

THE IMPACT OF DIVIDEND IMPUTATION *on share prices, the cost of capital and corporate behaviour*

ANDREW AINSWORTH, Senior Lecturer, Discipline of Finance, University of Sydney Business School
GRAHAM PARTINGTON, Associate Professor, Department of Finance, University of Sydney Business School
GEOFFREY J WARREN, Research Director, Centre for International Finance and Regulation

Debate continues about how dividend imputation affects equity markets. Central issues are whether franking credits are 'priced' by the market, and how imputation influences the behaviours of market participants. We argue that the presence of imputation affects investor and corporate behaviour, and that it would be dangerous to assume imputation has no effect on prices because they are entirely determined in global markets. Focusing on the impact on corporate behaviour, especially with regard to dividend payout and capital structure policies, we conclude that imputation matters and it has probably been beneficial.

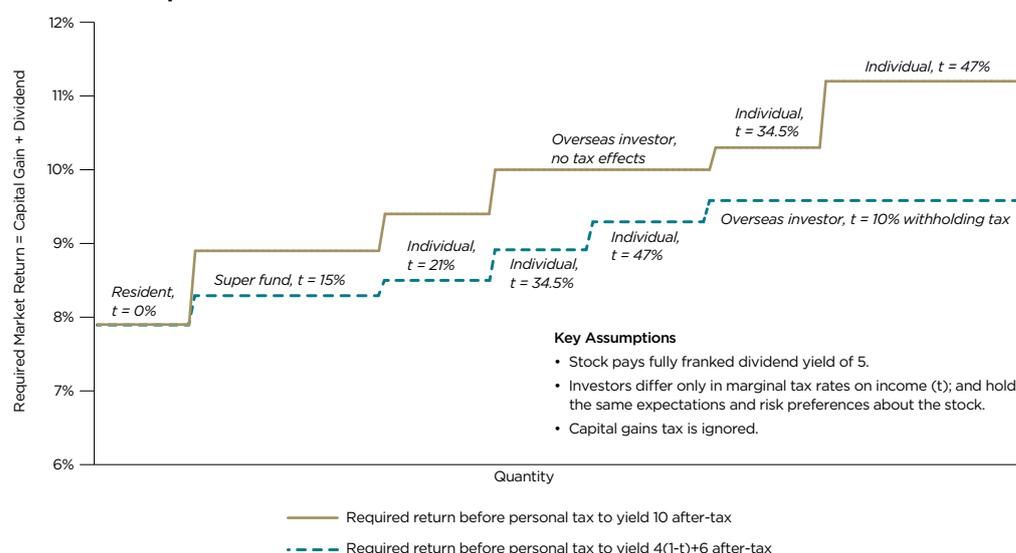
Tax wedges, share prices and cost of capital

Let's start with the idea that the translation of company income through to the return ultimately received by an investor is subject to a 'tax wedge', comprising any corporate tax, plus taxes paid by the investor themselves. Assume that the investor requires a certain rate of after-tax return to invest in a company. It follows that a lower tax wedge means that the investor gets to access higher net income arising from the company's operations and, consequently would be willing to pay a higher price for the company, if all else remains unchanged. Further, the company needs to generate a lower income from its operations in order to generate the return that the investor requires – which effectively means the cost of capital is lower. Thus, reducing the tax wedge on corporate income can both raise share prices and lower the cost of capital. Now let's start complicating things.

Imputation allows the (domestic) corporate taxes paid to be distributed as a tax credit attached to dividends, which reduces the amount of income tax that a (domestic) investor is required to pay. As a result, it reduces the tax wedge relative to what would apply under a classical, 'double taxation' system. A problem with gauging the effects is that imputation affects shareholders differently. Some investors, like superannuation funds, benefit greatly, as imputation credits create a rebate stemming from the difference between the corporate tax rate (30 per cent on large companies) and the superannuation income tax rate (15 per cent). Others, like foreign investors, receive at best a modest or possibly no benefit: fully franked dividends are exempt from withholding tax although, in some instances, any withholding tax may be recouped in the home country. To further complicate things, imputation is just one component in a complex tax picture where different investors face a variety of tax rates and therefore different tax wedges. It is questionable, perhaps even dangerous, to focus on imputation in isolation (an issue directly raised by Lally and van Zijl (2003) with respect to capital gains tax, and also implicitly addressed by Dempsey and Partington (2008) in their valuation model for dividends).

