**Dividend imputation in Australia: The value of franking credit balances**

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## Abstract

The growing level of undistributed franking credits held by Australian companies provides an important puzzle for finance theory. In 1987, the Australian Government set up a system of tax credits to address the problem of double taxation of dividends. Double taxation of dividends arises in a classical system when earnings are taxed at the corporate level at the corporate tax rate and again at shareholders level when dividends are taxed at the shareholders individual personal tax rate. In Australia, under the dividend imputation system, a tax credit equal to the Australian corporate tax paid on earnings is allowed to resident shareholders and it is attached to the dividends that Australian resident shareholders receive. This tax credit is called a dividend imputation credit, or a franking credit, and franking credits that remain undistributed at year-end are called franking credit balances. Franking credit balances accumulate over time where dividend distributions are not sufficient to allocate all of the available franking credit balance. At first glance it might be expected that companies would pay out all dividends that attract the franking credits as these are valuable in the hands of resident shareholders, yet considerable franking credit balances have accumulated for some companies. If franking credits are valuable to investors then some care needs to be taken in the way that companies and regulators treat franking credit balances. If franking credit balances are not valuable to shareholders then this finding has implications for equity market risk premium estimation, valuation of companies and determination of appropriate rates of return for regulated companies. Analysis is based on a sample of over 3000 company year observations, spanning the period 2001 to 2006, for companies that report franking credit balances in their annual reports. Fixed effects panel data analysis suggests that franking credits are valuable to the marginal shareholder in the smaller companies in the sample though there is little evidence of these balances being of value to marginal shareholders in the larger companies, specifically those that fall among the largest 100 listed companies. Further, while there is evidence that larger companies are more likely to accumulate franking credit balances over time smaller companies with concentrated shareholdings are less likely to accumulate these balances.

**JEL Code:** H25, G18
**Key words:** Australian corporate tax, franking credits, effective corporate tax rate

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## Acknowledgements

I acknowledge the Australian Research Council for funding this project via ARC Discovery Grant, DP0770453. I would like to thank Professor Bruce Grundy, the participants at the Finance Research Day held at the University of Newcastle in August 2009, particularly Professor Stephen Easton, and the participants at the 14th Finsia-MCFS Banking and Finance Conference in September 2009, particularly Christine Brown, for their comments and suggestions. I also acknowledge the support of Sinclair Davidson in this work. My thanks go to the research assistants who have worked on the project, Solomon Yaw Adomako, John Fowler, Peter Le, Muktah Noah and Binesh Seetanah for their diligence in entry and verification of the data used in this paper.

## 1. Introduction

The introduction of the dividend imputation tax system in Australia in 1987 heralded a major change in the taxation of Australian dividends as it essentially removes double taxation of these dividends for Australian resident shareholders.[1] Under the dividend imputation system, Australian resident investors are credited for the Australian corporate tax paid by the Australian companies through the distribution of dividend imputation credits, or franking credits. These credits are attached to dividends distributed by Australian companies either as fully or partially franked dividends. While Australian companies are penalised for distributing more franking credits than they have accumulated, franking credit balances can build up over time where profits are retained for investment purposes or where dividends are not fully franked. The only exclusions under this system are non-resident investors and resident institutions not included under the legislation. The question of whether franking credits are valuable has proven to be an important question for regulators and consultants in the determination of appropriate rates of return for regulated industries (Gray & Hall 2008). Yet, while there has been research into the value of franking credits at the company level there has been no analysis of the value of franking credit balances that Australian companies accumulate over time. One of the key contributions of this paper is to provide evidence that the franking credits are not valuable in the hands of the marginal investor in large companies while they are valuable to the marginal investor in smaller companies. One explanation for this result is that the marginal investor in large companies is most likely a non resident investor while the marginal investor in smaller companies is an Australian resident investor.

The theoretical link between tax and the value of a company is well understood (Modigliani & Miller 1958, 1963; Miller 1977) though empirical support for the impact of taxes on the value of

[1] Prior to this change earnings were taxed once at the corporate level at the corporate tax rate and then at the individual investor level at the individual tax rate when dividends were paid out. This change to the Australian tax system creates an integrated tax system for Australian resident shareholders with dividend income being taxed at the investor marginal income tax rate.

the company has been less forthcoming (Myers 1984, 2001).[2] The introduction of dividend imputation provides an opportunity to further explore the impact of the taxes on the value of a company. Empirical research into the Australian imputation system supports the existence of tax effects in corporate financing and share valuation (Walker & Partington 1999; Faff *et al.* 2001; Twite 2001; Cannavan *et al.* 2004; Hathaway & Officer 2004; Beggs & Skeels 2006; Pattenden 2006) though much of this research is based on data drawn from the period prior to 1 July 1997 when tax regulations were introduced to limit franking credit trading schemes. Research using data that extends beyond 1 July 1997 is limited (Cannavan *et al.* 2004; Hathaway & Officer 2004; Beggs & Skeels 2006) though it is evident that the regulatory changes introduced on 1 July 1997 restricted the ability of non-resident investors to benefit from franking credits (Gray & Hall 2008; Lally 2008; Truong & Partington 2008). The introduction of a tax rebate for unused franking credits from the 1 July 2000 is another important change to imputation system (Beggs & Skeels 2006) as this removes a constraint on the use of franking credits by resident investors.[3]

The specific exclusion of non-resident taxpayers is particularly important given non-resident investors control more than 40% of the equity listed on the Australian Stock exchange.[4] Indeed, there are examples of non-resident investors using various schemes to benefit from franking credits (Cannavan *et al.* 2004). A further exclusion, perhaps more by omission than design, affects all investors and this relates to undistributed franking credits (or franking credit balances). Companies can choose not to distribute all of their Australian taxed income as dividends and so Australian resident shareholders do not necessarily gain the full benefit of the franking credits accumulated by the company. Since 1987, the level of franking credit balances accumulated by Australian

[2] There have been some exceptions (MacKie-Mason 1990; Graham 2003).
[3] This rebate allowed individuals and superannuation funds who held franking credits in excess of their taxable income to claim a tax refund. It has been suggested that this led to greater emphasis on dividend payment as resident investors were no longer limited by their taxable income in their use of franking credits (Beggs & Skeels 2006).
[4] Non-resident ownership of Australian listed equity amounted to 42% as of the end of the December quarter 2008 (ASX 2009).

companies has grown, resulting in a substantial notional tax benefit withheld at the corporate level for Australian resident shareholders.[5]

This paper uses a large sample of corporations listed on the Australian Securities Exchange that report their franking credit balances over the period 2001 to 2006. This sample is used to explore the question of whether undistributed franking credits held at the company level are of value to shareholders. Fixed effects panel analysis suggests that franking credit balances are correlated with the market value of shares in the company, consistent with the franking credits being of value to shareholders, though this effect is not uniform across the sample. Importantly, there is little evidence that franking credits are of value to the marginal shareholder in very large companies, those drawn from the largest 100 listed companies by book value of assets. Further, there is evidence that franking credit balances are increasing in company size and decreasing in shareholder concentration. The literature is reviewed in the next section, with data description provided in Section 3. The results of the analysis are reported and discussed in Section 4 and summary and conclusions follow in Section 5.

