Having read the articles on valuation and dividend imputation presented by the academic community in the March, September and December 1995 issues of JASSA, it seems timely to have a contribution from the practitioner's side which summarises the main issues and advocates an overall approach to the task.

The articles related to how the introduction of dividend imputation in July 1987 should affect the investment decision process for Australian companies. As a practitioner, I found the presentation of the material rather confusing and believe a simpler approach is possible.

First, Officer (1991) developed a general approach to valuation under a dividend imputation system which applies to cashflows that can be considered perpetuities.

\[
\begin{align*}
V &= \frac{\text{NOI} [1 - t_c (1 - \gamma)]}{r} \quad (1) \\
V &= r_d [1 - t_d (1 - \gamma)] \frac{D}{V} + r_e \frac{E}{V} \quad (2)
\end{align*}
\]

Where
- NOI is net operating income
- \( t_c \) is the corporate tax rate
- \( \gamma \) is the proportion of corporate tax that can be considered a prepayment of shareholder personal tax (ie, the fraction of tax that is used as personal tax credits), \( \gamma = 1 \) for "full" imputation and \( \gamma = 0 \) for no imputation or the "classical" tax regime
- \( r_d \) is the cost of debt
- \( r_e \) is the cost of equity
- \( D/V \) is the fraction of equity in the capital structure
- \( E/V \) is the fraction of equity in the capital structure

\( r \) is the weighted average required rate of return WARR, also the same as the weighted average cost of capital WACC.

\( V \) is the value of the firm, or the value of the new investment under consideration.

From the two equations it is straightforward to consider the cases of a "classical" tax system and one where "full" imputation takes place.

**A: Classical (\( \gamma = 0 \))**

\[
\begin{align*}
V &= \frac{\text{NOI} (1 - t_c)}{r} \quad (3) \\
r &= r_d (1 - t_d) + r_e \frac{E}{V} \quad (4)
\end{align*}
\]

This is the familiar result found in the majority of finance textbooks.

**B: Full imputation (\( \gamma = 1 \))**

\[
\begin{align*}
V &= \frac{\text{NOI}}{r} \quad (5) \\
r &= r_d \frac{D}{V} + r_e \frac{E}{V} \quad (6)
\end{align*}
\]

This formulation discounts pre-tax cashflows by a pre-tax discount rate but can easily be converted to an after-tax case by multiplying both numerator and denominator by \((1 - t_c)\).

\[
\begin{align*}
V &= \frac{\text{NOI}(1 - t_c)}{r (1 - t_c)} \quad (7) \\
r (1 - t_c) &= r_d \frac{D}{V} (1 - t_c) + r_e \frac{E}{V} (1 - t_c) \quad (8)
\end{align*}
\]

Having reached this point, the second issue is that of estimating what \( r_e \) should be (given that leverage, \( r_d \) and \( t_c \) are relatively easy to ascertain). The thrust of the previous articles has been to explain how the Capital Asset Pricing Model can be used to estimate \( r_e \).

The basic CAPM states:

\[
r_e = r_f + (r_m - r_f) \beta \quad (9)
\]

In this form the CAPM is useable where there are no taxes, or after all taxes, or after corporate taxes but before personal taxes, where income from different types of security (eg, equities and debt) are taxed in the same way. This is so because the CAPM is based on the decisions of an individual choosing between investments in different assets according to their risk-return trade-off. Provided all the chosen assets have the same tax implication for the investor, then the exact nature of those taxes will not affect the choices made.

The third step, undertaken by Hathaway in the December 1995 article, is to point out that the practitioner can use \( r_e \) either directly from the CAPM in equation 6 if pre-tax cashflows are being used, or in equation 8 if after-tax cashflows are being used. From a practitioner's point of view, the most significant contribution from Hathaway was the explanation of the defects in the so-called "Treasury Model" of the CAPM, which states that:

\[
r_e = r_f (1 - t_c) + (r_m - r_f (1 - t_c)) \beta \quad (10)
\]

Hathaway points out the flaws in this relationship and recommends that practi-
tioners should not use it. This is advice which I am happy to accept.

