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Insider ownership and dividend policy in an imputation tax environment

Balasingham Balachandran [a,*], Arifur Khan [b], Paul Mather [a], Michael Theobald [c]

[a] La Trobe Business School, La Trobe University, Australia
[b] Department of Accounting, Deakin University, Australia
[c] Mifranthe Associates and Emeritus Professor at University of Birmingham, United Kingdom

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ABSTRACT

Firms are more likely to pay dividends with higher payout ratios in an imputation environment. The effects of profitability and earned/contributed capital mix on the decision to pay dividends and dividend payout are weaker for firms following imputation tax system than traditional tax system. Insider ownership is positively related to the decision to pay dividends and dividend payout and this effect does not vary between traditional and imputation tax systems. Firms with higher foreign institutional ownership are less likely to pay dividends and have lower payout ratios. The study demonstrates the significance of the imputation tax system upon dividend policy.

1. Introduction

The impact of taxation on dividend policy has received much attention in the finance literature (see for example, Poterba and Summers (1984), Fung and Theobald (1984), Masulis and Trueman (1988), Poterba (2004), Barclay et al. (2009) and Desai and Jin (2011)). However, there is a scarcity of research on how dividend policy differs across imputation and traditional tax environments. In this paper, we address this important and interesting issue by utilizing the unique Australian tax setting. Under the Australian imputation tax system, Australian companies pay dividends on profits that are earned and taxed in Australia (known as franked dividends) and provide shareholders resident in Australia with a credit for the corporate tax paid that can be subsequently offset against their own personal tax liabilities. Any dividends paid arising from the profits that are earned outside Australia, referred to as unfranked dividends, do not carry any tax credits and are taxed as ordinary income in the hands of investors in a similar fashion to the treatment in a traditional tax environment. As such, then, we use this novel Australian setting that has these two tax systems operating contemporaneously to provide insights regarding the effect of insider share ownership and institutional ownership on the dividend decision and how these effects vary as between imputation (paying franked dividends) and classical (paying unfranked dividends) tax environments.

* Corresponding author at: Department of Economics and Finance, La Trobe Business School, La Trobe University, Bundoora, Vic 3086, Australia.
E-mail address: B.Balachandran@Latrobe.edu.au (B. Balachandran).

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Brav et al. (2008) survey executives to determine the effects of the 2003 dividend tax cut in the US on dividend policy and find that the tax rate reduction is less important for executives than the stability of future cash flows, cash holdings, and the historic level of dividends.[1] However, Brown et al. (2007) find that the share ownership of the top five executives in a company is significantly and positively related to an increase in dividends after the tax cut in 2003. A significantly negative relation between insiders' effective tax rates and dividend payouts is found by Holmen et al. (2008) in Sweden. Furthermore, Korkaemaki et al. (2010) find that payouts increased immediately prior to the tax reform in 2004, when Finland abolished its full imputation tax system and introduced a traditional tax system with double taxation of dividends. The findings in Brown et al. (2007), Holmen et al. (2008) and Korkaemaki et al. (2010) demonstrate the significance of taxation on dividend policy in both traditional and imputation tax environments and the potentiality of tax induced clientele effects.

Balachandran et al. (2012) find a negative relation between the market reaction to dividend reductions and reductions in franking credits after controlling for the magnitude of the dividend reduction. They assert that this evidence provides empirical support for the view that the market incorporates the impact of the reduction in the franking credit in prices at the announcement date of the dividend reduction. Therefore, we argue that companies will pay dividends when imputation credits are available, irrespective of the size of profits and earned/contributed mix. We further predict that the effect of profitability and earned to contributed capital mix on the decision to pay a dividend will be lower for firms subject to the imputation tax system than for firms subject to the traditional tax system. As companies tend to distribute imputation credits as early as possible, we argue that dividend payout ratios will be larger for firms with franking credits available than for others, ceteris paribus.

Dividend payments can be considered to be a part of a firm's optimum monitoring/bonding package, thereby serving to reduce agency costs, and thus firms establish higher dividend payouts when managers hold a lower fraction of equity (Rozeff, 1982). We argue that if managers, themselves, have larger shareholdings they will, ceteris paribus, have a greater incentive to pay dividends in order that they may enjoy the imputation tax benefits. Since institutions are likely to be better informed than individual investors and have more incentives to devote resources to monitoring activities, a positive relation between firms' payout and institutional holdings would be anticipated. However, Grinstein and Michaely (2005) find little evidence that the presence of institutional investors does lead to increases in payout in the US. Similarly, Brav et al. (2005) find that most executives do not use payout policy as a tool to alter the proportion of institutions among their investors. In a partial adjustment framework, Short et al. (2002) find that dividend payout ratios are significantly higher for firms with 5% or more institutional ownerships in the UK when the partial imputation tax system prevailed.[2] This result indicates that the presence of institutional ownership does have a positive impact upon dividend payout ratios. Since non-resident shareholders are ineligible for tax credits in Australia, we examine whether domestic and foreign institutional investors have differential impacts upon dividend policy. We argue that firms with larger foreign institutional ownership are less likely to pay dividends and have lower payout ratios.

Jensen et al. (1992) argue that insider ownership is itself determined by many of the same firm-specific variables that affect dividend and debt policy and suggest that estimation within a simultaneous equation system framework will reduce the possibility of drawing false causal inferences as a consequence of these interdependencies. Using a simultaneous equation system, Jensen et al. (1992) find that insider ownership and debt levels determine dividend payout ratios while insider ownership and dividend payout ratios determine debt levels in the US.

Following Jensen et al. (1992), we use a simultaneous equation system estimator approach and find that earned/contributed capital mix, insider ownership and the prior year franking dummy variable are significantly and positively related to the likelihood of paying a dividend and the payout ratio. The profitability is positively related to the decision to pay, while it is negatively related to the payout ratio. Further, we find that the effect of profitability and the earned/contributed capital mix on the decision to pay dividends and the payout ratio are weaker for firms following the imputation tax system (that is, firms paying franked dividends) than for those following the traditional tax system (i.e. firms paying unfranked dividends). In addition, we find that firms with higher foreign institutional ownership are less likely to pay dividends and have lower payout ratios, as foreign institutional investors will not be eligible to receive the imputation credit under the Australian tax legislation as described in Section 2. Franking status does not affect the positive impact of insider ownership on the decision to pay dividends and the level of payout. Overall, our findings demonstrate that the tax treatment of dividends does have a significant impact on the role of both profitability and earned/contributed capital mix on the dividend decision. We also find that dividends, leverage and insider ownership are simultaneously determined within the Australian context.

Our study extends the literature on tax clientele effects in dividend policy (Brown et al., 2007; Holmen et al., 2008; Pattenden and Twite, 2008; Korkaemaki et al., 2010; Henry, 2011; Alzahrani and Lasfer, 2012; Hanlon and Hoopes, 2014) and contributes to the debate on shareholders' tax preferred corporate dividend policies using a unique institutional setting – the imputation and traditional tax systems operating contemporaneously. First, we find that the likelihood of paying a dividend is stronger and the magnitude of the payout ratio is higher in an imputation tax environment than under a traditional tax system. Second, we extend the previous research findings that profitability and earned/contributed capital mix are important determinants of the decision to pay dividends (DeAngelo et al., 2006; Denis and Osobov, 2008) and show that the effects of profitability and earned/contributed capital mix on the decision to pay dividends and dividend payout are weaker for firms following an imputation tax system than for the traditional tax system.

[1] Brav et al. (2005) document that tax considerations are not a dominant factor in executives' decisions about whether to pay dividends or to increase dividends.

[2] During the period from 1973 to 1999 the UK had a partial imputation tax system where shareholders are able to claim a tax credit reflecting the advance corporation tax (ACT) paid by a company.

Our third contribution in this paper is to extend the research evidence regarding the impact of governance/monitoring on dividend policy (Rozeff, 1982; Jensen et al., 1992; John et al,. 2015; Mori and Ikeda, 2015) and we show that insider ownership is positively related to the likelihood of both the dividend payment decision and dividend payout, irrespective of franking status. Our empirical analyses indicate that firms with higher proportions of foreign institutional investors are less likely to pay a dividend and have lower payout ratios. Finally, we demonstrate via a simultaneous equation system framework the interdependence between dividends, insider ownership and debt. Overall our study reveals the importance of understanding the effects of profitability, earned/contributed capital mix and insider ownership within an environment which encompasses features of both an imputation and traditional tax system and demonstrates that these effects do vary across these tax systems.

