



The Value of Imputation Credits for Regulatory Purposes¹

¹ Envestra wishes to thank Dr Steven Bishop for support in preparing this paper

1 Introduction

The value of imputation credits and its application to the regulatory framework is a contentious issue. Estimates of the value of imputation credits vary widely between zero and potentially full face value, however there are not many instances of a value of 1 being advanced in the regulatory, research or practitioner context. Historically, regulators have tended to place a value on imputation credits (γ) equal to 0.5, with some suggesting that a more appropriate value should be closer to 1.²

Clearly, the view adopted by regulators on the value of imputation tax credits when setting maximum prices will impact the return to investors in a regulated business. Incorrectly valuing imputation credits can distort the availability of capital, pricing, demand, the level of investment in infrastructure assets and behaviour of the regulated businesses.³

The objective of this paper is to derive a plausible range for the value of γ for use in setting Reference Tariffs. The plausible range value has been derived from a comprehensive review of:

- Academic and practitioner research;
- Economic theory;
- Regulatory determination documents;
- Utility company tax and franked dividend statistics;
- Analysis of Australia Tax Office (“ATO”) and Australian Bureau of Statistics (“ABS”) data;
- The context of tax reforms that were implemented in conjunction with dividend imputation.

One component of Envestra’s analysis examines utility company data as well as ATO and ABS data to form a view on the value of imputation credits using recognition that the relevant value for the QCA is a function of:

- a) The proportion of imputation credits distributed by the firm;
- b) The value to investors when redeemed;
- c) The time delay between when tax is assumed to be paid by the regulated business and the time the resulting FTCs are redeemed by investors.

This analysis places the most likely marginal value for utility sector investors at zero, with a possible value around 21% if the marginal investor is a domestic taxpaying investor, and an average value for the capital market in the range 0 to 35%.

The key findings of our analysis are:

- The relevant cost of capital is determined by the risk profile of the regulated business rather than the taxation regime that affects the return available to investors
- Any value placed on FTCs should be adjusted in the effective tax rate applied to valuing businesses or assessing a pre-tax revenue requirement in a regulatory environment,

² ACCC, Queensland Transmission Network Revenue Cap: Draft Decision, 18 July 2001, pp17

³ It is for reasons such as these that the productivity commission formed a view that it is better to err on the side of higher prices than discouraging investment in these vital infrastructure assets.

- Historical analysis of the value of gamma for the gas and electricity sector suggests the upper end of the range is 0.29 if the domestic taxpaying investor is the marginal investor. Envestra believes that this assumption is implausible based on the weight of capital invested in the sector, therefore the value of gamma is most likely below 0.29;
- The most recent empirical drop-off based research places the average value of gamma at 0.35. This updates the 0.5 value used in prior regulatory price determinations;
- More recent research finds that the value of gamma has fallen to zero for the marginal investor since regulations have made trading in FTCs too costly;
- Assessment of the average value of gamma from ATO and ABS data suggests a value of 0.19.

The weight of evidence supports a value of gamma of zero for regulatory purposes. Envestra supports this position. There is a potential of 0.21 in the unlikely event that the marginal investor is a domestic taxpaying investor and 0.35 based on average investor analysis. Hence, the value of gamma at 0.5 is too high and not supported by the evidence available. This paper has been structured to present the evidence used in support of these key findings.

2 Setting

The imputation system (introduced on 1st July 1987) was intended to remove the tax bias against equity income and place it on the same tax footing as debt income. In this way, imputation would remove the double taxation of dividend income under a classical tax system (once at the corporate level then again at the personal level).

This has been argued as leading to corporate tax being a mixture of both personal and corporate tax collection – the former if the tax is rebated against personal tax, the latter if not.⁴ If all corporate tax was rebated against personal tax then it would be 'as if' no corporate tax existed, only personal tax. In this unusual case, the effective corporate tax rate would be zero. Since not all investors can access the franking tax credits ("FTCs") e.g. foreign investors, the effective corporate tax rate will, on average, lie between zero and the statutory rate, or perhaps above it if the effective tax on capital in inflationary environment is considered.

Since then, the Australian system has been modified in a number of ways, including:

- a capital gains tax introduced in 1985 allegedly to remove a bias in favour of capital gains;
- a corporate tax on superannuation funds introduced from 1st July, 1988 to enable them to use FTCs and remove any disincentive to invest in companies paying imputation benefits;
- introduction of a 45 holding period around the distribution of FTCs in 1997 which imposes additional 'cost' on trading in credits;
- a move to a rebate rather than tax credit system in 2002 which enables domestic tax exempt and low taxed payers to now fully access FTCs.

An outcome of the imputation system is a differential effect across some shareholder groups. The 'beneficiaries' are, in the broad, individuals and superannuation funds whereas foreign investors and tax-exempt shareholders (historically) did not gain directly from the change. As a result, the *dollar return* these different shareholders groups earn after taxes can differ and the *rate of return* on investment may also vary if one group sets the value. For example, Australian Resident Personal Taxpaying Shareholders ("ARPTS") will earn a higher rate of return if overseas investors set the prices based on no benefit from the FTCs - ARPTS may enjoy a tax induced 'consumer surplus' - whereas overseas investors may not earn the cost of capital if the value of the company is set by ARPTS. Given overseas investors have choices for their investment we would expect to see them withdraw from Australian assets to invest elsewhere where they are able to earn at least their cost of capital.

A challenge facing valuers, researchers and regulators is to understand how (or whether) imputation tax affects value, returns, effective tax and possibly the cost of capital. Since the QCA is proposing to set regulatory maximum regulated prices to ensure investors earn their cost of capital once all costs, including effective taxation, is covered both Envestra and the QCA have an interest in the quantifying impact of the imputation system.

⁴ For example Officer 1984

3 Impact of Imputation Tax System

The impact of changing to an imputation tax system on regulatory pricing considerations is best analysed by the impact on the effective corporate tax rate. This is usually implemented by making an adjustment to the statutory rate of the form:

$$t_e = t_c(1-\gamma)$$

where t_e is the effective rate, t_c the statutory rate and γ is that part of company tax that is a prepayment of personal tax for the marginal investor in the business.

As noted previously, Envestra believe that the appropriate value for gamma is zero based on empirical research and commercial practice. The sections below set out the reasons why this is the case, by examining the impact of imputation tax on:

- The cost of debt and equity;
- The returns available to different shareholder groups; and
- The valuation of these credits in the market place.

3.1 Impact on Cost of Debt and Equity

Envestra believes that:

- the underlying cost of debt and equity (required rates of return) are not directly affected by corporate tax under the models typically used by regulators to estimate these;
- the cost of capital is not affected by ownership of the assets – it varies according to the underlying risk of the assets so in this sense consideration of imputation taxes is not about these costs; and
- imputation tax benefits affect the return available to investors rather than the cost of capital. As noted earlier, the effective corporate tax rate, from an imputation perspective, can differ across shareholder groups according to whether they can use FTCs to reduce personal tax.

