

# THE VALUE OF IMPUTATION TAX CREDITS

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## ABSTRACT

A large proportion (48%) of the tax that "masquerades" as company tax is personal tax collected (withheld) at the company level. This means that the effective company tax in Australia is much closer to 19% than the statutory rate of 36%. This is because the introduction of imputation tax in July 1987 substantially reduced the previous position of double tax on company earnings; company tax followed by personal tax on dividends. Shareholders now pay personal tax on the gross of dividends and imputation tax (company tax) credits and obtain credit for the company tax paid. There are three milestones in the life of franking credits; they are created when company tax is paid, they are distributed along with dividends and they are redeemed when shareholders claim them against personal tax liabilities. Two issues thus arise; how many credits are issued (access) and how many of these distributed credits are redeemed (utilisation)? We find that the access factor is 80% and increasing (an increasing amount of company tax is being distributed as credits) and about 60% of distributed credits are being redeemed. Overall, 48% of company tax is actually pre-payment of personal tax.

## NOTE

The results of this paper were first presented at a Pacific Basin Finance Conference in New York in December 1991. There have also been a number of presentations at seminars in Sydney, Brisbane and Melbourne during 1992, 1993 and 1995. The paper has benefited from comments at these seminars. The authors acknowledge the invaluable assistance of the Australian Stock Exchange (Melbourne Office) and Knight Ridder/Equinet in giving us access to the data. Funding by Esso for the extension of the study in 1993 is gratefully acknowledged. The authors are also indebted to Professor Frank Finn for insightful comments on the Study.

## 1. Introduction

Imputation credits are valuable but how valuable depends on dividend policy and the tax status of the recipient shareholder. (Do they pay Australian taxes?) Unfortunately, tax laws prevent the trade in imputation tax credits and therefore there is no open market to observe the value of the credits. The consequence is that an implicit value of the credits has to be estimated indirectly. This paper, which is a "cut down" version of a more comprehensive (academic) paper, is a study of the value of imputation tax credits.

The introduction of the imputation tax system for companies in 1987 has partially eliminated the double taxation of the classical company tax system that prevailed before 1st July 1987. Under the classical tax system, company tax was charged on a company's profit and then personal tax was charged on dividends distributed from after-tax company profits. Under the imputation tax system, tax is first collected as "company tax" and then when shareholders receive (franked) dividends they are credited with these "company tax" payments, called imputation credits, for use against their personal tax liabilities on the grossed up (for tax credits) dividends. Shareholders aggregate the cash dividends received and the credits allowed and are liable for personal tax on this total. The imputation credits (company tax collections) are credited against this personal tax liability and the shareholder pays the net liability or, in the case of an excess of imputation credits over personal tax liability, receives a net credit that can be applied against other tax liabilities in that year. No cash refund of excess credits is allowed and credits cannot be carried across tax years by personal investors.

Most countries have some form of imputation tax system that credits some proportion of company tax against personal tax liabilities. There are only a handful of OECD countries still applying the classical tax system, with the USA the most noteworthy. However, the USA is known to be considering introducing some form of crediting system.

Under the imputation tax system, the much of the money collected as "company tax" is really a withholding of personal tax. If shareholders could access all company tax payments as imputation credits and all such credits could be redeemed as pre-payment of personal tax liabilities, then there would be no company tax. The only tax liability would be the personal tax liability. In practice,

this extreme case of zero company tax is not achieved. Not all company tax payments are distributed as credits and of those credits that are distributed, not all can be utilised by the recipients. Companies rarely have a policy of 100% payout of earnings so some credits are not accessible by shareholders. In turn, some recipients are not liable for Australian tax (noticeably, foreign shareholders and Australian tax-exempts, such as charitable funds and universities) and so they do not have a tax liability against which they can utilize the credits. There has been some "trading" in tax credits between taxable and tax-exempt shareholders but the Australian Tax Office (ATO) has actively sought to curtail this activity with considerable success.

In summary, we find the following overall results:

1. *access* - 80% of company tax payments are distributed as imputation credits, and
2. *utilisation* - 60% of the distributed credits are redeemed by taxable investors.

These are *two factors* which, when compounded, indicate that statutory company tax rate is reduced by 48%. Effectively, company tax is substantially less than the statutory rate of 36% and much closer to an effective rate of 19%. 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. As we will see below, the *access* factor has been increasing over time. An increasing proportion of the credits are becoming available to shareholders. The effective company tax rate, as distinct from the statutory rate, is declining.

There are three milestones in the life of imputation credits:

1. They are **created** when company tax is paid.
2. They are **distributed** when franked dividends are paid to shareholders.
3. They are **redeemed** when shareholders lodge their personal tax claims.

These three events are analysed in order to establish the value of franking credits.

We derive our results in two ways. Firstly, we examine the national tax statistics from which we derive the overall average results as imputation credits are redeemed. However, when tax statements are lodged by taxpayers, there is no requirement to identify the source of the credits claimed, but rather just the aggregate of tax, dividends and credits. Hence we can only obtain broad results from the taxation statistics. For example, we cannot use them to distinguish between credits paid and received by resources versus industrial stocks. To overcome this problem, we also analyse the ex-dividend behaviour of stock prices.

When stocks go ex-dividend, the share price typically drops because the assets, in the form of dividends and franking credits, are being distributed. The drop in the share price reflects the market's value of the dividend and credit being paid out. If shareholders value the associated imputation credits, then the share price should drop further to reflect the trade-off between capital value and dividend cash plus credits. This is indeed what happens. Share prices of fully-franked dividends fall further, as shares go ex-dividend, than shares which pay out unfranked dividends. We analyse the *extra* drop-off in the share price that is attributable to the credits as distinct to the drop-off attributable to the dividend alone.