Figure 1 provides a sense of the impact of differing tax wedges under some highly stylised assumptions. This chart plots the return that an Australian company is required to generate in order to deliver various investors a 6 per cent risk premium over the return on fixed interest (or 'risk-free' rate) after accounting for all taxes. We call this the 'required return', as it equates to the return (i.e. capital gain plus dividends) that an investor needs from the shares before personal taxes are taken into account. However, it might also be thought of as the return that the company needs to generate from its operations after paying corporate taxes, and hence is equivalent to a cost of equity. The analysis assumes that the company pays a fully franked dividend yield of 5 per cent, no capital gains taxes are incurred, and the fixed interest return is 4 per cent. We first focus on the upper solid line, where the required return after personal taxes is 10 per cent for all investors. An overseas investor who pays no taxes and does not value imputation credits is satisfied with a 5 per cent capital gain plus a 5 per cent dividend. If this investor sets the cost of capital, the company would need to earn 14.3 per cent pre-tax (10 per cent scaled up for the 30 per cent corporate tax) on its investments to deliver this investor's required return. The possible cost of capital line varies above and below this zero personal tax baseline depending on the investor's tax status. For instance, a superannuation fund only needs the company to deliver an 8.9 per cent return before personal tax because the excess imputation credits top them up to 10 per cent after all taxes. The 47 per cent private investor requires a return of 11.2 per cent before personal tax to cover their higher personal tax liabilities, in order to achieve a net return of 10 per cent.

FIGURE 1: Required returns with investor income taxes



The lower dashed line in Figure 1 adds an additional complication. Here we assume that the 6 per cent required premium is in excess of the fixed interest return after personal tax. This assumption lowers the required return curve overall, with the magnitude of reduction varying across investors due to differing assumed tax rates on interest income. If we were to add in capital gains tax, the curve would shift yet again. The point we are trying to make is that how tax might affect company value and the cost of capital depends on *what* tax effects are taken into account.

What return might the 'market' require?

So how might imputation affect share prices and cost of capital when there are a variety of investors of differing tax status? In other words, how, and by whom, is market equilibrium determined? Unfortunately, there is no consensus among finance academics as to how differing investors' required returns before personal tax might translate into share prices. Figure 1 might be interpreted as presenting two different demand curves where income taxes and imputation credits are the only variables of interest. Two alternative approaches for translating investor demands into prices are: the aggregation approach and the marginal investor approach.

The *aggregation approach* simply involves estimating a weighted average of investor demands, often with reference to amounts invested and risk aversion (see Brennan 1970; Monkhouse 1993; Lally and van Zijl 2003). This approach implies that imputation *must* be partially priced. For instance, Black and Kirkwood (2010) estimate that approximately 60 per cent of Australian equities are held by domestic investors, while Handley (2014) reports on data indicating that domestic investors own 71 per cent of listed equities and 75 per cent to 81 per cent of total equity. Subject to the extent that domestic investors can fully utilise imputation credits and how investor demands are aggregated, this approach suggests that imputation credits might be priced in the order of 60 per cent to 80 per cent of face value.

The *marginal investor approach* is tantamount to drawing a supply curve on Figure 1, and working out where the demand and supply curves intersect. This approach accords with Miller (1977) among others, and is implicit in references to the 'marginal investor'. The Treasury's Tax Discussion Paper (TDP) and Gruen (2006) effectively adopt this stance, to the extent that they assume the marginal investor is an overseas investor who attaches no value to imputation credits. Under a strict interpretation of the marginal investor approach, imputation would make no difference only if the curves intersect at an investor that places no value on imputation credits, i.e. the zero tax-paying overseas investor in Figure 1. If intersection occurs elsewhere, then imputation will matter for share prices at the margin. Indeed, if a high tax-paying individual is the marginal investor, then imputation credits would be priced *and* the cost of capital could be higher than if shares were priced in global markets.

