

Effective Tax Rates on Different Corporate Investments

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Abstract

An effective tax rate is measured by the difference between the pre-tax return earned by the company investor and the after-tax return received by the saver providing the funds. The personal income and foreign withholding taxes as well as the corporate income tax are considered. Under current taxation in Australia, effective tax rates vary between debt and equity, resident and non-resident savers, distributed and retained earnings, and across companies of different sizes. Corporate income tax reforms, including changes to the tax base and the tax rate, change the patterns of, as well as the magnitudes of, effective tax rates. By way of illustration, effects of a lower corporate tax rate and of accelerated depreciation on the pattern and magnitudes of effective tax rates are assessed.

1. Introduction

An important first step in evaluating the effects of reforms to the taxation of corporate income is to assess the initial or first round effects on the effective tax rate on capital income generated by company investments. The effective tax rate refers to the difference between the pre-tax return earned by the company investor and the after-tax return received by the saver providing the funds. It involves more than the corporate income tax. For resident fund suppliers, the effective tax rate depends also on either the progressive rate personal income tax for individuals or the flat rate taxation of superannuation fund income¹ paid on debt interest, dividends and capital gains. A series of bilateral tax treaties which set foreign income withholding tax rates interact with the corporate income tax to determine the effective tax rates on capital income generated by company investments funded by non-residents. The statutory incidence of company tax falls on the investor or demand side, while the statutory incidence of the personal, superannuation and withholding taxes fall on the saver or supply side. Interactions between these demand side and supply side income taxes result in a diverse pattern of effective tax rates for debt and equity, for residents and non-residents, and for dividends and retained earnings.

¹ In effect, individuals with savings in superannuation funds pay no additional personal income tax on withdrawn funds.

Different options for saving fund sources, investment options and corporate income distribution involves many different characteristics and dimensions. Companies can draw on funds in the form of debt or equity, and then much additional equity comes from retained earnings rather than new issues. For both debt and equity, funds come from residents and non-residents. Diverse portfolio preferences for different packages of characteristics for both the company investors and the savers providing the funds mean that these different saving and investment options are imperfect substitutes.

Most small companies are family owned and controlled with no direct access to non-resident funds, while most large companies and multinationals access non-resident funds from a very large global market. Differences in the relevance and importance of economies of scale and scope, and differences of the forms and magnitudes of principal-agent relations and of company-customer relations across firms of different sizes lie behind the observed mix of companies by size, ownership and management structures.

This paper brings together the corporate, personal, superannuation and withholding income taxes in measures of the different effective tax rates across the heterogeneity of company investment, funding and income distribution decisions, resident and non-resident shareholders, and providers of debt and equity funds. It describes the different effective tax rates for the current tax system. Most proposals for corporate income tax reform are likely to change the pattern of, as well as the magnitudes of, effective tax rates for different investment, fund source and income distribution decision options. Potential corporate income tax reforms include changes to the tax rate, allowable deductions and exemptions to change the tax base, through to the tax system such as a classical versus the current imputation, an allowance for corporate equity or a comprehensive business income tax. Also, reforms overseas affecting the supplies of funds to Australia will induce changes to effective tax burdens and then changes to domestic company and other decisions.

Analyses of the magnitude of the response of investment and saving decisions, and then other general equilibrium effects, to the changes in effective tax rates require a general equilibrium model.² The limited aim of this paper is to highlight the potential importance of disaggregating saving and investment decisions to capture significant differences in the effective capital income tax rates across the different and heterogenous categories of company fund supply, investment route, and income distribution choices.

² Current Australian computable general equilibrium model analysis of corporate income tax reforms include Cao et al. (2015), Murphy (2016) and Dixon and Nassios (2016).

Section 2 provides a background of the heterogeneity of, and the imperfect substitutability of, different saving, investment and income distribution options associated with investment by Australian located companies. The interactions of the corporate, resident and non-resident income taxes in determining effective capital income tax wedges across the different decision options are set out in Section 3. Measures of the different effective tax wedges under the current tax system are derived in Section 4. Effects on effective tax rates of changes to the Australian corporate tax rate are explored in Section 5. Some implications of accelerated depreciation through to immediate write-off for new investments by Australian companies are evaluated in Section 6. Section 7 considers changes associated with the Trump tax reforms for the availability and cost of funds for Australian companies. A final Section concludes.

2. Some Heterogeneity Characteristics

There are many different potential sources of funds for investment by companies, available investments to the companies, size, management and operating structures for companies, and options for distribution of the capital income generated. Each of the options has different mixes of a large set of characteristics of value to the decision makers. Portfolio preferences across the many decision makers for the different packages of characteristics result in the different funds, investment and company structure options being imperfect substitutes, and often with different market prices. The focus of this section is the interface of some of these dimensions of heterogeneity and their interaction with the current tax system to generate different effective capital income tax rates on the different options.