The remainder of this paper is structured as follows. Section 2 briefly outlines the institutional setting as regards the Australian imputation environment. Section 3 discusses the theoretical framework and develops a number of research propositions. This is followed by an outline of the research design in Section 4. We discuss the results on the likelihood of paying dividends and the determinants of payout ratios in Section 5. Finally our conclusions are presented in Section 6.

2. Institutional setting – imputation environment

The dividend imputation system was introduced in Australia on 1 July 1987 to avoid double taxation on dividends. If dividends are paid out of profits that are earned and taxed in Australia, resident shareholders who receive a dividend (known as a "franked dividend") are able to reduce their tax paid on the dividend by an amount equal to the imputation tax credits. An individual's marginal tax rate and the company tax rate will determine how much tax an individual will pay on a dividend payment. If the shareholder's marginal and/or average tax rate is less than the appropriate company tax rate, then not only will s/he pay no tax on the franked dividend, but s/he will also have an unused tax credit. S/he can use this credit to offset tax that s/he would otherwise have to pay on other income received in that tax period. Since July 2000 shareholders are entitled to claim a refund for any unused franking credits from the Australian Tax Office. To be eligible for receipt of the tax credit, the shareholder should be an Australian resident. Since 1 July 1997, investors must hold the stock for at least 45 calendar days, not including the day the stock was acquired or disposed of, in order to qualify for the imputation credits on franked dividends (known as the 45-day rule).[3] Dividends paid arising from the profits that are earned outside Australia are known as "unfranked dividends". A shareholder who receives an unfranked dividend pays the normal income tax on the unfranked dividend which corresponds to the classical tax system. A shareholder who receives a mixture of franked and unfranked dividends pays the normal income tax on the part that is unfranked, but is able to claim a tax credit for the part of the dividend that is franked.

The amount of tax an individual will pay on a fully franked dividend is equal to $\frac{DIV_F}{1-t_c} * (t_p - t_c)$.

Where, DIV_F is the franked dividend received by the individual investor, t_c is the company tax rate and t_p is the marginal tax rate of the individual who received the franked dividend.

The amount of tax an individual will pay on unfranked dividend, DIV_{UF}, is equal to $DIV_{UF} * t_p$.

Individuals are required to pay tax on dividends and capital gains at their personal marginal tax rates. The corporate tax rate was 34% for the tax year ending on 30 June 2001. This rate was reduced to 30% for the tax year ending on 30 June 2012 and has remained at this level up to the present time. During the years 2001 to 2006 the top marginal personal tax rate was 47%. This rate was reduced to 45% for the tax year ending on 30 June 2007 and has not subsequently changed. Pension funds/superannuation funds face a tax rate of 15% on dividend income and capital gains. In the case of non-resident investors, franked dividends are exempt from withholding tax whereas unfranked dividends are subject to a 30% withholding tax (a 15% withholding tax if covered by double taxation treaty).

Assets purchased after 19th September 1985 are subject to capital gains tax in Australia. Since 21st September 1999, if the asset is held for more than 12 months an individual can reduce the amount of capital gains tax payable by 50% whereas a superannuation or pension fund can reduce the amount of capital gains tax payable by 33.33%. Since September 1999, corporations are taxed on capital gains at the corporate tax rate without any discount/reduction being available on such gains. Non-resident investors are exempt from capital gains tax on shares if the investor owns less than 10% of company's shares.

3. Hypothesis development

Jensen (1986) argues that managers who wish to increase their compensation have incentives to enlarge firm size beyond an optimal level. The disbursement of excess cash flows will mitigate the agency cost associated with this potential for overinvestment. Dividends may then serve as a mechanism to reduce the cash that is available at the discretion of management and thus help to mitigate the associated agency problems. Prior studies that concentrate on the agency costs rationale for dividends argue that dividend payouts to shareholders will help to reduce agency problems either by increasing the frequency of external capital raising and the associated monitoring by investment bankers and investors (Easterbrook, 1984), or by eliminating free cash flow (Jensen, 1986). Furthermore, from a behavioral perspective, dividend payments will reduce the potentiality of overconfident managers retaining earnings to fund suboptimal projects. Jensen and Meckling (1976) argue that the agency problem is less severe when managers hold a larger fraction of the outstanding shares. In a similar vein, Rozeff (1982) argues that firms have higher

[3] This was introduced to prevent arbitrage schemes that would enable foreign investors to extract value from the imputation system.

dividend payouts when managers hold a lower fraction of outstanding shares, since dividend payments are part of a firm's optimum monitoring/bonding package and thereby serve to reduce agency costs. Consistent with these arguments, Rozeff (1982) and Jensen et al. (1992) find that insider ownership is negatively related to the dividend payout ratio in the US. Eckbo and Verma (1994) examine the impact of insider and institutional ownership on dividend policy in Canada where institutional shareholders receive 100% of the cash dividend tax free and owner-managers face a tax penalty on their cash dividend. They demonstrate that cash dividends decrease as the voting power of insider ownership increases and that cash dividends increase as the voting power of institutional ownership increases.

In contrast to the survey evidence of Brav et al. (2005, 2008), recent studies document that tax considerations play significant roles in the determination of dividend payments. Chetty and Saez (2005) find that a large number of firms initiated or increased regular dividend payments in the year after the 2003 tax cut in the US. Similarly, Brown et al. (2007) find that the ownership levels of the top five executives in a firm are positively related to increases in dividends after the tax cut in 2003, whereas they do not find any support for this relation in the period before the tax cut. They argue that (see, Brown et al., 2007, p. 1964) "this finding is consistent with a standard agency theory perspective that, rather than operating the firm solely in the best interests of shareholders who may still prefer share repurchases or earnings retention to dividends even after the tax cut, managers are inclined to also incorporate their own financial incentives in corporate decisions". Hanlon and Hoopes (2014) find a surge of special dividends in the final months of 2010 and 2012, immediately before individual-level dividend tax rates were expected to increase. Further, Korkaemaki et al. (2010) find that Finnish firms with a higher proportion of large shareholders who were affected by the 2004 Finnish tax reform paid significantly higher dividends in the year prior to the tax reform. Dividend payout ratios also decreased following this tax reform. Holmen et al. (2008) explore the relation between insider's marginal tax-rates and dividend policy and find that firms with insiders who have low tax rates pay higher dividends, while insiders with zero tax rates sell blockholdings before dividend decreases. They conclude that insiders, who have sufficient power, set dividends at levels that reduce their personal tax burden.

The tax environment in Australia is different from the tax environment that operates in the US and the tax credits available with dividend payments in Australia could have impacts upon the dividend decision due to their potential for reducing personal tax liabilities. Foreign investors or non-resident investors do not pay Australian withholding tax on franked dividends; however, they pay a 30% Australian withholding tax on unfranked dividends, which can be reduced to 15% in the presence of a double-taxation treaty with their home country. In the case of resident Australian investors, the credit associated with franked dividends will be available to them and hence investors would be attracted to such firms with the creation of clientele effects (see Wood (1997)). Since the possibility of tax clienteles is driven by characteristics that cannot easily be changed (e.g. residency and location of revenue streams) the likelihood of such clienteles is raised within the Australian context. The larger the insider shareholding, the more tax credits the managers can access by paying franked dividends; since the managers are likely to be Australian residents, the tax credit will be available to such managers. Thus, an imputation tax system can have an impact upon the insider ownership-dividend articulation via this dividend preference. That is, Australian managers are likely to have a greater incentive, relative to a classical tax system, to make dividend payouts since resident shareholders, including share-owning managers, would prefer dividends where the double taxation of dividends is eliminated and where tax benefits accrue to dividends such that they figure in a pricing equilibrium (Fung and Theobald, 1984).