This method of valuing the credits has the advantage that separate valuations of tax credits can be made for market sectors and even individual companies.. However, much caution should be exercised when interpreting such sub-sector valuations because there is considerable "noise!" in the individual results. Consistent with our taxation statistics results, we find that the **average** drop-off value of the credits is between 50% - 60% of their face value.

Ex-dividend drop-off statistics can only address the *second* factor, **distribution**, associated with company tax and imputation credits. Drop-off analyses (and any other valuation based on dividend events) can only value the tax credit attached to a dividend when it (the franked dividend) is paid. This happens after the company makes its decision about how much of the profit, after-company tax, to distribute as a franked dividend. The value of credits derived from drop-off analyses indicates the market value of credits, not the redemption value. In theory, we would expect the drop-off valuations to be less than the redemption valuations in order to allow

for the time value of money between the payment of the franked dividend and the redemption of the franking credit.. In practice, the "noise" in the data may mask any such finessing of the results.

Before proceeding to the results, there are two issues that should be cleared away. These are issues that we find are frequently raised and represent some confusion in the minds of some people.

The first such issue is that the personal taxation rate (as distinct from the tax status) of the shareholder recipient of the dividend is irrelevant. The only fact that matters is that the shareholder has an Australian taxation liability against which the imputation credits can be applied. Whether that tax liability was incurred at a marginal tax rate of 15% or 48% is immaterial. To see the veracity of this statement, simply ask yourself the question "if they could sell their imputation credits, what would two taxpayers, one on a 15 % and the other on a 48% rate, want as monetary compensation for their imputation credits paid from a company on 36% corporate rate?" To make this concrete, suppose each received a \$0.64 fully franked dividend. Men each would be liable for personal tax on the grossed up amount of \$1.00 (\$0.64 cash dividend plus \$0.36 imputation credit). The answer is that *both* would want \$0.36 cents for their imputation credit. In this case alone, they would end up with \$1.00 cash and their personal tax position would remain unaltered. The fact that they are on two separate marginal personal tax rates is immaterial Being able to both access and utilize the credits are the important aspects of the value of imputation credits.

The second major issue of confusion is that foreign investors (indeed, non-taxpayers in general) would not pay anything for the value of future imputation credits impounded in Australian share prices. But this would only be true if tax-exempt shareholders always traded their shares with other tax-exempt shareholders. In this case, none of the future credits would ever be used so they would indeed be valueless (assuming some mechanism is not invoked to trade credits with taxpayers). However this is very unrealistic. The Australian Stock Market turns over about 50% of its aggregate market capitalisation each year. So, on average, each share is traded every two years. Even if foreign investors held their Australian shares for this average of two years, they would only lose value for the imputation credits paid out over the two year holding period. When they sell out of their shares, they are selling into a market that does place value on the credits.

Our result, that distributed credits are valued at about 60% of face value reflects a market of investor, some of whom place no value on the credits and some of whom place a high value on the credits.

To avoid paying for something you cannot use, we would expect that shareholders arrange their affairs to be the most tax efficient. Presumably, taxable investors would be attracted to shares with fully franked dividends and, insofar as these shares reflect some value in the franking credits, non-taxpayers would be attracted to shares with unfranked dividends, all else being the same. There is certainly strong evidence that this clientele effect is occurring. We will present the results below. However, it is difficult to avoid franking credits when buying shares because the vast majority of dividends are franked and of the franked dividends, the vast majority are fully franked.<sup>1</sup> All up, 83% (by value) of the dividends paid out are franked dividends. These franked dividends are, on average, 96% franked; 92% are fully franked and the other 8% are on average 50% franked, giving an overall average of 96% franking. So while there is a theoretical argument for market segmentation, there are practical limits on how far this segmentation can go.

We now turn to presenting our empirical results. Section 2 presents the Australian Tax Office (ATO) data and the associated analyses. In Section 3 we present the ex-dividend drop-off events. We present only the main results and only sufficient detail to understand the analyses and the results. We make some concluding remarks in Section 4, as well as some precautionary dictates on using these results in practical valuation exercises. The authors have been involved in quite a wide range of projects that involve applying these results and have made some deductions about their practical implementation.

## **2 . REDEMPTION VALUE OF CREDITS (ATO DATA)**

We extracted data on dividends paid, company tax payments, credits issued and credits claimed by taxable claimants. This data set describes the *creation* of credits (i.e. company tax payments), the *distribution* of credits (i.e. franked dividend payments) and the *redemption* of credits (i.e.

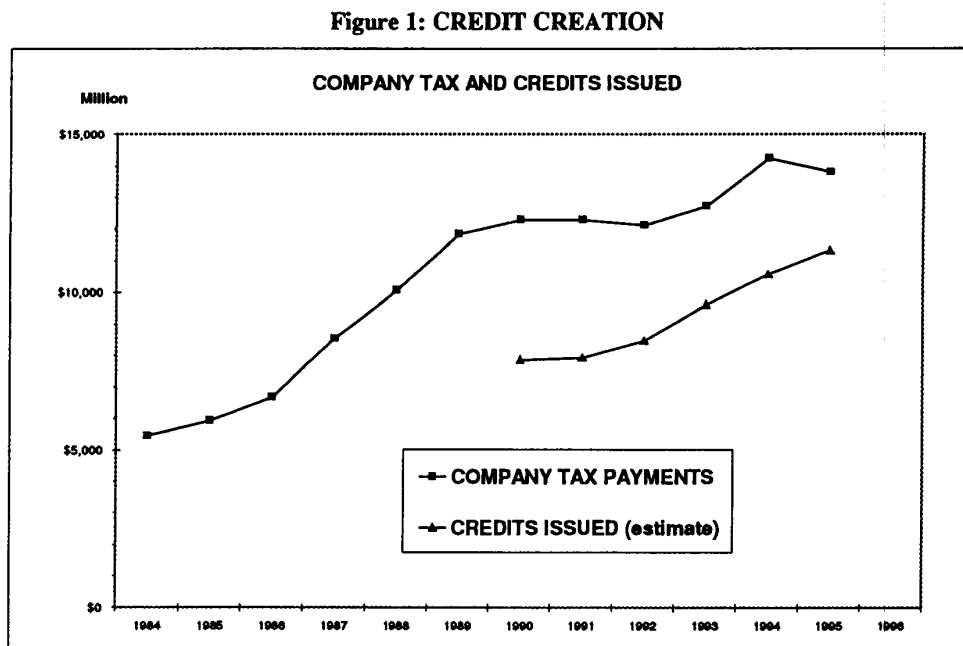
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<sup>1</sup> Dividends are either 100% franked or unfranked (0%) but a company can payout a mixture of franked and unfranked dividends. We include those dividends paid out as a mixture in our figures on “franked” dividends unless otherwise stated.

