STATISTICS IN ESTIMATING GAMMA OR THETA

The DNSPs suggest that theta should not be estimated from tax statistics for both conceptual reasons and data reasons and in particular, the DNSPs suggest that no reliance should be placed on the Handley and Maheswaran (2008) study whatsoever. A number of issues in this regard are discussed below.

4.1 Why are Redemption Rates from ATO Tax Statistics Relevant to Estimating Gamma ?

The key to understanding why redemption (or utilisation) rates from tax statistics are relevant to estimating gamma is in recognising the underlying source of value of a franking credit to an investor.

It is well understood that under the Australian imputation tax system, tax paid at the company level represents a mixture of corporate tax and personal tax. A distribution of franking credits is the means by which a credit for taxes paid by the company is passed onto (or imputed) to shareholders. Depending on tax status and domicile, franking credits received by investors may be used by investors to reduce their personal taxes, and since 1 July 2000, resident individuals and certain resident funds have been entitled to a refund of any excess imputation credits (i.e. any excess of credits received over and above their tax liability). In other words, it is the reduction in personal taxes, if any, as a consequence of receiving a franking credit which is the ultimate source of value of the credit to an investor.[28]

In this regard, tax statistics concerning the extent to which franking credits have been used by investors to reduce their personal taxes are then relevant in estimating gamma.

There is however an important complication which arises. For the purpose of using a capital asset pricing model to estimate equity returns, the value of franking credits that is required is not the value of franking credits to any one investor or to any single group

[28] As discussed in Handley and Maheswaran (2008) the situation is more complicated for non-residents but the general principle remains the same – the value of a franking credit to a non resident can be modelled as the reduction in the investor's worldwide personal taxes as a consequence of receiving the credit.

of investors but rather is the value of franking credits to the "average" or "representative" investor.[29] Identification of the average investor has been the subject of much debate in the past. But conceptually it is clear that the relevant set of investors are those who determines prices and returns in the relevant market and so ultimately this translates to a question as to whether or not the Australian equity market is integrated with world equity markets.[30] Unfortunately this is an empirical issue to which there is currently no definitive answer.

The AER has adopted a domestic version of the CAPM to estimate expected rates of return, whereby the "market" is represented by a domestic stock index (the All Ordinaries Accumulation Index) and so by choosing a domestic market portfolio, the (equilibrium) value of gamma is by definition equal to a wealth weighted average over all investors in the domestic market – including foreign investors to the extent that they invest domestically. If on the other hand, the AER had adopted an international version of the CAPM whereby the "market" was represented by an appropriate international stock index then the (equilibrium) value of gamma would by definition be equal to a wealth weighted average over all investors in the international domestic market.[31] This distinction is directly relevant to interpreting the results of the Handley and Maheswaran (2008) study which is discussed in the next section.

---

[29] It should be noted that the use of the term "representative investor" in this case is a bit loose. In the standard Sharpe-Lintner CAPM, all investors collectively determine the prices of all assets and demand (hold) the same portfolio of risky assets in equilibrium – the market portfolio. In other words, all investors hold the same portfolio as the representative investor. In other versions of the CAPM which take into account some sort of heterogeneity across investors (such as differential personal tax rates or, in the current context, differential valuation of franking credits) all investors still collectively determine the prices of all assets but different investors demand (hold) different portfolios of risky assets in equilibrium – in this case, portfolio holdings are tilted according to each investor's particular position relative to the market So whilst prices reflect the influence of all investors, different investors hold different portfolios. Specifically, in the current context, each investor holds a diversified portfolio, but one which is tilted according to the value that the investor places on a dollar of franking credits relative to the equilibrium value of franking credits (i.e. gamma) i.e. investors who place a higher than average value on franking credits are expected to be overweight in assets with higher franking credit yields whereas investors who place a lower than average value on franking credits are expected to be underweight in assets with higher franking credit yields.

[30] It is should be noted that in this context, integration does not refer to whether there are capital flows in and out of Australia (which we know there are) or whether the Australian equity market is effected by events on foreign equity markets (which we know it is) but rather whether returns are better explained by an integrated asset pricing model compared to a segmented asset pricing model. In the CAPM framework, this translates to whether domestic assets are priced relative to (and so, expected rates of return are based on) a domestic benchmark (such as the All Ordinaries Accumulation Index) or are priced relative to (and so, expected rates of return are based on) an international benchmark (such as the S&P500 or the MSCI World Index).

[31] It is noted that SFG Consulting (2010 p.27-28) still disagrees with this interpretation.

As a final point, it is noted that the potential usefulness of ATO tax statistics in estimating gamma is acknowledged by Hathaway (2010b p.1) who states that: *"the tax data give an overall measure of redeemed credits. The ATO data ought to give an upper bound for the gamma value of credits. After all, the capital value estimate is a "pay now collect later" measure whereas the ATO data are a measure of the eventual "collect" value."*

4.2 What Does the Handley-Maheswaran (2008) Study Show ?

Handley and Maheswaran (2008) examine taxation statistics in order to estimate the extent to which franking credits have ex-post reduced the personal taxes of various classes of resident and non-resident equity investors in Australian companies over the seventeen year period from 1988 to 2004 and report (in their table 4) an average utilisation rate across all investors of around 70–80%. Notwithstanding this represents a simple average of utilisation rates across investors (rather than a complex weighted average across investors in accordance with a CAPM framework) and assuming the set of investors is indicative of the set of investors in the domestic market portfolio, then this may be interpreted as a reasonable upper bound estimate of the value of gamma.

There appears to be a misconception by the DNSPs concerning what the reported results represent. For example, the DNSPs suggest that tax studies estimate the ratio of credits redeemed in a given year to the number of credits created in that year and so these studies provide limited information on the value of imputation credits to those investors.[32] Similarly, SFG appears to suggest that the Handley-Maheswaran results simply represent the proportion of credits claimed by investors but not necessarily the redemption value of those credits.[33]

---

[32] For example, Jemena (2010 p.258) states: *"Tax studies would only be relevant to estimating theta if one assumed that the value of redeemed credits was equal to 100 per cent of their face value. If on the other hand, the value of these credits to redeeming investors was only 50 per cent of their face value, then theta would be 50 per cent of the redemption rate."*

[33] For example, SFG Consulting (2010 p.25) states: *"Handley and Maheswaran (2008) and Handley's reports to the AER[] 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. 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."*

For the avoidance of doubt, it is noted that Handley and Maheswaran (2008) clearly state that they estimate the amount of personal tax that has been reduced by investors as a result of having received franking credits i.e. the extent to which credits have been used to reduce personal taxes.[34] In other words, Handley and Maheswaran (2008) do not simply estimate the amount of credits claimed by investors and do not simply estimate the proportion of credits claimed by investors (as a proportion of credits created) but rather, they estimate the end use value of those credits in offsetting personal tax liabilities for tax paid at the corporate level.