## 2. Literature review

The impact of dividend imputation on the cost of capital has been discussed in the literature with a focus on further developing the traditional one-period model (Monkhouse 1993; Officer 1994; Boyle 1996; Monkhouse 1996; Wood 1997; Lally & van Zijl 2003; Dempsey & Partington 2008). Much of the research is based on the assumption that the Australian market is segregated and this gives rise to the argument that the value of franking credits is impounded in share prices. In this scenario undistributed franking credits are valuable to the shareholders in the company. Yet, the value of franking credits at the company level is not so clear when Australia is viewed as a small market within an integrated world financial market (Officer 1994; Wood 1997; Gray & Hall

[5] Corporations maintain a record of franking credits that are available for distribution to investors but companies are not required to disclose this information and so there is considerable variation in disclosure of franking credit balance across companies. Thus, it is difficult to get an accurate estimate of the total franking credit balance for the firms in this sample, though a recent estimate puts the total franking credit balances held by all Australian companies at more than $100 billion dollars (Kerin 29 January 2010).

2006, 2008). If franking credits are of no value to the marginal investor then the company's share price will not reflect their value.

The identity of the marginal investor has proven to be an important consideration in this literature given the restrictions placed on non-resident shareholder access to franking credits. If the marginal investor cannot benefit from franking credits then the price of the share will not impound this benefit (Officer 1994). Indeed, the possibility of restricting non-resident shareholder access to franking credits while allowing resident investors full access to the credits is specifically catered for in the literature. In an integrated market there may be a tendency for resident investors and non-resident investors to form tax based investment clienteles that are attracted to particular companies on the basis of the level of fully franked dividends paid by the company (Wood 1997). Wood predicts that the market value of franking credits in a small, integrated market characterised by these two classes of investor is essentially zero.

Argument about whether franking credits are actually valued in the market has continued with the observation that the models used by regulators may not be internally consistent. On the basis of the Officer model, it is suggested that dividend yields would need to be set at excessively high levels to justify the franking credit value proposed in the literature (Gray & Hall 2006, 2008). Indeed, Gray and Hall argue that setting the value of franking credits to zero appears to be more consistent with observed dividend yields. The response to this proposition is generally based on the assumption that franking credits are valuable to shareholders (Lally 2008; Truong & Partington 2008). Nevertheless, there is some evidence that value to investors of franking credits is approximately 50% of their theoretical value (Hathaway & Officer 2004). This poses the question. Are franking credits actually valuable in the hands of the marginal investor?

If franking credits are valuable then this should have some impact on corporate finance decisions. There is evidence to support an imputation driven change in capital structure away from debt and towards equity with the introduction of the imputation system (Twite 2001; Pattenden 2006) from the 1980s through to the late 1990s. There is also evidence of imputation effects in the

price drop that occurs on the dividend ex date, supporting the existence of valuable imputation tax benefits.[6] Yet, virtually all of the period covered by these studies is marked by fairly lax enforcement of the non-resident franking credit benefit rules, with a number of schemes providing non-residents access to franking credit benefits specifically denied to them under the legislation. But, from 1 July 1997 a set of regulations, introduced by the Australian Government, made it considerably more costly for non-resident shareholders to access franking credits through derivative based strategies in particular and it is argued that this had a considerable impact on the benefit of franking credits to non-resident investors (Cannavan *et al.* 2004).

Two recent studies focusing on dividend ex date effects provide quite different interpretations even though both the data sets and the estimated coefficients are similar.[7] Hathaway and Officer calculate the magnitude of the drop off, which is less than one, with the economic interpretation that the marginal investor attaches a value to franking credits of about 50% (Hathaway & Officer 2004). Beggs and Skeels rely on statistical tests of the basic tax arbitrage relationship that is assumed to exist around the ex dividend date. They generally reject the tax arbitrage explanation for the dividend ex date effect, finding that the franking credit coefficient is only statistically significantly different from zero in the later part of the study period (1998, 1999 and 2002 to 2004). These studies make no attempt to account for whether the shareholders that receive these dividends can legally benefit from the franking credits attached to the dividends.

The valuation of franking credits has proven a difficult task. The work of Cannavan, Finn and Gray (2004), Beggs and Skeels (2006) and Hathaway and Officer (2004) provide examples of recent research in the area though there is still some contention as to whether franking credits are valuable to shareholders. Further, there is no evidence of whether franking credit balances held by

[6] (Walker & Partington 1999; Hathaway & Officer 2004; Beggs & Skeels 2006).

[7] It is difficult to reconcile the two data sets. The Beggs and Skeels data set spans the period from April 1984 to May 2004 and includes around 5511 observations (Beggs & Skeels 2006). Their sample excludes small company observations (market capitalisation less than 0.03 in the All Ordinaries share price index), observations with company events reported around the dividend ex date, special dividends and dividends reported in October 1987. Sample size is carefully reported throughout the paper. The Hathaway and Officer data set includes 6870 observations and covers the period, August 1986 to August 2004 (Hathaway & Officer 2004). This data set excludes dividends distributed by companies outside the ASX/S&P500 index though it is difficult to identify the final data set used in analysis as sample sizes are not reported in Table 3 of the paper.

Australian companies are valuable to the marginal investor, particularly following the tax regulation changes that took effect from 1 July 1997.

### 3. Modelling and hypothesis development

Officer models the cash flows accruing to shareholders in terms of perpetuity equivalents for profit to shareholders, $X_i$, dividends paid to shareholders, $D_i$, operating income of the company, $X_O$, interest paid on loans, $X_D$, and Corporate tax rate, $T$ (Officer 1994). The corporate tax paid by the company is defined, $CTP_i = T(X_O - X_D)$, with the proportion of franking credits that shareholders access in equilibrium being the franking credit proportion, $\gamma$. Essentially, companies can only pay franked dividends out of income that is subject to Australian corporate tax and so not all dividends need be franked. Further, companies may choose not to distribute all of the profit subject to Australian corporate tax and so undistributed franking credits may accumulate over time.

The proportion of credits optimally distributed to shareholders could depend on the mix of resident and non-resident shareholders in the company and the impact of imputation credits on price will be determined by the marginal shareholder (Wood 1997). Thus, the profit attributable to share *i* can be decomposed into two terms (Officer 1994). Officer assumes that not all after tax earnings need create imputation franking credits in the hands of the resident shareholder consistent with $\gamma_i \in [0,1]$. Thus, the benefit to resident shareholders is the sum of dividends received and the proportion of franking credits attached to these dividends.

$$X_i = D_i + \gamma_i T(X_O - X_D) = D_i + \gamma_i CTP_i \qquad (1)$$

For simplicity, both dividend and franking credits are assumed to be expressed as perpetuities and discounted at the rate $(k)$ to give the value of the shares in the company $(S_i)$.[8]

$$S_i = \frac{D_i + \gamma_i CTP_i}{k} = \frac{D_i}{k} + \frac{\gamma_i}{k} CTP_i \qquad (2)$$

[8] An appropriate discount rate will reflect the risk attached to the sum of these perpetuities.