Given the franked/unfranked dichotomy that is discussed in Section 2, this tax impact may be more powerfully investigated by partitioning on a tax related basis. The availability of a franking credit and INSO interact with each other such that in the case of firms with franking credits available (i.e. corresponding with a full imputation system), INSO levels will be positively related to the likelihood to pay dividends and the dividend payout ratio via this tax induced preference, while a negative relationship will be induced from an agency costs perspective. However, in those firms which have no franking credits available (i.e. corresponding to a classical tax system), INSOs will have a negative relationship with the decision to pay dividends and with the payout ratio (which is consistent with US findings). Thus we hypothesize that there will be a franking status impact upon the dividend decision which is encapsulated in the following two hypotheses:

H1. *(a): Firms with (without) franking credits available will have a higher (lower) probability of paying dividends.*

H1. *(b): Firms with (without) franking credits available will have a higher (lower) dividend payout ratio.*

As we discussed, above, there will be an articulation between INSO, franking status and the dividend decision. While the INSO/dividend articulation will be negative where imputation tax credits are not available, there are two opposing effects in the case of franked dividends. If the tax effect is stronger than the agency cost effect, then there will be a positive relationship between INSO and dividends leading to the following two hypotheses:

H2. *(a): In an environment where imputation credits are (are not) available, INSO will be positively (negatively) related to the decision to pay a dividend.*

H2. *(b): In an environment where imputation credits are (are not) available, INSO will be positively (negatively) related to the dividend payout ratio.*

The empirical findings that derive from these hypotheses will provide insights into the relative strengths of tax and agency cost effects in the Australian market. That is, for example, if the relationships are invariant across the differing tax environments, then an agency cost rationale for dividends will prevail.

Fama and French (2001) show that firms with high profitability and lower growth rates tend to pay dividends. In DeAngelo et al. (2006) they demonstrate that the decision to pay dividends in the US is positively related to the earned to contributed capital mix, controlling for firm size, profitability, sales growth, and prior dividend history. They argue that the trade-off between earnings retention and the distribution of dividends evolves over time as profits accumulate and investment opportunities decline, with the result that paying dividends becomes increasingly likely as firms mature and they show that the earned/contributed capital mix is positively related to the decision to pay a dividend.

Ainsworth et al. (2015) argue that paying out imputation tax credits will, on the margin, support the share price and that the payment of excess credits can be achieved at a relatively low cost. Though the profitability of a firm will be an important variable in the determination of both the probability of a dividend declaration and in the levels of a dividend or payout, we argue that the relative impacts of profitability as between firms that are subject to the imputation system versus those within a traditional tax system will differ. In terms of the probability of paying a dividend, traditionally taxed firms will place more emphasis upon profitability, ceteris paribus, relative to firms with tax credits available since the latter firms will have the strong additional incentive to distribute the tax credits as soon as possible due to their declining values through time. As a consequence we argue that Australian managers would choose to pass the imputation benefit to shareholders as early as possible in the form of a franked dividend payment rather than delaying the dividend payment (see also Pattenden and Twite (2008)). For example, Monkhouse (1993) demonstrates that the present value of the tax credits will decline at a discount rate given by the traditional (i.e. non-tax adjusted) CAPM within such an imputation tax system. This incentive is also supported within the more general framework developed in Masulis and Trueman (1988) where trade-offs between personal taxes on dividend payouts are balanced against investments in lower yielding projects.

The lower dividend tax impact under an imputation system will lead to an earlier dividend payout relative to the declining marginal returns on investment within this structure. Effectively, then, where franking credits are available, the impact of profitability upon dividends will be less important, since the value of the credits will decline with the passage of time via the arguments advanced above, thereby providing incentives for firms to shift their dividend payments to earlier points in time. Essentially, there is an additional factor to be considered in determining the dividend levels where tax credit effects are present which will reduce the impacts of the other phenomena relative to the non-tax credit case where such tax incentives drive the dividend decision. Therefore, we predict that the effects of profitability and earned to contributed capital mix on the decision to pay a dividend and upon the level of the payout ratio will be lower for firms under an imputation tax system as compared to a traditional tax system. Thus, we develop the following hypotheses related to the decision to pay a dividend:

H3. *(a) The impact of profitability on the decision to pay dividends will be stronger for firms under a traditional tax system than for those under an imputation tax system.*

H3. *(b) The impact of earned to contributed capital mix on the decision to pay dividends will be stronger for firms under a traditional tax system than under an imputation tax system.*

And on the basis of the above arguments, we develop the following hypotheses related to the dividend payout:

H4. *(a) The impact of profitability on the dividend payout ratio will be stronger for firms under a traditional tax system than for those under an imputation tax system.*

H4. *(b) The earned to contributed capital mix will have a lower impact on the dividend payout ratio for firms under a traditional tax system than for those under an imputation tax system.*

4. Research design

This section briefly discusses the sample selection procedures and methods that we use to examine the determinants of the decision to pay a dividend and the dividend payout ratio by addressing endogeneity issues between dividend, insider ownership and leverage variables.

4.1. Sample and data description

We use the DatAnalysis, Securities Industry Research Centre of Asia Pacific (SIRCA), Datastream and Thomson Reuters Global Equity Ownership databases to construct our sample. We obtain insider ownership and board independence data from the SIRCA corporate governance database. The coverage on governance data starts from 2001 in the SIRCA corporate governance database with the consequence that our sample period is 2002–2013. The relevant accounting variables are collected from DatAnalysis. We use the Thomson Reuters Global Equity Ownership database to obtain institutional ownership for both domestic and foreign investors and Datastream to calculate the standard deviation of weekly stock returns. We exclude firm-year observations in the banking, financial institutions, trusts and utility sectors as their dividend policies are influenced by government regulations. We also exclude companies in the resource industry (mining and energy) as a large number of firms in this sector have negative retained earnings during the study period and are unable to pay dividends. Using the DatAnalysis database, we initially identified 6544 firm-year observations for non-financial and non-resource firms which have market capitalizations of a minimum of at least A$10 million. Further, we use the following criteria to obtain our final sample: i) firms must have insider ownership and board independence data in the SIRCA database, ii) accounting data is available to calculate the required dependent and independent variables; iii) each firm year observation has earnings data for a previous three year period in order to calculate the standard deviation of earnings. The final sample comprises 2475 firm year observations over the period from 2002 to 2013. Table 1 presents details on the sample. Panel A presents the sample distribution by year and Panel B presents the sample distribution by industry. Our sample observations represent six industries based on the Global Industrial Classification Standard Sectors (GICS): consumer discretionary, consumer staples, healthcare, industrials, telecommunication services and, information technology.

Table 2 presents the definitions of the variables used in this study while in Table 3 we present descriptive statistics for our sample, partitioning the sample into dividend payers and non-payers. We provide mean and median values for the relevant variables and the test statistics for the differences between the median values of dividend payers and non-payers. We find that 81% percent of our sample firms are dividend payers and that the mean and median payout ratios for the dividend payers are 59.7% and 58.2%, respectively. The mean and median insider ownership (INSO) variables for the sample firms are 22.3% and 12.6%, respectively. We also observe that dividend non-payers have statistically significantly higher insider ownership compared to dividend payers. The mean and median leverage (LEV) ratios for the sample firms are 19.8% and 19.7%, respectively; dividend payers have statistically significantly higher leverage compared to dividend non-payers.

Further, we find that profitability (ROA), retained earnings to total assets (RETA), market value (MV), domestic institutional investors ownership (INSTHD), board independence (BIND) and the tangibility ratio (PPE) are larger for dividend payers than for non-payers. In addition, the volatility of earnings (VOLROA), volatility of stock returns (VOLRET) and sales growth (SGR) are larger for non-payers than for payers. Investment (INV) does not vary between payers and non-payers.