The last point for discussion is the selection of the market risk premium for the CAPM; that is, \((r_m - r_f)\). The previous articles point out that \(\hat{\beta}\) is not affected by imputation since it is a measure of relative risk, and that the tax affects all equities in the same way. Similarly, \(r_f\) is not influenced by imputation, which leaves only the market risk premium.

There has been considerable effort expended in estimating the long-term market risk premium across a range of countries and combinations of countries, including Australia. The general result is that the market risk premium is relatively stable (considerably less volatile than the stockmarket returns) and shows no systematic inclination to increase or decrease over time. Given that some of these studies use data that go back as far as the 1920s, it is clear that many changes to tax regimes have taken place without producing a systematic long-term change in the market risk premium.

My view as a practitioner is that there may be a short-term change in the domestic market risk premium as a result of imputation (to be tested empirically in due course) but that overall the long term will have no discernible effect. On that basis, the practitioner should continue to use the same value for the market risk premium as before (typically in the range of 6 per cent to 8 per cent per annum).

I hope that this paper answers the question posed by Brailsford and Davis in their March 1995 article as to how companies should incorporate the impact of dividend imputation into their estimation of the cost of equity for investment decisions. The short answer is that imputation makes no difference to the cost of equity, and that the process for investment decision-making only needs modification to use equations 5 and 6 (or 7 and 8) rather than equations 3 and 4.

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BRAILSFORD/DAVIS:
A CLARIFICATION

In the March 1995 issue of JASSA, we outlined one of the possible approaches to incorporating the impact of dividend imputation on the cost of equity capital. The framework for our analysis was the commonly used capital asset pricing model (CAPM). We did not prescribe our approach as the only approach, but rather pointed out that if analysts wanted to use the CAPM to adjust for imputation tax credits, rather than adjusting for the tax credits in the cashflows, then our approach was a feasible solution.

This approach was subsequently criticised by Easton and Howard in the September 1995 issue of JASSA, but this criticism was refuted by ourselves and Neville Hathaway in the December 1995 issue. However, Hathaway also raised new criticism of our approach.

Readers who have been following this series of articles will be aware that the central issue concerns the formulation of a CAPM, which is based on returns measured on an after-company-tax but before-personal-tax basis. Another debate is whether the imputation adjustments should be made in the cashflow (numerator) or the cost of capital (denominator). Either treatment is, in principle, feasible and we have previously pointed out that our comments are only applicable if the analyst wishes to make the adjustment to the cost of capital.

If the analyst decides that an adjustment to the CAPM is desired, then the issue becomes one of whether our specification (in the March issue), which Hathaway terms the "Treasury model", is incorrect. Hathaway argues that the model has two faults. First, the model apparently leads to a distribution effect where there is an interaction between tax and risk. His second criticism claims that the cost of capital is set by the world market and that, because our model allows for prices that can be set by domestic investors, the model is flawed. Both of these arguments are incorrect.

Hathaway uses a numerical example to illustrate his first argument that our approach implies that a decrease in company tax causes an increase in the after-tax cost of capital for low beta risk firms but a decrease in the after-tax cost of capital for high beta risk firms. The example (and logic) is flawed as it does not compare like with like. Specifically, Hathaway does not allow for the interaction between the corporate tax rate and the market risk premium (as defined in this model) under an imputation tax system. We now illustrate this flaw using Hathaway’s example.

Hathaway assumes a value for the expected return on the market portfolio \((R_{mk} = 13.3\) per cent) which applies to both the classical and Treasury models. In our original analysis, we argued that if imputation is akin to a subsidy to domestic purchasers of equities and prices are set by these investors, then the "ungrossed" market risk premium in

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**UNDER IMPOSITION, THE BEFORE-ANY-TAX REQUIRED RATE OF RETURN FOR DOMESTIC INVESTORS WILL HAVE FALLEN, REFLECTING THE REMOVAL OF THE DOUBLE TAXATION OF DIVIDENDS.**
Australia can differ from the corresponding premia overseas. Hence, if the corporate tax rate is 33 per cent and all equity returns are in the form of franked dividends, Hathaway’s (classical tax) market risk premium of 3.3 per cent becomes the grossed-up imputation risk premium, which implies that the expected return on the market portfolio falls to 8.91 per cent. (Note that the fully franked return of 8.91 per cent, when grossed up [ie, 8.91/(1-Tc)] is equivalent to an after-all-tax return of 13.3 per cent in a classical tax system.)

