STRUGGLING WITH IMPUTATION

A CASE FOR ADJUSTING CASHFLOWS

In the March 1995 issue of JASSA, Tim Brailsford and Kevin Davis examined how dividend imputation can be incorporated into the estimation of the cost of equity capital. They argue that the effects of imputation should be incorporated into valuation analysis by making adjustments to the cost of capital. Their basic conclusion is that the introduction of the imputation system should have reduced the cost of equity capital for Australian companies.

However, adjusting the cost of capital to reflect the effects of imputation is only one of many approaches that may be adopted. A more straightforward alternative involves adjustments to cashflows rather than to the cost of capital. STEVE EASTON and PETER HOWARD demonstrate that the Brailsford and Davis approach is flawed in that cashflows and the cost of capital are not treated consistently.

Valuation and Taxes
First, BD fail to recognise the need to define cashflows and the discount rate in a consistent manner. This failure may be due to confusion about the nature of company tax under the imputation system. Valuation has traditionally been based on after-company-tax cashflows and discount rates. That approach was straightforward under the classical tax system because observed rates of return on shares and market indices were after company tax but before personal tax. Therefore, observed market rates could be used to estimate the cost of equity and this cost could be used to discount after-company-tax cashflows.

One effect of the imputation system is that rates of return measured in the usual way are no longer simply "after company tax". Instead, they are after company tax and after some personal tax as well. To illustrate this point, consider an example.

Suppose that a company pays an annual dividend of 20 cents per share. If the dividend is fully franked, then at the proposed corporate tax rate of 36 per cent, the dividend will carry a franking credit of $0.20 x 36/64 = $0.1125. A resident investor will be taxed on the grossed-up dividend of $0.3125. If the investor's marginal tax rate is 47 per cent then gross personal tax will be $0.3125 x 0.47 = $0.1469, but the investor is entitled to the franking credit ($0.1125). This means that most of the personal tax has already been paid.

In other words, under imputation most of the tax collected from companies is not really company tax, but a pre-payment of personal tax. That is, the tax collected from companies consists of two components: implicit personal tax and "true" company tax, which refers to any tax that is not paid out via franked dividends and claimed as a credit by investors.

It may be seen from this discussion that under imputation there are two approaches that may be used to define "after-company-tax" cashflows. First, the tax collected from a company may be treated as a cash outflow so that a company's equity would be valued by discounting only the cash dividends paid to shareholders. In the above discussion this amount is 20 cents per annum. Clearly, this cashflow stream must be...

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valued using a discount rate that is expressed as an after-tax discount rate.

Second, the cash dividends may be adjusted by adding back the tax credits transferred to shareholders by payment of franked dividends. In the above discussion the amount of tax credits is 11.25 cents, giving a total of 31.25 cents per annum. If the cashflows include franking credits, then the discount rate must be adjusted and will be larger than the rate applicable to cash dividends only. Indeed, in the extreme case where all franking credits are distributed and fully valued by investors, the stream of cash dividends plus franking credits is effectively on a before-company-tax basis. Therefore, the discount rate must also be expressed as a before-company-tax rate.

The following example may be used to illustrate this simple point. The after-company-tax capital asset pricing model (CAPM) applicable to cash dividends only may be written as:

\[ k_e = r_f (1 - t_c) + \beta_e [E(r_m) - r_f] \]

where \( k_e \) is the cost of equity capital, \( r_f \) is the risk-free interest rate, \( \beta_e \) is the beta of the company’s equity, and \( E(r_m) \) is the expected return on the market portfolio. If \( r_f \) is 6 per cent, \( t_c \) is 36 per cent, \( \beta_e \) is 1.375, and \( E(r_m) \) is 13 per cent, then the after-company-tax cost of equity capital is:

\[ k_e = 6\%(1 - 0.36) + 1.375(13\%(1 - 0.36) - 6\%(1 - 0.36)) \]

\[ = 10 \text{ per cent} \]

Therefore, if a cash dividend of $0.20 were to be expected each year on a share in this company, then its value would be $0.20/0.10 = $2.00.