4.2. Dividend policy, insider ownership, leverage and endogeneity

In this section the endogeneity issue regarding dividend policy with insider ownership and leverage is addressed and the system of equations used in our analysis to examine the determinants of the decision to pay dividends and the dividend payout level is presented. Jensen et al. (1992) argue that insider ownership itself is determined by many of the same firm specific features that affect both dividends and debt policy. They also argue that firms differ from each other with respect to factors such as size, growth and profitability, and these factors are empirically related to debt, dividends and INSO. Additionally, they argue that the signaling and the agency theories suggest that a firm's INSO, dividend payouts and debt are directly and causally related to each other, and hence their effects have to be determined simultaneously. The resultant improper estimations resulting from ignoring endogeneity impacts may lead to incorrect inferences of causality, and empirical work should be so structured as to avoid any false attributions of causality that actually stem from spurious correlations. Holmen et al. (2008) and Korkaemaki et al. (2010) similarly use a simultaneous equations framework to overcome endogeneity problems in examining the determinants of dividend payout ratios. The finding in Twite (2001) that the introduction of the imputation tax system increases dividend payout and reduces retained earnings and debt levels further emphasizes the need to employ a simultaneous equations system framework to control for endogeneity impacts within the research design.

Table 1
Sample distribution.

Panel A: distribution of observations by year	
Year	Number of observations
2002	183
2003	184
2004	216
2005	211
2006	217
2007	215
2008	209
2009	219
2010	213
2011	203
2012	204
2013	201
Total observations (firm-year)	2475
Panel B: distribution of observations by GICS sector	
GICS sector	Number of observations
Consumer staples	262
Consumer discretionary	791
Healthcare	258
Industrials	799
Information technology	279
Telecommunication services	86
Total observations (firm-year)	2475

Table 2
Definition of the variables used in this study.

Variable abbreviation	Variable name	Definition
BIND	Board independence	Board independence calculated as the number of independent directors scaled by the size of the board at the balance sheet date in year t
CFLOW	Cash flow	Operating cash flow scaled by total assets in year t
DFDL	Lagged franked dividend dummy	A dummy variable takes value of unity if the firm declares franked dividends in year t − 1, and zero otherwise.
DIVDUM	Dividend dummy in year t	A dummy variable takes a value of unity if the firm declares dividend in year t, and zero otherwise.
DIVDUML	Dividend dummy in year t − 1	A dummy variable takes a value of unity if the firm declares dividend in year t − 1, and zero otherwise.
DIVL	Lagged dividend payment	Dividend payment in year t − 1.
PAYOUT	Dividend payout ratio in year t	We follow Holmen et al. (2008) and define the payout ratio as total dividends paid during the year divided by accounting earnings, where accounting earnings are net profits after tax before abnormal items. Consistent with Holmen et al. (2008), if dividends are paid but accounting earnings are negative, the payout ratio is set to one while if dividends are larger than accounting earnings, the payout ratio is again set to one.
PAYOUTL	Dividend payout in year t − 1	Payout ratio in year t − 1.
FRANKPL	Lagged franking percentage	Percentage of franking dividend in year t − 1
FRCRL	Lagged franking credit relative to total assets	Franking credit relative to total assets in year t − 1. This is calculated as $\frac{DIVL*FRANKPL}{TAL} * \frac{t_c}{1-t_c}$
INSO	Insider ownership	Percentage of ordinary shares owned by the directors of the board in year t
INSTH	Institutional investors holdings	is the percentage of institutional investors ownership immediately prior to the balance sheet date in year t − 1.
INSTHD	Domestic institutional investors holdings	Is the percentage of domestic institutional investors ownership immediately prior to the balance sheet date in year t − 1.
INSTHF	Foreign institutional investors holdings	Is the percentage of foreign institutional investors ownership immediately prior to the balance sheet date in year t − 1.
INV	Investment	Calculated as the ratio of capital expenditure to book value of assets in year t
LEV	Leverage	Calculated as the ratio of book value of debt to book value of total assets in year t.
LMV	Logged market value of equity	Natural logarithm of market value of equity at the balance sheet date in year t
MV	Market value of equity	Market value of equity at the balance sheet date in year t
PPE	Tangibility	Property, plant and equipment divided by book value of total assets in year t
RETA	Retained earnings to total assets in year t	Retained earnings scaled by total assets in year t
ROA	Profitability in year t	Return on assets, calculated as net profit after tax before abnormal items scaled by the book value of total assets in year t.
SGR	Sales growth	Sales growth in year t − 1
TAL	Lagged total assets	Book value of total assets in year t − 1
VOLROA	Volatility of earnings	Volatility of earnings calculated as a standard deviation of ROA of preceding three years
VOLRET	Volatility of stock return	Volatility of stock return calculated as a standard deviation of weekly return of year t − 1.

We use the following baseline simultaneous equation framework to examine the decision to pay a dividend.[4] We use lag DIVDUM, lag MSO and lag LEV as instrument variables.

$$\text{DIVDUM} = \text{f}\ (\text{INSO}, \text{DIVDUML}, \text{DFDL}, \text{ROA}, \text{RETA}, \text{INSTH}, \text{BIND}, \text{LEV}, \text{VOLROA}, \text{SGR LMV}, \text{CFLOW}, \text{INV}, \text{year effect}, \text{industry effect}) \quad (1)$$

$$\text{INSO} = \text{f}\ (\text{DIVDUM}, \text{LEV}, \text{ROA}, \text{VOLROA}, \text{LMV}, \text{CFLOW}, \text{INV}, \text{year effect}, \text{industry effect}) \quad (2)$$

$$\text{LEV} = \text{f}\ (\text{DIVDUM}, \text{INSO}, \text{ROA}, \text{VOLROA}, \text{INV}, \text{PPE}, \text{year effect}, \text{industry effect}) \quad (3)$$

A similar baseline simultaneous equation framework is used to examine the determinants of the dividend payout ratio. We use lag PAYOUT, lag MSO and lag LEV as instrument variables.

$$\text{PAYOUT} = \text{f}\ (\text{INSO}, \text{PAYOUTL}, \text{DFDL}, \text{ROA}, \text{RETA}, \text{INSTH}, \text{BIND}, \text{LEV}, \text{VOLROA}, \text{SGR LMV}, \text{CFLOW}, \text{INV}, \text{year effect}, \text{industry effect}) \quad (4)$$

$$\text{INSO} = \text{f}\ (\text{PAYOUT}, \text{LEV}, \text{ROA}, \text{VOLROA}, \text{LMV}, \text{CFLOW}, \text{INV}, \text{year effect}, \text{industry effect}) \quad (5)$$

$$\text{LEV} = \text{f}\ (\text{PAYOUT}, \text{INSO}, \text{ROA}, \text{VOLROA}, \text{INV}, \text{PPE}, \text{year effect}, \text{industry effect}) \quad (6)$$

[4] Our dependent variable DIVDUM is a dummy variable in the decision to pay a dividend equation. Mak and Li (2001) also used a dummy variable as a dependent variable in their analysis using a simultaneous equation framework.

Table 3
Descriptive statistics.
This table presents the descriptive statistics on key variables for dividend payers and non-payers. PAYOUT is dividend payout ratio in year t calculated as total dividends paid during the year divided by net profit after tax before abnormal items. If dividends are paid but earnings are negative, or if dividends are larger than accounting earnings, the payout ratio is set to one; INSO is the percentage of ordinary shares owned by the directors of the board in year t; ROA is the return on assets, calculated as net profit after tax before abnormal items scaled by total assets; BIND is board independence calculated as the number of independent directors scaled by the size of the board in year t; RETA is calculated as retained earnings scaled by total assets in year t; LEV is leverage ratio, calculated as the ratio of book value of debt to book value of total assets in year t; VOLROA is the volatility of earnings calculated as a standard deviation of ROA of preceding three years; VOLRET is the volatility of stock return calculated as the standard deviation of weekly stock returns for the year t − 1; SGR is the sales growth in year t; MV is the market value of equity at the balance sheet date in year t; INSTH is the percentage of institutional investors ownership immediately prior to the balance sheet date in year t − 1; INSTHD is the percentage of domestic institutional investors ownership immediately prior to the balance sheet date in year t − 1; INSTHF is the percentage of foreign institutional investors ownership immediately prior to the balance sheet date in year t − 1; CFLOW is the ratio of cash flow from operations scaled by the book value of assets in year t; INV is investment, calculated as the ratio of capital expenditure to book value of total assets; PPE is tangibility ratio, calculated as a ratio of property plant and equipment and book value of total assets in year t; and FRCRL: is the franking credit distributed in year t − 1 scaled by total assets in year t − 1.