taxpayer claims of credits, including individuals, superfunds and some financial companies). The proportion of credits claimed (redeemed) and thus the dollar value of the credits to the ultimate users of the credits can be derived from this ATO data.

## 2.1 Creating Imputation Credits (ATO Data)

The source of credits is company tax collections. Figure 1 illustrates these data over the 13 financial years 1984 to 1996. There have clearly been some major events in company tax collections, including the hiatus from the recession in the early 1990t plus a sudden downturn in 1995, notwithstanding th3l company profits and tax payments appeared by then to have recovered from the recession. However, dividends and credits can be issued from retained earnings, within the confines of a company's Franking Account Balance (FAB), which means that the credits issued need not directly correlate with current year tax collections. The *ATO* only began to report data on credits from the 1990 financial year.

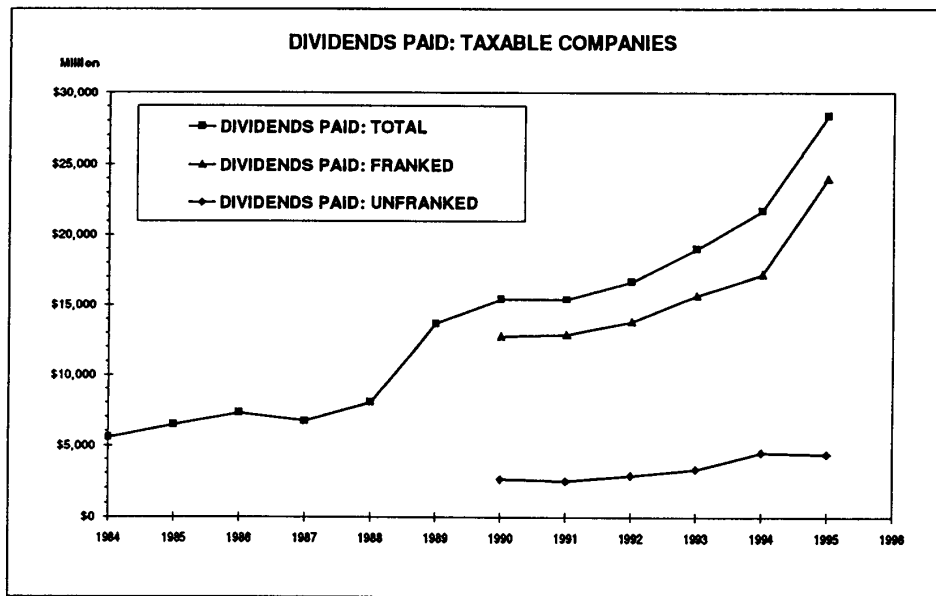


Ultimately, any downturn in company tax payments must be reflected in the distribution of future credits as any pool of undistributed credits is exhausted.

## 2.2 Distributing Credits (ATO Data)

Credits are distributed to the ultimate users (credit redeemers, which include personal taxpayers, superfunds and some finance companies), either directly by the taxable companies which create the credits or passed through other entities such as taxable and non-taxable companies, and partnerships and trusts. In the case of trusts, the dividend is passed on as a cash distribution and the credits (and therefore their value) received by a trust can be passed on to the trust recipients. The ATO data distinguishes between credits received by investors in their own right (*primary credits*) and credits received via these intervening trusts (*secondary credits*).

The ATO have published data on the amount of dividends paid (franked and unfranked) since the 1990 financial year. The amount of franking of dividends has averaged about 83% of total dividends. These results are seen in Figure 2: distribution of credits via taxable companies (distribution of credits via non-taxable companies are not presented here. The ATO data have two years missing for data). Obviously the nontaxable companies are distributing credits from their FAB account received as investment income from franked dividends. These non-taxable companies are not creating any tax credits of their own (after all, they do not pay company tax) but are just passing such credits through to their shareholders. Another way that credits are passed through to the ultimate redeemers of the credits is via trusts. This data is described in Figure 3: distribution of credits via trusts. The franking credits accompanying the franked dividend income of trusts is distributed to trust beneficiaries as their *secondary imputation credits*.

**Figure 2: DISTRIBUTION VIA TAXABLE COMPANIES**

We have estimated the credits issued from the franked dividends paid data. We had previously established that franked dividends averaged a 96% franking level. We used this calculation and the contemporaneous company tax rate to estimate the amount of credits issued from the amount of franked dividends distributed. Any credits issued that were created under a previous company tax rate will cause an overestimate (underestimate) to the amount of credits issued if that tax rate was lower (higher) than the contemporaneous tax rate. Figure 1 contains this estimate plotted against company tax payments. We are now in a position to estimate the first or access factor of imputation credits. This is the proportion of credits issued as a percentage of company tax paid. This is plotted within Figure 4.