Companies draw on a mix of debt and equity funds to finance their investments. The current finance mix averages about 40% debt and 60% equity (Connolly and Jackman, 2017). Most debt is raised via financial intermediaries rather than direct company debt instruments. Most new equity comes from retained earnings rather than from new issues. For both the company investor and the saver supplying funds, debt and equity have different characteristics, including average rate of return, variability of returns, priority of payment, and influence on management decisions. As a result, debt and equity are imperfect substitutes for both the company investor and the saver providing the funds. The combination of different packages of characteristics and different portfolio preferences lie behind different debt and equity mix portfolio choices by both investors and savers. Most company investors choose a mix, and so do most savers.

There are important differences across the sizes and organisation structure of companies which influence investment options and fund sources, and then effective capital income tax rates. There are many different and arbitrary measures of size, including employment, turnover, value added, tax

paid, and then magnitudes for each measure (Moore and Simon, 2015). Private companies represent 99 per cent of private plus public companies by number, but less than 40 per cent of company income tax (ATO, 2015). Across all companies, over a half of Australian equity is attributed to listed companies, and just under 40% of shareholders are non-residents (Connolly and Jackman, 2017).

For the private and family owned companies, the major source of company funds competes against alternative household uses of a limited and inelastic in supply of family household saving. Further, many of the small family companies have not sought external finance or expressed an interest in expanding production in 2015-16 (Connolly and Jackman, 2017).

By contrast, larger public companies with more transparent and public available information draw on funds from non-residents as well as residents. The larger public companies, including multinational companies, have access to a highly elastic supply of globally mobile funds at the going international market rate.

An associated component of heterogeneity is that often small and large companies are not perfect substitutes in investing in, and producing, many products. Key drivers of different company sizes and of ownership and management structures include the importance of economies of scale and scope, customer relationships, segmented markets, and principal-agent relationships.

Another heterogeneity characteristic affecting the effective tax burden, and the effects of company tax changes on the capital income tax burden, is the distribution options for the after-tax company income, namely income distributed as dividends and income retained for further investment by the company. On average, about 70% of after-tax company income is estimated to be distributed as dividends (Bergmann, 2016). Not all dividends are backed by franking credits to reflect company tax paid: Davis (2015) reports a 90% average franking rate; Swan (2018) quotes 64% fully franked and another 17% with 80-99% franking credits, and further he observes that companies with fully franked dividends proxy greater certainty and confidence of future returns. In the case of retained earnings and franking credits carried forward, the franking credits are fixed in nominal terms and their present value declines the longer the time lag before they are attached to future dividends. Many shareholders have different preferences over dividends and retained earnings leading to different portfolio mixes of companies with different mixes of distributed and retained earnings, and for distributed earnings with reference to the franking percentage.

In any one tax accounting year up to a quarter of companies pay no corporate income tax (ATO, 2017). This can reflect companies making a profit over the lifetime of investments, but with some individual year recorded negative taxable income associated with, for example, different time

profiles of revenues and outlays, with market fluctuations for outputs, and the carry-forward of losses. A much smaller share of companies experience a long term loss leading to bankruptcy or a take-over.

While Australia has been a net capital importing country since 1788, at the same time its households and businesses have invested a significant share of their savings overseas. The mixture of allocating saved funds for investment in Australia and overseas provides another example of product heterogeneity and the diversity of portfolio preferences across the different investment and saving options.

3. Taxation of Capital Income

This section discusses the corporate income tax, personal and superannuation fund income taxes on residents, and withholding taxes on non-residents, in terms of tax bases and rates. Their statutory incidence affecting the demand for and supply of funds for company investment, and their comparative static equilibrium effects on market quantity and prices, are assessed.

The corporate income tax base is the residual return to equity funds, namely

$$\text{TBC} = \text{Rev} - \text{Lab} - \text{Mat} - \text{DebtR} - \text{Dep} - \text{OthT} \quad (1)$$

where, TBC is tax base corporate, Rev is revenue, Lab is labour costs, Mat is material costs, DebtR is debt interest, Dep is depreciation, and OthT is other taxes, including special mining and bank taxes and state taxes. (1) represents a nominal income base, and a source or origin base with exports taxable and imports deductible.

Under current taxation, the tax base of (1) is close to a comprehensive nominal income tax base. Accepting Treasury Tax Expenditure estimates (Australian Treasury, 2018), the important special deductions by revenue foregone for accelerated depreciation of transport equipment and buildings, and a R&D tax offset to internalise external benefits, with smaller allowances for offshore banking, film making and farm management deposits, are small compared with the taxable sum.³ Arguably, immediate expensing of the growing share of capital expenditure on intangibles, including outlays on intellectual property, human capital, marketing and management expertise, which provide benefits over many years is a exemption from a comprehensive income tax base.