		Total	Non-payers	Payers	MW test
PAYOUT	Mean	0.486	0	0.597	
	Median	0.498	0	0.582	33.73***
INSO	Mean	0.223	0.253	0.216	
	Median	0.126	0.147	0.120	3.66***
ROA	Mean	0.069	0.002	0.085	
	Median	0.065	0.022	0.070	15.89***
BIND	Mean	0.446	0.355	0.467	
	Median	0.500	0.333	0.500	8.07***
RETA	Mean	0.071	−0.222	0.138	
	Median	0.102	−0.195	0.130	21.07***
LEV	Mean	0.198	0.169	0.204	
	Median	0.197	0.130	0.208	5.53***
VOLROA	Mean	0.045	0.104	0.031	
	Median	0.018	0.060	0.015	20.15***
VOLRET	Mean	0.055	0.080	0.049	
	Median	0.048	0.075	0.043	20.34***
SGR	Mean	0.234	0.504	0.172	
	Median	0.086	0.139	0.080	3.47***
MV (A$M)	Mean	1752.76	259.79	2096.32	
	Median	177.73	46.74	238.85	18.03***
INSTH	Mean	0.334	0.278	0.347	
	Median	0.299	0.197	0.314	6.40***
INSTHD	Mean	0.281	0.210	0.297	
	Median	0.233	0.134	0.250	8.38***
INSTHF	Mean	0.054	0.069	0.051	
	Median	0.005	0.001	0.006	3.13***
CFLOW	Mean	0.103	0.040	0.118	
	Median	0.093	0.042	0.101	13.82***
INV	Mean	0.055	0.055	0.055	
	Median	0.036	0.036	0.036	1.49
PPE	Mean	0.237	0.224	0.240	
	Median	0.185	0.135	0.196	3.53***
FRCRL	Mean	0.016	0	0.020	
	Median	0.010	0	0.013	27.7***
Sample size		2475	463	2012	

***Significant at 1% level; **significant at 5% level; *significant at 10% level.

The variables appearing in Eqs. (1) to (6) are fully defined in Table 2. The dependent variable for the decision to pay a dividend (DIVDUM) takes a value of unity if the firm declares a dividend in year t, and zero otherwise. In the dividend payout equation with dependent variable, PAYOUT, we follow Holmen et al. (2008) and define the payout ratio as total dividends paid during the year divided by net profit after tax before abnormal items. If dividends are paid when earnings are negative, or if dividends are larger than accounting earnings, the payout ratio is set to one. The dependent variable for the insider ownership equation (INSO) is measured as the percentage of ordinary shares owned by the board directors in year t and in the leverage equation LEV is calculated as the ratio of the book value of debt to the book value of total assets in year t.

Following the extant literature on the decision to pay dividends and the determinants of dividend payout, we include a number of explanatory variables in the decision to pay a dividend equation, that is, DIVDUML: a lagged dividend dummy, ROA: profitability, RETA: earned to contributed capital mix, and SGR: sales growth (DeAngelo et al., 2006); LMV: logarithm of market value, BIND: board independence (Hu and Kumar, 2004; Sharma, 2011), and LEV: leverage (Jensen et al., 1992; Hu and Kumar, 2004); INSO: insider ownership (Jensen et al., 1992); INV: investment and CFLOW: cash flow (Eisdorfer et al., 2015) and INSTH: institutional investors' holdings (Amin et al., 2015). We use a lagged franked dividend dummy (DFDL) as proxy for the franking status to examine how dividend policy differs between firms following the imputation and traditional tax systems. In the case of the dividend payout equation, an identical set of variables are used to those in Eq. (1) apart from replacing the lagged dividend dummy variable with the lagged dividend payout (PAYOUTL) ratio.[5]

In determining the equation specification for the insider ownership (INSO) variable within our simultaneous equation system we again use a number of explanatory variables that appear appropriate in the light of the available literature. The selected variables are: LEV: leverage and ROA: profitability (Jensen et al., 1992); VOLROA: volatility of earnings, LMV: firm size, CFLOW: cash flow and INV: investment (Cho, 1998). In addition to these variables we also include a dividend dummy variable in examining the decision to pay a dividend and include the dividend payout ratio in examining the determinants of the dividend payout. The leverage (LEV) equation in the equation system employs the following explanatory variables, INSO: insider ownership, ROA: profitability, PPE: the tangibility ratio and INV: investment (Jensen et al., 1992); and VOLROA: volatility of earnings as a proxy for risk (Anwar and Sun, 2015). As before, we also include a dividend dummy in examining the decision to pay dividends and the dividend payout ratio in examining the determinants of payout.

5. Empirical results

5.1. Baseline results - determinants of decision to pay a dividend and the payout ratio

In this section we present the baseline results on the determinants of the decision to pay a dividend and the payout ratio in Panels A and B of Table 4, respectively, within the simultaneous equations framework. As can be seen in Panel A of Table 4, the likelihood of paying dividends is positively related to the lagged dividend payment dummy (DIVDUML), indicating that dividends paid in the previous year are an important determinant of the likelihood of paying a dividend in the current year, consistent with the findings of DeAngelo et al. (2006). In Panel B of Table 4, we find that the previous year's dividend payout ratio (PAYOUTL) is also positively related to the current dividend payout ratio, a result that is consistent with the findings of Korkaemaki et al. (2010).

The estimated coefficient of the lagged franked dividend dummy (DFDL) is significantly positive for both dividend equations, indicating that firms which paid franked dividends in the previous year are more likely to pay a dividend this year and have higher payout ratios compared to those that paid an unfranked dividend in the previous year, thereby supporting our hypotheses H1 (a) and (b) — firms with (without) franking credits available will have a higher (lower) probability of paying dividends and have a higher level of the dividend payout ratio. That is, there is a clear tax impact in the determination of the probability of dividends being paid and in the levels of dividend paid which are induced by the existence of the two alternative tax systems that operate in Australia.

Further, we find insider ownership (INSO) has implications for distribution policy in that it is positively related to the likelihood of a dividend being paid and the payout ratio. We also find that profitability (ROA) and retained equity to total assets (RETA) have a significantly positive relation with the likelihood of paying dividends, consistent with the findings in DeAngelo et al. (2006). However, the profitability has a negative relation with the payout ratio while the retained equity to total assets (RETA) has a positive relation with the payout ratio. The leverage ratio is significantly and positively related to the decision to pay a dividend whereas it is significantly and negatively related to the payout ratio, indicating that firms with higher leverage pay dividends but at lower levels to protect bondholders' wealth.[6] The size (LMV) of the firm is positively related to the likelihood of paying a dividend consistent with the findings in the US reported by Fama and French (2001) and DeAngelo et al. (2006). We also find that larger firms tend to pay a larger proportion of their earnings as dividend.

We find that sales growth (SGR), investments (INV) and institutional ownership (INSTH) variables do not have any impact on the decision to pay a dividend, however they are significantly and negatively related to the payout ratio. The negative relation between INV and the payout ratio is a reflection of the articulation between dividends, retention and investment while the negative relation between sales growth and payout ratio indicates that firms with growth opportunities, as anticipated, pay lower levels of dividend. The negative relation between INSTH and payout ratios indicates that firms with higher institutional ownership pay lower levels of dividends. The board independence (BIND) and cash flow (CFLOW) variables do not have any impact on the decision to pay a dividend, however they are significantly and positively related to the dividend payout ratio. In the case of the cash flow variable, clearly a larger payout would be anticipated, ceteris paribus, where cash flows were higher. The volatility of earnings (VOLROA) does not have any impact on either decision to pay a dividend or the payout ratio.[7]

Since the main focus of our analysis is within the dividend domain, we only briefly report the results deriving from the other non-dividend equations. In the case of the insider ownership equations, we find that the decision to pay a dividend and the payout ratio are positively related to INSO in panels A and B, respectively. The size of the firm (LMV), volatility of earnings (VOLROA) and leverage (LEV) are negatively related to insider ownership (INSO). For the leverage equation, we find that the decision to pay a dividend and the payout ratio are both positively related to leverage. Further, we find that insider ownership (INSO), volatility of earnings (VOLROA), profitability (ROA) and investment (INV) are negatively related to leverage (LEV), whereas the tangibility (PPE) is positively related to the leverage (LEV) variable.