Figure 3: DISTRIBUTION VIA TRUSTS

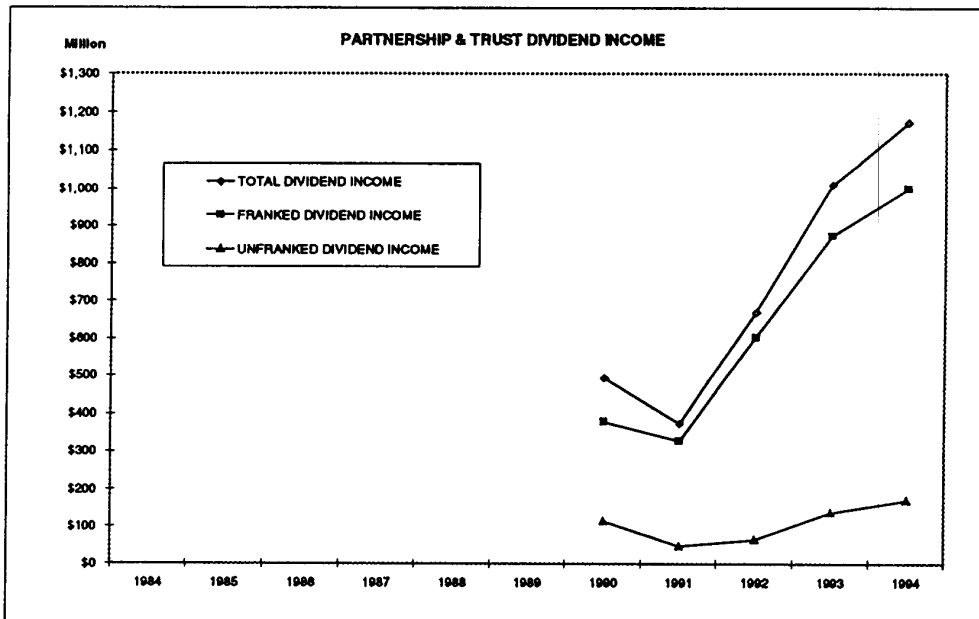
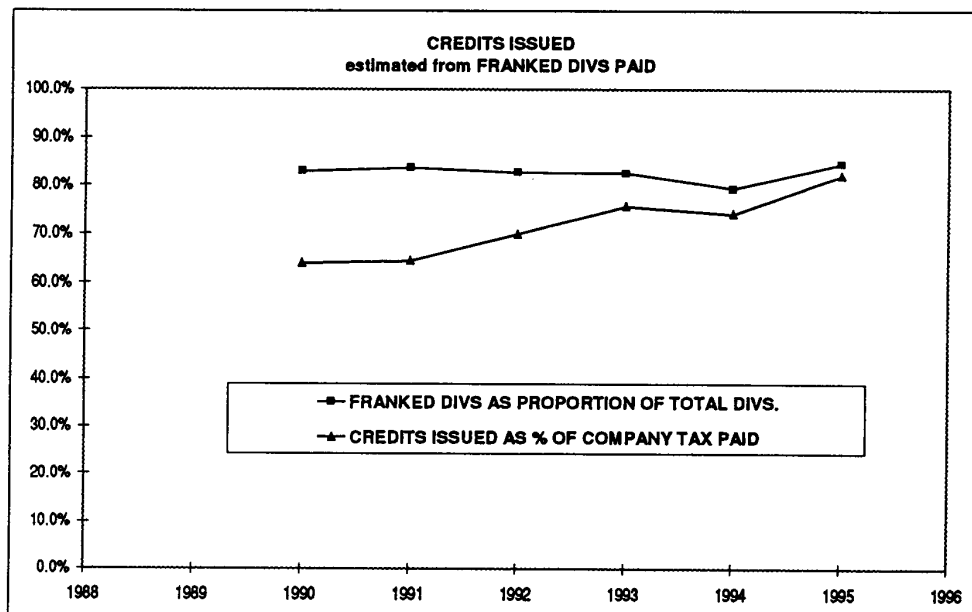


Figure 4: CREDIT ACCESS



### 2.3 Redemption of Credits

We next estimate the credits redeemed (claimed) by the ultimate consumers of the tax credits. These include taxable and non-taxable individuals, superfunds and some finance companies. The imputation credits that are redeemed by (1) taxable individuals are shown in Figure 5 (non-taxable individuals are not shown: these credits are lost as non-claimed credits cannot be held over once received by shareholders), (2) superfunds are shown in Figure 6 and by (3) some finance companies are shown in Figure 7.