The key prediction from this relationship is that equity value is increasing in the value of franking credits and this will vary across companies. The discount rate will also vary across companies with variation in risk. The required rate of return could be specifically modelled using either a one factor market model (Sharpe 1964; Lintner 1965) or a multifactor model like the three-factor model proposed by Fama and French (Fama & French 1993). Alternatively, a statistical technique like fixed effects panel data analysis could be relied upon to capture the impact of unobservable company specific effects such as discount rate and franking credit proportion.[9]

If it is assumed that the company distributes all available franking credits and that the marginal investor can fully use these distributed franking credits then $\gamma = 1$ and the share price fully reflects available franking credits with $\frac{\gamma}{k} > 0$. If $\gamma = 0$ then franking credits are not valued in the market and the share price is a function of the dividend perpetuity alone. In this case franking credits have no value to the marginal shareholder. If $0 < \gamma < 1$ then franking credits are partially impounded into share prices again giving $\frac{\gamma}{k} > 0$. To get a sense of the impact that franking credits could have on share price, assume that a share generates an equivalent dividend perpetuity of $20.00 per share and an equivalent corporate tax payment perpetuity of $6.00 per share. The discount rate is 0.05 and this is applied to both dividends and franking credits. If we set $\gamma = 0.5$, as is often assumed in the literature (Hathaway & Officer 2004), then $\frac{\gamma}{k} = \frac{0.5}{0.05} = 10$. If $\gamma = 1$ then this ratio would be equal to 20. Table 1 provides a summary of the value of the company equity under each of the three scenarios. The greater the franking parameter, the more valuable is the franked dividend paying share in the hands of a resident shareholder. With the introduction of franking credit refunds after 1 July 2000 resident investors may obtain the full benefit of the

[9] The latter is chosen in this study given the difficulty of accurately measuring required rates of return for small thinly traded shares, which account for a large percentage of the sample using this study.

franking credits regardless of their taxable income.[10] The value of franking credits for a non-resident investor is lower because of the cost of setting up a scheme to recoup the value of franking credits and so a fully franked share is assumed to be less valuable to non-resident investors, at worst being equal in value to an unfranked dividend paying share.

[Insert Table 1 about here]

The reliance on equivalent perpetuities is important in these simple valuation models. The actual cash flows generated by the underlying company could differ considerably over the life of the company and it is likely that the distribution of franked dividends will vary over time, reflecting variation in investment opportunities and business conditions. Thus, franking credit balances will tend to increase in some periods and decrease in other periods, regardless of whether these credits are valuable to the marginal shareholder or not. If the marginal investor is a non-resident investor and share price does not reflect franking credits then franking credit balances will be uncorrelated with the value of the company, all else held constant. If a resident shareholder is the marginal shareholder then franking credits and franking credit balances will be valuable to the shareholder and this value will be reflected in share price. This leads to the first hypothesis.

**Hypothesis 1**

Null: The value of franking credit balances is uncorrelated with the value of the company.
Alternate: The value of franking credit balances is positively correlated with the value of the company.

As indicated in equation (2), the share price can be written in terms of the sum of the present value of an equivalent perpetuity of dividends and the present value of an equivalent perpetuity of franking credits. Under the null, franking credit balances have no value to the marginal investor in company $i$ at time $t$ and so the value of equity is the present value of the dividend perpetuity:

[10] Thus, if the shareholder's tax is insufficient to claim a full tax offset for the franking credit then they may apply for a cash rebate for the remainder.

$$S_{it} = \frac{1}{k_i} D_{it} \tag{3}$$

Taking natural logs results in the linear form:

$$s_{it} = d_{it} - k_i^* \tag{4}$$

where $s_{it} = \ln(S_{it})$ = the natural log of the share price of company *i* at time *t*,
$d_{it} = \ln(D_{it})$ = the natural log of the dividend perpetuity value for company *i* at time *t*,
$k_i^* = \ln(k_i)$ = the natural log of the discount rate for company *i*,

Both share value and dividends are likely to be non-stationary and correlated in a fundamental way, given the dividend perpetuity pricing relationship assumed in this paper (Kleidon 1988a, 1988b; Cuthbertson & Hyde 2002; Heaney 2003) and so the model is restated in error correction form. Assuming the discount rate is constant over the study period for each company and adding and subtracting $s_{it-1}$ and $d_{it-1}$ gives:

$$\begin{aligned} s_{it} - s_{it-1} &= -dk_i^* + d_{it} - d_{it-1} + (d_{it-1} - s_{it-1}) \\ ds_{it} &= \alpha_i + dd_{it} - \kappa(d_{it-1} - s_{it-1}) \end{aligned} \tag{5}$$

where $ds_{it} = s_{it} - s_{it-1}$
$dd_{it} = d_{it} - d_{it-1}$
$\alpha_i = -dk_i^*$
$\kappa$ = speed of adjustment parameter

Using dummies (fixed effects) to capture unobservable company, $\alpha_{i0}$, and time effects, $\alpha_{t0}$, and with the addition of error term, $\varepsilon_{it}$, this model can be written as:

$$ds_{it} = \alpha_{i0} + \alpha_{t0} + \alpha_1 dd_{it} + \alpha_2 (d_{it-1} - s_{it-1}) + \varepsilon_{it} \tag{6}$$

If franking credits are valuable then franking credit balances $(fcb_{it})$, accumulated over time by Australian companies, are also valuable to shareholders and so the franking credit balance will be positively correlated with company value. Equation (5) is supplemented with the change in the

natural log of franking credit balance, $dfcb_{it}$ , and a residual term, $\nu_{it}$ , to give the equation used to test hypothesis 1 within a fixed effects panel framework.

$$ds_{it} = \alpha_{i0} + \alpha_{t0} + \alpha_1 dd_{it} + \alpha_2 (d_{it-1} - s_{it-1}) + \alpha_3 dfcb_{it} + \nu_{it} \quad (7)$$

where $dfcb_{it}$ = the change in the natural log of the franking credit balance

There is little reason to expect resident investors to want companies to delay dividend payments, regardless of their marginal tax rate (See Appendix). Yet, there is considerable incentive for non-resident investors who face a classical tax system (e.g. US investors) to delay dividend payment in lieu of capital gains. This is particularly the case where this group of investors are denied access to franking credit benefits. Further, in small open economies, non-resident investors favour larger, liquid companies with an international focus and diversified shareholding. This is evident both in Taiwan (Lin & Shiu 2003) and in Sweden (Dahlquist & Robertsson 2001) and it is expected that these characteristics will also apply to non-resident investors who invest in Australian companies. Given the difficulty associated with identifying non-resident ownership in Australian companies, these company characteristics are used to proxy for the level of non-resident investor control of the company. This gives rise to the second hypothesis, concerning the relation between non-resident ownership and franking credit balances. If non-resident investors prefer capital gains to dividends and they control dividend policy then franking credit balances will accumulate more rapidly over time than would occur where resident shareholders control the company.

**Hypothesis 2**

Null: Undistributed franking credit balances are independent of company characteristics conducive to non-resident investment

Alternate: Undistributed franking credit balances are greatest for those companies most attractive to non-resident shareholders.

It is expected that the magnitude of the franking credit balances will be correlated with the incidence of non-resident shareholder control over the company. As indicated above, non-resident

shareholders favour larger liquid companies that have an international focus and diversified shareholdings when investing in a small, open economy. Non-resident shareholders, subject to a classical tax system, will prefer capital gains to dividends and it is expected that where these investors control the company there will be a steady build up of franking credit balances over time. The test of this hypothesis is also set within a fixed effects panel data framework with error term, $\eta_{it}$, as follows:

$$fcb_{it} = \beta_{i0} + \beta_{t0} + \beta_1 LBVA_{it} + \beta_2 SHRCONC_{it} + \beta_3 INTFOCUS_{it} + \eta_{it} \qquad (8)$$

where $fcb_{it}$ = natural log of the franking credit balance for company *i* at time *t*,
$LBVA_{it}$ = natural log of the book value of assets for company *i* at time,
$SHRCONC_{it}$ = ratio of the shares held by the largest shareholder to the shares held by the top 20 shareholders for company *i* at time,
$INTFOCUS_{it}$ = ratio of non-resident revenue to total company revenue for company *i* at time.