There are other potential complications under the marginal investor approach. The supply curve might not be fixed: a high cost of capital might lead companies to reduce investment and/or supply of equity, changing the point of intersection. The nature of investors operating in the market may change over time, such that imputation is priced in some situations and not in others. For example, imputation could influence pricing around dividend events, such as ex-dividend day drop-offs, because investors who benefit from imputation credits are active at the time. However, prices at other times may not be affected. Another possibility is that prices in different market segments might be set by different marginal investors with different valuations of imputation credits. For instance, imputation might be priced for domestic small-cap stocks but not large-caps held by international investors; or imputation might be priced for stocks that pay high fully franked dividends and so attract a clientele of investors who value imputation credits

Whether the marginal investor or aggregation approach best describes how imputation credits become priced in remains a point of debate. The marginal investor approach might be seen as more in keeping with the 'Economics 101' notions of price determination. By contrast, the aggregation approach assumes that investors have found their equilibrium position, given market prices. Another issue is that both approaches are often applied as if tax were the only determinant of differences in demand. In practice, an investor's demand may reflect a whole range of considerations, including their expectations, desire to diversify, liability hedging, portfolio constraints, other costs, and so on. This makes it particularly problematic to determine the value placed on imputation credits by observing investor behaviour, as it is entirely possible that a stock could be held for a raft of reasons other than imputation. Just because an investor receives imputation credits does not necessarily mean they have priced them.

The above discussion raises more issues than it resolves. But this is the key point. The manner in which imputation is priced by the market is quite unclear in theory. It is also going to be inherently difficult to estimate the value of imputation credits empirically, especially given that imputation is just one of many effects that determine share prices. The value attributed might also vary across stocks and through time, further compounding the problem of valuation. The most we can say is that the proposition that imputation is not priced is an extreme position along the spectrum of possibilities. Such a position can only be justified a priori by adopting the marginal investor approach, and presuming that the marginal investor is everywhere and always an overseas investor who places no value on imputation credits.

The manner in which imputation is priced by the market is quite unclear in theory. It is also going to be inherently difficult to estimate the value of imputation credits empirically, especially given that imputation is just one of many effects that determine share prices. The value attributed might also vary across stocks and through time, further compounding the problem of valuation.

The empirical evidence is inconclusive

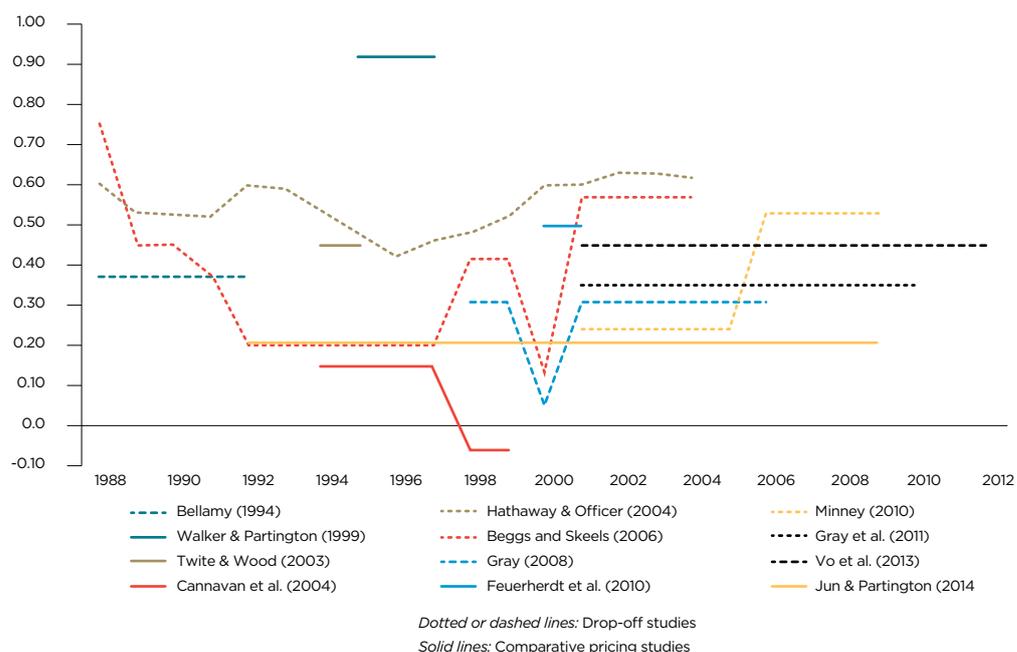
The absence of clear theoretical guidance renders the pricing of imputation credits a largely empirical issue. Unfortunately, the empirical evidence is mixed. Again, no consensus emerges. The four methods commonly used to examine the pricing of imputation credits in the Australian equity market are:

1. *Dividend drop-off studies* — A sizeable number of studies observe the price change (drop-off) occurring when a stock goes ex-dividend. As the drop-off provides a measure of the combined market value of a 'package' of dividends and any attached imputation credits, the objective is to infer the value attributed to imputation credits by examining how they influence the relative magnitude of the drop-off.
2. *Comparative pricing studies* — Some studies attempt to infer the value of imputation credits by comparing differences in the pricing of securities that provide comparable stock exposure, yet differ in their entitlement to imputation credits. These include: certain derivatives versus the underlying stock; cum-dividend trades during ex-dividend periods; and new shares, such as bonus issues, which have differing claims to dividends relative to the old shares.
3. *Examination of returns* — Lajbcygier and Wheatley (2012) examine whether the presence of imputation credits is associated with lower realised returns under a range of asset pricing models. If imputation is priced, then stocks that pay imputation credits should generate lower market returns.
4. *Examination of price levels* — Saiu et al. (2015) consider whether imputation credits are associated with higher stock prices under various valuation models, a regression explaining forward earnings yields, and examining portfolios of stocks sorted by imputation credit yields.

A very mixed set of results emerges from this body of work. Figure 2 summarises the findings from the majority of dividend drop-off and comparative pricing studies. While a wide range of estimates emerges, on balance these studies indicate that imputation credits are partially priced. The data points in Figure 2 average 0.38, which would suggest that imputation credits are priced at about \$0.38 in the dollar.

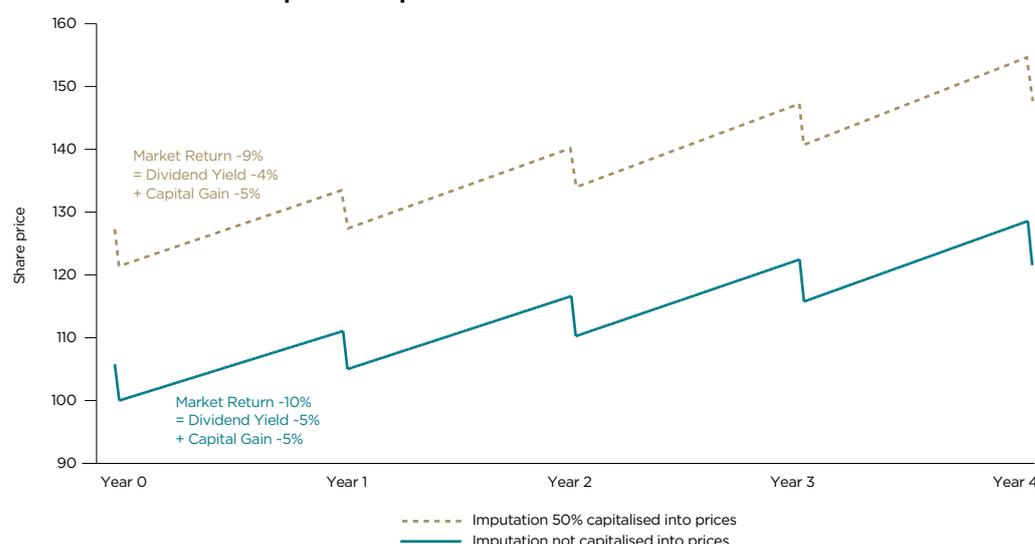
In contrast, examination of returns and price levels reveals little evidence that imputation credits are priced. Lajbcygier and Wheatley (2012) find that the presence of imputation credits is not associated with lower realised returns — if anything, they find a tendency towards the reverse. Saiu et al. (2015) generate a mixed set of results, but overall emerge with no clear evidence that stocks paying franked dividends are priced more highly.