If we use all of Hathaway’s other numbers - \( R_{\text{free}} = 10\% \), \( T_c = 33\% \), \( T_d = 15\% \) - and using \( R_{\text{max}} = 8.91\% \), then in the case where \( B = 0.1 \), the classical \( E(R_e) \) remains at 10.33% and the Treasury \( E(R_e) \) becomes 6.92% (fully franked). In the case where \( B = 2.0 \), the classical \( E(R_e) \) remains at 16.60% and the Treasury \( E(R_e) \) becomes 11.12% (fully franked). That is, contrary to Hathaway, in both the low beta risk and high beta risk cases the \( E(R_e) \) falls. Hence, there is no so-called distribution effect.

The problem with Hathaway’s second criticism is that it arises from his use of loose terminology. Hathaway argues that the cost of capital is set on the world market, and that this is “the source of the flaw” in our article. We have previously argued that the required rate of return after all taxes on Australian equities (which is unobservable) is unchanged subsequent to the introduction of imputation. We agree that the Australian imputation tax system does not affect the required rate of return after all taxes (or after Australian company tax as conventionally defined) of foreign investors. However, we argue that, under imputation, the before-any-tax required rate of return for domestic investors will have fallen, reflecting the removal of the double taxation of dividends. Which of these required rates of return is then reflected in observed market prices is an empirical issue. We note that Hathaway is unclear on this issue, as he simply refers to the “cost of capital” and does not distinguish between specific required rates of return and rates of return inferred from observed market prices. This is a crucial point and the distinction is central to any discussion.

We believe that the imputation tax system operates like a subsidy, and such fiscal measures can affect domestic prices relative to those in overseas markets. In our December reply to Easton and Howard (which we assume Hathaway did not have the opportunity of reading before making his criticism), we carefully spelt out this argument and its possible implications for the market risk premium. Hathaway’s second criticism is thus, we believe, misguided. It takes the valid point that the imputation tax system should not affect required rates of return of foreign investors, and jumps to the unsubstantiated and invalid assertion that “the” cost of capital in Australia must equal that on foreign markets, despite differences in international tax systems.

Ultimately, the precise impact of imputation is an empirical question. In our framework, the question of whether the observed market risk premium has changed is central to the debate. We have previously pointed out that a definitive answer cannot be provided until enough time has passed to permit extensive empirical analysis. Our very casual empirics (March 1995), which ironically were supported by Easton and Howard in their criticism, together with our “theory” is the base on which we argue that domestic investors have a role as price-setters. Further, Hathaway’s own research (see Hathaway and Officer 1992) demonstrates that the market clearly places a positive value on tax credits which is consistent with a price-setting role for domestic investors. What Hathaway fails to recognise is that his refusal to allow domestic investors a role as (before-tax) price-setters violates the underpinning of our model. Therefore, it is no surprise that the model subsequently provides strange numbers when he uses strange input values.

For practitioners, the clear message of this debate is that imputation matters, and that a variety of approaches can be used to allow for imputation tax credits in valuation. Uncertainty about the value of imputation tax credits creates problems of calibration (ie, obtaining estimates of model parameters) irrespective of whether the analyst adjusts for the tax credits in the cashflows or the cost of capital. This does not imply that one approach is necessarily superior to another. In our original article in March 1995, we outlined one approach and provided guidance on how to implement that approach in practice. The subsequent criticism of this model has failed to demonstrate any logical inconsistencies in our approach, or to show that the calibration of the model is unsatisfactory.

REFERENCE

- Tim Brailsford and Kevin Davis
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