An accepted principal of regulatory pricing is that maximum prices should be determined to enable investors to earn a return *on* capital in addition to a return *of* capital over and above meeting operating costs and taxes. There are numerous mixes of the description of the cost of capital and the description of the cash flows that avoid double counting of costs and returns on the one hand and ensure that all costs are 'covered' on the other hand. An essential principle is to ensure consistency between these definitions⁵.

Regulators in Australia use the after corporate, but before personal, tax version of the capital asset pricing model to estimate the cost of equity capital. This model presents the cost of equity capital as a function of the risk of the underlying asset relative to market risk (influenced by leverage), the risk free rate and the market risk premium. It does not have an explicit tax term in it.⁶

Additionally, the convention has been to use a weighted average cost of capital to apply to a regulatory asset base to arrive at a 'required return on assets' component of the building block to maximum revenue. Consistency requires the underlying required rate of return to include

⁵ Officer (1984) describes 5 consistent approaches under a perpetuity assumption.

⁶ There are after personal tax versions of the CAPM. For example see Brennan (1970), Ashton (1989), Monkhouse (1993).

both the return debt-holders and equity holders require since the assets are viewed as being funded by debt and equity.

A tax term sometimes appears in the WACC because the treatment of taxes in the allowance for corporate tax in the cash flows differs from actual taxes. For example, the use of a $(1-t_c)$ term, where t_c is the corporate tax rate, prior to the cost of debt in the WACC is there to 'correct' the fact that taxes are estimated based on an EBIT concept rather than an after interest assessable income concept i.e. the tax deductibility of interest is not reflected in the tax calculation. The tax term in the WACC formulation is a consequence of the consistency principle rather than a model of rate of return determination (e.g. CAPM). An alternative treatment of taxes will lead to an alternative but consistent 'definition' of the WACC.

None of the alternative treatments of corporate tax affect the cost of equity given by the CAPM or the cost of debt, just adjustments to these to derive a consistently defined WACC.

It is in this sense that we argue the cost of capital (debt and equity) is not an explicit function of corporate tax rates. Tax adjustments affect the way the WACC and cash needs are defined to ensure consistent treatment. Tax adjustments are made at the effective tax rate and therefore it is the impact of imputation tax on the effective tax rate that is important to understand.

This view, although perhaps subtle, is important when analysing the impact of imputation tax on the building block components and revenue setting.

3.2 Impact of imputation taxes on returns

FTCs are not redeemable by all investors, the imputation tax system affects the return available to investors differentially. ARPTS can redeem the FTCs, consequently the return to them from investment in a tax paying company will be higher than the return to those who cannot redeem them, notably foreign investors. It is 'as if' the effective tax for ARPTS is lower than for foreign investors.

Also, as noted elsewhere, foreign investors could obtain some value from the FTCs if they were able to 'sell' them to ARPTS in some manner. Officer (1988) noted that offshore investors appeared to be able to trade in FTCs thereby enabling them to experience a lower effective corporate tax rate for Australian companies they chose to invest in. Cannavan, Finn, and Gray (2004) find that the introduction of the 45 day holding rule has now made this too costly and offshore investors no longer access these credits.

The important question therefore is to address the effective corporate tax rate from an imputation perspective⁷ and how to incorporate this into the building block approach. Is it near the statutory rate or lower?

The question can only be answered from a market perspective with knowledge of which group sets prices and or, from a regulatory perspective, in which group of taxpayers' interests the regulator chooses to determine the effective tax rate.

⁷ The effective tax rate can differ from the statutory rate for many reasons other than because of imputation taxes e.g. carry forward losses, interest deductions.

3.3 *Impact of Imputation Tax on Valuation*

As noted above, ARPTS have access to a component of return from investing in shares that generate Australian taxable income that is not available to foreign investors. They enjoy a mix of dividend, capital gain and FTCs whereas foreign investors do not enjoy the FTCs.

A higher value of shares would be expected if ARPTS set prices and / or if foreign investors can trade the benefits (either through transaction based activity or subsequent sale of shares) than if the price setter (marginal investor) was the overseas investor.

It is not clear whether the tax induced higher return drives a higher valuation or leads to a value based on the dividend and capital gain (dividends over the long term) or just leads to tax based clienteles of shareholdings i.e. ARPTS are attracted to companies that pay FTCs whereas foreign investors would be indifferent to them (if there is no value effect).

The clientele argument suggests there is no value effect of imputation tax, just an attraction of different investor groups to company's that best match their dividend, franking and capital gain needs. Here, ARPTS earn a higher rate of return (like a consumer surplus) than foreign investors but the value is set by foreign investors. The effective tax rate, from an imputation perspective, is therefore equal to the statutory rate i.e. $\gamma = 0$. In this case regulatory pricing should use the statutory tax rate to either gross up a post tax WACC to a pre tax WACC or to include statutory tax rate based taxation as a cash cost that prices need to cover.

3.4 *Marginal Investor*

Arguments have been advanced that the marginal investor is usually a foreign investor and therefore γ is zero and the effective tax rate from an imputation tax perspective is the statutory rate. Evidence consistent with this argument includes:

- Approximately 25% of shares in Australia are owned by 'the rest of the world'⁸, suggesting that these investors must be earning at least their cost of capital or they would have invested elsewhere (they wouldn't earn the cost of capital on investment if ARPTS were setting the prices of these shares and foreign investors could not trade in FTCs). Foreign ownership in the regulated gas and electricity sector is higher than the average and recent transactions suggest they are the marginal investors in this sector in particular⁹;
- There is extensive evidence that a lack of domestic capital necessitates foreign investment, which in turn requires companies to return foreign investors at least their cost of capital. ARPTS investors therefore invest up to their funds available, with additional investment by foreigners setting the price as the marginal investors;
- The Hathaway & Officer findings of a positive value of γ (but much less than 1) on average across companies is consistent with a mix of marginal investors setting prices across companies or sectors – some that explicitly value FTCs and others that don't;
- The Cannavan, Finn and Gray (2004) finding that the 'market' value of FTCs fell to zero after the introduction of the 45 day holding rule thus foreign investors could not

⁸ ABS Data 26.15 Equity Market (a), Amounts on issue - 30 June

⁹ This may mean that these investors are able to extract synergies with their other operations that more than offset the negative impact of regulators setting a positive γ . These synergies may ultimately come through in lower Australian operating costs, therefore will ultimately lead to lower prices arising through the building block approach.

gain from trading FTCs and this is consistent with foreign investors being the marginal investor in large Australian firms. In their words “. . . we interpret our results as suggesting that after the 45 day rule, one dollar of imputation tax credits is worthless in the hands of a (marginal) foreign investor.” This is additionally significant because most academic empirical evidence available that finds a positive valuation effect from FTCs pre-dates this research;