The natural log scaling simplifies analysis with $\beta_1 = \frac{dfcb/fcb}{dBVA/BVA} = \xi(fcb, BVA)$, being the elasticity of the franking credit balance with respect to the company size. The coefficient, $\beta_2 = \frac{dfcb/fcb}{dSHRCONC}$, is the rate of change in the franking credit balance with a change in shareholder concentration and the coefficient, $\beta_3 = \frac{dfcb/fcb}{dINTFOCUS}$, is the rate of change in the franking credit balance with a change in international focus.

## 4. Data

The initial data set used in analysis is drawn from the population of listed Australian companies covered by Aspect Huntley over the period 2001 through to 2006.[11] While some quite large companies like Rio Tinto do not report franking credit balances in their annual reports, many Australian listed corporations do choose to report this information in the notes to their annual

[11] I thank Steve Easton and Howard Chan for their suggestion to focus only on those companies that report franking credit balances.

report. Information on shareholder concentration, non-resident revenue and dividend buyback is also manually collected from the notes to the financial accounts.[12] Total dividend paid, market value of shares in the company, book value of assets and book value of shareholders equity are obtained from the Aspect Huntley data set with gaps filled manually from the original pdf copies of the financial accounts or from individual company web sites.

The natural log of the market value of shares in the company, $s_{it}$, the change in the natural log of the market value of shares in the company, $ds_{it}$, the natural log of the sum of dividends and share buy backs, $d_{it}$, the change in this variable $dd_{it}$ and the change in the natural log of franking credit balances, $dfcb_{it}$, are used in tests of hypothesis 1. Tests of hypothesis 2 require the natural log of franking credit balances, $fcb_{it}$, as well as variables chosen to capture the level of non-resident investment in individual companies. The natural log of the book value of assets is used as a proxy for size, $LBVA_{it}$. The proxy for shareholder concentration is the ratio of the shares held by the largest shareholder to the shares held by the top 20 shareholders, $SHRCONC_{it}$ and international focus is captured by the ratio of non-resident revenue to total revenue, $INTFOCUS_{it}$.

The definition of equivalent dividend perpetuity amount for each of the companies in the sample is a difficult task. We rely on historical data to proxy for this perpetuity amount, in particular the sum of dividends plus share buybacks paid out during the current year is used as a proxy. This definition does not appear too extreme given the fairly sticky nature of dividends over time (Fama & French 2002). The inclusion of share buy backs could be contentious and so the analysis is also run excluding the share buyback data from dividend calculations, though this has little impact on the final analysis. It appears that dividend stream definition is not particularly sensitive to whether share buybacks are included as dividends or not.

Sample characteristics and descriptive statistics are reported in Panels A and B of Table 2. The initial sample of companies available for analysis ranges from 1250 companies in 2001 through

[12] The pdf copies of the financial accounts were obtained either from the Aspect Huntley web site or from individual company web sites.

to 1536 companies in 2006 but this paper focuses only on those companies that report franking credit balances (columns 2 through 5, Panel A). The number of companies with franking credit balances (512 companies on average each year) exceeds the number of companies paying dividends (449 companies on average each year). There is also a small number of companies that report share buybacks (31 companies on average each year). Total franking credit balances for the sample increase over the sample period, rising from a total of $5 billion in 2001 through to $17 billion in 2006 and the average franking credit balance for those companies reporting franking credit balances is $21 million over sample period.[13]

[Insert Table 2, Panels A and B about here]

Descriptive statistics are reported in Panel B of Table 2. While not reported separately, the average market value of shares in the company is $1.363 billion with a maximum of $174 billion over the 6-year period for all sample firm-year observations. The average dividend paid by a company across all franking credit reporting companies over the 6-year period is $45 million and the average company year share buy back is $104 million.[14] The shareholder concentration ratio over all company years is 34%, indicating the importance of the shareholding of the largest shareholder relative to the largest 20 shareholders for the sample as a whole. This is expected given the number of small companies in the sample. The ratio of non-resident revenue to total revenue averages 9% across all company-years available for the franking credit reporting companies.

[13] The method of calculating franking credit balances was changed with the Business Tax Reform's Simplified Imputation System, which became effective from 1 July 2002. This required that franking balances as at 30 June 2002 be converted to reflect the credit balances on a tax paid basis rather than on an after tax distributable profits basis. The tax paid balances basically represent the imputation tax credits that are available for distribution. A factor of 30%/70% is applied to the 2001 and 2002 franking credit balances to bring them into line with later year balances.

[14] Average dividends and average share buybacks are averaged over the total sample of companies reporting franking credits in these statistics. It should be noted that few companies institute share buy backs during the study and not all companies pay a dividend in each year.

## 5. Analysis

Fixed effects panel data analysis is used in testing hypotheses 1 and 2 as proposed in Section 3. The first hypothesis involves a test of whether company value is correlated with franking credit balances. Under the second hypothesis, if non-resident investor preference for capital gains explains the build up of franking credit balances at the company level then company characteristics attractive to non-resident investors like size, shareholder concentration or international focus will be correlated with franking credit balances. Separate analysis is reported for the full sample, for those companies that fall within the largest 100 companies by total book value of assets[15] as well as those that do not fall within the largest 100 companies.

There is evidence that franking credits may not be valued by shareholders in large Australian companies (Cannavan *et al.* 2004; Beggs & Skeels 2006) though this rather extreme position is questioned by Hathaway & Officer (2004) who propose that franking credits are valued at approximately 50% of their theoretical value. If non-resident access to franking credit benefits is restricted then, given the substantial non-resident shareholding evident in Australian listed companies, franking credits may indeed be valued at less than their theoretical value where the marginal share holder in a non-resident shareholder. Recent dividend ex date based analysis has tended to focus on the impact of known dividend payments on share prices (Hathaway & Officer 2004) though there has been little attention directed to determining whether franking credit balances held by the company are valuable to shareholders.

### *5.1 Value of franking credit balances*

The analysis described in this section focuses on the sensitivity of equity value to franking credit balances. If franking credits accumulated by the company are valuable then share value will be correlated with franking credit balances after controlling for dividends and company specific effects. The empirical tests reported in this section are based on equation (6) and equation (7) and

[15] The largest 100 companies are identified using the full sample of companies. This includes both those companies that report franking credit balances and those that do not.

estimated using unbalanced fixed effects panel analysis. The coefficient estimates are reported in Table 3 for both the simple pricing model, equation (6), and the expanded model that includes the change in franking credit balances, equation (7). Each of the estimated models reported in Panel A of Table 3 are statistically significant at the 5% level of significance. Further, it would seem that fixed effects regression is suitable for estimation of the models used in this study. While the fixed effect dummy variables taken as a group are statistically significantly different from zero for each of the estimated models, correlation between the explanatory variables and the fixed effect dummy variables is generally quite large.

[Insert Table 3, Panel A about here]

Coefficients are reported for both the basic model, equation (6), and the extended model, equation (7) in Panel A of Table 3. The coefficient estimated for the change in dividends is positive and statistically significant as predicted by the dividend discounting valuation model. Further, the error correction term coefficient is negative and statistically significant. These results hold regardless of the sample chosen for analysis.