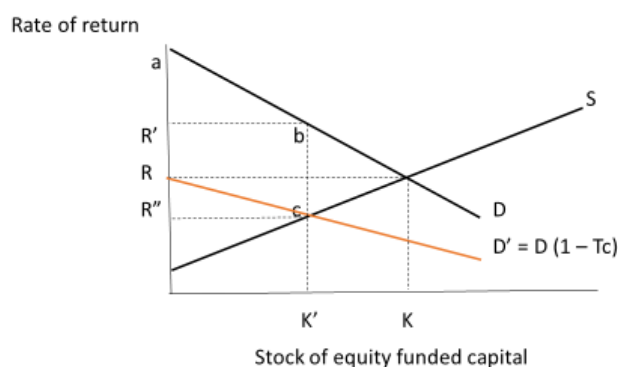
³ Specifically, relative to a corporate tax base of over \$1800 billion for 2016-17, the tax expenditures for low life cap for transport equipment, B69, no estimate for this version but around \$1 billion in preceding reports, and for construction, B71, of \$1.0 billion, and R&D, B80, of \$0.8 billion are small; and smaller again concessions for offshore banking, B8, of \$325 million, film concessions, B26, of \$325 million, and farm management deposits, B33, of \$245 million.

The corporate income tax base of (1) represents a normal return on savings plus above-normal returns. The normal return includes a price to compensate the saver to defer consumption and a risk premium. The above normal return includes economic rents on limited in supply natural resources, including mining deposits and land, quasi-rents for advances in intellectual property and management expertise, monopoly profits, benefits of government provided infrastructure and other services below cost, and the consumer surplus on inframarginal investments. Several authors estimate the above normal returns at a half or more of the corporate income tax base (Cao, et al., 2015, Murphy, 2016).

The corporate income tax can be interpreted as government taking a tax rate share of the return to equity. But, as government does not directly pay a share of any measured negative corporate income, and losses can be carried forward only in nominal value, and then with restrictions on continuity of business, the average effective government share is above the statutory tax rate.

In its initial or legal incidence, the corporate tax shifts the company demand curve for equity funds for capital investment downwards. The investment demand function shifts with changes in market prospects, input costs, technology, the cost of debt funds, and other factors. In Figure 1, in the first round and ceteris paribus, the corporate tax shifts down the demand for funds for equity funded investment capital from D to $D' = D(1 - T_c)$, where T_c is the corporate tax rate.

Figure 1 Corporate income tax



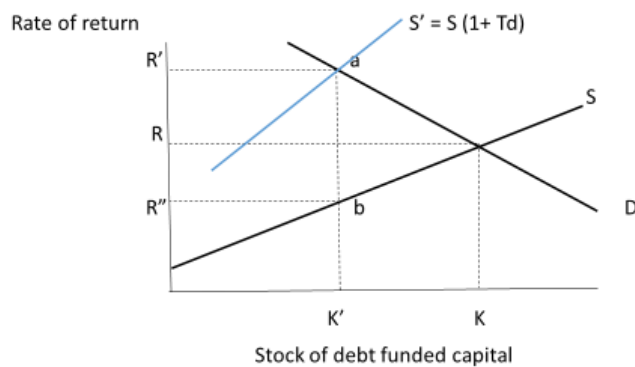
For the supply of funds curve shown as S , and discussed below, in a comparative static equilibrium assessment, the corporate income tax in isolation reduces equity funded capital from K to K' , raises

the pre-tax return from R to R' , and reduces the after-tax return to the shareholders to $R'' = R'(1-T_c)$. The area between D and D' is government revenue, namely $Rabc$.

Income taxation of debt interest, dividends and realised capital gains on the sale of shares is levied on the saver or provider of funds. Tax on capital income received by the saver has a statutory incidence on the saver. For residents, the relevant income tax is either the progressive rate personal income tax or the flat rate tax levied on the investment income earnings of superannuation funds. For non-resident providers of funds, a series of bilateral tax treaties set tax rates on company income repatriated to the home countries; and for most countries no additional home country income tax is levied. As for the corporate income tax base, the tax base for capital income received by savers is a nominal income measure of normal plus above normal returns.⁴ Initially, these taxes shift upwards the supply curve of funds for company investment.

Figure 2 illustrates the story for debt funded company investment provided by residents and non-residents. Debt interest is a deduction for the company investor and taxable income for the saver or fund supplier. An income tax rate of T_d on savings allocated to debt funding shifts the fund supply curve upwards from S to $S' = S(1 + T_d)$.

Figure 2 Taxation of capital income on debt



The comparative static equilibrium assessment of the effects of the income tax on the saver is to reduce the stock of debt funded capital from K to K' , to raise the pre-tax return from R to R' and to

⁴ This similarity of taxable sums across the different taxes simplifies the analysis. For potential corporate income tax reforms involving a structural change in the corporate tax base, such as a cash flow or allowance for corporate equity model which effectively exempts the normal rate of return, a more challenging assessment of the interaction of the different taxes is required.

reduce the after-tax return to $R'' = R' / (1 + T_d)$. Government tax revenue is given by the rectangle $R''R'ab$.