- Commercial practice appears not to ascribe any value to FTCs. Lonergan (2001) reports that from a survey of 122 independent expert reports only 7 made an explicit valuation adjustment for imputation credits and, of these, 5 attributed little or zero net effect on the value. Further, Cannavan et al note “It is common in commercial practice to ignore the value of imputation credits both when valuing real assets and when conducting capital budgeting analysis”¹⁰; and
- Hathaway and Officer (2004) cite evidence of a clientele effect whereby ARPTS are attracted to companies that pay FTCs as evidenced by ARPTS holding approximately 90% of their stocks as those with franked dividends whereas the supply is well below this. These clienteles can form without a valuation effect.¹¹

4 Application to Regulatory Price Setting for Envestra

We note, more than just in passing, that there have been a number of changes to the taxation system over the time since the imputation system was first mooted but these do not appear to have entered into the regulatory debate. The debate appears to have focussed on imputation tax but not capital gains tax, which is also a basis of differential taxation between debt and equity. Nor has it recognised that superannuation funds are now taxed when they were not before the introduction of the system – this means they have been disadvantaged by the system, especially as it appears they are now net tax payers even after allowing for FTCs (see below). If the regulatory price setting process is to adjust for one change (viz. imputation tax), then why not others? Nevertheless we focus on the imputation changes but refer to other changes when we look at gamma for the ‘average’ investor later.

Any adjustment for imputation tax is an adjustment to the statutory tax rate. This may be an adjustment to, not of, the cost of capital or to building block cash flows. Typically the adjustment is referred to as a ‘gamma’ adjustment such that:

$$\text{Effective tax rate} = \text{statutory tax rate} * (1-\gamma)$$

where γ is the value between 1 and zero reflecting the value of a franking tax credit as described earlier.

The adjustment to the taxation rate, gamma, (γ) has been defined as:

$$\gamma = (f \times \omega)$$

where f is the fraction of current Australian Tax that the firm distributes (distribution rate), and ω is the value of imputation credits to the marginal in

10 p 174

11 Also see Bellamy (1994). The clientele argument, with no value effect, was presented by Modigliani and Miller (1961)

investor expressed as a percentage of the credit's value to shareholders (utilisation or redemption value).¹²

For regulatory purposes, Envestra believes that the utilisation or redemption value should be estimated at the time the tax adjustment is incorporated in building block estimation process, not when it is redeemed. Since recognising imputation is about effective tax rate, then regulatory adjustments should involve estimating gamma for the 'notional benchmark entity'. This position is supported by academic research as follows:

"the [drop-off] estimation approach assumes that the value of tax credits does not vary over the sample period and is constant across companies in the sample. Wood (1995) makes this point and argues that both assumptions may be invalid" Cannavan, Finn & Gray p175

"Because different firms have different stockholder bases, an analysis of the average firm is of limited use" Cannavan, Finn & Gray p 192

A different payout ratio and a different shareholder tax status would be obvious reasons for deviations from the average [value of gamma]" Officer and Hathaway (2004) p8

It is a difficult challenge to empirically determine a gamma for a company. Hathaway and Officer, for example, found too much noise to measure it at this individual company or sector level and for this reason they estimated ω for all firms in the first instance in their stepwise estimation of gamma. Some evidence is presented at a sector level but in their words:

"Effectively, company tax is substantially less than the statutory rate, now 30%, and much closer to an effective rate of now 19-21%. It must be emphasised that these are Australia-wide average results and market sectors or individual companies may experience substantial variations from the average. A different payout ratio and a different shareholder tax status would be obvious reasons for a deviation from the average" p8

The Officer and Hathaway *average* value for gamma (0.35 in the latest update, 2004) appears to have led many (including regulatory authorities) to focus on the average rather than marginal investor – probably because the data was available. While an average rate can be estimated, it is a weighed average of 0 for those that cannot redeem and possibly 1 (less at the time corporate tax is paid because of the time delay at redemption) for those that can. It is not a meaningful number for valuing anything other than the average investment (whatever that is!). Equally it is not meaningful for establishing building block revenue for a specific sector because of the reasons described above.

The building block approach should provide investors in the regulated gas and electricity distribution sector with the return required to encourage investment in that sector i.e. it is sector specific and not related to an average Australian investor that does not set any prices.

Based on our review of the literature and evidence presented plus transactions and ownership in the regulated utility sector, Envestra considers that the relevant marginal investor is foreign

12 Brealey R, Myers S, Partington G, Robinson D (2000) Principles of Corporate Finance, 1st Australian edition, McGraw-Hill Australia, pp 585-586. Also see Officer and Hathaway (2004)

i.e. ω is zero, and that therefore γ is zero. Thus Envestra is of the view that believes that no value should be ascribed to imputation tax credits in the establishment of maximum regulated prices. This outcome is reinforced by further analysis below which pursues the value of component of gamma in the gas and electricity sector i.e. it examines values for f and ω in:

$$\gamma = (f \times \omega)$$

4.1 Value of f

Australian corporate tax paid represents the maximum amount of FTCs that can be distributed to shareholders as an 'attachment' to dividends. The FTCs attach to franked dividends. Data is available for listed utility companies engaged in regulated business that enable an estimate of f for a 'typical' company in this sector. This presented in Table 1.

Our analysis finds f to be 39% for such companies over the five year period 2000 to 2004 and therefore the value to apply going forward.

As can be seen in Table 1, the percentage of franked dividends paid in listed utility companies in regulated gas and electricity businesses is low. The cumulative franked dividends paid from 2000 to 2004 was 52% of total dividends. Further the percentage of credits distributed of total tax paid (available for distribution) was 39%¹³. This number is in sharp contrast to the Hathaway and Officer (2004) overall company average of 71%.

Table 1: Franking tax credits distributed as a percentage of tax paid gas and electricity DBs

	2000	2001	2002	2003	2004	Cumulative
Tax Expense	191,895,000	208,149,000	245,997,000	302,687,000	399,411,000	1,348,139,000
Dividends	443,802,000	330,640,000	375,953,000	503,020,000	551,956,000	2,205,371,000
Franked Dividends	121,177,800	200,201,736	259,689,166	221,520,000	354,310,088	1,156,898,790
Franking %	27%	61%	69%	44%	64%	52%
Implied FTC Distributed	68,162,513	103,134,228	111,295,357	94,937,143	151,847,181	529,376,420
FTC Distributed / Tax Expense	36%	50%	45%	31%	38%	39%

4.2 Value of ω

It has been argued that the redemption value of \$1 imputation credit is worth \$1 to investors who can benefit from the tax rebate. This is likely to be true at the time the investor 'receives' the cash flow benefit i.e. when a personal tax payment transaction occurs, however this is some time after the company pays the tax 'on behalf' such an investor.