As recognised above, the after-company-tax rate including the full use of imputation credits is effectively the same as the before-company-tax rate. Therefore, in this case the model may be written as:

\[ k_e = r_f + \beta_e [E(r_m) - r_f] \]

In this formulation, we have:

\[ k_e = 6\% + 1.375(13\% - 6\%) \]

\[ = 15.625 \text{ per cent} \]

The grossed-up dividend corresponding to a cash dividend of $0.20 is $0.20/(1 - 0.36) or $0.20/(1-0.36) = $0.3125. Therefore, with an expected grossed-up dividend of $0.3125 each year on a share in this company, its expected value would be $0.3125/0.15625 = $2.00.

Note: the value of the share is the same, whether both the cashflows and the discount rate are defined to exclude the value of the imputation credits, or whether both the cashflows and the discount rate include the value of the imputation credits.

**IMPUTATION AND THE COST OF CAPITAL**

It should also be recognised that BD’s basic conclusion, namely that the introduction of the imputation system should have reduced the cost of capital for Australian companies, is open to very significant question. As pointed out by Officer (1987), the Australian economy is an open one. That is, capital can flow easily into and out of the country. Therefore, investors are not restricted to holding only local investments and can easily move funds either into or out of the country in response to even small changes in rates of return.

Since the Australian economy is an open one, it is unlikely that the cost of capital for Australian companies changed as a result of imputation. The supply of funds available for investment in Australian companies by resident shareholders should have increased, but any downward effect on rates of return should lead overseas investors to withdraw funds. Also, Australian investors, particularly institutions, can readily invest overseas and would be expected to move funds overseas in pursuit of higher returns if the rate of return available in Australia decreased. Consequently, any effect on the cost of capital is likely to have been minor and transitory.

Yet BD argue, when using the cost of capital applicable to cash dividends only, that is \( k_e = 10.0 \) per cent in the above example, that “the cost of equity is lower under the imputation system which is consistent with the view that corporate investments will be stimulated because of the lower cost of capital” (p.16). This is wrong. The cost of capital that BD have chosen is lower simply because it ignores the value of franking credits. If the lower corresponding cashflow is also recognised, then there will be no impact on valuation, and no reason to expect corporate investments to be stimulated.

Indeed, BD appear to recognise earlier in their paper that the cost of capital will be unchanged. They note that “the introduction of imputation will not affect the
final after-all-tax required rate of return of Australian investors” (p. 16). It is difficult to see how the cost of capital could have changed if the rate of return required by investors is the same.

The error made by BD is not simply an oversight in their numerical example. On page 15 they note that the simplest form of the CAPM is applicable to after-corporate-tax cashflows in a classical tax system, but they claim that “it is not appropriate under the dividend imputation tax system”. The following example shows that this statement is incorrect. The model may be used under either tax system, provided that cashflows are defined correctly.

Continuing to use the above rates, suppose a company’s cost of equity capital under the classical tax system was 15.625 per cent. If the expected cash dividend is $0.20 each year, then the value of each share would be $0.20/0.15625 = $12.80. Under the imputation system, the same share should be more valuable as imputation removes one layer of taxation and results in larger cashflows to shareholders.

If dividends are fully franked at a corporate tax rate of 36 per cent, then the share price would be $0.20 x (1 - 0.36) = $0.125. To incorporate the benefits of imputation, the franking credit may be added to the cash dividend giving a total annual cashflow of $0.20 + $0.125 = $0.3125 per share. The share price can be valued using the same rate of 15.625 per cent, which as shown above gives an expected value of $12.80.

The increase in value from $12.80 to $31.20 reflects the benefits of imputation to resident investors and this benefit is received in the form of larger cashflows after all taxes. The point to be stressed is that the same discount rate of 15.625 per cent may be used in both cases.

### MARKET RETURNS UNDER IMPUTATION

The second flaw in the BD analysis is that they appear to have used the All Ordinaries Price Index in their discussion on the behaviour of the return on the market since the introduction of the imputation system (page 16). BD examine average returns on the “All Ordinaries Index” since 1987 to support their argument that the expected market risk premium, and hence the cost of equity capital, are likely to be lower post-imputation.