Accordingly, the item that is estimated by Handley and Maheswaran (2008) is the item of interest that is sought from taxation statistics in relation to estimating gamma.

An important question is, why can the Handley and Mahewaran (2008) results be interpreted as an upper bound on gamma ? The answer follows from the discussion in section 4.1 above. As have been previously stated, the ultimate source of value of a distributed franking credit is the amount of personal tax saved as a result of receiving that credit. Ignoring any timing difference between the receipt of the franking credit and the receipt of the tax saving (whether by way of tax offset or straight refund of the franking credit), Handley and Maheswaran (2008) estimate the aggregate reduction in personal taxes due to the aggregate receipt of franking credits. Since it is extremely unlikely that credits would be worth more than this amount and in the absence of a market for the trading of franking credits, the redemption rate by definition represents an upper bound on the value of a distributed franking credit (theta) and so represents an upper bound of the value of a franking credit (gamma). How relevant an upper bound it is depends on the extent to which the Australian equity market is assumed to be integrated with world equity markets. If the Australian market is considered to be segmented – and recall this means that a domestic CAPM is used to estimate equity returns (which is what the AER does) – then the estimates from Handley and Maheswaran (2008) can be interpreted as wealth weighted average franking credit redemption rates and so may be taken to represent a reasonable upper bound on the value of gamma. On the other hand, if the Australian market is considered to be

[34] Handley and Maheswaran (2008 p.83) state: *"The purpose of this paper is to examine whether the elimination of the double taxation of dividends has in fact occurred. In particular, we measure the efficacy of the Australian imputation tax system by the extent to which imputation credits have reduced the personal tax liabilities of equity investors in Australian firms."*

integrated – and recall this means that an international CAPM is used to estimate equity returns (which is not what the AER does) – then the estimates from Handley and Maheswaran (2008) cannot be interpreted as a wealth weighted average franking credit redemption rates and so would not represent a reasonable upper bound on gamma. Since the current approach of the AER is to adopt a domestic CAPM in estimating equity returns then it follows that Handley and Maheswaran (2008) provides a reasonable upper bound on the value of gamma.

Finally, three further features of the Handley and Maheswaran (2008) study are worth noting. First, Handley and Maheswaran (2008) describe in detail the methodology that they have used in estimating the extent to which imputation credits received have been used to reduce the personal taxes of investors. Second, Handley and Maheswaran (2008) expressly identify the limitations with the data (including when data is unavailable) and clearly state when assumptions have been made and clearly state the basis on which those assumptions have been made. Third, Handley and Maheswaran (2008) has been published in a peer reviewed high quality academic journal and so has been subjected to the standard refereeing process typical of such publications.

4.3 Hathaway's Commentary on the Handley-Maheswaran (2008) Study

The DNSPs seriously questioned the integrity of the results of the Handley and Maheswaran (2008) study. Specifically, based on a commentary by Hathaway (2010a), the DNSPs conclude that the Handley and Maheswaran (2008) study has been discredited and no reliance should be placed on it.[35]

In this section I review the Hathaway (2010a) commentary and conclude that it is a paper without substance. Specifically, as will be explained below, every criticism that Hathaway (2010a) raises or alludes to is either based on a misunderstanding or an incomplete reading of the Handley and Maheswaran (2008) study or simply is just without foundation.

[35] Jemena (2010 p.260-261, 268). Similarly, United Energy (2010 p.171) state: *The tax study by Handley and Maheswaran (2008c) has been discredited, as a result of investigations undertaken by Hathaway, and reported in Hathaway (2010g1). The data used in the Handley and Maheswaran (2008c) study was contrived and the results are therefore invalid. The AER should resile from using the flawed results of this published work."*

In short, the Hathaway (2010a) paper has no credibility as a valid commentary on the Handley and Maheswaran (2008) study.

Moving on to specifics, Hathaway (2010a) makes the following Statement of Conclusions about the Handley and Maheswaran (2008) study:[36]

> *"• This paper should not be used for application to corporate and regulatory issues within Australia.*
>
> *• The results are contrived as they are based on analyses of data that the authors themselves have created by their assumptions.*
>
> *• They ignore significant changes in the taxation regime associated with franking credits and miss important data.*
>
> *• This paper does not address the access of investors to company tax via credits. It focuses solely on the credits of distributed dividends and does so via contrived tax statistics. Notwithstanding that tax statistics can only give an upper bound for theta, the problems with the estimates within this paper make it most unsuitable for practical use."*

Hathaway (2010a) sets out his reasons for these conclusions in the Executive Summary:[37]

> *"• This paper purports to establish estimates for the utilisation of distributed franking credits, known as theta. The estimated numbers range between 67% (1990-2000) and 81 % (2001-2004).*
>
> *• Some of these results are of dubious quality because:*
>
> *• The authors create their dividend income data for non-resident investors. They use dividend withholding tax (DWT) data to*

[36] Hathaway (2010a p.3).
[37] Hathaway (2010a p.3).

estimate both franked and unfranked dividends but DWT is not collected on franked dividends, only on unfranked dividends.

- *They average data over periods of quite different tax regimes: the period 2001-2004 encompasses the "old" imputation tax system and the new "simplified" imputation tax system (STS) which was introduced on 1 July 2002 and had extensive transition arrangements.*

- *Apparently not appreciating the impact of the abolishment of the Inter Corporate Dividend Rebate on investors behaviour, they "smoothed the reported amounts for 2000 and 2001" to overcome "a material spike" in the data.*

- *There is double counting of dividends and credits. They combine final recipients (Individuals and Funds) with pass-through investors (Trusts and Partnerships) ignoring the fact that many of these pass-through investors return their dividends and credits to the very companies that issued them.*

- *They ignore the super funds within Life Offices which are final claimants of credits but reporting as companies.*

- *They present a series of excess credits for Personal taxpayers but offer no justification at all for this series. It is not published by the ATO so it must have been estimated by the authors.*

- *They compare $64 unfranked dividends to $64 franked dividends in the hands of various investors and get different after-tax returns. This is hardly surprising because one already has $36 company tax paid and the other has zero company tax paid. They claim the perverse result that the only class of nonresident investors that can utilise the franking credits are those that get no credit for any tax paid in Australia on their unfranked dividends."*

I will now comment on each of these criticisms in turn (and for brevity will refer to Handley and Maheswaran (2008) as HM and Hathaway (2010a) as Hathaway in this part of the report).