[5] Korkaemaki et al. (2010) use lagged dividend payout in their payout equation.

[6] See for example, Smith and Warner (1979) and Kalay (1982) for the impact of the restrictions on dividend payouts to reduce the conflicts of interest between bondholders and stockholders.

[7] When we use the volatility of weekly stock returns (VOLRET) of the previous year instead of VOLROA, we find similar results thereby establishing the robustness of our volatility driven results.

Table 4
Baseline results for simultaneous equations of decision to pay, INSO and LEV and PAYOUT, INSO and LEV.
This table reports the baseline results for the simultaneous equations system regarding decision to pay dividend, insider ownership, and leverage in Panel A and payout ratio, insider ownership, and leverage in Panel B. DIVDUM is a dummy variable which takes value of unity if the firm declares dividends in year t, and zero otherwise; INSO is the percentage of ordinary shares owned by the directors of the board in year t; LEV is leverage ratio, calculated as the ratio of book value of debt to book value of total assets in year t; PAYOUT is dividend payout ratio in year t calculated as total dividends paid during the year divided by net profit after tax before abnormal items. If dividends are paid but earnings are negative, or if dividends are larger than accounting earnings, the payout ratio is set to one. DIVDUML is a dummy variable which takes value of unity if the firm declares dividends in year t − 1, and zero otherwise; PAYOUTL is the payout ratio in year t − 1; DFDL is a lagged franked dividend dummy, which takes a value of unity if the firm declares franked dividends in year t − 1, and zero otherwise; ROA is the return on assets, calculated as net profit after tax before abnormal items scaled by total assets; RETA is calculated as retained earnings scaled by total assets in year t; INSTH is the percentage of institutional investors ownership immediately prior to the balance sheet date in year t − 1; BIND is board independence calculated as the number of independent directors scaled by the size of the board in year t; VOLROA is the volatility of earnings calculated as a standard deviation of ROA of preceding three years; SGR is the sales growth in year t; LMV is the natural logarithm of market value of equity at the balance sheet date in year t; CFLOW is the ratio of cash flow from operations scaled by the book value of assets in year t; INV is investment, calculated as the ratio of capital expenditure to book value of total assets; and PPE is tangibility ratio, calculated as a ratio of property plant and equipment and book value of total assets in year t.

	Panel A – simultaneous equations for decision to pay dividend, INSO and leverage			Panel B – simultaneous equations for payout, INSO and leverage		
	Model 1 DIVDUM equation	Model 2 INSO equation	Model 3 LEV equation	Model 4 PAYOUT equation	Model 5 INSO equation	Model 6 LEV equation
INSO	0.0785 (3.45)***		−0.1520 (−13.58)***	0.0786 (3.38)***		−0.1573 (−14.09)***
LEV	0.1279 (2.83)***	−0.3736 (−8.39)***		−0.1838 (−3.95)***	−0.3703 (−8.34)***	
DIVDUM		0.0658 (3.01)***	0.0630 (5.65)***			
PAYOUT					0.0688 (2.71)***	0.0362 (2.73)***
DIVDUML	0.4781 (26.02)***					
PAYOUTL				0.3914 (22.13)***		
DFDL	0.1642 (11.05)***			0.2547 (19.05)***		
ROA	0.5049 (6.06)***	0.0424 (0.51)	−0.4289 (−12.30)***	−0.3296 (−3.86)***	0.1116 (1.40)	−0.3549 (−11.25)***
RETA	0.1144 (5.25)***			0.0476 (2.17)**		
INSTH	−0.0175 (−0.89)			−0.0566 (−2.80)***		
BIND	0.0167 (0.74)			0.0442 (1.91)*		
VOLROA	−0.0617 (−0.87)	−0.1757 (−2.50)**	−0.1418 (−3.69)***	−0.0540 (−0.75)	−0.2047 (−3.01)***	−0.2022 (−5.48)***
SGR	−0.0067 (−1.09)			−0.0118 (−1.87)*		
LMV	0.0159 (4.97)***	−0.0496 (−16.26)***		0.0090 (2.75)***	−0.0489 (−16.51)***	
CFLOW	0.0065 (0.09)	−0.0162 (−0.23)		0.1528 (2.13)**	−0.0319 (−0.45)	
INV	−0.0803 (−0.89)	0.1735 (1.92)*	−0.1012 (−1.90)*	−0.2165 (−2.34)**	0.1948 (2.13)**	−0.1000 (−1.87)*
PPE			0.2189 (14.31)***			0.2210 (14.42)***
Constant	0.1464 (3.63)***	0.5531 (14.62)***	0.1303 (6.63)***	0.1434 (3.49)***	0.5627 (14.98)***	0.1593 (8.36)***
Yr. effect	Yes	Yes	Yes	Yes	Yes	Yes
Ind. effect	Yes	Yes	Yes	Yes	Yes	Yes
Chi^2	4291.64	576.28	922.45	2256.96	583.80	902.40
R^2	0.6303	0.1362	0.2240	0.4683	0.1369	0.2214
P value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N	2475	2475	2475	2475	2475	2475

*** Significant at 1% level.
** Significant at 5% level.
* Significant at 1% level.

Overall, we find the likelihood of paying a dividend is stronger and the payout ratio is higher in an imputation tax environment as compared to a traditional tax system. In addition, we show that insider ownership has a positive impact upon the decision to pay dividends and the payout levels whereas it negatively impacts upon leverage. Leverage itself is found to negatively affect insider ownership and to positively affect both the decision to pay a dividend and the payout ratio, while the probability of paying a dividend and the payout ratio positively influence both insider ownership and leverage. Taken together, these results

Table 5
Results for further analysis on the decision to pay and PAYOUT within simultaneous framework with INSO and LEV.
Panel A of this table reports the results for further analysis on the decision to pay dividend that derives within the simultaneous equations system regarding decision to pay, insider ownership, and leverage. Panel B of this table reports the results for further analysis on the determinants of dividend payout ratio that derives within the simultaneous equations system regarding payout, insider ownership, and leverage. DIVDUM is a dummy variable which takes value of unity if the firm declares dividends in year t, and zero otherwise; INSO is the percentage of ordinary shares owned by the directors of the board in year t; LEV is leverage ratio, calculated as the ratio of book value of debt to book value of total assets in year t; PAYOUT is dividend payout ratio in year t calculated as total dividends paid during the year divided by net profit after tax before abnormal items. If dividends are paid but earnings are negative, or if dividends are larger than accounting earnings, the payout ratio is set to one. DIVDUML is a dummy variable which takes value of unity if the firm declares dividends in year t − 1, and zero otherwise; PAYOUTL is the payout ratio in year t − 1; DFDL is a lagged franked dividend dummy, which takes a value of unity if the firm declares franked dividends in year t − 1, and zero otherwise; ROA is the return on assets, calculated as net profit after tax before abnormal items scaled by total assets; RETA is calculated as retained earnings scaled by total assets in year t; INSTH is the percentage of institutional investors ownership immediately prior to the balance sheet date in year t − 1; INSTHD is the percentage of domestic institutional investors ownership immediately prior to the balance sheet date in year t − 1; INSTHF is the percentage of foreign institutional investors ownership immediately prior to the balance sheet date in year t − 1; BIND is board independence calculated as the number of independent directors scaled by the size of the board in year t.