FIGURE 2: Empirical estimates of value of imputation credits attached to dividends



Thus, empirical research suggests that imputation credits may be partially priced based on examination of dividend events, while any footprints from imputation are hard to detect in either returns or price levels. One possible way to reconcile these conflicting findings is to draw on the earlier point that the identity of the marginal investor around dividend events may differ from that determining price levels and longer-term expected returns. Figure 3 illustrates how this might play out. The upper dashed line represents a notional price path where 50 per cent of the value of imputation credits is capitalised into the price level, while the lower bold line aligns with no value for imputation credits being incorporated into prices. Annual market returns are 1 per cent lower where imputation credits are partially priced, relative to where they not priced. This 1 per cent annual return difference is attributable to differences in *dividend yield*, reflecting different share price levels. Nevertheless, both price paths are drawn such that the dividend drop-off ratio is (nearly) the same under both scenarios, reflecting the dividend plus 50 per cent of the imputation credit. Thus the lower bold line reflects a scenario whereby imputation affects neither the price level nor long-run returns, but yet is still reflected in drop-off rates. However, this is just one interpretation of what might be occurring.

FIGURE 3: Dividend drop-off and price level



Notes:

Same dividend and imputation credit
 Similar drop-off = dividend + 50% imputation credit, but ...
 Different price level, valuation measures and returns

Another issue is that there are substantial methodological problems in identifying the value attributed to imputation credits in the market. Indeed, all the empirical findings discussed above should be viewed with caution. The most substantive problem relates to the fact that dividends and imputation credits arrive together as a package. This greatly hampers the ability of researchers to confidently tease out how imputation impacts prices relative to other influences. It is known as the ‘allocation problem’, and refers to the identification issues that arise from the need to disentangle two components that are highly correlated with a problematic distribution (most dividends are either fully franked or unfranked). Other empirical problems relate to: the possible existence of confounding influences around dividend events (e.g. capital gains tax effects, costs and risks associated with arbitrage); the sensitivity of results to method and sample; and the possibility that dividends or imputation credits may be acting as proxies for unobserved variables.

In summary, between the mixed results and methodological problems, it is impossible to trace a clear empirical link from imputation to the cost of capital. On balance, imputation appears to affect share price patterns around dividend events, and hence plays some role in determining prices. However, there is no clear evidence linking imputation through to higher share prices, lower returns and thereby also a lower cost of capital.

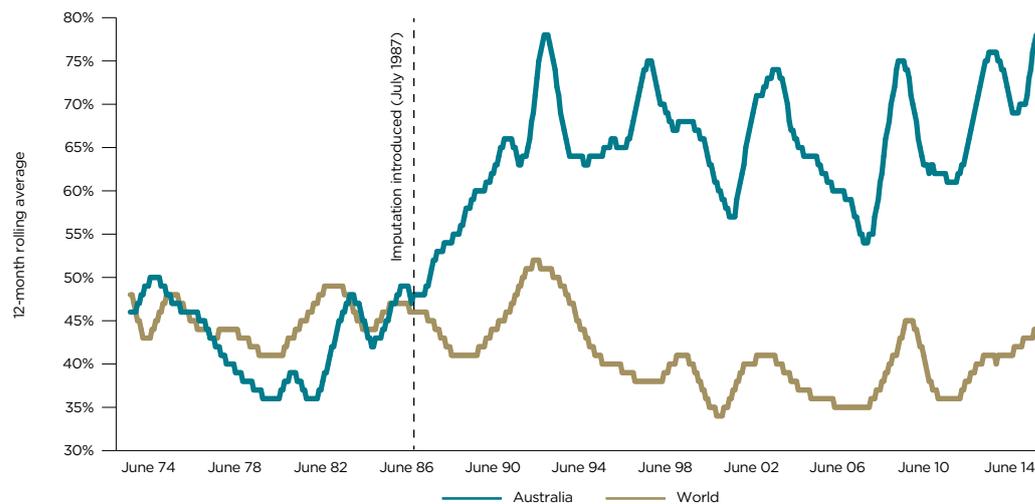
In summary, between the mixed results and methodological problems, it is impossible to trace a clear empirical link from imputation to the cost of capital. On balance, imputation appears to affect share price patterns around dividend events, and hence plays some role in determining prices. However, there is no clear evidence linking imputation through to higher share prices, lower returns and thereby also a lower cost of capital.