(i) *"The authors create their dividend income data for non-resident investors. They use dividend withholding tax (DWT) data to estimate both franked and unfranked dividends but DWT is not collected on franked dividends, only on unfranked dividends."*

This corresponds to what Hathaway also refers to as the non-resident data problem.[38]

There are three elements to his criticism.

First, Hathaway notes that HM have created their dividend and franking credit data series for non-resident investors and then proceed to analyse the data series they have created. He later refers to the franked dividend series for non-residents as *"just a contrived series they have created by their assumptions"*[39] – a statement which conveys all the negative connotations which arise from using such a description.

Second, Hathaway notes HM have used reported dividend withholding tax (DWT) data for the period 1988-2001 to estimate both the franked and unfranked non-resident data series and states that whilst it is reasonable to attempt to use DWT to estimate unfranked dividends paid to non-residents, it is totally inappropriate to do so for franked dividends because DWT is not levied on franked dividends.

Third, Hathaway notes that the HM franked dividend series for non-residents is based on an assumption concerning the proportion of franked dividends to total dividends paid to non residents each year (specifically 50% pa for three years followed by 63% pa thereafter) and suggests that *"this is a crucial input into their created data series but receives scant justification."* [40]

---

38 Hathaway (2010a p.18).
39 Hathaway (2010a p.11).
40 Hathaway (2010a p.7).

But none of these criticisms are valid.

In regards to the first, it is baseless to criticise a study simply because the authors have created a data series from a number of data sources. The important issue is whether the authors disclose the methodology they have used to construct the data series – and this is precisely what HM has done in section III of their paper.[41]

In regards to the second, HM explain how they have used the observed DWT data to estimate both the franked and unfranked non-resident data series and in doing so that DWT is assumed to be payable on unfranked dividends but not on franked dividends (contrary to the claim by Hathaway).[42]

In regards to the third, Hathaway's claim that there is scant justification for the particular assumption referred to is just plain wrong. HM provide a detailed explanation to support this assumption in their footnote 8 [43]. [44]

---

[41] See section III entitled "Data and Methodology" in Handley and Maheswaran (2008 p.85-88).

[42] See Handley and Maheswaran (2008 p.84, 87-88). Specifically, HM note that non-resident investors come from a variety of countries and take a variety of forms including individuals, companies, funds, trusts and partnerships, and since it is not feasible to consider all possible combinations in detail, they assume that all non-resident investors may be classified according to one of three broad types: (i) the investor is tax exempt in its home country, for example, US and UK pension funds (referred to as a Type I non-resident); (ii) the investor is domiciled in a country with which Australia has a Double Tax Agreement (DTA) and Australian DWT is fully creditable against any home country personal tax liabilities (Type II non-resident); and (iii) the investor is domiciled in a country with which Australia does not have a DTA and Australian DWT is not creditable against any home country personal tax liabilities (Type III non-resident). For 1988-2001, HM then use DWT data sourced from the ATO to estimate the amount of unfranked dividends, franked dividends and imputation credits paid to each class of non-resident each year using the simple model described in their equations (2) and (3). By definition, the aggregate amount of DWT paid by non-residents each year is equal to $DWT = d_I D_I^U + d_{II} D_{II}^U + d_{III} D_{III}^U$ where d_I, d_{II}, d_{III} is the rate of DWT imposed on unfranked dividends paid to Type I, II and III non-residents and $D_I^U, D_{II}^U, D_{III}^U$ is the amount of unfranked dividends paid to Type I, II and III non-residents each year. HM state that *"In using Equations (2) and (3), we assume that DWT is imposed at a rate of 15 per cent (30 per cent) on unfranked dividends paid to Type II (Type III) non-residents" (p.87)* and further that "*certain dividends are exempt from DWT, including franked dividends and dividends paid to foreign super/pension funds provided the fund is exempt from tax in its home country. (p.84)*" – in other words, consistent with their definition of Type I non-residents, HM assume that DWT is imposed at a rate of 0 per cent on unfranked dividends paid to Type I non-residents. (For justification of the assumed DWT rates, see for example, CCH Australia (2004, para. 22-010), Australian Taxation Office (2006a p.143) and Department of the Treasury (2010) and say Bodie, Kane and Marcus 2009 p.100). For 2002-2004, DWT data was not available and so HM estimate the amount of franked and unfranked dividends paid to non-residents over this period based on data from the earlier 1991-2001 period i.e. that non-residents receive 25% of the total dividends paid in each year (to resident individuals, funds, trusts, partnerships and non-residents combined) of which 63% are franked.

[43] See Handley and Maheswaran (2008 p.87-88). Specifically, HM estimate that the proportion of franked dividends paid to all investor classes after excluding resident individuals, funds, trusts and partnerships, averaged 63 per cent over 1991-2001. In other words, this amount applies to non-residents,

(ii) *"They average data over periods of quite different tax regimes: the period 2001-2004 encompasses the "old" imputation tax system and the new "simplified" imputation tax system (STS) which was introduced on 1 July 2002 and had extensive transition arrangements."*

(iii) *"Apparently not appreciating the impact of the abolishment of the Inter Corporate Dividend Rebate on investors behaviour, they "smoothed the reported amounts for 2000 and 2001" to overcome "a material spike" in the data."*

Collectively, (ii) and (iii) correspond to what Hathaway also refers to as the post 2000 data problem.[45]

There are two elements to his criticism.

First, Hathaway suggests there is a problem simply because the average results reported for the 2001 – 2004 period straddles the introduction of the Simplified Imputation System (SIS) from 1 July 2002.

---

life assurance companies, other companies and tax exempt entities but since it is not possible to break it down into separate components attributable to each of these remaining investor classes, HM use this as their estimate of the proportion of franked dividends paid to non-residents over that same period. A lower rate of 50% was assumed for the earlier 1988-1990 period to allow for the likely higher proportion of unfranked dividends paid to non-resident investors prior to the introduction of anti-dividend streaming rules in 1990.