As shown in Panel A of Table 1, they report an average return on the “All Ordinaries Index” since July 1987 of only 2.2 per cent per annum and 6.7 per cent per annum when returns are measured from 1988 to avoid the effect of the October 1987 market crash. The exact time periods used to calculate these average returns were not specified, but BD’s results are similar to the average returns on the All Ordinaries Price Index shown in Panel B of Table 1. However, when the All Ordinaries Accumulation Index is used (this index includes both dividends and capital gains), the average returns are considerably higher. For example, the average return from 31 December 1987 to 31 December 1994 is 10.3 per cent per annum. Varying the starting and ending dates by a few months yields very similar results.

Therefore, while we are unable to precisely replicate BD’s figures, the similarity between their figures and returns on the All Ordinaries Price Index and the dissimilarity between their figures and returns on the All Ordinaries Accumulation Index provides convincing evidence that they almost certainly relied on the price index. It is to be expected that returns measured by share-price indices should be lower post-imputation than they were under the classical tax system. Lower increases in share prices over time are a logical consequence of the substantially higher dividend payouts that have occurred since imputation was introduced.

For example, Nicol (1992) found that for the top 100 companies by market capitalisation, the median dividend payout ratio increased from about 45 per cent over the 1982-86 period, to more than 60 per cent in 1990. Other things being equal, higher dividends mean lower retained profits and lower growth in share prices over time. Clearly, when examining returns, both dividends and capital gains must be recognised. The problem in the BD analysis is that the All

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**Table 1: Returns on Australian sharemarket indices — post-imputation**

<table>
<thead>
<tr>
<th>Period</th>
<th>From July 1987</th>
<th>From 1988</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average return % p.a.</td>
<td>2.2</td>
<td>6.7</td>
</tr>
</tbody>
</table>

**Panel B of Table 1.**

<table>
<thead>
<tr>
<th>Period</th>
<th>Price Index</th>
<th>Accumulation index</th>
</tr>
</thead>
<tbody>
<tr>
<td>From 30 June 1987 to 31 Dec 1994</td>
<td>1.1</td>
<td>5.6</td>
</tr>
<tr>
<td>From 30 June 1987 to 31 Dec 1994</td>
<td>5.5</td>
<td>10.3</td>
</tr>
</tbody>
</table>

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Ordinaries Price Index recognises only capital gains.

Curiously, when discussing the pre-imputation period, BD argue that the market return was “around 13 per cent” (p.16). This is consistent with Officer (1989), who provides a long-term average rate of 13.2 per cent, a return based, at least where possible, on both dividends and capital gains. Therefore in their analysis of returns pre-imputation, BD do include both dividends and capital gains.

BD have not measured returns consistently in the periods before and after imputation. Therefore they have provided no meaningful evidence that “market returns appear to have fallen” (p. 16) since the introduction of imputation.

CONCLUSION
Given the nature of the flaws identified in the BD analysis, it is not surprising that they report that some “corporate treasurers, finance officers, financial analysts and advisers are struggling to incorporate the precise impact of dividend imputation on the estimation of the cost of equity capital” (p.14).

This article illustrates that some aspects of the struggle need not be difficult. Valuation analysis requires adjustment of cashflows and/or the cost of capital to reflect the effects of the imputation system. The adjustments are, in principle, straightforward and it is essential that the cashflows and the discount rate are treated consistently.

In the case of the imputation tax system, consistency can best be achieved by including the value of imputation tax credits in the cashflows. If this approach is followed, no change in the definition of the discount rate is required.

NOTES

2. The argument that the change in the tax system probably had little effect on the cost of capital for Australian companies should not be taken to imply that the tax changes were unimportant. Clearly, the shares of companies paying franked dividends became more attractive to Australian resident investors and their prices should have increased. The increase may have been substantial, but would be difficult to identify, given the volatility of share prices and the fact that the change was a market-wide effect.