The estimated franking credit balance coefficients are positive and statistically significant for the all companies sample and for the small company sub-sample (not being one of the largest 100 companies) though they are negative and statistically insignificant for the large company sub-sample. The lack of consistency between the small company and large company analysis suggests that franking credit balances are valued differently for these two sub-samples. These results are consistent with the argument that the marginal shareholder in large companies is a non-resident while the marginal investor in smaller companies is a resident. Certainly, the literature on non-resident investment in small open economies, suggests that non-resident investors prefer to invest in larger companies (Dahlquist & Robertsson 2001; Lin & Shiu 2003). This interpretation is also consistent with the lack of franking credit value reported by Cannavan, Finn and Gray (2004), who

analysed option and warrant arbitrage relationships for listed Australian companies. Options and warrants are rarely traded on companies that fall outside the largest 100 companies listed on the stock exchange and so this study is very much a large company analysis. Thus, it would appear that franking credit balances are probably still of little value to marginal shareholders in the larger, more liquid Australian stocks. It seems that the marginal investor in these companies is a non-resident investor who faces quite severe restrictions on their ability to capture value from franking credits.

It is important to test the sensitivity of these results to alternative explanations for the change in share value. While there is support in the literature for the dividend discounting model it is useful to allow for the possibility of confounding effects. Thus, the model is extended to include a measure of profitability (net profit after tax to total revenue), growth options (R&D to total revenue) and leverage (total liabilities to book value of total assets) as well as measures of size, shareholder concentration and international focus as defined above. Interaction terms are also included to test for the possibility of an interaction between the franking credit balance variable and each of the three variables, size, shareholder concentration and international focus. It is appears that foreign investors prefer large liquid firms with diversified shareholding and international business focus (Dahlquist & Robertsson 2001; Lin & Shiu 2003). The results for the extended model are reported in Panel B of Table 3.

[Insert Table 3, Panel B about here]

Consistent with the simple model reported in Panel A of Table 3, both the dividend and the error correction terms are statistically significant. Further, the franking credit balance coefficient is positive and statistically significant at the 5% level for the full sample and at the 10% level for the small company sub-sample while not being statistically significant for the large company sub-sample. Thus, franking credit balances appear to have little impact on the value of large companies

though they are value relevant for small companies (Officer 1994; Cannavan *et al.* 2004; Hathaway & Officer 2004).

While some of the remaining estimated coefficients are statistically significant the interaction term coefficients are of particular interest as they offer further insight into the impact of franking credit balances on the value of listed Australian companies. For the full sample, the size and the international focus interaction term coefficients are negative and statistically significant at either the 5% or the 10% level. Thus, the sensitivity of share price to a change in franking credit balance is negatively related to size and international focus. Franking credit balances are less valuable to shareholders in large Australian companies with an international focus than they are to shareholders in smaller, less internationally focused companies.

The difference in the valuation of franking credits in large companies relative to small companies is further borne out in the sub-sample analysis. The coefficients for the size based interaction variable is not statistically significant for either the large company sub-sample or the small company sub-sample. This suggests that the size based interaction effect takes place between these two groups rather than within them. This provides further support for the argument that the marginal investor in small companies views franking credits more favourably that the marginal investor in large companies.

The coefficient for the international focus interaction variable is statistically significant for the large company sub-sample but not for the small company sub-sample. International focus has no impact on the share value of small companies and it also has no impact on the sensitivity of share prices to changes in franking credit balances. This is consistent with the argument that the marginal investors in smaller Australian companies are Australian residents who tend to value franking credits regardless of the international focus of the company. This is not the case for larger companies as the international focus interaction coefficient is statistically significant and negative when estimated using the large company sub-sample. Thus within the top one hundred companies, the share price of those companies with greater international focus is less sensitive to changes in

franking credit balances than the share price of those companies with lower levels of international focus.

It would seem that foreign investors who tend to favour large liquid companies with an international focus (Dahlquist & Robertsson 2001; Lin & Shiu 2003) and who have limited ability to benefit from franking credits (Cannavan *et al.* 2004) are the marginal investors in large Australian listed companies. As a result, franking credits have little impact on the value of shares in these companies. The marginal investor in smaller companies appear to value franking credits and are most likely Australian resident investors. Thus, while hypothesis 1 is rejected for companies falling within the top 100 companies listed on the stock exchange, this hypothesis is supported for the small company sub-sample and for the sample overall. Given these results, it is natural to extend analysis to the franking credit balances themselves in order to assess whether international investors might have some impact on the magnitude of these balances.

*5.2 Determinants of franking credit balances*

The second hypothesis is concerned with explaining the level of franking credit balances that a company chooses to hold. It is expected that non-resident shareholders, subject to a classical tax system, will prefer to reduce the level of dividend payments that a company makes if they are unable to benefit from franking credits. In this situation, franking credit balances would tend to build up over time due to relatively low dividend payout rates, all else held constant. Given that there is evidence that non-resident shareholders favour large liquid companies with a foreign focus and diversified shareholdings (Dahlquist & Robertsson 2001; Lin & Shiu 2003) it is expected that company variables that capture these characteristics would be correlated with the level of franking credit balances that companies accumulate over time.

The model used to test this proposition is described in equation (8) and the coefficients estimated for this model are reported in Table 4 for the three samples; all companies, those falling within the largest 100 company group and the remaining smaller companies. Each of the estimated

models reported in Table 3 are statistically significant at the 5% level of significance. The fixed effect dummy variables taken as a group are statistically significantly different from zero for each of the estimated models and the correlation between the explanatory variables and the fixed effect dummy variables is also quite large.

[Insert Table 4 about here]

The size coefficients are positive and statistically significant. These coefficients are measures of the elasticity of franking credit balance with respect to company size and so they indicate the percentage change in franking credit balance associated with a one percent change in company size. The elasticity is considerably greater for large companies (1.1626) than it is for the smaller companies (0.40). Indeed it is almost three times the size. For large companies, franking credit balances increase more than proportionately with increases in company size while for small companies franking credit balances are much less sensitive to variation in company size. This result is consistent with a classically taxed non-resident shareholder who is relatively insensitive to the accumulation of franking credit balances investing in larger companies. Non-resident shareholders subject to a classical tax system who cannot benefit fully from franking credits prefer capital gains to dividends and this leads to a proportionately greater increase in franking credit balances as these balances are of little value to these investors.

The shareholder diversification coefficient is negative in all cases and statistically significant for the full sample and for the smaller company sub-sample. Thus, the change in franking credit balances is decreasing in shareholder concentration. This supports the argument that increases in the diversification of shareholding are associated with increases in the rate of change of franking credit balances. While this result supports the non-resident investor preference argument the statistical strength of the results for the small company sub-sample suggests an alternative explanation. Perhaps resident owner controlled small companies distribute franking credits as soon

as it is feasible to do so.[16] This will result in smaller, more stable franking credit balances for resident controlled companies, all else held constant. Given, owner controlled companies are rarely found among the large 100 company group, this provides a viable alternative explanation for the variation in estimated shareholder diversification coefficients between the two sub-samples.

While there is no evidence of a statistically significant international focus effect in this analysis, the size effect and shareholder concentration results are consistent with hypothesis 2. This is particularly the case if the shareholder concentration effect reflects the impact of smaller resident owner controlled companies distributing fully franked dividends as soon as it is feasible to do so.