This time delay between tax being paid on behalf of shareholders and the cash benefit taking effect represents loss in value due to the time value of money, therefore it is not worth \$1 at the time it is paid. Hathaway and Officer recognise that their drop off analysis give a value at distribution rather than redemption therefore the former will be lower than the latter given the time delay. It will be even lower at payment of corporate tax as this precedes distribution. The differential is further reduced because not all company earnings are distributed in the year earned. The non-distributed FTC's sit in a franking account (cash with the Government) until distributed – which can be well into the future. *"It is a wasting asset since it is unlikely to be earning its opportunity cost of capital in the hands of the tax authorities"* (paraphrased from Hathaway and Officer).

¹³ Companies included in the analysis were; AGL, Alinta, Australian Pipelines Trust, United Energy (until sale), Origin Energy, Envestra, GasNet Australia. Data from Aspect Huntley

Since the QCA is considering prices based on the time cash flows occur at company level, then Envestra believes the appropriate redemption value is the present value of \$1 as at this time, rather than the full \$1. Envestra's conservative estimate is \$0.75 for \$1 redemption value if ARPTS were seen to be marginal price setters¹⁴. It would, therefore, be 0 for investors who cannot redeem the FTCs.

4.3 Value of gamma

There are several gammas that can be derived from gas and electricity regulated business data (see table below), Envestra believes that the relevant gamma is that for the marginal investor in the notional regulated utility sector.

Table 2: Possible Values for derived gamma for regulated utility sector

Type	f	ω	gamma	Comment
Sector marginal investor foreign	0.39	0	0	Most likely case
Sector marginal investor ARPTS	0.39	0.75	0.29	Unlikely given recent transactions
Average investor in Sector	0.39	?		Data not readily available but average investor no relevant
Average investor in Australia	0.71 0.71	0.5 0.27	0.35 0.19	Hathaway & Officer but not applicable Envestra assessment using ATO & ABS data
Large company			0	Cannavan, Finn & Gray finding since trading in FTC uneconomic due to regulatory change
Regulatory Practice	0.8	0.6	0.5	Assumed based on early Hathaway & Officer paper

* based on share ownership – conservative about foreign ownership (17.5% at 0, 82.5% at 0.75)

Our view that the marginal investor in the regulated utility sector is foreign investors unable to utilise FTCs is based on past and more recent transactions in the sector . These transactions include¹⁵:

- Investment by International Power in:

¹⁴ Assumes PV at end December, 60% of profit paid as dividend in Dec & June quarter of following year, 60% of remaining paid in similar quarters a year later, balance paid in similar quarters one year later, beta of 1, MRP of 6% and rf of 5.2%.

¹⁵ Source: The Age 13 August 2005

- Hazelwood Power
 - Loy Yang B
 - Valley Power
 - SEAGas Pipeline
- Stake held by Tokyo Electric Power in:
 - Loy Yang A
- Investment by Singapore Power in:
 - TXU's distribution assets
- Purchase by China Light and Power of:
 - PowerNet
 - Yallourn Energy
 - TRU retail
- Investment by Cheung Kong Infrastructure in:
 - CitiPower distribution
 - Powercor distribution
 - Envestra

As a consequence there is substantial offshore investment in the regulated industry which is consistent with businesses being valued by these investors who do not value FTCs.

As noted above, recent academic research places gamma for large companies at zero since the restriction of trading in credits and our view of gamma at zero is in line with that evidence.

Envestra does not accept an average investor view of the value of gamma, consistent with the view expressed by Cannavan, Finn and Gray:

"Because different firms have different stockholder bases, an analysis of the average firm is of limited use." p192

Nevertheless it notes that there is a focus on this in regulatory determinations e.g. ESC. The most widely accepted gamma value in historical regulatory decisions is 0.5, which is consistent with average value quoted from Officer and Hathaway 'early' research. This average in most recent research is 0.35 by these authors and they expect it to fall further. The Cannavan, Finn and Gray study do not provide an average gamma but provide evidence that the marginal value for large firms is zero. The authors argue their research is freer of the measurement challenges the drop-off approach takes. Given the uncertainty around the appropriate value of gamma, taking a simple mid-point of the range 0 – 0.35 may be reasonable. On this ground, a gamma of 0.18 is a reasonable compromise.

5 Australian Average Gamma Analysis

Given the propensity for regulatory authorities to use an Australian average based assessment of gamma, Envestra has undertaken some research into its possible value using ATO and ABS data. It found a value in the range 0.11 to 0.5, with a mid point of 0.3. As noted, we do not believe this to be a useful number but if such an average value for gamma is to be used it then it should be 0.3 rather than 0.5. This means the effective tax rate that reflects this will be 21%. This is similar to Officer and Hathaway who find the effective tax rate to be 19-21% using a combination of drop-off analysis for the redemption rate and analysis of ATO tax statistics for the proportion of tax paid that is distributed as FTC along with dividends.

While the analysis presented earlier examined the components of gamma for the regulated gas and electricity sector, this section examines the same components but at an Australian market level. That is, it examines the following relationship:

$$\gamma = (f \times \omega)$$

where f is the fraction of current Australian Tax that the firm distributes (distribution rate), and ω is the value of imputation credits to the marginal investor expressed as a percentage of the credit's value to shareholders (utilisation or redemption value).¹⁶

The fraction of current imputation credits that the average firm distributes is largely an empirical issue. To ascertain the fraction of current imputation credits that the average firm distributes (f) it is necessary to take account of:

- i) the legal and commercial limitations placed on corporations paying out all imputation credits created each year,
- ii) the historical dividend payout ratios;
- iii) Australian Taxation Office data; and then
- iv) Derive a value for f for the Australian market.

5.1 Legal and Commercial Aspects to the Distribution of Imputation Credits

In the absence of timing differences between recognition of profit and derivation of taxable income, a firm must pay out 100 percent of its after tax profits, in order to distribute all of the associated imputation credits. However, there are limitations to how much profit a firm can pay to shareholders in the form of dividends. These limitations are imposed by:

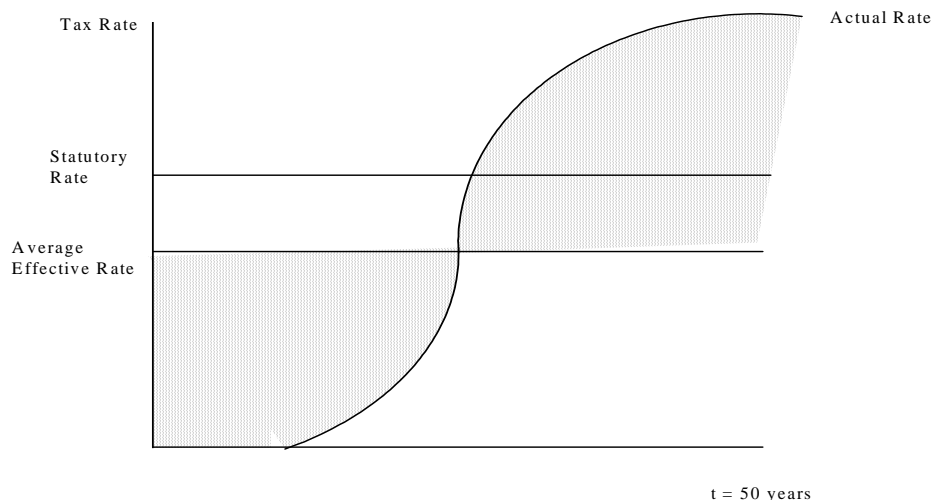
- *Corporations Law*
The payment of dividends is only permitted from (i) current year profits, and/or (ii) retained earnings;
- *The profit retention/dividend policies adopted by the firm*
Such policies are adopted to enable reinvestment of earnings, or to facilitate dividend maintenance during periods of earnings volatility, and
- *Liquidity requirements*
Cash flow constraints may not allow management to authorise the distribution of the full amount reported as profit/earnings amount as a cash dividend payment to shareholders.