As is the ECON101 result, Figures 1 and 2 illustrate that the comparative static effects of a tax on the buyer, this time the company investor, and the seller, the saver providing the funds, result in the same equilibrium effects on quantity and price outcomes.

Consider next the taxation of capital income earned on equity funded investments. Interlinks between the corporate income tax and the income tax on saver dividends and capital gains make a more nuanced story than for debt, and the tax system and resulting tax burden differs between resident and non-resident shareholders. For resident shareholders and dividends, under the imputation system the corporate income tax is a pure withholding tax; and, as under the supply side model of Figure 2, the shareholder pays the relevant marginal personal income rate if an individual and the flat rate if a superannuation fund. If the saver's marginal income tax rate, T_p , exceeds the corporate income tax paid and represented as franking credits, T_c , the saver pays additional capital income tax $T_p - T_c$, and if T_p is less than T_c the saver receives a refund of $T_c - T_p$.⁵ For retained earnings, corporate tax paid and unused franking credits are carried forward, but only in constant nominal dollars resulting in a higher effective tax burden in present value terms. Alternatively, if the shares are sold, the domestic shareholder bears any corporate income tax paid plus capital gains tax generated by the additional investment of the retained earnings per share at a half of the personal rate and two-thirds the superannuation rate on realised capital gains.⁶ Together, for most low marginal personal income tax rate individuals and the superannuation funds, the joint effects of the demand curve downward shift plus upward supply curve shift involves a larger tax burden on retained earnings than for income distributed as dividends; and vice-versa for high marginal tax rate individuals.⁷

Having both a tax on the company investor and the individual domestic shareholder and saver draws on some complementary strengths of the two taxes. The progressive tax rate schedule for the individual shareholder is important for vertical equity of the overall tax system relative to the flat rate of the corporate income tax. On the other hand, while the individual income tax captures

⁵ This sentence assumes fully franked dividends. If the dividends are less than fully franked and the franking share is $F\% < 1$ means an effective average corporate tax on dividends of $T_c' = F\%T_c < 30$ per cent. Then replace T_c with T_c' .

⁶ The rate concessions assume the shares have been held for at least 12 months.

⁷ Formally, the effective aggregate corporate plus capital gains taxes for the effective tax burden is $T_c' + 0.5 T_p$, where $T_c' < T_c$ is the average corporate tax on retained earnings and T_p is the marginal individual tax rate. Then, the effective tax burden on retained earnings is larger than the effective tax burden of T_p on dividends if $T_c' > 0.5 T_p$.

income distributed as dividends, the corporate income tax applies to both retained earnings and distributed income as dividends. Integration of the two taxes to avoid or reduce double taxation is an important design issue, with the Australian imputation system one of several options.

Interaction of the corporate income tax and the different withholding tax agreements for non-resident shareholders provide another pattern of capital income taxation. Franked dividends are exempt from further tax, so they bear the flat rate corporate income tax. Unfranked dividends by design bear no corporate tax, but a withholding tax. Under most agreements a rate below 10 per cent applies to unfranked dividends (Australian Treasury, 2015). Retained earnings may have been subject to some corporate tax, but often at a lower average rate than the statutory rate because of exemptions and deductions from a comprehensive base, and withholding taxes on capital gains are zero except for a few companies with dominant investments in property.

Comparative static equilibrium effects of the different taxes illustrated in Figures 1 and 2 on the investment level and the distribution of the tax between a higher pre-tax return and a lower after-tax return to the funder depend on the elasticities of investment demand and fund supply, as well as the magnitude of the effective tax. Importantly, the heterogeneity of saving and investment options, including firm size, together with portfolio preferences, discussed in Section 2 require a more disaggregated understanding than aggregate demand and supply elasticities. Company level demand functions and saver supply functions for equity and debt finance include the returns to both options. Clearly, curves for each of debt and equity are more elastic than an aggregate function, but not perfect substitutes. Since small and large companies are not perfect substitutes, the investment demand functions for companies of different size include pre-tax returns for companies of different sizes.

On the funds supply side, small companies largely dependent on family savings for funds face a relatively low elasticity of supply of funds. By contrast, large public companies, and especially multinationals, with access to the global market face a highly elastic supply of funds at the required world rate of return.

4. Effective Tax Rates

This section brings together Sections 2 and 3 for measures of the effective income tax burden on the capital income received for different categories of savings invested by residents and non-residents as debt and equity, and then for company incomes distributed as dividends or retained for further investment. The tax burden is a measure of the difference between the pre-tax return earned by the company investor and the after-tax return received by the saver providing the funds. Company

income tax paid by the investor, personal income tax and superannuation fund income tax, withholding tax paid by the saver, and any credits between tax paid by the investor and saver, are included in the measure. Table 1 provides a summary, and it highlights the different effective tax rates across the different options.