[44] In addition, in their footnote 9, HM explain that their assumed split of non-resident investors into 30% Type I, 60% Type II and 10% Type III is based on ten years of data sourced from the Australian Bureau of Statistics (ABS) – the only reliable public data that is available. In particular, the ABS distinguishes between portfolio investment (e.g. funds) and direct investment (e.g. multinationals) and *"Over the 10-year period from 1992 to 2001, 89 per cent on average of the total level of foreign equity investment in Australia was attributable to investors from OECD countries, whereas 29 per cent on average was attributable to portfolio investors from the UK and USA" (p.88).* In other words, the ABS data suggested that (about) 30% came from portfolio investors from the UK and USA (the bulk of which would be funds) and so HM assume Type I = 30% and the ABS data also suggested that (about) 10% came from non OECD countries (countries which are more likely to be tax havens/not have double tax agreements in place) and so HM assume Type III = 10% with Type II being the balance. HM also note *"the limitation expressed by the Australian Bureau of Statistics, that it is inherently difficult to estimate the precise nature of non-resident equity investment in Australia because 'where nominees are involved, the issuer generally does not know who holds the share'."*(p.88). The above limitation noted by the ABS would still arise even if one had access to the share registries of each firm. Combining with the assumed DWT rates of 0, 15 and 30 percent for Type I, II and III non-resident investors leads to the observation by Hathaway (2010a p.6) that HM have effectively assumed a constant weighted average DWT rate of 12 per cent.

[45] Hathaway (2010a p.18).

Second, Hathaway suggests there is another problem since HM smooth "the data" for 2000 and 2001. He suggests that HM erroneously assume an error in the ATO data represented by a spike when in fact it was a real event in the market place and should not have been treated as an error in the data (i.e. Hathaway suggests that it arose from the market place reaction to the Australian Treasurer's announcement in 1999 of the abolition of the Inter-Corporate Dividend Rebate).

Again, neither of these criticisms is valid.

In regards to the first, it is noted that the changes introduced by the SIS were essentially mechanical in nature[46] and so it is considered highly unlikely that the introduction of the SIS has had any material impact on the results reported in table 4 of HM concerning the utilisation of franking credits.

In regards to the second, Hathaway exaggerates the extent to which "the data" was smoothed. Specifically, HM state that they smoothed the reported DWT (and only the DWT) amounts for 2000 and 2001 by taking a simple average over the 2-year period i.e. no other data was smoothed.[47] This means that HM's estimated credit utilisation rate for 2000 (reported in table 4) is slightly higher than it otherwise would be (i.e. in the absence of smoothing) and the estimated credit utilisation rate for 2001 (reported in table 4) is slightly lower than it otherwise would be [48] and further, the effect would be even less on the various average utilisation rates reported by HM (1990-2000, 2001-2004 and 1990-2004). In other words, irrespective of the cause of the spike in the reported data, the minor smoothing adjusted undertaken by HM would have had no material impact on their results and so the problem that Hathaway alludes to does not exist.

---

[46] For example, according to Australian Tax Office (2004 p.5), *"The system is largely unchanged for individuals who receive franked dividends ... The simplified imputation system generally provides the same outcomes as the previous system, but changed the mechanics of the former system to provide: simpler rules; increased flexibility in franking distributions; and consistency of treatment across entities receiving franked dividends."*

[47] Handley and Maheswaran (2008 p.83).

[48] By taking an average over the two years, the DWT data reported in HM's table 4 is lower for 2000 and higher for 2001 compared to that reported by the ATO . Therefore, by smoothing these amounts, HM's estimate of franked dividends paid to non-resident investors is lower in 2000 and higher in 2001 than would be the case in the absence of smoothing and (due to the relatively low use of credits by non-residents) the average utilisation rate is higher in 2000 and lower in 2001 than would be the case in the absence of smoothing.

(iv) *"There is double counting of dividends and credits. They combine final recipients (Individuals and Funds) with pass-through investors (Trusts and Partnerships) ignoring the fact that many of these pass-through investors return their dividends and credits to the very companies that issued them."*

This corresponds to what Hathaway also refers to as the double counting problem.[49]

Hathaway notes that in their table 3, HM have presented combined aggregate dividend data for five separate groups: individuals, funds, trusts, partnerships and non residents and so is correct to point out that since part of the dividend received by trusts in particular would likely flow back to companies, then there is some (unknown) element of double counting in the aggregate dividend data in table 3. [50]

However, Hathaway misrepresents the importance of the issue as he fails to note that, for the purposes of estimating gamma, the relevant table in HM is not table 3 but rather is table 4. Importantly in table 4, only individuals, funds and non residents are included and so there is no double counting problem along the lines that he suggests. Specifically, HM's estimate of the average utilisation rate of imputation credits is based only on credits received and used by the ultimate end investor – resident individuals, resident funds and non-residents[51] – including credits received directly in the form of franked dividends and credits received indirectly as part of a distribution from a partnership or trust – but does not include credits received by pass through investors such as partnerships and trusts. By not including credits received by trusts and partnerships (and companies), HM avoid any double counting problem that would otherwise arise as dividends are paid along chains of interposed entities within the same corporate group structure. In other words and for the avoidance of doubt, there is no double counting problem in HM's estimate of the credit utilisation rates.

---

49 Hathaway (2010a p.18).

50 It is noted that any double counting of dividends paid in table 3 would appear in both the aggregate amount of franked dividends (numerator) and the aggregate amount of total dividends (denominator) and so for the purposes of estimating the proportion franked in table 3, would largely cancel out.

51 For the purposes of estimating gamma, a non-resident investor can be regarded as an "ultimate end investor" since DWT is a final (Australian) tax imposed on dividends paid to non-resident investors irrespective of the from it takes i.e. irrespective of whether the non-resident is an individual, fund, company, partnership or trust. For example see Australian Taxation Office (2006a p.143).

(v) *"They ignore the super funds within Life Offices which are final claimants of credits but reporting as companies."*

This corresponds to what Hathaway also refers to as the missing data problem.[52]

Hathaway notes that HM do not include data on franking credits redeemed by the complying superannuation businesses of Life Offices and designated organisations like certain charities that can get a refund for their credits (and importantly he also notes that HM acknowledge that they have excluded this data).

Hathaway also asserts that HM are under the misapprehension that State Government enterprises can claim the credits as tax exempts. But it is Hathaway who is confused on this point for HM state: *"We note that, due to a lack of data, our estimates do not include superannuation funds operated by life assurance companies (to whom imputation credits are valuable) but also our estimates do not include tax-exempt entities, such as State government and educational, religious and community service organisations (to whom imputation credits are of no value)."*[53]

In other words, HM clearly state that franking credits are of no value to State Government (entreprises) and are simply suggesting that their estimate of the average utilisation value of franking credits is understated by the extent to which credits received and redeemed by superannuation funds operated by life assurance companies have not been included,[54] but on the flip-side, that their estimate of the average utilisation value of franking credits is overstated by the extent to which credits received and which cannot be redeemed by State Governments and other similar tax exempts have not been included.[55]

---

52 Hathaway (2010a p.18).

53 Handley and Maheswaran (2008 p.88).

54 This conclusion is consistent with the suggestion by Hathaway (2010a p.14) that it would be reasonable to assume that Life Office superannuation businesses will have the same allocation to franked and unfranked Australian shares as do funds and so we would expect them to have much the same proportional claims on franking credits.