The consequence of not distributing 100 percent of earnings is that not all imputation credits generated by the firm will be distributed to shareholders each year. Moreover, due to the existence of timing differences (for example in the recognition of book depreciation compared with tax depreciation) it is likely that profits will be earned at a faster rate initially than tax credits will be 'booked' in the franking account. This will occur when a firm is operating on the left-hand side of the S – curve¹⁷.

16 Brealey R, Myers S, Partington G, Robinson D (2000) Principles of Corporate Finance, 1st Australian edition, McGraw-Hill Australia, pp 585-586. Also see Officer and Hathaway (2004)

17 The S-curve is created when businesses benefit from large tax depreciation allowances. Businesses accessing these allowances would pay little or no tax during their first few years of operation, with tax payments

Figure 1: S – Curve: actual tax rate compared with statutory rate



This could result in profits being available for distribution before taxable income generates sufficient imputation credits if the company pays out all income in dividends. In early years, dividends are therefore likely to be un-franked or partly franked. Over time the timing differences reverse, but because in the early years profits have been released through the payment of dividends, there will be insufficient profit in the future to distribute all imputation credits. This is further compounded by factors such as profit retention/dividend policy and liquidity requirements (as noted above).

5.2 Historical Dividend Payout Ratios

It is a demonstrable fact that corporations do not distribute all of their profits, as is evidenced by the inclusion of retained earnings on most companies' balance sheets. Over the long term not all profits, and therefore not all imputation credits, can be distributed. Some opportunity for further distribution is possible via share buy-backs but not all companies have excess free cash flow to enable this to happen as evidenced by positive franking account balances – Hathaway & Officer present ATO data showing the FAB is circa 30% of tax paid representing FTCs that have not been distributed¹⁸. A conclusion therefore is that f is unlikely to have a value of 100 percent.

Figure 1 displays the payout ratio for listed gas and electricity distribution related businesses over the last 4 years and, with an occasional exception these are much less than 100%. The rise above 100% is usually driven by a desire to maintain a steady or rising dividend per share (see Figure 2) and when earnings experience a drop off or there are abnormal items, the payout ratio can rise above 100%.

Figure 2: Payout ratio for listed gas and electricity distribution related businesses¹⁹

rising at an increasing rate then flattening out through time, creating an S-shaped tax payment profile. Source: Office of the Regulator-General, Access Arrangements for Multinet, Westar and Stratus, Final Decision, October 1998, pp 228

¹⁸ Hathaway and Officer (2004) p 11

¹⁹ Companies included in the analysis for Figures 2 and 3 were; AGL, Alinta, Australian Pipelines Trust, United Energy (until sale), Origin Energy, Envestra, GasNet Australia. Data from Aspect Huntley

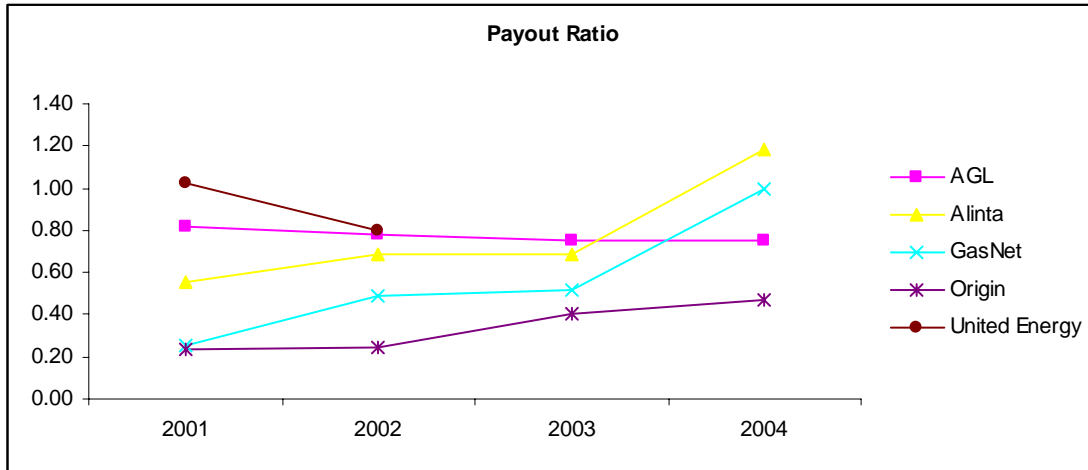
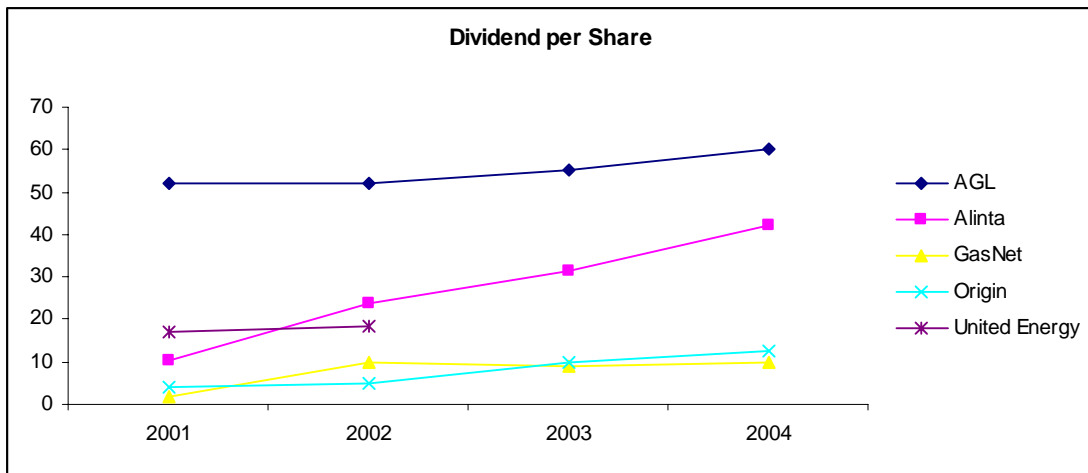


Figure 3: Dividend per share for listed gas and electricity distribution related companies



The average payout ratio for these companies from 2000 to 2004 was 68%.