## 6. Conclusions

The question of whether franking credits are valuable is important both for regulators and for the analysts. This paper provides some insight into the impact of franking credits on share prices through analysis of the relation that exists between market value of shares in the company and reported franking credit balances as well as providing some analysis of the determinants of the magnitude of franking credit balances. The main contribution of the paper is the insight provided into the marked differences in the literature concerning the value of franking credits. Some of the literature argues that franking credits have no value while much of the remainder argues that franking credits are valuable. Analysis in this paper suggests that the existence of two groups of marginal investors with different views on the value of franking credits, Australian resident shareholders and the non-resident shareholders. While Australian resident shareholders value the credits, recent regulation has meant that non-resident shareholder attach less value to these credits, possibly due to the cost of creating schemes to benefit from franking credits.

Whether franking credits are impounded in share prices, and thus whether franking credit balances are valuable, depends on the identification of the marginal shareholder. If the marginal shareholder is a non-resident with little access to franking credit benefits then prices will not reflect

[16] As indicated in the appendix there is no tax-based reason for a resident shareholder to prefer that the company delay payment of fully frank dividends.

these credits and the market value of shares in the company will not be correlated with reported franking credit balances. If the marginal shareholder is an Australian resident for tax purposes, or a non-resident shareholder who is able to capture the benefit of these credits, then share price will reflect the value of these credits.

Franking credit balances are correlated with company value for the full sample, suggesting that franking credits are of value to the marginal shareholder on average. But, while there is strong support for the existence of valuable franking credit balances for the small company sub sample, this is not apparent for companies that fall within the top 100 companies. This inconsistency provides some support for the argument that there are two tax based groups of companies on the Australian stock exchange with respect to franking credits. The first group consists of the large, liquid internationally focused Australian companies that are most likely to have non-resident marginal shareholders. Franking credits may be of little value to these marginal shareholders and so the market value of shares in these companies is not correlated with franking credit balances. The second group consists of smaller companies where the marginal shareholder is likely to be an Australian resident. Franking credits are of value to this group and analysis suggests that there is a strong positive correlation between the market value of smaller company shares and the franking credit balances that these companies hold.

There is some support for the second hypothesis, that companies most attractive to non-resident shareholders report larger franking credit balances. While foreign focus explains little of the variation in franking credit balances in the sample, company size is an important explanatory variable. The estimated size coefficient, measuring the elasticity of franking credit balance with respect to size, is positive and statistically significant with the coefficient exceeding one for the large companies and being less than one for the small companies. This suggests that franking credit balances are more sensitive to changes in company size for large companies than for small companies. This lends further support for the argument that non-resident shareholders, being the marginal shareholders in large companies, are less averse to the build up of franking credits over

time than resident shareholders would be. The shareholder concentration results also support this argument though the statistical significance of the small company coefficients may be better explained in terms of the behaviour of resident shareholders who control the company and ensure prompt distribution of available franking credits.

**Appendix, Should Australian shareholders prefer to delay dividend payments?**

Is it possible that Australian resident shareholders with high marginal rates of tax will prefer corporate retention of dividends? Assume the company can either pay earnings out as dividends when they are earned or accumulate the earnings over time and pay one dividend at some future time *T*. Where dividends are paid as they are earned it is assumed the investors can reinvest the dividends in the company. Further, it is assumed that company chooses to pay out all earnings ( $E$ ) after corporate tax ( $t_c$) as dividends $\left(D = E\left(1-t_c\right)\right)$ for each period from $t = 1$ to $T$. The required rate of return for the company is $k$ and the personal tax rate is $t_p$.

For the case of regular dividend payments, the company pays dividends to the investor equal to earnings after corporate tax each period. At the end of each period the dividend, reduced by investor personal tax and increased by the franking credit, is paid to the investor and this is reinvested in the company until time $T$ at the required rate of return, $k$. The future value to the investor of this stream of $T$ one period dividends reinvested in the company is: [17]

$$\left(E\left(1-t_c\right)\frac{\left(1-t_p\right)}{\left(1-t_c\right)}+Et_c\right)\left(1+k\right)^{T-1}+\left(E\left(1-t_c\right)\frac{\left(1-t_p\right)}{\left(1-t_c\right)}+Et_c\right)\left(1+k\right)^{T-2}+...+\left(E\left(1-t_c\right)\frac{\left(1-t_p\right)}{\left(1-t_c\right)}+Et_c\right)$$

$$=\left(E\left(1-t_p\right)+Et_c\right)\left(\frac{\left(1+k\right)^T-1}{k}\right) \qquad (8)$$

Alternatively, if the company pays one dividend at the end of $T$ periods then the after corporate tax earnings must be compounded forward and the franking credit ( $Et_cT$ ) is then received at the end of period $T$.

$$\left[E\left(1-t_c\right)\left(1+k\right)^{T-1}+E\left(1-t_c\right)\left(1+k\right)^{T-2}+...+E\left(1-t_c\right)\right]\frac{\left(1-t_p\right)}{\left(1-t_c\right)}+Et_cT$$

$$=E\left(1-t_p\right)\left(\frac{\left(1+k\right)^T-1}{k}\right)+Et_cT \qquad (9)$$

[17] Note that it is assumed that franking credits equal corporate tax when dividends are paid each period, ensuring that the regular dividend payments are taxed at the investor's personal tax rate.

The difference between these two streams is the value to the investor of receiving dividends each period rather than receive a final dividend payment at the end of the period *T*.

$$\left(E\left(1-t_p\right)+Et_c\right)\left(\frac{\left(1+k\right)^T-1}{k}\right)-E\left(1-t_p\right)\left(\frac{\left(1+k\right)^T-1}{k}\right)-Et_cT$$

$$=Et_c\left(\frac{\left(1+k\right)^T-1}{k}\right)-Et_cT \qquad (10)$$

This difference is positive for positive *k*, *E* and $t_c$. Thus, a resident investor prefers the receipt of regular dividends rather than one deferred dividend because of the impact of the time value of money on the franking credit benefits attached to dividend payments. This result is independent of personal tax rate and corporate tax rate.

**Reference**


ASX, 2009. Australian Cash Equity Market. In: ASX: An International Centre for Resources Capital, pp. 1-8

Beggs, D.J., Skeels, C.L., 2006. Market arbitrage of cash dividends and franking credits. Economic Journal 82, 239-252

Boyle, G.W., 1996. Corporate investment and dividend tax imputation. The Financial Review 31, 209-226

Cannavan, D., Finn, F., Gray, S., 2004. The value of dividend imputation tax credits in Australia. Journal of Financial Economics 73, 167-197

Cuthbertson, J.H., Hyde, S., 2002. Excess volatility and efficiency in French and German markets. Economic Modelling 19, 399-418

Dahlquist, M., Robertsson, G., 2001. Direct foreign ownership, institutional investors, and firm characteristics. Journal of Financial Economics 59, 413-440

Dempsey, M., Partington, G., 2008. Cost of capital equations under the Australian imputation tax system. Accounting and Finance 48, 439-460

Faff, R., Hillier, D., Wood, J., 2001. Taxation and Black's zero beta strategy revisited. Financial Analysts Journal 57, 57-65

Fama, E.F., French, K.R., 1993. Common risk factors in the returns on stocks and bonds. Journal of Financial Economics 33, 3-56

Graham, J.R., 2003. Taxes and corporate finance: A review. Review of Financial Studies 16, 1075-1129

Gray, S., Hall, J., 2006. Relationship between franking credits and the market risk premium. Accounting and Finance 46, 405-428

Gray, S., Hall, J., 2008. Relationship between franking credits and the market risk premium: A reply. Accounting and Finance 48, 133-142

Hathaway, N., Officer, R.R., 2004. The value of imputation tax credits update 2004. In: Capital research Pty. Ltd., pp. 1-26