Figure 5: CREDITS REDEEMED BY TAXABLE INDIVIDUALS

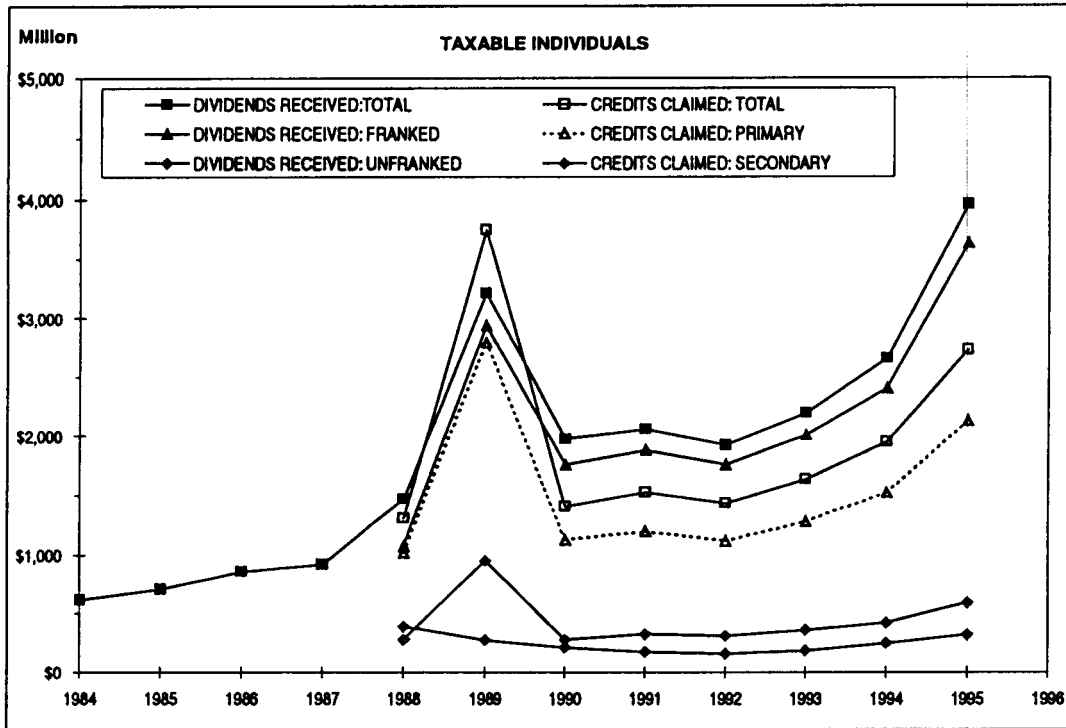
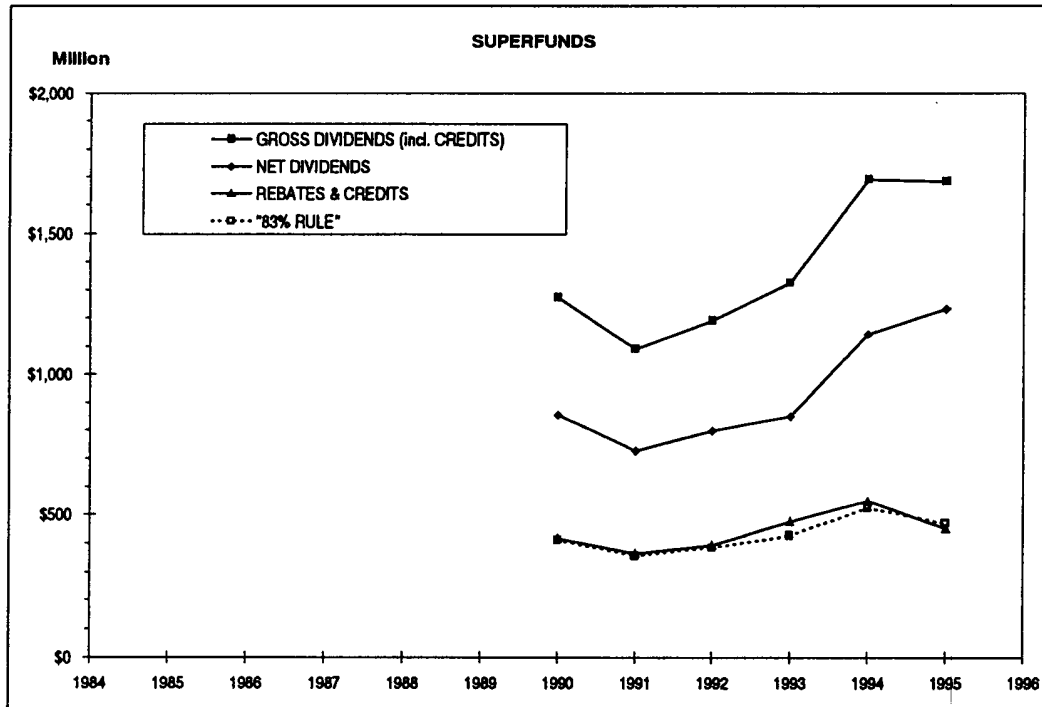


Figure 6: CREDITS REDEEMED BY SUPERFUNDS



Superfund dividend receipts are not reported as franked or unfranked. Instead, the grossed-up dividend (credit plus cash) is reported as well as net dividends and aggregate rebates and credit

claims. These credit claims include items other than just dividend imputation credits. We cannot assume that all dividends are domestic sourced dividends so the proportions developed above for franked and unfranked dividends may be in error for superfunds. Accordingly, we plotted the theoretical credit amount assuming the superfunds received credits in the same overall proportion as the complete market for that year. Incidentally, this has averaged 83% of franked dividends so we call this assumption the "83% rule". The superfunds' actual claims for rebates and credits very closely follows the theoretical amount. Accordingly, we assume that the aggregate rebates and credits claim by superfunds are all redeemed franking credits. Any error in this assumption means we are overstating the amount of credits redeemed by superfunds.

Redemptions by finance companies were considered in detail. Many credits are claimed by the superfund subsidiary of a finance (holding) company which appears in the ATO statistics as a **company** redemption instead of as a superfund. The vast majority of dividends paid by Australian companies are paid to other companies, and finance companies (as defined by the ATO) receive the bulk of these company dividends. Some finance companies can redeem the credits. To explore this important source of credit redemption, we plotted by industry sector the gross dividends received, the rebates and credits claimed and the theoretical credits that would accompany the dividends (assuming the "83% rule" of franked versus unfranked dividends). We did this for taxable and non-taxable finance companies across a number of years. An example is shown for taxable finance companies in 1993-94 (Figure 7).