Imputation does appear to influence behaviours

Notwithstanding the ambiguous theory and empirical findings, there are strong signs that imputation has influenced the behaviours of companies and investors. Further, some of these behaviours are sufficiently constructive to support a case that the imputation system has yielded benefits, regardless of any cost of capital impacts.

The clearest effect is that the imputation system has encouraged **higher dividend payouts**. Figure 4 reveals a stark divergence in the dividend payout ratios for the Australian and world equity markets after imputation was introduced. A number of researchers have conducted analysis that confirms the link between imputation and higher payouts, e.g. Callen et al. (1992), Pattenden and Twite (2008), and Brown et al. (2015). In contrast, a survey by Partington (1989) found that tax was ranked as the least important consideration in payout policy prior to the introduction of imputation.

FIGURE 4: Dividend payout ratio



Source: Datastream.

We surmise that imputation induces higher payouts because companies recognise that imputation credits are beneficial to some shareholders, and try to distribute them accordingly. Doing so allows them to demonstrate that they have shareholders' interests at heart. In addition, the costs of distributing imputation credits are often relatively minor. The desire to distribute imputation credits is also revealed in the use of dividend streaming in the early years of imputation, the use of structured off-market buybacks, and the use of dividend reinvestment plans to facilitate the distribution of higher dividends.

We contend that the main benefit of higher payouts is that they *create capital* discipline, which is good for both shareholders and the economy at large. Higher payouts erode the 'money burning a hole in our pockets' syndrome, whereby companies may feel they need to do something with any spare cash. It increases the likelihood that companies will have to seek external funding for investments, which requires them to justify their plans in the process. Further, investors are given the opportunity to 'recycle' the funds back towards the most worthy investments. Thus, higher payouts make it more likely that good investments are pursued.

It has been argued that the imputation system has contributed to lower *corporate* leverage by reducing the tax bias in favour of debt over equity that arises under a classical system. Here the evidence is less clear. Figure 5 reveals that Australian corporate leverage declined markedly in the early-mid 1990s, settling at much lower levels than observed prior to the introduction of imputation.

FIGURE 5: Net debt/equity for Australian non-financial corporations



Source: Australian Bureau of Statistics, Cat. No. 5232.0.

The extent to which imputation was a key driver of the shift in leverage is an open issue. First, the theory of how tax impacts on capital structure remains unresolved. Myers (2001) notes three theories of the capital structure (trade-off theory; pecking order theory; free cash flow theory) plus the alternative that capital structure doesn't matter. Only the first theory suggests that tax matters, and Miller (1977) disputes this, arguing that tax benefits are neutralised in equilibrium. Some researchers have tied the introduction of imputation to changing capital structures in the 1990s (Twite 2001; Pattenden 2006). However, many other influences can be identified at the time. Mills et al. (1993) point to: an upwards shift in real borrowing costs; a potential decline in the cost of equity; changing attitudes towards gearing; forced restructurings for some firms; and the growing availability of hybrid instruments. Also, the fact that excessive debt played a key role in propagating the 1990s recession probably compounded the aversion to gearing, while inflation fell markedly in Australia following the 1990s recession, as did the corporate tax rate after 1987–88. Basically, there was too much going on to be confident that imputation was a prime cause of reduced corporate leverage. Nevertheless, it is entirely possible that it was a contributing factor.