	Panel A: decision to pay dividend equation			Panel B: dividend PAYOUT equation			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
INSO	0.0798	0.1070	0.1066	0.0859	0.1081	0.1097	0.1072
	(3.42)***	(2.70)***	(2.74)***	(3.52)***	(2.66)***	(2.73)***	(2.68)***
LEV	0.1182	0.1265	0.0181	−0.1049	−0.1860	−0.2692	−0.2632
	(2.56)**	(2.80)***	(0.40)	(−2.16)**	(−4.00)***	(−5.70)***	(−5.60)***
DIVDUML	0.5957	0.4793	0.4522				
	(37.82)***	(26.05)***	(24.74)***				
PAYOUTL				0.4399	0.3928	0.3864	0.3013
				(23.30)***	(22.18)***	(21.95)***	(12.49)***
DFDL		0.1758	0.2564		0.2674	0.3293	0.2514
		(9.91)***	(13.43)***		(15.95)***	(18.15)***	(10.64)***
FRCRL	0.0447			2.4955			
	(0.19)			(9.66)***			
DFDL * PAYOUTL							0.1753
							(5.12)***
INSO * DFDL		−0.0523	−0.0210		−0.0560	−0.0337	−0.0337
		(−1.19)	(−0.48)		(−1.24)	(−0.75)	(−0.75)
ROA	0.5555	0.5019	0.8114	−0.3885	−0.3322	−0.0357	−0.0358
	(6.35)***	(6.02)***	(8.66)***	(−4.21)***	(−3.88)***	(−0.37)	(−0.37)
RETA	0.1324	0.1164	0.1928	0.1299	0.0500	0.0915	0.1087
	(5.95)***	(5.34)***	(7.21)***	(5.76)***	(2.27)**	(3.38)***	(4.00)***
ROA * DFDL			−0.8488			−0.8075	−0.8120
			(−6.97)***			(−6.41)***	(−6.48)***
RETA * DFDL			−0.2186			−0.1357	−0.1431
			(−5.01)***			(−3.02)***	(−3.20)***
INSTH	−0.0047	−0.0177	−0.0104	−0.0351	−0.0568	−0.0522	−0.0478
	(−0.23)	(−0.90)	(−0.54)	(−1.66)*	(−2.81)***	(−2.60)***	(−2.39)**
BIND	0.0132	0.0150	0.0042	0.0426	0.0424	0.0345	0.0347
	(0.57)	(0.66)	(0.19)	(1.76)*	(1.83)*	(1.51)	(1.52)
Constant	0.1333	0.1393	0.1326	0.1439	0.1368	0.1220	0.1414
	(3.22)***	(3.34)***	(3.24)***	(3.34)***	(3.23)***	(2.91)***	(3.37)***
All other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yr. effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ind. effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Chi^2	3969.48	4290.33	4578.72	1823.76	2256.45	2377.11	2427.95
R^2	0.6125	0.6304	0.6458	0.4153	0.4686	0.4790	0.4848
P value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N	2475	2475	2475	2475	2475	2475	2475

*** Significant at 1% level.
** Significant at 5% level.
* Significant at 1% level.

are strongly indicative of the dividend decision (both the decision to pay and the level of payout), insider ownership and leverage being simultaneously determined.

5.2. The impact of insider ownership, profitability and earned/contributed capital mix

In this section we conduct further analyses within a simultaneous equations system framework to understand how the impacts of profitability (ROA), earned/contributed capital mix (RETA) and insider ownership (INSO) on both the decision to pay dividend and level of payout vary across the imputation and traditional tax environments. The results for these analyses are presented in Panels A and B of Table 5.[8] We also examine the impact of the magnitude of franking credits on dividend decision using the franking credit available during the prior year.

[8] We do not present the results for the insider ownership (INSO) equation and debt (LEV) equation to conserve space.

We find that the estimated coefficient of FRCRL is insignificant in the decision to pay a dividend equation while it is significantly positive in the dividend payout equation. This finding indicates that the magnitude of the franking credit distributed in the previous year plays a significant role in determining the dividend payout ratio but not for the decision to pay dividend. That is, while franked status drives both the payout and decision to pay a dividend, its magnitude, only has implications for the level of the dividends declared.

We examine whether the impact of insider ownership on dividends is dependent upon the franking status of dividends by creating the interaction term INSO ∗ DFDL, which comprises the franked dividend paid in the previous year (DFDL) and insider ownership (INSO). We find an insignificant coefficient for the interaction term in all models reported for both dividend equations, implying that franking status does not have any impact on the positive effect of insider ownership on both the decision to pay a dividend and the dividend payout ratio. These findings do not support our hypotheses H2 (a) and (b). Instead, we find firms with higher insider ownership are more likely to pay a dividend and, when doing so, pay larger dividends, irrespective of their franking status. Since insider ownership is negatively related to firm size and leverage, firms with higher insider ownership have lower monitoring and higher agency costs, hence, they pay higher dividends to reduce agency costs, irrespective of their tax status.

We then similarly examine the tax related impact of profitability (ROA) on dividends by introducing an interaction term, ROA ∗ DFDL. We find a significantly negative coefficient for the interaction term ROA ∗ DFDL in both the decision to pay a dividend and in the dividend payout equations. This outcome supports our hypotheses H3 (a) and H4 (a) — the impact of profitability on the decision to pay a dividend and the level of the dividend payout will be lower for firms under an imputation tax system than for those under a traditional tax system.

Finally, the analysis is then repeated for the retained equity to total assets (RETA) variable by including an interaction term, RETA ∗ DFDL. We find that the coefficient for the interaction term, RETA ∗ DFDL, is significantly negative in both equations, indicating that the earned to contributed capital variable plays a less significant role in the likelihood of paying a dividend and in the determination of the dividend payout ratio under an imputation tax system than under the traditional tax system, thereby providing support for our hypotheses H3 (b) and H4 (b).[9]

Overall, we find that the likelihood of paying a dividend is stronger and the dividend payout level is higher in an imputation tax environment than within a traditional tax system. Further, we find that the impact of profitability and earned to contributed mix on the likelihood of paying a dividend and the payout ratio are stronger for firms following a traditional tax system compared to the imputation tax system.

5.3. The impact of domestic and foreign institutional ownership

Bathala et al. (1994) examines the impact of institutional holdings on insider ownership and debt policy utilizing a simultaneous system of equations and find that institutional ownership is inversely related to the leverage and insider ownership. Since foreign institutional investors will not be eligible to receive the imputation credit under the Australian tax legislation, we extend the work of Bathala et al. (1994) and explore the impact of domestic institutional ownership (INSTHD) and foreign institutional ownership (INSTHF) on the dividend decision, insider ownership and leverage. We present the results on the determinants of the decision to pay a dividend and the payout ratio in Panels A and B of Table 6, respectively, in a simultaneous equations framework including specifications for insider ownership and leverage. First, we present the results using INSTH in the DIVDUM/PAYOUT, INSO and leverage equations and again find that institutional holdings (INSTH) do not affect the decision to pay a dividend, while firm payout is lower for firms with higher institutional ownership. Further we find that firms with higher institutional holdings have lower insider ownerships, while the level of institutional holdings does not have any impact upon leverage.

Second, we present the results that are obtained using the partitioned domestic (INSTD) and foreign (INSTF) institutional holdings variables in the DIVDUM/PAYOUT, INSO and leverage equations. We find that INSTHF is significantly and negatively related to both the decision to pay a dividend and the dividend payout ratio, indicating that firms with higher foreign institutional ownership are less likely to pay dividends, and in the case that they do pay a dividend, it is at a lower level. This result is consistent with the Australian tax system wherein non-resident shareholders are ineligible for tax credits and is, furthermore, an indication of the potentiality of the existence of tax credit induced clienteles arising within the market on this basis. Further we find that INSTHF is significantly and negatively related to insider ownership and significantly and positively related to leverage. INSTHD does not have any significant impact on the decision to pay a dividend, payout ratio, insider ownership and leverage. These findings are a strong reflection of the tax credit system feature in Australia wherein tax credits are only available to Australian tax residents.

6. Conclusions

Extant research examines the determinants of the dividend payment decision and a number of theoretical and empirical structures have been developed for investigating this phenomenon. We examine the effects of insider ownership, profitability and earned/contributed capital mix on the dividend decision, controlling for the generally acknowledged endogeneity issues between dividends, insider ownership and the leverage ratio in Australia. We further examine how their effects differ between firms within

[9] When we use the interaction terms RETA ∗ DFDL and ROA ∗ DFDL in the decision to pay a dividend equation the coefficient of the leverage variable becomes insignificant.

Table 6

Further analysis on the impact of domestic and foreign institutional ownership on the decision to pay and level of PAYOUT within simultaneous framework with INSO and LEV.