Heaney, R.A., 2003. Excess volatility? The Australian stock market from 1883 to 1999. Managerial Finance 29, 76-94

Kerin, P., 29 January 2010. Investors frankly deserve more franking credit In: The Australian, http://www.theaustralian.com.au/business/opinion/investors-frankly-deserve-more-franking-credit/story-e6frg9if-1225824471198

Kleidon, A.W., 1988a. The probability of gross violations of a present value variance inequality: Reply. Journal of Political Economy 96, 1093-1096

Kleidon, A.W., 1988b. Bubbles, fads and stock price volatility tests: A partial evaluation: Discussion. Journal of Finance 43, 656-660

Lally, M., 2008. Relationship between franking credits and the market risk premium: A comment. Accounting and Finance 48, 143-151

Lally, M., van Zijl, T., 2003. Capital gains tax and the capital asset pricing model. Accounting and Finance 43, 187-210

Lin, C.H., Shiu, C.-Y., 2003. Foreign ownership in the Taiwan stock market - An empirical analysis. Journal of Multinational Financial Management 13, 19-41

Lintner, J., 1965. The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. Review of Economics and Statistics 47, 13-37

MacKie-Mason, J.K., 1990. Do taxes affect corporate financing decisions? Journal of Finance 45, 1471-1493

Miller, M., 1977. Debt and taxes. Journal of Finance 32, 261-275

Modigliani, F., Miller, M., 1958. The cost of capital, corporation finance and the theory of investment. American Economic Review 48, 261-297

Modigliani, F., Miller, M., 1963. Corporate income taxes and the cost of capital. American Economic Review 53, 433-443
Monkhouse, P.H.L., 1993. The cost of equity under the Australian dividend Imputation tax system. Accounting and Finance 33, 1-18
Monkhouse, P.H.L., 1996. The valuation of projects under the dividend imputation tax system. Accounting and Finance 36, 185-212
Myers, S.C., 1984. The capital structure puzzle. Journal of Finance 39, 575-592
Myers, S.C., 2001. Capital structure. Journal of Economic Perspectives 15, 81-102
Officer, R.R., 1994. The cost of capital of a company under an imputation tax system. Accounting and Finance 34, 1-17
Pattenden, K., 2006. Capital structure decisions under classical and imputation tax systems: A natural test for tax effects in Australia. Australian Journal of Management 31, 67-92
Sharpe, W.F., 1964. Capital asset prices: A theory of market equilibrium under conditions of risk. Journal of Finance 19, 425-442
Truong, G., Partington, G., 2008. Relationship between franking credits and the market risk premium: A comment. Accounting and Finance 48, 153-158
Twite, G., 2001. Capital structure choices and taxes: Evidence from the Australian dividend imputation tax system. International Review of Finance 2, 217-234
Walker, S., Partington, G., 1999. The value of dividends: Evidence from cum-dividend trading in the ex-dividend period. Accounting and Finance 39, 275-296
Wood, J., 1997. A simple model for pricing imputation tax credits under Australia's dividend imputation tax system. Pacific-Basin Finance Journal 5, 465-480

**Table 1, Example of the effect of franking credits on share value**

| | *Unfranked Dividends* | *Partially franked dividends* | *Fully franked dividends* |
|---|---|---|---|
| Gamma | 0 | 0.5 | 1 |
| Dividends Perpetuity amount | 20 | 20 | 20 |
| Corporate tax paid perpetuity amount | 6 | 6 | 6 |
| Discount rate | 0.05 | 0.05 | 0.05 |
| Dividend component of price | 400 | 400 | 400 |
| Franking credit component of price | 0 | 60 | 120 |
| Final share price | 400 | 460 | 520 |

## Table 2, Descriptive Statistics

### *Panel A, Sample characteristics and franking credit balances*

Sample counts and franking credit balances are provided for those companies that report their franking credit balance details in their annual reports for the years, 2001 through to 2006. The number of companies in the total sample along with the number of companies that report franking credit balances, that pay dividends, involved in share buy backs appear in columns 2 through 5 of Panel A. Total of the franking credit balances for the year ($millions) and average franking credit balance per company ($millions) are reported by year as well as for the full period in the last two columns of panel A.

| *Year* | *Number of Companies in initial sample* | *Companies With franking credit balances* | *Companies paying dividends* | *Companies with buybacks* | *Total franking credit balance ($ Millions)* | *Average franking credit balance ($ Millions)* |
|---|---|---|---|---|---|---|
| 2001 | 1250 | 450 | 320 | 17 | 4937 | 11 |
| 2002 | 1251 | 460 | 310 | 31 | 5457 | 12 |
| 2003 | 1328 | 510 | 339 | 37 | 11084 | 22 |
| 2004 | 1372 | 535 | 378 | 29 | 12783 | 24 |
| 2005 | 1473 | 576 | 422 | 20 | 15383 | 27 |
| 2006 | 1536 | 540 | 431 | 10 | 16995 | 31 |
| *Total* | 8210 | 3071 | 2200 | 144 | 66638 | |
| *Average* | 1368 | 512 | 367 | 24 | 11106 | 21 |

### *Panel B, Panel data descriptive statistics*

Summary statistics for all company-year observations available for franking credit balance reporting companies for the years, 2001 through to 2006. Summary statistics include the mean, standard deviation (Std. Dev.), minimum (Min.) and maximum (Max.). $s_{it}$ is the natural log of the market value of shares in the company, $ds_{it}$ is the change in $s_{it}$, $d_{it}$ is the natural log of the sum of dividend and share buy backs, $dd_{it}$ is change in $d_{it}$, $lag(s_{it-1} - d_{it-1})$ is the error correction term, $fcb_{it}$ is the natural log of the company's franking credit balance, $dfcb_{it}$ is the change in $fcb_{it}$, $LBVA_{it}$ is the natural log of the book value of total assets, $SHRCONC_{it}$ is the ratio of the shareholding of the largest shareholder to the total shareholding of the top 20 shareholders, $INTFOCUS_{it}$ is the ratio of the non-resident revenue to total revenue.

| *Variable* | *Mean* | *Std. Dev.* | *Min.* | *Max.* |
|---|---|---|---|---|
| $s_{it}$ | 18.49 | 2.20 | 12.72 | 25.88 |
| $ds_{it}$ | 0.16 | 0.53 | -3.26 | 3.37 |
| $d_{it}$ | 15.80 | 2.11 | 0.00 | 22.97 |
| $dd_{it}$ | 0.20 | 1.08 | -7.60 | 15.28 |
| $lag(s_{it-1} - d_{it-1})$ | 3.34 | 0.98 | -3.84 | 17.59 |
| $fcb_{it}$ | 14.83 | 2.27 | 0.00 | 20.84 |
| $dfcb_{it}$ | 0.25 | 1.11 | -13.00 | 7.37 |
| $LBVA_{it}$ | 18.65 | 2.24 | 8.16 | 26.91 |
| $SHRCONC_{it}$ | 0.34 | 0.18 | 0.09 | 0.95 |
| $INTFOCUS_{it}$ | 0.09 | 0.21 | -0.13 | 1.02 |