Imputation could potentially impact on other behaviours, which we mention here without exploring them in any depth. It encourages Australian companies to invest in the Australian economy, in preference to overseas. This is not necessarily a bad thing, given some of the failed overseas ventures by Australian companies, and the fact that investors can always gain exposure to overseas companies on their own account, rather than needing companies to do it on their behalf. Imputation may also encourage companies to pay their Australian corporate tax at the margin, with potential benefits for the integrity of the tax base. It is worth noting that imputation probably matters more for small, domestic companies (at least those profitable enough to pay corporate tax). It is in this segment that local investors who value imputation credits are more likely to determine share prices, and be chiefly responsible for providing funding.

Concluding remarks

The value of the imputation system has been under scrutiny over recent years, which might be traced back to Gruen (2006), and was taken up by the 2015 Tax Discussion Paper. The premise is that imputation is of limited benefit as the cost of capital is assumed to be determined by international investors who do not value imputation credits. As such, imputation rewards domestic investors with a tax cut without lowering the cost of capital.

It has been suggested that Australia would be better off removing or restricting imputation as a trade-off for a lower corporate tax rate. In evaluating this case, it is important to fully consider the effects that imputation might be having.

While the theory and evidence may be unclear, the notion that imputation has no impact on share prices and the cost of capital sits at the extreme of the spectrum of possibilities. It is more likely that imputation has had some effect on share prices, even if just in certain situations such as for smaller, domestic companies. Further, imputation appears to have influenced behaviours, some of which have been beneficial. It has encouraged higher dividend payouts, and possibly lower corporate leverage and a propensity for Australian companies to invest domestically at the margin. On balance, we believe that the imputation system has made a positive contribution to the Australian economy.

While the theory and evidence may be unclear, the notion that imputation has no impact on share prices and the cost of capital sits at the extreme of the spectrum of possibilities. It is more likely that imputation has had some effect on share prices, even if just in certain situations such as for smaller, domestic companies. Further, imputation appears to have influenced behaviours, some of which have been beneficial. It has encouraged higher dividend payouts, and possibly lower corporate leverage and a propensity for Australian companies to invest domestically at the margin. On balance, we believe that the imputation system has made a positive contribution to the Australian economy.

Further detail is provided in our 2015 CIFR Working Paper, [‘Do franking credits matter? Exploring the financial implications of dividend imputation’](#).

References

- Australian Government, *Re:think: Tax Discussion Paper*, Australian Government, March 2015.
- Beggs, David J and Skeels, Christopher L 2006, ‘Market arbitrage of cash dividends and franking credits’, *Economic Record*, vol. 82, no. 25, pp. 239–52.
- Bellamy, David E 1994, ‘Evidence of imputation clienteles in the Australian equity market’, *Asia Pacific Journal of Management*, vol. 11, no. 2, pp. 275–87.
- Black, Susan and Kirkwood, Joshua 2010, ‘Overseas ownership of Australian equities and corporate bonds’, *Bulletin*, Reserve Bank of Australia, September quarter, pp. 25–33.
- Brennan, Michael J 1970, ‘Taxes, market valuation and corporate financial policy’, *National Tax Journal*, vol. 23, no. 4, pp. 417–27.
- Brown, Christine, Handley, John and O’Day, James 2015, ‘The dividend substitution hypothesis: Australian evidence’, *Abacus*, vol. 51, no. 1, pp. 37–62.
- Callen, Tim, Morling, Steven and Pleban, Jill 1992, ‘Dividends and taxation: A preliminary investigation’, *Reserve Bank of Australia, Research Discussion Paper*, no. 9211, October.
- Cannavan, Damien, Finn, Frank and Gray, Stephen 2004, ‘The value of dividend imputation tax credits in Australia’, *Journal of Financial Economics*, vol. 73, no. 1, pp. 167–97.
- Dempsey, Mike and Partington, Graham 2008, ‘Cost of capital equations under the Australian imputation tax system’, *Accounting and Finance*, vol. 48, no. 3, pp. 439–60.
- Feuerherdt, Clinton, Gray, Stephen and Hall, Jason 2010, ‘The value of imputation tax credits on Australian hybrid securities’, *International Review of Finance*, vol. 10, no. 3, pp. 365–401.
- Gray, Stephen 2008, ‘The impact of franking credits on the cost of capital of Australian firms’, report prepared for ENA, APIA and Grid Australia, SFG Consulting, September.
- Gray, Stephen, Hall, Jason and Costello, David 2011, ‘Dividend drop-off estimate of theta’, SFG Consulting, March.
- Gruen, Nicholas 2006, ‘Tax cuts to compete: The influence of corporate taxation on Australia’s economic growth’, *CEDA Information Paper*, no. 85, Committee for Economic Development of Australia and Lateral Economics.
- Handley, John C 2014, ‘Report prepared for the Australian Energy Regulator: Advice on the value of imputation credits’, 29 September.
- Hathaway, Neville 2013, ‘Imputation credit redemption, ATO Data 1988–2011: Where have all the credits gone?’, Capital Research, September.