Table 1: Effective Income Tax Burdens for Different Categories of Australian Company Capital Income

Income category	Effective tax rate
1. Residents: Individuals (a) Shareholder equity Dividends Retained income (b) Debt	Progressive personal rate* (a) Deferred income tax* plus loss on nominal value of franking credits carried forward (b) Up to 30% + 0.5 progressive rate on realised capital gains* Progressive personal rate*
2. Residents: Super funds (a) Shareholder equity Dividends Retained earnings (b) Debt	Flat 15% rate (a) Deferred 15% income tax plus loss on nominal value of franking credits carried forward (b) Up to 30% plus 10% on realised capital gains Flat 15%
3. Non-residents (a) Shareholder equity Franked dividends Unfranked dividends Retained income (b) Debt	30% corporate rate Withholding tax rate, generally $\leq 10\%$ Up to 30% corporate rate Low withholding rate, average 3.5%

*Progressive personal rate with marginal rates of 0% to 47%.

For debt funds provided by both residents and non-residents, or about 40 per cent of company investment, the debt interest is a deductible expense for the company and taxed in the hands of the saver. For residents the effective tax burden is the marginal rate of the individual progressive personal income tax and for superannuation funds a flat 15 per cent rate. A withholding tax is

imposed on debt interest income repatriated to non-residents. Under bilateral tax treaties the debt interest withholding tax rate is low, with an average of less than 3.5 per cent (Smalls, 2015).

For resident shareholders and dividends under the imputation system, the company tax operates as a withholding tax. Individuals and superannuation funds face an effective tax wedge given by their marginal income tax rate, namely the marginal rate of from zero to 47 per cent of the progressive personal income tax and a flat 10 per cent rate for superannuation funds. This means also identical tax wedges for resident provided debt and the dividend share of the return on equity funds.

The effective tax burden on the approximate 30 per cent of resident shareholder income re-invested by the company depends on the shareholder's decision to sell or to hold shares into the future. Both options involve an element of double taxation. If the choice is to sell, the effective tax burden involves any corporate income tax paid up to the statutory 30 per cent rate, but a lower average rate with exemptions and deductions from a comprehensive base, plus taxation of realised capital gains generated by the additional investment flowing through to a higher share price than otherwise. For the shares held for more than 12 months a concessional capital gains tax rate of half the personal rate for individuals and a flat 10 per cent rate for superannuation funds is applied. Alternatively, if shares are held into the future, corporate tax paid and not allocated to franking credits can be carried forward as future franking credits, but only in nominal terms. Then, the effective tax burden becomes the personal income tax rate plus the loss in present value terms of the franking credits carried forward.

For resident suppliers of savings to finance Australian company investments the effective tax burden is close to neutral across the equity and debt options. Effective tax burdens are identical for debt and for the share of equity income distributed as dividends. For equity income retained and reinvested, the effective tax burden is higher than for current period dividends in the case for future period dividends and franking credits carried forward and for low income taxpayers if shares are sold; for some high marginal tax rate individuals and few franking credits carried forward, the sell option involves a lower tax burden.

Effective tax burdens for capital income earned by non-resident shareholders on their funds in Australian companies involves interaction of the company tax and withholding taxes.⁸ A diverse pattern of effective tax burdens are applied. For franked dividends, the effective tax rate is the 30 per cent company rate and no withholding tax. Unfranked dividends face no company tax but now a

⁸ For all countries except the US a territorial system means no further home country tax. While the US does not have a territorial system, any additional tax in most cases is very low as funds are held off-shore for extended periods.

dividend withholding tax. While the statutory withholding tax on unfranked dividends is 30 per cent, under most bilateral agreements the actual rate is 10 per cent or less. That is, even for non-residents the corporate tax has some tax withholding properties. Retained earnings are subject to the company tax, but often at an effective rate below the statutory rate because of exemptions and deductions from a comprehensive income base. Other than a few companies involved with property, capital gains tax is not levied on non-resident shareholders. The wide range of effective tax burdens across debt, franked dividends, unfranked dividends and retained earnings for non-resident shareholders constitutes a very unlevel playing field not supported by demonstrated market failures.

Swan (2018) makes a case that the first-round effect of the Australian capital income tax burden on capital income provided to non-resident shareholders summarised in Table 1 becomes close to zero with behaviour responses.⁹ His argument builds on two premises: one, share prices fully reflect the gross dividend income, and the market value falls by this sum when moving from cum-dividend to ex-dividend; and, second, non-residents sell shares cum-dividend and repurchase them ex-dividend to resident shareholders for a net capital gain equal to the corporate tax component which is valuable as franking credits to residents and almost valueless to non-residents, and non-residents are not taxed on the capital gains. Effectively, this arbitrage game means a zero corporate tax burden on non-resident shareholders.

Although the literature reviewed by Davis (2015) and Swan (2018) includes studies with a wide range of estimates of the effects on share prices when the shares change to ex-dividend, Swan provides new econometric support for the share price movement.