Just as for superfunds, we are forced to assume that all the claim for rebates and credits were actually claims for imputation tax credits. If the dividend income was all domestic, we would expect dividends to be franked in line with the overall Australian average for that year- the "83% rule". The imputation credits would then be derived from the grossed-up amount of that dividend. These theoretical credits are calculated and compared to the actual credits claimed by ATO records. In 1994 the theoretical credits are generally too high compared to what was claimed by finance companies, particularly for finance companies not elsewhere classified (n.e.c.), indicating we are grossing up dividends that actually have less franking than the Australian average. We have no means of correcting each estimate so we make the assumption that the finance company credit and rebate amounts are all the redemption of franking credits. To the extent that some finance companies derive overseas dividend income which does not have any

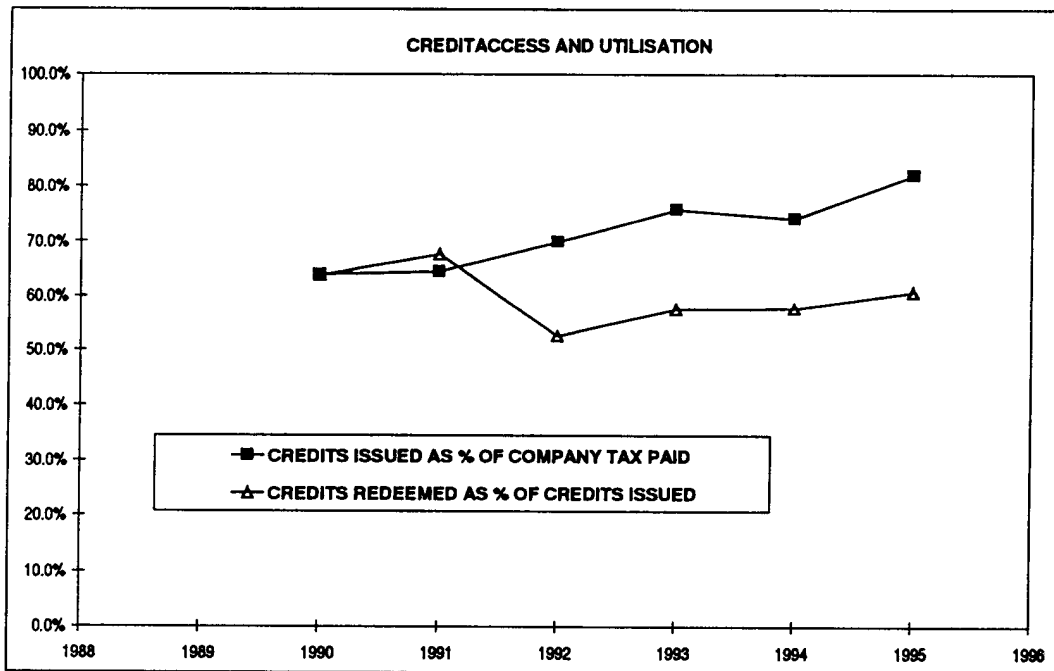
attached franking credits, our estimates will overstate the redemption of imputation credits by these companies. In other years the error was in the opposite direction. We can only hope that with sufficient years of data, the errors will cancel out.

The redemption of franking credits by *taxable investors* is our overall measure of the redemption value of credits. This fraction is the ratio of the aggregate credits redeemed by taxable individuals, taxable finance companies and superfunds to the aggregate credits issued by taxable companies. If we included credits of nontaxable companies we would certainly be double counting. Most dividends received by non-taxable companies are passed through. Over the five years 1990-96, non-taxable companies received aggregate dividends of \$45.616 billion and paid out aggregate dividends of \$43.532 billion, a 95% pass-through ratio.

We have now established the two important factors for imputation tax credit valuation. These are an increasing access to credits (now standing at 82%) and a redemption factor of 60% for distributed credits.

The aggregate redemption (*utilisation*) fraction of imputation credits by taxable claimants is plotted in Figure 8, along with the other important factor of the access rate. The utilisation fraction has fluctuated around 60%. On the basis of these data and our assumptions, we estimate the redemption value of credits to average 60 cents per \$1 of issued credit.