This table reports the impact of domestic and foreign institutional ownership on the decision to pay and level of PAYOUT within simultaneous framework with INSO and LEV. Panel A presents the results on the decision to pay dividend, insider ownership, and leverage. Panel B presents the results on the payout ratio, insider ownership, and leverage. DIVDUM is a dummy variable which takes value of unity if the firm declares dividends in year t, and zero otherwise; INSO is the percentage of ordinary shares owned by the directors of the board in year t; LEV is leverage ratio, calculated as the ratio of book value of debt to book value of total assets in year t; PAYOUT is dividend payout ratio in year t calculated as total dividends paid during the year divided by net profit after tax before abnormal items. If dividends are paid but earnings are negative, or if dividends are larger than accounting earnings, the payout ratio is set to one. DIVDUML is a dummy variable which takes value of unity if the firm declares dividends in year t − 1, and zero otherwise; PAYOUTL is the payout ratio in year t − 1; DFDL is a lagged franked dividend dummy, which takes a value of unity if the firm declares franked dividends in year t − 1, and zero otherwise; ROA is the return on assets, calculated as net profit after tax before abnormal items scaled by total assets; RETA is calculated as retained earnings scaled by total assets in year t; INSTH is the percentage of institutional investors ownership immediately prior to the balance sheet date in year t − 1; INSTHD is the percentage of domestic institutional investors ownership immediately prior to the balance sheet date in year t − 1; INSTHF is the percentage of foreign institutional investors ownership immediately prior to the balance sheet date in year t − 1; BIND is board independence calculated as the number of independent directors scaled by the size of the board in year t.

Panel A - simultaneous equations for decision to pay dividend, INSO and leverage						
	Using INSTH in all three equations			Using INSTD and INSTF in all three equations		
	Model 1 DIVDUM	Model 2 INSO	Model 3 LEV	Model 4 DIVDUM	Model 5 INSO	Model 6 LEV
INSO	0.1070 (2.75)***		−0.1492 (−13.49)***	0.0937 (2.42)**		−0.1366 (−12.22)***
LEV	0.0174 (0.38)	−0.3714 (−8.38)***		0.0319 (0.70)	−0.3384 (−7.62)***	
DIVDUM		0.0627 (2.94)***	0.0646 (5.91)***		0.0489 (2.25)**	0.0690 (6.28)***
DIVDUML	0.4522 (24.74)***			0.4504 (24.65)***		
PAYOUTL						
DFDL	0.2564 (13.43)***			0.2533 (13.27)***		
INSO * DFDL	−0.0210 (−0.48)			−0.0262 (−0.60)		
ROA	0.8113 (8.65)***	0.0393 (0.47)	−0.4315 (−12.44)***	0.8115 (8.66)***	0.0591 (0.71)	−0.4323 (−12.49)***
RETA	0.1928 (7.21)***			0.1916 (7.18)***		
ROA * DFDL	−0.8488 (−6.97)***			−0.8318 (−6.83)***		
RETA * DFDL	−0.2186 (−5.01)***			−0.2189 (−5.02)***		
INSTH	−0.0079 (−0.41)	−0.0515 (−2.59)***	0.0005 (0.04)			
INSTD				0.0135 (0.65)	−0.0344 (−1.63)	−0.0143 (−1.23)
INSTF				−0.1051 (−2.38)**	−0.1482 (−3.25)***	0.0671 (2.76)***
BIND	0.0042 (0.19)			0.0037 (0.17)		
Constant	0.1319 (3.23)***	0.5653 (14.89)***	0.1282 (6.46)***	0.1313 (3.21)***	0.5584 (14.73)***	0.1228 (6.19)***
All other controls	Yes	Yes	Yes	Yes	Yes	Yes
Yr. effect	Yes	Yes	Yes	Yes	Yes	Yes
Ind. effect	Yes	Yes	Yes	Yes	Yes	Yes
Chi^2	4578.73	584.03	926.27	4593.35	576.18	923.03
R^2	0.6458	0.1393	0.2250	0.6473	0.1477	0.2322
P value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N	2475	2475	2475	2475	2475	2475
Panel B – simultaneous equations for payout, INSO and leverage						
	Using INSTH in all three equations			Using INSTD and INSTF in all three equations		
	Model 1 PAYOUT	Model 2 INSO	Model 3 LEV	Model 4 PAYOUT	Model 5 INSO	Model 6 LEV
INSO	0.1046 (2.62)***		−0.1541 (−13.96)***	0.0912 (2.28)**		−0.1436 (−12.88)***
LEV	−0.2635 (−5.61)***	−0.3685 (−8.34)***		−0.2480 (−5.27)***	−0.3411 (−7.72)***	
PAYOUT		0.0622 (2.52)**	0.0398 (3.09)***		0.0484 (1.93)*	0.0446 (3.43)***

(continued on next page)

Table 6 *(continued)*

Panel A - simultaneous equations for decision to pay dividend, INSO and leverage	Using INSTH in all three equations			Using INSTD and INSTF in all three equations		
	Model 1 DIVDUM	Model 2 INSO	Model 3 LEV	Model 4 DIVDUM	Model 5 INSO	Model 6 LEV
DIVDUML						
PAYOUTL	0.3014 (12.49)***			0.2995 (12.39)***		
DFDL	0.2515 (10.64)***			0.2487 (10.50)***		
DFDL * PAYOUTL	0.1754 (5.12)***			0.1773 (5.17)***		
INSO * DFDL	−0.0337 (−0.75)			−0.0367 (−0.82)		
ROA	−0.0346 (−0.36)	0.1056 (1.33)	−0.3575 (−11.35)***	−0.0294 (−0.30)	0.1082 (1.36)	−0.3550 (−11.30)***
RETA	0.1087 (4.00)***			0.1083 (3.99)***		
ROA * DFDL	−0.8122 (−6.48)***			−0.8011 (−6.37)***		
RETA * DFDL	−0.1432 (−3.20)***			−0.1447 (−3.23)***		
INSTH	−0.0446 (−2.22)**	−0.0484 (−2.43)**	0.0034 (0.31)			
INSTD				−0.0313 (−1.47)	−0.0316 (−1.50)	−0.0098 (−0.85)
INSTF				−0.0960 (−2.11)**	−0.1476 (−3.23)***	0.0621 (2.54)**
BIND	0.0348 (1.52)			0.0346 (1.52)		
Constant	0.1420 (3.38)***	0.5747 (15.23)***	0.1557 (8.04)***	0.1432 (3.40)***	0.5668 (15.03)***	0.1514 (7.83)***
All other controls	Yes	Yes	Yes	Yes	Yes	Yes
Yr. effect	Yes	Yes	Yes	Yes	Yes	Yes
Ind. effect	Yes	Yes	Yes	Yes	Yes	Yes
Chi^2	2427.25	590.77	904.39	2428.16	585.29	902.03
R^2	0.4850	0.1400	0.2228	0.4872	0.1476	0.2293
P value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N	2475	2475	2475	2475	2475	2475

*** Significant at 1% level.
** Significant at 5% level.
* Significant at 1% level.

imputation and traditional/classical tax environments. In particular, we are able to empirically establish that franking status will have an impact upon both the probability of paying a dividend and on the level of the dividend payout. That is, both the dividend payment probability and payout level are higher for firms within an imputation tax environment than within a traditional tax system.

Within an agency framework, the degree of insider ownership will be negatively related to the dividend payout and the decision to pay a dividend. However, we argue that the reverse could occur in an imputation system where the tax bias towards paying dividends is strong. We find that firms with higher insider ownership are more likely to pay dividends and to have higher payout ratios, irrespective of franking status. Moreover, smaller firms with lower leverage have higher insider ownership, indicating that firms with higher insider ownership have less monitoring and potentially have greater agency problems. Therefore, firms with higher insider ownership pay higher dividends in order to reduce agency costs and to provide quality signals to market participants such that they can achieve the highest possible price for their securities.

We further argue that the tax incentives that are available to franked dividend payments essentially incentivize dividend payments to be shifted to earlier points in time, since the value of the tax credit will diminish through time. We also argue that the magnitude of the dividend, as reflected in the payout ratio, will depend upon the availability of sufficient profitability to generate the tax credits and show that the impact of profitability and earned/contributed capital mix on the decision to pay dividends is stronger for firms following a traditional tax system. We are able to demonstrate the important and significant impacts that the tax treatment of dividends can have upon the dividend decision. The results reported in this paper have public policy implications as we highlight the significant impacts that the tax treatment of dividends can have on dividend decisions.

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