55 Handley and Maheswaran (2008 p.88) note that from 1 July 2000, some (but not all) tax exempt organisations may claim a refund for franking credits, not withstanding they do not pay tax. For example see Australian Taxation Office (2006b p.80).

To be clear, HM have ignored credits received by these groups of investors simply due to a lack of separate data being available from the ATO.

Hathaway suggests that the approach adopted by HM biases their results: *"The comment by HM seems to imply that these two neglected sets may be (at least partially) offsetting. This will not be the case. The Life Office claim is much bigger than the tax exempts redeeming credits via a refund. While it is true that Life Offices data is not published separately by the ATO, much data is published about Life Offices by APRA and sensible estimates can be made."*[56]

The point of difference between the HM treatment of credits received by Life Offices, State Governments and other tax exempts and Hathaway's treatment of credits received by Life Offices, State Governments and other tax exempts is that HM ignore all groups in estimating the average utilisation value of franking credits (but suggest there is at least some offset i.e. that their estimate is understated by not including the Life Offices but their estimate is overstated by not included the State Governments) whereas Hathaway suggests there is no such offset.

It is noted, however, that whilst Hathaway presents data on credits received by Life Offices, he does not present any corresponding data on credits received by State Governments. In other words, Hathaway provides no evidence to substantiate the claim that there is no offset and that HM's results are biased.

It is also noted that, notwithstanding Hathaway's confusion concerning HM's treatment of State Governments, the bias that Hathaway alludes to would mean that HM's estimates of the utilisation rate of imputation credits are understated (since Hathaway appears to suggest that the amount of credits received by Life Offices would dwarf the amount of credits received by State Government enterprises).

---

[56] Hathaway (2010a p.14). In his companion paper (see Figure 16 in Hathaway (2010b)), Hathaway uses data sourced from the Australian Prudential Regulation Authority (APRA) to suggest that over the period 1996-2008, Life Office superannuation funds held an amount of equities equivalent to around 20-30% of that held by the (visible) resident funds reported by the ATO. Hathaway (2010b p.24-25) goes further to suggest that if the other funds claimed $4.2 billion in credits (in 2008) then, after making a number of simplifying assumptions, the estimated claim by Life Offices would be $1 billion and this would increase to $1.5 billion if one also takes account of credits refunded to charities and other designated tax exempt organisations in 2008.

(vi) *"They present a series of excess credits for Personal taxpayers but offer no justification at all for this series. It is not published by the ATO so it must have been estimated by the authors."*

This corresponds to what Hathaway also refers to as the Individuals' utilisation of credits 1990-2000 problems.[57]

In this regard, Hathaway also states: *"The 'Excess Credits' reported by HM in their Table 4 are their estimates based on some unspecified calculation ... There is no justification supplied by HM for their estimation of this series"*[58]

But contrary to Hathway's claims, HM describe in detail the methodology they have used to estimate the series of excess credits for resident individuals in section III (i) of their paper.[59]

---

[57] Hathaway (2010a p.18).

[58] Hathaway (2010a p.13).

[59] Handley and Maheswaran (2008 p.85-86). It is noted in particular that HM take into account imputation credits received both directly by investors (primary credits) and indirectly by way of a distribution from a trust or partnership (subsidiary credits) and, prior to 1 July 2001, they allow for less than a full utilisation of credits received, as reflected in: *"If a taxpayer is entitled to multiple rebates, then a key sequencing issues arises from the fact that the total rebate allowed to a taxpayer cannot exceed the amount of tax otherwise payable (excluding Medicare) and any excess non-refundable rebate is lost. Because we wish to examine the incremental effect of the receipt of a franked dividend compared to the receipt of an otherwise equivalent unfranked dividend, we assume that if a taxpayer is entitled to multiple rebates, then the franking rebate is allowed last."* Post 1 July 2000, HM assume full utilization of credits by resident individuals since excess credits were refundable from that time. It is of course likely that the actual utilization rate would be somewhat lower due to for example, "investor irrationality" and the impact of the 45 day rule but any difference is likely to be small. (The effect of the 45 day rule is that the franking credit is denied i.e. the credit is worthless unless certain conditions are satisfied. I am not aware of any data on the extent to which credits have been denied pursuant to this rule, but one would expect that it continues to have some operation each year. As a guide, in their table 4, HM report that the estimated credit utilization rate for resident individuals was 94% in 1998, 89% in 1999 and 90% in 2000. Since the rule was operating at this time and assuming the less than 100% utilization is fully attributable to the impact of the 45 day rule (which would not be the case since credits were not refundable at that time), then the rule would have had about a5-10% impact on the utilisation rate. It is further noted that HM describe in detail the methodology they have used to estimate the series of excess credits for resident funds in section III(ii) of their paper. The same data was not available each year so slight variations to the approach were required at different times. Importantly, the general principle to estimating the utilisation rate for funds was the same as for individuals i.e. HM estimate credits used and credits received and then divide the first by the second. For example, for 1989, data on subsidiary imputation credits received by funds was not separately disclosed so HM estimated this amount based on the actual proportion of primary to subsidiary credits received by funds during the 2001-2004 period. For 1990-2000, data only on "gross dividends received" was disclosed so HM decomposed it into the required amounts using equation 1. For 2001-2004, data on the credits received (the franking rebate + refundable credits) was disclosed and HM then assumed these were fully used..