## Table 3, Regression analysis of equity value effects of franking credit balances

Fixed effects panel data analysis is used in the estimation of the relation between the change in natural log of the market value of shares in the company, $ds_{it}$, and the set of explanatory variables. These include the change in the natural log of the sum of the dividends paid and share buy backs, $dd_{it}$, the error correction term, $lag(s_{it-1} - d_{it-1})$, and the change in the natural log of franking credit balance, $dfcb_{it}$. Results are reported for all companies that report franking credit balances as well as for those franking credit reporting companies that fall within the largest 100 companies by book value of assets and those that do not fall within this group. In Panel A, Model A is the basic valuation model which relates the change in the value of the company to the change in dividends and the error correction term. Model B adds the variable, change in franking credit balances, to test whether this variable provides additional explanatory power over the value of the company. The results from estimation of an extended form of model B are reported in Table B. Additional variables include proxies for size (natural log of the book value of asset, $LBVA_{it}$), shareholder concentration (the ratio of the shareholding of the largest shareholder to that of the largest 20 shareholders, $SHRCONC_{it}$), international focus (the ratio of non-resident revenue to total revenue, $INTFOCUS_{it}$),. Leverage (ratio of liabilities to book value of total assets), profit (the ratio of net profit after tax to total revenue, $PROFIT_{it}$), growth options (the ratio of R&D expenses to total revenue, $R\&D_{it}$), and interaction terms for the change in franking balances with respect to size ($LBVA_{it}$ x $dfcb_{it}$), shareholder concentration ($SHRCONC_{it}$ x $dfcb_{it}$) and international focus ($INTFOCUS_{it}$ x $dfcb_{it}$). *F-test ($\beta$=0)* is a test of the restriction that the estimated parameters are zero and *Corr (u,Xb)* is the correlation between the fixed effects company specific constants and the exogenous variables. * is statistically significant at the 5% level.

**Panel A, Franking credit balance effects within dividend discount model**

| *Variable* | *Full Sample (Model A)* | *Full Sample (Model B)* | *Largest 100 company (Model A)* | *Largest 100 company (Model B)* | *Not Largest 100 company (Model A)* | *Not largest 100 company (Model B)* |
|---|---|---|---|---|---|---|
| $dd_{it}$ | 0.1655* | 0.1570* | 0.1491* | 0.1253* | 0.1660* | 0.1625* |
| | (9.08) | (8.71) | (4.50) | (3.97) | (7.64) | (7.55) |
| $lag(s_{it-1} - d_{it-1})$ | -0.2512* | -0.2421* | -0.2699* | -0.2527* | -0.2466* | -0.2419* |
| | (-10.56) | (-10.31) | (-5.70) | (-5.63) | (-8.82) | (-8.74) |
| $dfcb_{it}$ | | 0.0353* | | -0.0058 | | 0.0463* |
| | | (3.78) | | (-0.38) | | (4.15) |
| Observations | 1519 | 1498 | 338 | 329 | 1181 | 1169 |
| Groups | 472 | 467 | 102 | 101 | 388 | 384 |
| F-test ($\beta$=0) | 56.19* | 39.64* | 16.26* | 10.71* | 39.17* | 30.30* |
| Corr (*u,Xb*) | -0.40 | -0.37 | -0.51 | -0.49 | -0.37 | -0.35 |
| R-square | 0.02 | 0.03 | 0.02 | 0.03 | 0.02 | 0.03 |
| F-test (*u*=0) | 1.97* | 1.89* | 1.89* | 1.93* | 1.92* | 1.85* |

**Panel B, Franking credit balance effects within extended dividend discount model**

| *Variable* | *Full sample* | *Largest 100 company* | *Not largest 100 company* |
|---|---|---|---|
| $dd_{it}$ | 0.1540* | 0.1035* | 0.1596* |
| | (8.50) | (3.27) | (7.25) |
| $lag(s_{it-1} - d_{it-1})$ | -0.2393* | -0.2382* | -0.2363* |
| | (-10.14) | (-5.22) | (-8.45) |
| $dfcb_{it}$ | 0.2744* | 0.0231 | 0.3171$^{+}$ |
| | (2.48) | (0.08) | (1.80) |
| $LBVA_{it}$ | 0.0566$^{+}$ | 0.0264 | 0.0620 |
| | (1.67) | (0.46) | (1.46) |
| $SHRCONC_{it}$ | -0.1133 | 0.4352 | -0.2013 |
| | (-0.70) | (1.47) | (-1.05) |
| $INTFOCUS_{it}$ | -0.0305 | 0.1973* | -0.1541 |
| | (-0.37) | (2.04) | (-1.31) |
| $LEV_{it}$ | -0.4113* | 0.0487 | -0.5058* |
| | (-3.03) | (0.16) | (-3.28) |
| $PROFIT_{it}$ | -0.0009 | -0.0003 | -0.0055 |
| | (-0.70) | (-0.33) | (-1.38) |
| $R\ \&\ D_{it}$ | 7.2255 | -33.1076* | 13.8122$^{+}$ |
| | (1.03) | (-2.31) | (1.73) |
| $LBVA_{it}$ x $dfcb_{it}$ | -0.0122* | -0.0008 | -0.0143 |
| | (-2.21) | (-0.06) | (-1.55) |
| $SHRCONC_{it}$ x $dfcb_{it}$ | 0.0342 | 0.1289 | 0.0201 |
| | (0.54) | (1.09) | (0.27) |
| $INTFOCUS_{it}$ x $dfcb_{it}$ | -0.0909$^{+}$ | -0.1874* | -0.0807 |
| | (-1.94) | (-3.28) | (-1.26) |
| Observations | 1490 | 323 | 1167 |
| Groups | 465 | 100 | 383 |
| F-test ($\beta=0$) | 11.92* | 4.42* | 9.55* |
| Corr ($u,Xb$) | -0.4392 | -0.7352 | -0.4612 |
| R-square | 0.0286 | 0.0374 | 0.032 |
| F-test ($u=0$) | 1.90* | 1.95* | 1.88* |

## Table 4, Regression analysis of the franking credit balances

Fixed effects panel data analysis is used in the estimation of the relation between the natural log of the franking credit balance, $fcb_{it}$, and the set of explanatory variables, the natural log of the total book value of assets, $LBVA_{it}$, the ratio of the shareholding of the largest shareholder to the that of the largest 20 shareholders, $SHRCONC_{it}$, and the ratio of non-resident revenue to total revenue, $INTFOCUS_{it}$. Results are reported for all companies that report franking credit balances as well as for those franking credit reporting companies that fall within the largest 100 companies by book value of assets and those that do not fall within this group. Observations is the total number of observations with groups referring to the number of separate companies with franking credit balances over the period of the study. *F-test ($\beta$=0)* is a test of the restriction that the estimated parameters are zero and *Corr (u,Xb)* is the correlation between the fixed effects company specific constants and the exogenous variables. * is statistically significant at the 5% level.

| *Variable* | *Full Sample* | *Largest 100 companies* | *Not one of the 100 largest companies* |
|---|---|---|---|
| $LBVA_{it}$ | 0.4730* | 1.1626* | 0.4012* |
| | (11.79) | (5.96) | (9.90) |
| $SHRCONC_{it}$ | -0.5741* | -0.2243 | -0.6689* |
| | (-2.35) | (-0.22) | (-2.70) |
| $INTFOCUS_{it}$ | 0.2188 | 0.0195 | 0.2847 |
| | (1.39) | (0.05) | (1.59) |
| Observations | 3005 | 453 | 2552 |
| Groups | 783 | 120 | 688 |
| F-test ($\beta$=0) | 51.79* | 11.87* | 38.74* |
| Corr (*u,Xb*) | 0.23 | -0.49 | 0.28 |
| R-square | 0.40 | 0.11 | 0.29 |
| F-test (*u=0*) | 8.87* | 6.98* | 9.17* |