Figure 8: CREDIT ACCESS AND UTILISATION

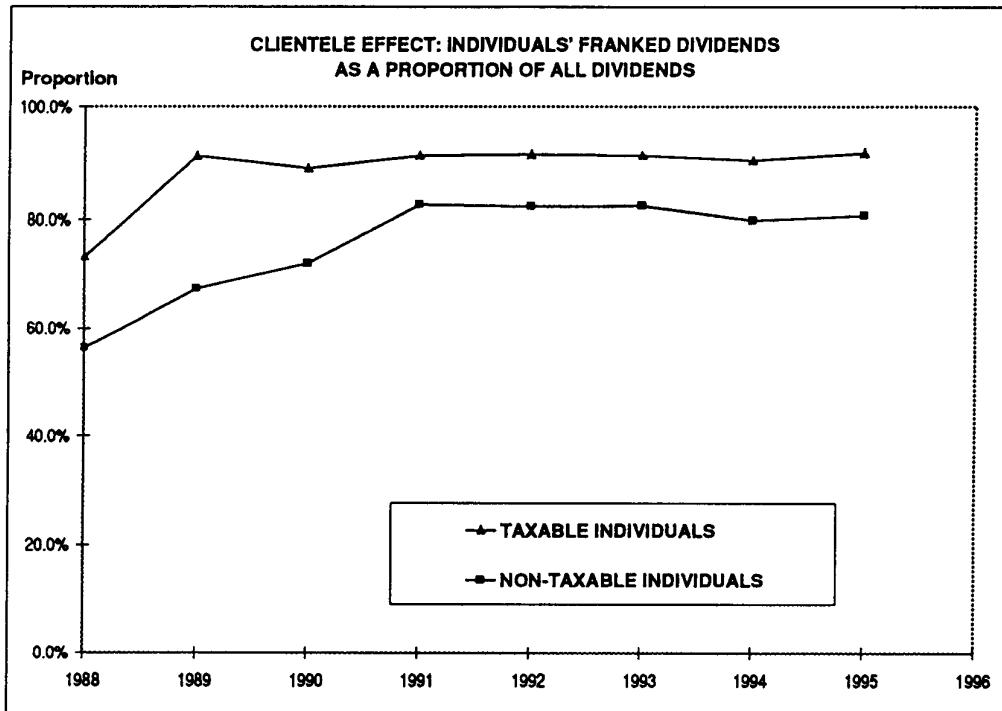


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## 2.4 Clientele Effects

In the above analysis, it is observed that franked dividends are pervasive. This does not mean however that all investors hold equal weightings of shares paying franked versus unfranked dividends. There is the opportunity for clientele effects which we observe in the data. Figure 10 plots a clientele effect among individual taxpaying investors. We observe that there has emerged a rather steady difference of 10% in the proportion of franked dividend income to total dividend income between taxable and non-taxable investors and since imputation commenced in June 1987, it took four years for this difference to become stable. Also of interest is the quick emergence (two years) of a stable fraction of franked dividends to total dividends in taxable investors' portfolios. Equilibrium appears to have been reached rather quickly which suggests that the clientele effect has little further progress to make.

Figure 9: CLIENTELE EFFECT



### 3. VALUING IMPUTATION CREDITS BY DIVIDEND DROP-OFFS (Listed Companies)

We now turn to the measurement of the value of imputation tax credits by examining dividend drop-offs which are the change in value of a share price when stocks go ex-dividend. Only the overall results and a brief outline of the method will be presented here.

If a stock pays a dividend of \$0.64 that is fully franked at the rate of 36% (i.e. a franking credit of \$0.36) then one might think that the stock price will fall by \$ 1.00, thus M impact of the cash and the credit. To establish the amount of the franking credit, the dividend is first grossed-up to a pre-tax amount (divided by 0.64) and then the tax component of this gross amount is calculated (multiplied by the tax rate, 0.36). This establishes the amount of a fully franked dividend. If the dividend is not fully franked then the tax credit component is scaled down by the franking percent factor.

$$\Delta P = \text{Div} + \text{FC}$$

A more general statement of this is as follows;

$$\Delta P = \text{Div} + \text{Div} \cdot [t/(1-t)]f \quad \dots (1)$$

where  $\Delta P$  = share price change over the dividend event,  $FC$  = franking credit amount,  $Div$  = cash dividend amount,  $t$  = company tax rate, and  $f$  = franking proportion of the imputation tax credit ( $f = 1$  for a fully franked dividend). If we eliminate the scale effect of the cash dividend, then equation (1) becomes simply

$$\Delta P / \text{Div} = 1 + [t/(1-t)]f \quad \dots (2)$$

We estimate (2) by running the regression equation

$$\Delta P / \text{Div} = a + b \cdot f \quad \dots (3)$$

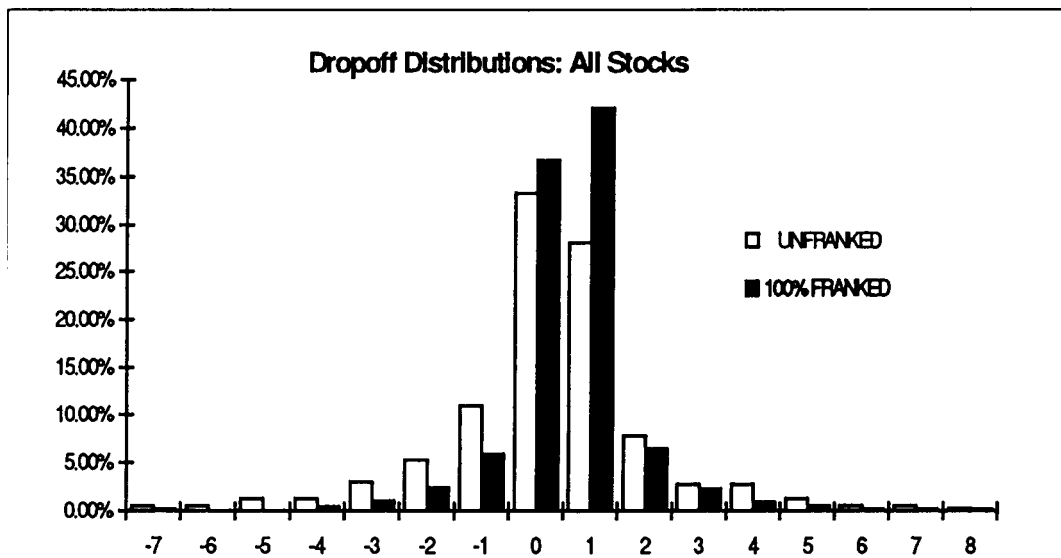
The interpretation of  $a$  is the drop-off proportion due to the cash component of the dividend and the interpretation of  $b$  is the extra drop-off proportion due to the franking component. We are particularly interested in this imputation factor.

The main data set analysed consisted of all closing share prices for the period January 1 1985 to June 30 1995. This data set contained 6179 dividends and associated stock drop-offs. There were enough data points to enable sub groups to be analysed. Only the broad results will be presented here. We confined the analyses to fully paid ordinary stocks which reduced the relevant dividend events to 4355. A drop-off calculated from non-consecutive closing price data is at risk of being influenced by extraneous information. Attempting to control for this by adjusting drop-offs for market moves is unlikely to make the drop-off more reliable estimates. In any event, we also conducted the analysis with the drop-offs adjusted for market moves. We found no consistent nor significant differences in the results.

We eliminated any zero drop-offs and confined our analysis to either zero franked or 100% franked dividends. The difference in means of the drop-offs for zero franked and 100% franked dividends is a measure of the extra drop-off due to the credits. Our final sample size was 1482 dividend events, with the following break down. These drop-off data were plotted as histograms

and then subjected to statistical analysis as before. Only the histogram for the entire set of 1482 drop-offs is presented in Figure 10. This histogram demonstrates a clear move to the right for 100% franked stocks compared to unfranked stocks, that is, fully franked stocks drop-off more than the unfranked stocks.