As noted above, we estimated an f of 0.36 for these companies. This was found by first multiplying dividends paid by percentage franked to obtain an estimate of franked dividends. These were multiplied by $t_c \div (1-t_c)$ to assess the implied FTCs attached to the dividend. This was then expressed as a percentage of tax expense to assess the percentage of credits available that were distributed. Interestingly the percentage of franking was quite low. On this basis we estimated an f for gas and electricity distribution businesses to be in the region of 0.36. Our analysis finds f would be larger for the broader economy.

5.3 Australian Taxation Office data

The proposition that not all imputation credits created each year are distributed is evidenced by statistics published by the Australian Taxation Office. Table 3 shows that the accumulated franking account balances (ie. imputation credits) for companies grew progressively until 2002 followed by a fall in 2003. While variable, it is clear that not all income tax paid is distributed as FTCs.²⁰

Table 3: Total Franking Account Balances 1999 - 2003²¹

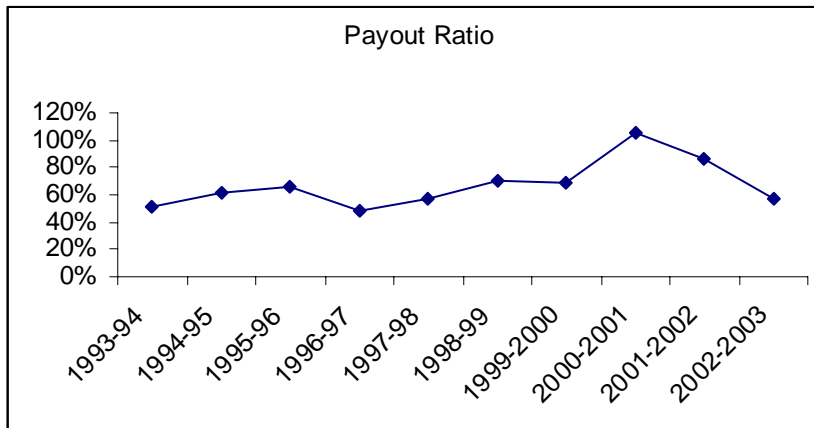
²⁰ There may be some double counting in these data – see Hathaway & Officer (2004)

²¹ Source: ATO website, company statistics, Table 2 for various years

	30 June 1999	30 June 2000	30 June 2001	30 June 2002	30 June 2003
Franking account balances for corporations	\$86 billion	\$102 billion	\$164 billion	\$179 billion	\$91 billion

Furthermore, company income tax return statistics published by the Australian Taxation Office show that cumulative total dividends (franked and unfranked) paid by companies represented a distribution of 70% of after tax 'taxable' earnings over the period 1993/4 to 2002/3²². Table 4 shows the ratio on a year by year basis.²³

Figure 4: Tax based dividend payout ratio



From this data we can conclude that not all imputation credits created are being distributed.

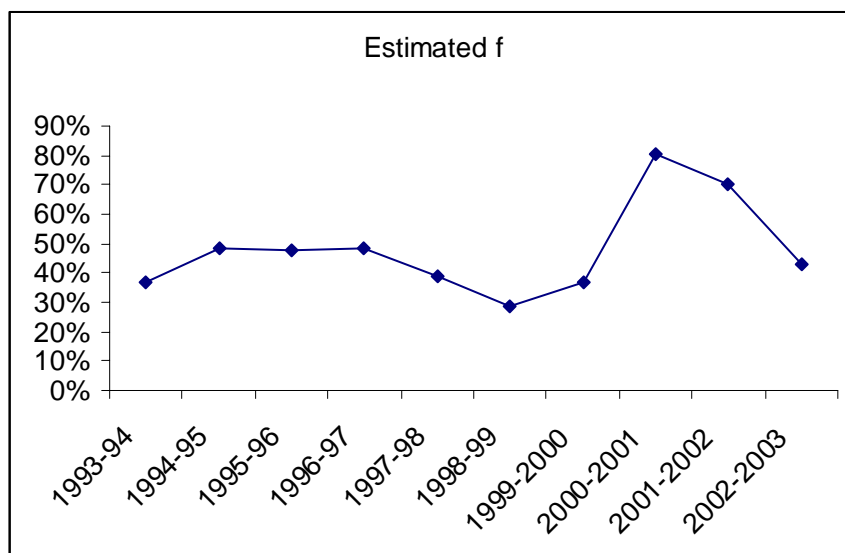
To hone in on the percentage of tax paid that is distributed, the franking tax dividends listed in ATO statistics were multiplied by $t_c(1-t_c)$ to estimate the implied FTCs attached to these dividends. This was then expressed as a percentage of tax paid. The tax rate used was based on net tax paid divided by assessable income in the ATO Tables. The average distribution rate of the period was 70%. The year by year distribution rates are shown in Figure 5. The average / cumulative percentage is close to the Hathaway and Officer estimate of 71% using a more exact measurement approach derived from the franking account balance.

We therefore estimate f to be 70% for the Australian market.

Figure 5: Implied distribution of FTCs as a percentage of Tax Paid

²² Source: ATO website, company statistics, Table 7 for 2003

²³ The payout ratio here is based on tax data (Source ATO website) so it may differ from published financial accounting data i.e. the ratio was calculated as total dividends divided by (Taxable Income less net tax paid). Consequently there may be some difference between this payout ratio and one based on financial accounts.



5.4 *The Value Of Imputation Credits as a Percentage of their Face Value*

The definition of the utilisation or redemption ratio, ω , calls for the measurement of the value of imputation expressed as a percentage of the imputation credit's face value to shareholders. For regulatory purposes the ratio needs to be estimated as at the time the tax is paid rather than redeemed. This poses two challenges.

The first challenge relates to the timing adjustment, the second to the value at redemption. Without the timing adjustment, maximum prices will be set too low to enable investors to recover the cost of capital on the tax sitting with the ATO until it is redeemed by investors when personal tax is 'paid'. A shareholder will not attribute 100 cents in the dollar at the time the imputation credit is distributed, if the realisation of the benefit of the imputation credit only occurs when an income tax return is lodged and assessed a year or so later.

The second challenge relates to assessing redemption value – redemption to whom? The redemption value differs by shareholder group as described earlier. The following sections set out a methodology for estimating an average value.

5.5 *Timing of Realisation*

Any benefit of imputation is realised some time subsequent to the payment of company tax, i.e. when the recipient of the dividend actually pays personal tax or is refunded. In order for a shareholder to claim the benefit of the imputation credit, a number of things must happen. These are:

- i) The company must make a profit;
- ii) The company must declare and pay a dividend;
- iii) The shareholder must lodge a tax return;
- iv) The Australian Taxation Office must issue an assessment; and
- v) The shareholder and the Australian Taxation Office must settle the net tax payable or refundable.