- Jun, Aelee and Partington, Graham H 2014, 'Taxes, international clienteles and the value of ADR dividends', *Journal of Business Finance and Accounting*, vol. 41, no. 9–10, pp. 1337–60.
- Lajbcygier, Paul and Wheatley, Simon M 2012, 'Imputation credits and equity returns', *The Economic Record*, vol. 88, pp. 476–94.
- Lally, Martin, and Van Zijl, Tony 2003, 'Capital gains tax and the Capital Asset Pricing Model', *Accounting and Finance*, vol. 43, no. 2, pp. 187–210.
- Mills, Karen, Morling, Steve and Tease, Warren 1993, 'Balance sheet restructuring and investment', *Research Discussion Paper*, no. 9308, Reserve Bank of Australia, June.
- Minney, Aaron 2010, 'The valuation of franking credits to investors', *Journal of Applied Finance*, vol. 2, pp. 29–34.
- Monkhouse, Peter HL 1993, 'The cost of equity under the Australian dividend imputation tax system', *Accounting and Finance*, vol. 33, no. 2, pp. 1–18.
- Myers, Stewart C 2001, 'Capital structure', *Journal of Economic Perspectives*, vol. 15, no. 2, pp. 81–102.
- Partington, Graham H 1989, 'Variables influencing dividend policy in Australia: Survey results', *Journal of Business Finance and Accounting*, vol. 16, no. 2, pp. 165–82.
- Pattenden, Kerry 2006, 'Capital structure decisions under classical and imputation tax systems: A natural test for tax effects in Australia', *Australian Journal of Management*, vol. 31, no. 1, pp. 67–92.
- Pattenden, Kerry and Twite, Garry 2008, 'Taxes and dividend policy under alternative tax regimes', *Journal of Corporate Finance*, vol. 14, no. 1, pp. 1–16.
- Siau, Shaun, Sault, Stephen and Warren, Geoffery J 2015, 'Are imputation credits capitalised into stock prices?', *Accounting and Finance*, vol. 55, no. 1, pp. 241–77.
- Twite, Garry 2001, 'Capital structure choices and taxes: Evidence from the Australian dividend imputation tax system', *International Review of Finance*, vol. 2, no. 4, pp. 217–34.
- Twite, Garry, and Wood, Justin 2003, 'The pricing of Australian imputation tax credits', working paper, Australian Graduate School of Management, University of New South Wales.
- Vo, Duc, Gellard, Beauden and Mero, Stefan 2013, 'Estimating the market value of franking credits: Empirical evidence from Australia', working paper, Economic Regulation Agency, April, Perth.
- Walker, Scott and Partington, Graham 1999, 'The value of dividends: Evidence from cum-dividend trading in the ex-dividend period', *Accounting and Finance*, vol. 39, no. 3, pp. 275–96.