**Figure 10: DROP-OFF DISTRIBUTION**



This extra drop-off is quantified in Table 1 for various sectors of stocks.

**Table 1: RESULTS OF THE REGRESSION EQUATION (3)**

$$\Delta P/D = a + b.f$$

SECTOR	MKT CAP < \$500m			MKT CAP >= \$500m			ALL		
	a	b	N	a	b	N	a	b	N
INDUSTRIALS	0.86	0.11	676	0.8	0.31	456	0.83	0.19	1032
	-7.14	-0.79		-6.23	-2.11		-9.47	-1.94	
RESOURCES	0.55	0.45	167	0.72	0.28	183	0.61	0.39	350
	-3.43	-1.64		-3.71	-1.13		-5.01	-2.22	
ALL STOCKS	0.71	0.26	843	0.77	0.31	639	0.74	0.28	1482
	-7.23	-2.48		-7.23	-2.48		-10.56	-3.44	

The company tax rate during the period of the analysis varied from 49% to 39% and finally for the last twelve months (July 1994 to June 1995) it was 33%. The bulk of the data cover the 39% regime. Attempts to discern any difference in means of drop-offs at the different tax rates proved inconclusive - there were insignificant differences in mean drop-offs.

## Interpretation

The theoretical value for the drop-off fraction due to the credit component of a fully franked dividend is  $t_c (1t_c)$ . As most of the data covers the 39% tax regime, we take this ratio to be  $0.39/0.61 = 0.64$ . Then, for example, a drop-off fraction for the credit of 0.31 (big industrials) means that those credits are being priced at 49% of their face value i.e. they are being priced at 49 cents per \$1 of credit. Table 2 describes the full set of these results.

**TABLE 2: VALUE OF THE CREDITS**  
(COMPANY TAX RATE = 39%)

SECTOR	MKT CAP < \$500m		MKT CAP >= \$500m		ALL	
	B	Value	b	Value	b	Value
INDUSTRIALS	0.11	17%	0.31	49%	0.19	30%
	-0.79		-2.11		-1.94	
RESOURCES	0.45	70%	0.28	44%	0.39	61%
	-1.64		-1.13		-2.22	
ALL STOCKS	0.26	41%	0.31	49%	0.28	44%
	-2.48		-2.48		-3.44	

The results for the Small Stocks appear erratic which in turn effects the results for AR Stocks. There is no logical reason why the credits of Small Resource are priced at 70 cents per \$1 of credit whilst the credits of Small Industrials are priced at just 17 cents per \$1 of credit. If small listed companies are similar to private companies in that their share holdings are dominated by Australian taxpaying shareholders then we would expect their credits to be more highly valued. Hence the 17% value for Small Industrials' credits appears to be the anomalous result.

All Big Stocks have their credits priced at 49 cents per \$1 of credit. The tax redemption value across all companies gives a value of about 60 cents per \$1 of credit. Of course this redemption value should exceed the market-derived values because the market value must be a time discounted value of the redemption value. In addition, the redemption value is necessarily a capitalisation weighted average over all companies (tax data only show the aggregate amounts collected), both listed (big and small) and private companies. Presumably the private company derived credits are more highly valued than credits from listed companies because the latter have non-Australian taxpayers as shareholders whereas the private companies would be dominated by Australian taxpaying shareholders.

In summary, we find broadly consistent values of imputation credits from two quite different analyses: one based on taxation statistics and one based on market values from dividend drop-offs.

#### **4. Observations**

Clearly our analyses demonstrate that imputation credits have a significant value. However, a word of caution. Both measures of credit value are taken after the company has announced the payment of the dividend and the credits. This means there is no uncertainty about the timing and the amount of the credit within the measures we obtain for the value of credits. Credits cannot be redeemed until paid with accompanying dividends and stocks cannot be traded cum-dividend until dividends are declared. Hence both methods of valuing the credits give conditional valuations: the value of the credits conditions on the company deciding to pay a franked dividend. Neither method accurately values the credits which remain locked inside the company. Typically there is uncertainty about when such credits will be paid out and the amount of the credits to be issued. For this case, we would have to apply a discount rate to allow for the uncertainty in accessing the credits. The exact discount rate remains obscure.

After applying the above measures in many discounted cash flow valuation exercises, we much prefer keeping imputation effects quarantined in the cash flow factors and not adjust the discount factor to allow for imputation. Certainly any combination of discount rate and cash flow can be derived to give consistent valuation results. However, allowing for franking credits in the discount rate poses practical issues that can be very difficult to solve. Valuations are usually done after company tax but before personal tax. As shareholders pay personal tax on the aggregate of dividends and imputation credits, an allowance for the value of imputation credits has to be added back. This is easier to add back into the cash flows.

Imagine a project with a cash flow stream that has a large lumpy capital expenditure that causes temporary large deductions before tax, maybe even sufficient to eliminate tax payments for a number of years (e.g. Pay TV and its cabling expenditure). This reduces company tax payments and hence reduces the creation of credits. Adding back a proportion (e.g. 50%) of company tax payments each year as a stream of credits automatically accommodates these lumpy events.

Trying to apply franking credits by modifying the cost of capital requires forming some geometric average of the annual franking credit value is very difficult, if not impossible, without first knowing the project value! There is an academic "cottage industry" in deriving new models of the costs of capital that incorporates the value of franking credits. It leads to some complicated models which are unnecessary.

We would be the first to admit that the value of imputation credits is not measured with any precision, but neither are many attributes of investment decisions which, by definition, must depend on future outcomes. Notwithstanding this lack of precision, ignoring them is tantamount to assuming a zero value for credits and this certainly is a gross error.