A corporate taxpayer will typically, but not necessarily, have a 30 June year-end. The tax instalment system requires that instalments of tax be paid throughout the year, with the balance of the assessment of income tax paid after 30 June. The company, if it makes a profit and has sufficient cash available for distribution to shareholders will declare a dividend, which is generally paid during the following October and April. The dividend will be franked to the extent that payments of income tax instalments paid allow.

In the case of certain shareholders (notably individuals and superannuation funds), the shareholder will include the dividend and imputation credit in their income tax return for that next financial year, and lodge their income tax return with the Australian Taxation Office. Formal lodgement of the shareholder's income tax return is made some time subsequent to the close of the financial year in which the dividend was received. The Australian Taxation Office will then assess the amount of tax due to be paid or refunded. The benefit of imputation (if any) therefore is not realised by the taxpayer until at least a year after that assumed by the regulatory model. As noted earlier, not all earnings are paid out as dividends in the following year. Some are retained but may be paid out in subsequent years. Consequently the FTC payment 'tail' may be quite long.

It is appropriate therefore to discount any FTC benefit at a discount rate equal to the investors' expected after tax return requirements over the period between when the company pays tax to and when the settlement of the shareholders' income tax liabilities is concluded.

We estimated the value of a \$1 of company income tax paid to be worth \$0.75 to an ARPTS at the time the company tax is paid. This represents the present value of \$1 of company tax paid in quarterly instalments in a regulatory year as at end December in that year when it is distributed with dividends over time. In order to estimate this, we assumed a 60% payout over 2 years with the balance in the following year. The payout is in 2 dividend instalments per year. That is 30c flows in the 2nd and 4th quarter of the year after income tax payment, 60% of the balance spread similarly in the next year with the balance in the next year. Given the retention policies of firms this probably over-estimates the value i.e. it should probably be less than \$0.75. For simplicity we used the cost of equity (beta of 1) to discount the flows. This analysis assumed quarterly PAYG payments by the taxpayer in anticipation of year end assessments may overstate the value for someone not able to recognise a benefit through quarterly PAYG.

5.6 Ownership of Equity

Dividend imputation reduces the tax payable on dividends to a narrow class of investors. It is instructive to look at the composition of the ownership of Australian equity. Table 4²⁴ illustrates the composition of equity owners as at 30 June 2004.

Table 4: Ownership Structure of Australian Equity

Equity-holder Category	Equity Holdings (\$b)	Proportion of Equity
Corporations	\$302.6	18%
Government	\$155.1	9%
Pension Funds and Insurance	\$563.6	33%
Overseas	\$429.9	25%
Individuals	\$262.1	15%
Total	\$1,713.3	100%

²⁴ Table derived from Australian Bureau of Statistics, Australian National Accounts: Financial Accounts (5232.0).

Dividend imputation issues relating to each category of equity holder are discussed further below.

5.6.1 Corporations

Franked dividends received by Corporations are subject to a dividend rebate, which means that the dividend is free of income tax. The major tax change associated with dividend imputation relevant to corporate equity holders is the abolition of dividend rebate on unfranked dividends received from non-wholly owned companies.

This is of course highly irrelevant to the discussion of ω , as ω only arises in respect of franked dividends. A corporation would only value imputation credits if it could derive some benefit from them. Imputation credits have no intrinsic value to companies however, as they do not reduce the taxation imposed on franked dividends.

Corporations that receive franking credits may pass them onto their ultimate shareholders. The value (if any) of imputation therefore arises if and when imputation credits are passed onto those shareholders, and will depend upon the identity of the ultimate shareholder. There is no intrinsic value to the company itself in imputation credits, as they do not reduce the amount of tax that is payable by the company.

The value of ω for a corporation can vary from zero if imputation credits cannot be passed onto shareholders to 75 percent due to time lags between creation and access.

5.6.2 Government

Government bodies fall outside of the Federal Income Taxation System. Imputation therefore has no value to Government owners of equity. In fact, there is probably a net cost to the government arising from ownership of equity in entities that pay (or could pay) franked dividends. This is because if the shares had been owned by individuals who have a marginal rate of tax (including the Medicare levy) greater than the corporate rate of tax the government will collect 30 cents of tax from the company, plus an additional amount of tax from these individual shareholders.

The value of ω for a government owned entity is equal to zero, or less than zero from a personal income tax revenue opportunity cost perspective.

5.6.3 Superannuation and life insurance Funds

Any assessment of the value these shareholders would attach to imputation credits must be viewed from the perspective of pre-imputation. To do otherwise would misrepresent the incremental value this class of shareholder attributes to them. Superannuation and life insurance funds were exempt from income tax prior to the introduction of CGT in 1985 and dividend imputation in 1987. Following the introduction of CGT and dividend imputation the funds remained exempt from tax and hence derived no benefit from imputation. Subsequent changes to taxation law resulted in the funds losing their exempt status. Eligible funds are now subject to an income tax rate of 15% on all earnings and are able to offset imputation credits against tax liabilities. These funds are now net payers of income tax, whereas prior to imputation they were not. As is evident from Table 5 taken from ATO statistics, these funds pay substantial tax, \$5.4b in 2002-03 despite using \$1.2b in imputation credits.

Table 5: Net Tax and Imputation Credits of Funds

Funds	2000-01	2001-02	2002-3
Net Tax	4,165,943,348	4,453,831,281	5,369,558,427
Imputation Credits	1,437,315,052	1,046,463,166	1,149,139,237

The proposition that superannuation funds have derived benefits from the changes around imputation is not supported by the observation that their tax liabilities have increased from nil to \$5.4 billion. On these grounds we argue that one view is that the introduction of imputation tax has had a substantially negative impact on Funds.

Nevertheless, given these funds are now taxed it appears they fully claim the imputation credits available to them as is apparent in Table _ where the credits claimed are approximately equal to the implied FTC.

Table 6: Imputation credits claimed by Funds

Funds	2000-01	2001-02	2002-3
Franked Dividends	2,889,722,638	2,503,100,829	2,661,069,283
Implied FTCs	1,488,644,995	1,072,757,498	1,140,458,264
Claimed Credits	1,437,315,052	1,046,463,166	1,149,139,237
Claimed / Implied	0.97	0.98	1.01
Statutory Rate	34%	30%	30%

Hathaway and Officer (2004) note that the imputation credits redeemed by funds appear to be 56% lower than they would be expected to be given an estimate of the dividends the industry receives. They suggest the shortfall could be claimed by Life Offices for which there are no separate statistics. As a consequence we cannot be sure that Life Offices fully claim imputation credits so we have treated them in the same manner as the funds.