More arguable is Swan's second assumption that most non-resident shareholders buy and sell all their Australian shares every six months to residents. First, there are limits to the arbitrage gains. The 45-day rule noted by Swan on non-resident shareholders erodes roughly a quarter of the potential arbitrage gain. Non-franked dividends at about 10 per cent of all dividends and the withholding tax rate on unfranked dividends of 10 per cent or less for most non-resident owned shares wash out some of the potential gains. Second, there are transaction costs. In addition to the formal costs, for resident shareholders the risk of capital gains tax at the full personal rate in a world of trend rising share prices to offset their buy at high price (with franked dividend) and sell at low price (ex-dividend) contributes to a perceived transaction cost. Also, diverse portfolio preferences of both resident and non-resident shareholders add to sticky market responses. Third, given the importance of non-resident shareholders at about 40% of the aggregate shareholder equity funds,

⁹ Davis (2015) describes a similar model in his full international integration model. He describes it as a "polar extreme model" with the alternative polar extreme model a "domestic integration" model.

and over 70% for some companies, an implicit assumption of close to infinite buy and sell elasticities for resident and non-resident shareholders for the required volume of transactions seems unlikely. And, resident shareholders would bargain for a share of the likely arbitrage gains. While the Treasury (Cao, et., 2015) and Murphy (2016) modelling assumption that non-resident dividends bear the corporate tax as shown in Table 1 may be an extreme position, the Swan argument is at the other extreme. Reality almost certainly falls between the two extremes.

Another perspective from Table 1 is the different patterns of effective tax rates for shareholders of small versus large companies. With most small companies, effective tax rates on debt funds and dividends on equity funds provided by residents are given by the marginal tax rate facing the dominant family savers. By contrast, for large companies, and especially if non-residents dominate the marginal supply of both debt and equity funds, the effective tax rate is negligible for debt, generally below 10 per cent for unfranked dividends, likely a little higher for retained earnings, and a maximum of the 30 per cent corporate tax rate for franked dividends.

Australians also allocate some of their savings to overseas investment options, including overseas based and taxed corporations. Non-resident company tax is paid on the capital income, but this tax is not able to be used as a franking credit for the Australian shareholder. Clearly, the effects of portfolio preferences, and for some companies the importance of complementary investments in Australia and overseas, lie behind the observed mix of savings allocated by Australians across their own country and other countries. These and other portfolio preferences together with the heterogenous mix of attributes of different options help to explain the observed variation of pre-tax and after-tax returns for different saving and investment path options.

5. A Lower Australian Corporate Income Tax Rate

Suppose Australia were to lower its corporate tax rate as proposed to 25%. In view of the effective tax rates summarised in Table 1, how and to what extent would a lower rate change the effective tax rates and change the incentives for investment by Australian companies and the sources of funds? Initially, as illustrated in Figure 1, a lower corporate tax rate would shift upwards the demand curve for equity funds under the current tax, D' , towards the tax-free demand curve, D . But, as discussed in the preceding sections, interaction of the corporate tax change with the resident income taxes on dividends and capital gains, and of the system of withholding taxes on dividends and capital gains for non-residents, will influence the changes in effective tax rates. Table 2 provides a summary of effective tax rate changes.

Table 2: Effects of a Lower Corporate Income Tax Rate on the Effective Tax Rates for Different Categories of Australian Company Capital Income

Income category	Change of effective tax rate
1. Residents	
(a) Shareholder equity	
Dividends	No change
Retained income	Partial reduction
(b) Debt	No change
2. Non-residents	
(a) Shareholder equity	
Franked dividends	Full pass through
Unfranked dividends	No change
Retained income	Full pass through
(b) Debt	No change

A change in the corporate tax rate will have no effect on the effective tax burden levied on both resident and non-resident debt funded investments. Accepting that debt and equity are imperfect substitutes, both for the company investor and for the resident and non-resident savers, a lower corporate tax rate will induce some increase of the equity to debt funding mix. Given the importance of debt at about 40 per cent of the funding for Australian companies, the flow-through of a lower corporate tax rate on the effective tax rate for investment in aggregate is significantly reduced below the corporate rate reduction, with a likely range of 30 to 40 per cent lower.

For resident shareholders, under the imputation system the effective tax burden for income distributed as dividends remains unchanged at the saver's income tax rate. Dividends are about 70 per cent of shareholder income. The lower corporate income tax is offset by an equivalent increase of saver income tax (personal or superannuation). In the context of Figures 1 and 2, the lower corporate tax rate upward shift of the D' curve in Figure 1 would be offset with an equivalent upward shift of the resident shareholder supply curve S' of Figure 2.

In the case of resident shareholder income not distributed, a lower corporate tax rate lowers the effective tax rate, but in net by less than the rate reduction. Some of the first-round lower corporate tax reduction is recovered from the benefits of a smaller value of franking credits carried forward and from higher future capital gains tax revenue. In addition to the investment incentive of a lower

effective tax rate, the lower corporate rate provides some additional funds which may be important for liquidity constrained family owned company investment decisions.