(vii) *"They compare $64 unfranked dividends to $64 franked dividends in the hands of various investors and get different after-tax returns. This is hardly surprising because one already has $36 company tax paid and the other has zero company tax paid. They claim the perverse result that the only class of nonresident investors that can utilise the franking credits are those that get no credit for any tax paid in Australia on their unfranked dividends."*

Contrary to Hathaway's claim, this is not a perverse result at all as HM explain in their table 1. This result directly follows from HM's definition of the utilisation value of a franking credit – i.e. as the incremental reduction in (worldwide) personal taxes, if any, which arises from the receipt of a franked dividend compared to the receipt of an otherwise equivalent unfranked dividend.[60] In other words, all else has to be held constant and so the appropriate comparison is between a franked dividend of say $64 and an unfranked dividend of the same dollar amount (of $64). In other words, the "different after-tax returns" that Hathaway refers to, represents the value of the distributed franking credits, because all else has been held constant from the investor's perspective – and this is precisely what HM are interested in estimating. Hathaway suggests an alternative comparison – a franked dividend of say $64 and an unfranked dividend of $100 – since he argues that *"if company tax is meant to just be a withholding of personal tax under an imputation tax system, then to ignore company tax payments amounts to ignoring a substantial and ultimately personal tax."*[61] But Hathaway's example is flawed since it is the domestic personal and corporate taxes which are (partially) integrated under the Australian imputation tax system and further if corporate taxes were to be taken into account then it would seem sensible to take into account all worldwide corporate taxes – i.e. presumably the unfranked $100 dividend is paid out of profits which have not been subject to Australian corporate tax because

60 As noted by Handley and Maheswaran (2008 p.84), determining the value of an imputation credit to a non-resident investor is more complicated than determining the value of an imputation credit to a resident investor, since one need consider the effect of the imputation credit on the investor's Australian withholding tax liabilities, its home country personal tax liabilities and whether these two items interact. It is for this reason that HM define the utilisation value of a credit to a non-resident investor as the incremental reduction in worldwide personal taxes, attributable to the receipt of the credit, rather than simply the incremental reduction in domestic taxes. Also note that any value associated with franking credits attached to franked dividends is effectively received "indirectly" by the non-resident – as illustrated in HM's table 2 – rather than being received "directly", as occurs in the case of resident investors – and as illustrated in HM's table 1.

61 Hathaway (2010a p.16).

those profits have already been subject to some foreign corporate tax – but regardless, this is a different question to the one considered by HM.

In summary, the Hathaway (2010c) commentary is a paper without substance and in no way discredits the Handley and Maheswaran (2008) study as the DNSPs would suggest.

4.4 Hathaway's Commentary on the Use of ATO Tax Data

Hathaway (2010b) is a companion paper to Hathaway's (2010a) commentary of the Handley and Maheswaran (2008) study.

In short, Hathaway (2010b) examines ATO tax statistics with a view to assessing how reliable the data is for the purposes of making upper bound estimates for gamma and theta and concludes: *"These two sets of data, taxation and financial, do not reconcile to the amount of $42.6 billion of franking credits over the period 2004-2008 ... Until that reconciliation has occurred or it can be explained to me how to account for those credits, I urge all caution in using ATO statistics for any estimates of parameters concerned with franking credits".*[62] and further *"I conclude that the ATO statistics cannot be relied upon for making conclusions about gamma and theta".*[63]

There is essentially nothing new here. A number of difficulties and limitations associated with using ATO data post around 2000-2001 to estimate utilisation rates is already noted in Handley and Maheswaran (2008)[64].

It is important to note that Hathaway's (2010b) criticism of the ATO data stems from his inability to reconcile some parts of the ATO data over the post 2004 period. Two key observations follow.

---

62 Hathaway (2010b p.iv).

63 Hathaway (2010b p.iv).

64 For example, in relation to resident individuals, Handley and Maheswaran (2008 p.86) state: *"From 1 July 2000, resident individuals are entitled to a cash refund of excess imputation credits. Therefore, we assume, consistent with investor rationality, that Excess Credits is zero for the 2001–2004 income years."* and in relation to non-residents: *"Desired data on unfranked dividends, franked dividends and imputation credits paid to non-residents are not available from the ATO. The only relevant data that might be sourced from Taxation Statistics is the aggregate collection of DWT during the 1988–2001 financial years ... From 2002, DWT is no longer separately disclosed and, therefore, based on data for 1992–2001, we assume that non-residents receive 25 per cent of the total dividends paid to individuals, funds, trusts, partnerships and non-residents each year of which 63 per cent are franked.* (p.87-88).

First, it is not necessarily the case that Hathaway (2010b) has in fact identified a problem with the ATO data – all that can be said at this stage is that, based on the information disclosed in the ATO Tax Statistics, Hathaway is unable to reconcile certain parts of it. In other words, an inability to reconcile data does not automatically mean there is a problem with or errors in the ATO data. For example, a plausible alternative explanation is that the ATO simply hasn't published "enough" information to allow Hathaway to complete his reconciliation.

Second, Hathaway (2010b) is unable to reconcile certain ATO data over the period 2004 to 2008. But Handley and Maheswaran (2008) report results from 1988 - 2004 and so any valid criticism that Hathaway may have concerning the ATO data would in turn have only limited relevance, if any, to the Handley and Maheswaran (2008) study.

5. MISCELLANEOUS ISSUES

5.1 Consistency Between the Value of Cash Dividends and Value of Distributed Franking Credits

In relation to the AER's use of tax statistics, SFG suggests that the AER makes an implicit assumption that investors who redeem franking credits all value them at 100 cents in the dollar – which is then inconsistent with the AER's use of dividend drop-off studies, in which the AER estimates the value of cash dividends to be only 80 cents in the dollar.[65]

Despite SFG's suggestion to the contrary, there is no inconsistency here.

The reason for the difference follows from the discussion in section 3.2 above where it was argued that the regression coefficients from dividend drop-off studies not only reflect the value of a dollar of franking credits and the value of a dollar of cash dividend but also reflect the impact of the differential personal taxes and risk. In other words, the

[65] SFG Consulting (2010 p.4 and 26).

after-company-before-personal tax value of one dollar of cash dividend is clearly one dollar. But an estimated regression coefficient of 0.8 does not mean that the after-company-before-personal tax value of one dollar of cash dividend is now only 80 cents. Rather the regression coefficient of 0.8 reflects a 20 cent adjustment due to differential personal taxes and risk. For clarity, the regression coefficient does not represent the after-company-before-personal tax value of one dollar of cash dividends if differential personal taxes and risk are important. Rather, it is only if there are no differential taxes and risk involved in trading around the ex-dividend date, or one assumes them away, that the coefficient can validly be interpreted as the after-company-before-personal tax value of one dollar of dividends. Importantly, this adjustment arises with dividend drop-off studies but not with tax statistics. Handley and Maheswaran (2008) define and report the (after-company-before-personal tax) utilisation value of imputation credits and so no adjustment is necessary.[66]

5.2 Comparison with Market Practice

SFG suggests that a comparison of the AER's estimate of the cost of equity with the practitioner cost of equity indicates that the AER's conventional cost of equity r_E^* (i.e. consisting of dividends and capital gains only) is substantially lower than the practitioner estimate, thereby indicating that the AER's estimate of gamma must be substantially higher than that implied by market practice. SFG further states that it is then a straightforward matter to determine what adjustment in relation to gamma would be consistent with market practice and concludes that this would require that the AER set its gamma equal to 0.09.[67]

Unfortunately the SFG analysis is invalid because it does not give due regard to the perpetuity assumption underlying the Officer (1994) model. Specifically, observed grossed-up rates of return consist of three components: capital gains, dividends and the value of franking credits. However, the Officer (1994) model is a perpetuity model – this means that grossed-up rates of return consist of only two components: dividends and the value of franking credits – i.e. there are no capital gains. This means that SFG's

[66] See table 4 in Handley and Maheswaran (2008).
[67] SFG Consulting (2010 p.33).