Viewed in the light of the collective tax changes that have been made to these funds (eg. CGT and removal of income tax exempt status), the value of imputation credits expressed as a percentage of the credit's face value to shareholders when distributed (ω) is therefore zero as the low estimate and \$0.75 as the upper estimate.

5.6.4 Foreign / Offshore Shareholders

The tax treatment of foreign shareholders will depend on the foreign shareholder's tax domicile, and the existence and nature of any double tax treaty between their tax domicile and Australia. Dividends paid to overseas shareholders are generally subject to dividend withholding tax. The rate of withholding tax is 30% unless there is a double tax treaty between Australia and the tax jurisdiction of the overseas shareholder.

Where a double tax treaty exists, the withholding tax rate will be specified in the double tax treaty. The overseas shareholder is generally subject to income tax in their tax domicile on the gross amount of the dividend but is able to claim a credit for withholding tax paid in Australia. Dividends that are fully franked are not subject to withholding tax. Where a dividend is not subject to withholding tax, there will be no tax credit available to the foreign shareholder in their tax domicile.

Taking these facts into consideration, an overseas shareholder is likely to attribute a value to ω of zero, as they will not derive any material benefit from imputation.

5.6.5 Individuals

Individuals are subject to tax on their taxable income at their marginal rate of tax, plus Medicare levy. Effective 1 July 2000, imputation credits in excess of the shareholder's tax liability are refunded at their face value. A complicating factor lies in how and when the value of ω is measured, as the present value will be less than the face value. For the purposes of this analysis we have assumed the delay process described in the sections above. The assumed discount rate is the cost of equity assumed to be 12 percent.

The value of ω to individual shareholders is approximately 75 percent in present value terms.

5.6.6 Other

There are other entities recognised by the Taxation system, such as Partnerships and Trusts. These entities are not taxed as entities as such, (apart from public trading trusts, which are treated under the taxation system as companies) because their income is distributed to partners and beneficiaries. The partners and beneficiaries are required to include their share of partnership income and trust distributions in their assessable income. The taxation consequences are measured under income tax statistics according to the identity of the partners and beneficiaries (ie Corporations, Funds, Government, Overseas Shareholder or Individual).

The value of ω to these 'Other' category of shareholders is indeterminate, but between 75 percent and zero in present value terms.

5.6.7 Summary

The above analysis shows that the value of ω lies in a range between 75 percent and zero in present value terms, with individual domestic resident shareholders attributing the highest value. Looking at the composition of equity ownership in Australia 'Individuals' directly comprise only 15 percent, while shareholders that attribute zero (or negative) value, such as government entities, superannuation funds and overseas shareholders make up 85 percent in the low case and 34% in the high case. Hence, a weighted average may be an appropriate way to calculate a value for ω as provided in Table 7 below.

Table 7: Weighted value of ω for an 'average' Australian firm

Equity-holder Category	Equity Holdings (\$b)	Proportion of Equity	Low)	High)	Weighted Average Low)	Weighted Average High)
Corporations	\$302.60	18%	0	0.75	0	0.135
Government	\$155.10	9%	0	0	0	0
Pension Funds and Insurance	\$563.60	33%	0	0.75	0	0.248
Overseas	\$429.90	25%	0	0	0	0
Individuals	\$262.10	15%	0.75	0.75	0.113	0.113
Total	\$1,713.30	100%			0.113	0.495

The weighted average range for ω lies between 11 and 50 percent. The mid-point of the weighted average value for ω is 30percent. Hence, for the point estimate for ω for the average investor is 30 percent.

Based on the proportional ownership of equity in Australia the weighted average value of ω is 30 percent.

5.7 *The Value of Imputation Credits (γ)*

In the preceding sections we have derived values for input into the formula from section to calculate the value of imputation credits (γ).

$$\gamma = (f \times \omega)$$

The fraction of current imputation credits that the firm distributes (f)

Using Australian Tax Office, historical payout ratios and stock exchange data we have estimated that the fraction of current imputation credits distributed by an 'average' firm operating in Australia is 70 percent.

The Value of Imputation Credits as a Percentage of their Face Value (ω)

The definition of ω calls for the measurement of the value of imputation expressed as a percentage of the imputation credit's face value to shareholders when distributed. Taking into consideration the lag between creation and utilisation of imputation credits and the composition of equity ownership in Australia a conservative point estimate of the average value of ω is 30 percent.

The value of imputation credits (γ)

From our analysis the average value of imputation credits (γ) is therefore 21 percent:

$$\gamma = 70\% \times 30\%$$

$$\gamma = 21\%$$

A market average value of gamma of 21% implies an effective tax rate of 24% (i.e. $0.30 (1 - 0.21)$).

We note however that the value of gamma is probably lower than 21 percent based on the conditions necessary to achieve equilibrium in the Australian capital market and taking into account the other equity taxation measures implemented with dividend imputation (eg. CGT). Our view is that 21 percent represents the maximum value that can be attributed to gamma for an average investor.

We point out however that we do not think the "average value" is a very useful concept. It is our view that it is the value of imputation credits to the marginal investor in regulated distribution businesses that is the relevant measure. This we estimate to be zero.

6 Conclusion

Having examined the value of imputation credits from a variety of angles using multiple independent data sources it has been demonstrated that the value attributed to imputation credits by investors is lower than the 50 percent used by regulators.

In our view the appropriate value of gamma is that applicable to the marginal investor in the gas and electricity regulated distribution sector from a regulatory perspective. For these investors, imputation credits have a value of zero and therefore the effective company tax rate (from an imputation tax perspective) is the statutory rate.

We have not calculated an average gamma for the gas and electricity sector at this stage because we have not estimated the overall share ownership structure. However applying an Australian average f of 0.7 and assuming an equal shareholding between those valuing the FTCs at 0.75 and zero, therefore an ω of 0.375, provides a gamma of 26% or an effective tax rate of 21%.

At the aggregate Australian market level, Australian Taxation Office data indicates that approximately 70 percent of imputation credits are being distributed (ie. the value of f). Over time the amount of imputation credits cannot exceed the proportion of company earnings that are distributed as profit. Due to timing differences between book and tax accounting and the mechanics of the imputation system, the proportion of franking credits that are distributed will be significantly less than 100 percent. Given these considerations, an appropriate value for the fraction of current imputation credits that the firm distributes (f) for regulatory purposes is 70 percent.

It is clear that some participants place no value on imputation credits, for example foreign shareholders and superannuation funds. Moreover, those shareholders that do place a value on imputation credits are unlikely to value imputation at 100 percent of face value. The highest value that can be attributed is 75 percent of face value. When weighted by the ownership structure we assess the mid point of the average redemption value to be 30%. Thus, at the average Australian company level, the value of gamma is 21%. This corresponds with an effective tax rate of 24%.

The value of gamma for estimating the effective corporate tax rate falls in a range between zero and 35 percent. A value for gamma of zero is the most appropriate estimate as it is consistent with the marginal investor in the regulated gas and electricity sector.

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