Overall, the lower corporate income tax rate provides only a small increase in the reward for additional resident shareholder funded investment. This limited effect is the full story for most small family owned and operated companies who represent about a third of the Australian corporate investment effort.

The effects of a lower corporate tax rate for the effective tax burden faced by non-resident shareholders who provide about 40 per cent of Australian company equity funds will vary with the extent of arbitrage effort by both resident and non-resident shareholders. If we take the no arbitrage scenario, as seems the assumption by Treasury (Cao, et al., 2015), Murphy (2016) and Dixon and Nassios (2016), except for the small share of income distributed as unfranked dividends, the lower corporate tax rate is fully passed forward to non-resident shareholders as an equivalent reduction of the effective tax rate on both distributed and retained earnings. This increases the after-tax return on funds invested in Australia relative to the rest of the world.

In such a scenario with most of a corporate income tax rate reduction passed on as a lower effective rate for non-resident funded equity investment, and assuming non-resident shareholders are the marginal investors, a lower corporate tax rate increases the incentives and rewards for additional company investment funded by non-resident shareholders. The non-resident marginal investor condition likely is reasonable for multinational companies and for other large and public listed companies. These circumstances point to a much larger investment response to a lower corporate income tax rate for large companies than for small and family owned companies. Also, the lower effective tax rate on equity relative to the much lower and unchanged effective tax rate on debt reduces current tax distortions to the mix of equity and debt.

To assess the effects on government revenue and for national income, a lower corporate tax rate provides a windfall transfer from Australia to non-residents on current investments and on future inframarginal investments. This transfer to non-residents is unlike a lower personal income tax rate which involves a transfer from government to resident Australians. Further, given that the corporate income tax base of (1) also includes investor consumer surplus and economic rents, the revenue transfer of the lower tax rate will be sustained over time. The transfer of income on existing non-resident shareholder funded investments by Australian companies, plus the after-tax income earned on the additional non-resident funded investment induced by a lower corporate tax rate and

associated fall in the effective tax burden, mean the change in GNI is much less than GDP, and possibly a GNI decrease (Dixon and Nassios, 2016, and 2018¹⁰).

Suppose instead we take the cum-dividend to ex-dividend arbitrage scenario between non-resident and non-resident shareholders with franking credits valuable to residents but not for non-residents as an extreme version of the Swan argument. For this scenario, the effective tax wedge on non-resident shares effectively is zero both before and after a corporate income tax rate change. For the reasons discussed in Section 4 above, I argue reality is closer to the no arbitrage scenario.

A potential positive effect for Australian tax revenue of a lower corporate tax rate is a reduction of profit shifting. The lower the Australian statutory tax rate relative to other countries, the lower the reward for multinational companies shifting expenses to Australia, such as debt interest, upfront investment costs to develop intellectual property, and a larger share of overhead or joint product costs for management, marketing and other outlays. De Mooij and Devereux (2011) find profit shifting important in Europe; and their elasticities are used in the Treasury (Cao, et al., 2015) and Murphy (2016) simulations, but not by Dixon and Nassios (2016). The magnitude of any profit shifting effects for a reduction of the Australian rate from 30 to 25 per cent is uncertain.

6. Changes to the Corporate Tax Base

Another set of corporate income tax reform options involve changes to the tax base as currently specified in (1). The set of special exemptions and deductions might be increased (or decreased) with the effect of decreasing (increasing) the taxable sum. By way of example, this section considers accelerated depreciation to replace current economic depreciation; and then with options of immediate application to all plant, equipment and buildings, or phased in for new acquisitions, and then for subsets of the tangible investments. By bringing forward tax deductions for capital, accelerated depreciation reduces the present value of corporate income tax paid. At the extreme of immediate expensing, the normal rate of return is exempt from income corporate income tax leaving above normal returns in the tax base.¹¹

¹⁰ Dixon and Nassios (2018) primarily attribute their negative GNI result relative to the positive Treasury and Murphy estimate to: lower export product demand elasticities and larger adverse terms of trade effects with expanded GDP and exports; a much lower elasticity of substitution between labour and capital meaning a less elastic investment demand function and smaller investment response; and, the transfer of tax revenue to non-resident shareholders over an extended adjustment period. Regarding the revenue transfer effect, while Dixon and Nassios assume the transfer phases out as current investment depreciates, I take the view that replacement investment will sustain above normal returns over the long run. Dixon and Nassios do not include a profit shifting effect discussed below which is included in the Treasury and Murphy model estimates.

¹¹ This corporate tax base situation corresponds to suggested reforms described as a cash flow tax and an allowance for corporate equity.

There would be no changes to the current effective tax rates on debt funded investments provided by residents and non-residents.