"Adjustment Step",[68] made in accordance with the Officer model (1994) strictly only applies in a perpetuity model

In other words, the difference that SFG reports has nothing to do with a difference between the AER's estimate of the conventional cost of equity r_E^* and that of practitioners. Rather, the source of the difference is the perpetuity assumption which holds in Officer's model, but which we know does not hold in practice.

6. OVERALL CONCLUSION ON GAMMA

The DNSPs give the impression that the estimation of gamma is reasonably straightforward but as discussed above, there are many issues involved which make the estimation of gamma subject to much uncertainty. In this regard, I wish to again draw attention to the inherent imprecision in the estimate of theta θ.

In summary, nothing in the DNSPs submissions causes me to change my view that a reasonable estimate of gamma is within the range 0.3 – 0.7.

[68] SFG Consulting (2010 p.31).

REFERENCES

Australian Energy Regulator, 2008, Explanatory Statement – Electricity Transmission and Distribution Network Service Providers: Review of the Weighted Average Cost of Capital (WACC) Parameters, Commonwealth of Australia, Canberra, December.

Australian Energy Regulator, 2009, Final Decision – Electricity Transmission and Distribution Network Service Providers: Review of the Weighted Average Cost of Capital (WACC) Parameters, Commonwealth of Australia, Canberra, May.

Australian Energy Regulator, 2010, Draft Decision – Victorian Electricity Distribution Network Service Providers Distribution Determination 2011-2015, June.

Australian Taxation Office, 2004, Imputation Reference Guide, Commonwealth of Australia, Canberra.

Australian Taxation Office, 2006a, Taxation Statistics 2003-2004, Commonwealth of Australia, Canberra

Australian Taxation Office, 2006b, Income Tax Guide for Non-Profit Organisations, Commonwealth of Australia, Canberra, September.

Australian Taxation Office, 2010, Taxation Statistics 2007-2008, Commonwealth of Australia, Canberra

Bodie,Z., A. Kane and A.J. Marcus, 2009, Investments, 8th edition, McGraw-Hill Irwin.

Citipower Pty, 2010, Revised Regulatory Proposal: 2011 to 2015, 21 July.

CCH Australia, 2004, Australian Master Tax Guide, CCH Australia Limited, North Ryde, NSW.

Department of the Treasury, 2010, Australian Tax Treaties, 15 September. Available on the website http://www.treasury.gov.au/contentitem.asp?pageId=&ContentID=625

Dempsey, M. And G. Partington, 2008, Cost of Capital Equations Under the Australian Imputation Tax System, Accounting and Finance, 48, 439-460.

Hathaway, N., 2010a, Comment on: "A Measure of the Efficacy of the Australian Imputation Tax System" by John Handley and Krishnan Maheswaran, Capital Research Pty Ltd, July.

Hathaway, N., 2010b, Imputation Credit Redemption ATO Data 1988 - 2008, Capital Research Pty Ltd, July.

Hathaway, N., 2010c, Practical Issues in the AER Draft Determination, Capital Research Pty Ltd, July.

Jemena Electricity Networks (Vic) Ltd, Revised Regulatory Proposal, 20 July.

Lally, M. And T. van Zijl, 2003, Capital Gains Tax and the Capital Asset Pricing Model, Accounting and Finance, 43, 187–210.

McKenzie, M.D. and G. Partington, 2010, Evidence and Submissions on Gamma, Report to the AER on behalf of The Securities Industry Research Centre of Asia-Pacific (SIRCA) Limited, 25 March.

Microsoft, 2002, Annual Report and Form 10-k.

Miles, J. and R. Ezzell, 1980, The Weighted Average Cost of Capital, Perfect Capital Markets and Project Life: A Clarification, Journal of Financial and Quantitative Analysis, 15, 719-730.

Miller, M. H., and F. Modigliani, 1961, Dividend Policy, Growth and the Valuation of Shares, Journal of Business, 34, 411–433.

Monkhouse, P.H.L., 1996, The Valuation of Projects Under the Dividend Imputation Tax System, Accounting and Finance, 36, 185–212.

Officer, R.R., 1994, The Cost of Capital under an Imputation Tax System, Accounting and Finance, 34, 1–17.

Powercor Australia Limited, 2010, Revised Regulatory Proposal: 2011 to 2015, 21 July

SFG Consulting, 2009, Gamma: Further Evidence to Support Departure from the AER's Statement of Regulatory Intent, Report prepared for Energex and Ergon Energy, 7 December.

SFG Consulting, 2009a, The Value of Imputation Credits As Implied By the Methodology of Beggs and Skeels (2006), Report prepared for ENA, APIA and Grid Australia, 1 February.

SFG Consulting, 2010, Issues Relating to the Estimation of Gamma, Report prepared for CitiPower, Jemena Electricity Networks, Powercor, SPAusnet and United Energy Distribution, 15 July.

SPI Electricity Pty Ltd, 2010, Electricity Distribution Price Review 2011-2015, Revised Regulatory Proposal, July.

Skeels, C.L., 2009, A Review of the SFG Dividend Drop-Off Study, A Report Prepared for Gilbert and Tobin, 28 August.

United Energy Distribution, 2010, Revised Regulatory Proposal for Distribution Prices and Services January 2011 – December 2015, July.

Curriculum Vitae

Dr John C. Handley

March 2010

QUALIFICATIONS

BCom, BMath *Newcastle*, MCom (Hons) *Melbourne*, PhD *Melbourne*

EMPLOYMENT HISTORY

Period	***Organisation***	***Position***
Jul 1993 to date	University of Melbourne Melbourne	Associate Professor of Finance (since July 2005)
Sep 2009 to Jan 2010	Stern School of Business New York University New York	Visiting Associate Professor of Finance (Fall Semester 2009)
May 2008 to Sep 2008	Stern School of Business New York University New York	Visiting Associate Professor of Finance (Summer Semester 2008)
Aug 1988 to Jul 1993	SBC Australia *(Now UBS)* Sydney and Melbourne	Corporate Finance Executive
Nov 1985 to Aug 1988	Coopers & Lybrand *(Now Pricewaterhousecoopers)* Newcastle	Audit Senior

RESEARCH

Research Focus: Corporate finance, derivative security pricing, corporate finance applications of derivative security pricing

Scholarly Publications (since 2000)

- Handley, J.C., 2008. "Dividend Policy: Reconciling DD with MM". Journal of Financial Economics, 87, 528-531.