For resident shareholders, while the personal income tax base continues with its normal plus above normal return, a shift to accelerated depreciation brings no change to the effective tax burden on dividends and a partial reduction for equity income reinvested by the company. Tax base concessions, including accelerated depreciation, reduce the company income tax payment as does a lower corporate tax rate, and then a smaller stock of available franking credits. Under the imputation system, in time the smaller share of fully franked dividends requires additional personal and superannuation income tax payments. For retained earnings reinvested by the company, only some of the reduced company tax paid is recouped from higher personal tax on future dividends and larger capital gains tax receipts. In short, under the imputation system a large share of the initial benefits of concessions and deductions from a comprehensive income tax base are offset by higher resident income taxes.

Effects of accelerated depreciation, and other reforms to reduce the corporate income tax base, on the effective tax rates levied on non-resident shareholder equity funds invested in Australian companies are along the lines of a lower corporate tax rate discussed in Section 5. That is, close to a dollar for dollar reduction of the effective tax rate, but also a transfer of revenue from the Australian revenue to non-resident shareholders on existing and on additional inframarginal investments.

7. Changes in Other Country's Corporate Income Taxes

An on-going concern is the implications for Australia of lower corporate tax rates in other countries. In late 2017 the US announced reforms to its taxation of corporations, including a reduction in the corporate tax rate and a narrower tax base with expensing of new investments. For the same reasons as discussed in Sections 5 and 6, these reforms will reduce the effective tax burdens on equity investments by US corporations. Relative to Australia with its imputation system which largely nullifies the reductions in effective tax rates for resident shareholders, under the US classical system of company taxation both the lower rate and expensing of new investments largely flow through to lower effective tax rates for resident as well as for non-resident shareholders of US companies. This section assesses some first-round implications of lower effective tax rates for shareholder funds allocated to US companies for the cost and availability of non-resident shareholder funds for Australian companies; or the supply of non-resident funds curve S in Figures 1 and 2.

A starting position for context is that much international investment is geographically mobile. Returns across different country investments with their different attributes are compared. Tax is

only one of the attributes that affects expected returns. However, our context for assessment is one of the US tax changes, *ceteris paribus* for all other factors affecting returns across different countries. Australia as a net capital importer with relatively few capital inflow restrictions is a small player in the global market, and can be considered close to a price taker.

Relative to a starting equilibrium, a lower US effective corporate tax rate driven by a lower corporate income tax rate and/or additional tax base concessions means an increase in the after-tax return for footloose funds invested in US corporations. The US becomes more attractive for international footloose funds relative to other countries. Some footloose funds of US investors initially invested outside the US, and footloose funds of non-US countries, including Australia, invested outside the US, are attracted to relocate to the US for the higher after-tax returns. A new equilibrium for the global footloose funds includes more funds allocated to the US and less to the rest of the world, and a higher after-tax return on the footloose funds in all countries.

The new global equilibrium with a higher required rate of return requires an increase in the pre-tax return for Australian companies to attract footloose funds, and both equity and debt funds. While the initial requirement for a higher pre-tax return applies to funds offered by non-residents, and then the larger companies, second-round general equilibrium effects will include higher pre-tax returns for funds provided by resident savers and for funds drawn on by small and family controlled companies.

If profit shifting is sensitive to the lower US statutory corporate tax rate, an additional incentive for Australian multinationals to shift profit from Australia to the US would reduce corporate income tax paid to the Australian government.

As discussed by Henty et al. (2017), in addition to the above first-round capital market effects, there are likely to be significant general equilibrium second-round effects in the US with another round of implications for Australian companies. One set of second-round effects will vary with the chosen US government option for funding or not funding the lower effective US tax rates, reactions of other countries to the US tax changes, and the reactions of international product and factor markets to the US investment, production and trade responses driven by the tax reductions. Clearly, there are many options for US policy, and then the effects of each policy option are areas of uncertainty and different plausible scenarios.

8. Conclusions

Effective tax rates driving investment decisions by companies and decisions to provide funds by savers include capital income taxation of residents and withholding taxes on non-residents as well as

the corporate income tax. In this more comprehensive capital income tax context, under current arrangements the effective tax burden varies between debt and equity, for equity between income distributed as dividends and retained for additional investment, and between resident and non-resident providers of funds. Also, the pattern of key effective tax rates varies for small companies, and especially family owned companies, and large companies, including multinationals, with access to global mobile funds. Different patterns of return characteristics of the different fund types and sources, together with different portfolio preferences, means that the different options are imperfect substitutes resulting in different pre-and after-tax returns across the options.

Corporate income tax reforms, including the illustration of a lower corporate tax rate, change the relative pattern of effective tax rates for the different fund types, resident and non-resident providers, and company income distribution, as well as the magnitudes of effective tax rates. For example, a lower corporate tax rate has no effect on the effective tax burdens on debt or on dividends for resident shareholders, a small reduction for retained earnings for resident shareholders, no effect on non-resident provided debt, and close to a dollar for dollar reduction for non-resident shareholders.

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