- Handley, J.C. and K. Maheswaran, 2008. "A Measure of the Efficacy of the Australian Imputation Tax System". Economic Record, 84, 82-94.

- Handley, J.C. and K. Maheswaran, 2008. "Re-examination of the Historical Equity Risk Premium in Australia". Accounting and Finance, 48, 73-97.

- Handley, J.C., 2005. "On the Upper Bound of a Call Option". Review of Derivatives Research, 8, 85-95.

- Handley, J.C., 2003. "An Empirical Test of the Pricing of VPO Contracts". Australian Journal of Management, 28, 1, 1-22.

- Dyl, E.A., W.B. Elliott and J.C. Handley, 2002. "Do Share Prices Matter?" Accounting and Finance, 42, 225-237.

- Handley, J.C., 2002. "On the Valuation of Warrants". Journal of Futures Markets, 22, 765-782.

- Handley, J.C., 2000. "Variable Purchase Options". Review of Derivatives Research, 4, 219-230.

Case Studies

- Tufano, P. and J.C. Handley, 1999. "General Property Trust". Harvard Business School case study 299-098, HBS Publishing.

Work in Progress

- Brown, C.A., J.C. Handley and K. Palmer. "A Closer Look at Barrier Exchange Options".

- Brown, C.A., J.C. Handley and K. Palmer. "Partial Differential Equations for Asian Option Prices".

- Handley, J.C. and C. Sobfeldt-Hansen. "Floating Priced Convertibles – A Direct Test of the Faulty Contract Design and the Last Resort Financing Hypotheses"

- Brown, C.A., J.C. Handley and A. Lamba. "Share Buybacks and Information Asymmetry – Winners and Losers"

- Handley, J.C. and M. Pinnuck. "Testing for Capital Structure Persistence Using a Flow Rather than a Stock Measure".

TEACHING

Teaching Focus: Financial Management, Corporate Finance, Derivatives, Investments

Awards

- 2008 Dean's Certificate for Excellence in Graduate Teaching.

- 2007 Dean's Certificate for Excellence in Undergraduate and Postgraduate Teaching.

- 2006 Dean's Certificate of Excellent Undergraduate and Postgraduate Teaching.
- 2005 Dean's Certificate of Excellent Undergraduate and Postgraduate Teaching.
- 2004 Dean's Certificate of Excellent Undergraduate Teaching for 2004.
- 2003 Dean's Individual Award for Excellence in Teaching in the Faculty of Economics and Commerce.[69]

  In the citation to the award, the Dean of the Faculty of Economics, Professor M.A. Abernethy wrote: *"The Award is based on your outstanding contribution to curriculum development in finance at both the undergraduate and postgraduate level and your excellent teaching evaluations over a lengthy period of time"*

ADMINISTRATION AND LEADERSHIP

- Deputy Head, Department of Finance, 2009—.
- Coordinator, PhD Program in Finance, 2009.
- Academic Director, Master of Applied Finance Program, 2006—2008.
- Coordinator, Honours Program in Finance, 2001—2003.
- Chair, 2003 Review Committee of the Honours Program in Finance at the University of Melbourne
- Chair, 2002 Review Committee of the Undergraduate Program in Finance at the University of Melbourne

KNOWLEDGE TRANSFER AND CONTRIBUTION TO THE PROFESSION

I have provided expert advice on various financial matters to the Australian Accounting Standards Board, Australian Competition and Consumer Commission, Australian Energy Regulator, KPMG Corporate Finance and the New Zealand Commerce Commission, including the following recent engagements:

- 2010, Consultant to the Australian Energy Regulator on matters dealing with the AER Electricity Distribution Determinations for Queensland and South Australia for 2010-2015, Victoria for 2011-2015 and Gas Distribution Decisions for New South Wales and the Australian Capital territory for 2010-2015, March–.
- 2009, Consultant to the Australian Energy Regulator on matters dealing with the AER Electricity Distribution Determinations for Queensland and South Australia for 2010-2015, October.

[69] This is awarded for the best performance in the entire Faculty of Economics and Commerce which covers four departments: Department of Accounting and Business Information Systems, Department of Economics, Department of Finance, Department of Management.

- 2009, Consultant to the Australian Energy Regulator on matters dealing with The AER Review of Proposed Debt and Equity Raising Costs and the Weighted Average Cost of Capital for the 2009–14 Regulatory Control Period, April.

- 2009, Consultant to the Australian Energy Regulator on matters dealing with The AER Review of the Weighted Average Cost of Capital for Electricity Distribution and Transmission, March/April.

- 2009, Consultant to the New Zealand Commerce Commission on matters dealing with the Telecommunications Service Obligations (TSO) Determination for the years ending 30 June 2005 and 2006, June.

- 2008, Consultant to the Australian Energy Regulator on matters dealing with The AER Review of the Weighted Average Cost of Capital for Electricity Distribution and Transmission, November.

- 2008, Consultant to the New Zealand Commerce Commission on matters dealing with the Telecommunications Service Obligations (TSO) Determination for the years ending 30 June 2004 and 2005, April.

- 2008, Presentation to the ACCC / AER on the Weighted Average Cost of Capital of Regulated Firms, February.

- 2007, Consultant to the New Zealand Commerce Commission on matters dealing with the Telecommunications Service Obligations (TSO) Determination for the year ending 30 June 2004, March.

- 2006, Consultant to the New Zealand Commerce Commission on matters dealing with the Telecommunications Service Obligations (TSO) Determination for the year ending 30 June 2004, May.

- 2005, Consultant to the New Zealand Commerce Commission on matters dealing with the Telecommunications Service Obligations (TSO) Determination for the year ending 30 June 2003, February.

- 2003, Consultant to the New Zealand Commerce Commission on matters dealing with the Telecommunications Service Obligations (TSO) Determination for the period ending 30 June 2002, June.

CONTACT DETAILS

Department of Finance
University of Melbourne VIC 3010
AUSTRALIA
Tel: x 613 8344 7663 (direct)
Email: handleyj@unimelb.edu.au