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Capital Structure of IPOs and Seasoned Firms Under an Imputation System

by

Adam B. Steen and Petko S. Kalev*

*Department of Accounting and Finance
Monash University, Clayton, Victoria 3800 Australia
Email: Adam.Steen@BusEco.monash.edu.au

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Abstract

This paper examines the relationship between tax status and capital structure while controlling for company history. The capital structure of a sample of IPOs is compared to seasoned companies as it is argued that the capital structure of IPOs is not as affected by the history of decisions and experiences as that of seasoned firms. Thus any link between tax optimisation and capital structure is more likely to be identified in IPO firms. Australia however, unlike many parts of the world, has had a full dividend imputation system since 1987. This theoretically at least should remove any bias between the use of debt and equity for taxpaying companies, while the bias remains for non-taxpaying companies unable to take advantage of the tax saving from debt. We find that non-taxpaying IPOs have significantly lower levels of debt than taxpaying IPOs, a result consistent with the tax incentive hypothesis.

1. Introduction

Under a classical taxation system, Modigliani and Miller (1958, 1963) show that there is a tax subsidy from interest on debt creating an incentive for taxpaying firms to have a greater propensity to use debt rather than equity in their capital structures. Scholes and Wolfson (1992) argue that the capital structure question is part of a tax planning problem and that industry-specific tax rules are important in determining a firm's capital structure. Several methods exist to reduce pre tax income in addition to issuing debt, including increasing research and development expenditure. Furthermore, Scholes and Wolfson (1992) propose that, because firms attempt to reach certain goals in addition to capital structure choice, there is no clear association between tax status and gearing, especially when firms are considered cross-sectionally and at different stages of development. Hence they argue that the effects of investment and financing decisions made years earlier may be seen years later and thus have an impact on the results of tests of the relationship between capital structure and taxes.

One can argue therefore, that tests of tax status and capital structure should be conducted on younger companies. This is because the capital structure of younger companies is less affected by the long history of decisions and experiences faced by seasoned companies. The link between tax optimisation and chosen capital structure should be clearer for these newer firms.

MacKie-Mason (1990) argues that most tax shields have a negligible effect on the marginal tax rate for most firms, but for seasoned firms' incremental financing

decisions, he finds debt financing to be positively associated with firms' effective marginal tax rates. Scholes and Wolfson (1992) consider this relationship between tax status and capital structure decisions with reference to a sample of new public companies. They propose that some firms can postpone payment of taxes on current income by using tax-loss carryforwards producing lower marginal tax rates. Further, they argue that low marginal tax rate firms have less incentive to finance operations with debt under a classical tax system than compared to those with higher marginal tax rates.

Miller, Morris and Scanlon (1994) empirically examine the relationship between tax status and capital structure and argue that high marginal tax rate firms should be associated with higher levels of debt. They analyse this by considering two groups (non-loss carryforward and loss carryforward) for both seasoned and IPO firms. IPO loss carryforward firms are found to have significantly less debt than non-loss carryforward IPOs. However, they did not however find any difference between the capital structures of the groups of seasoned firms.

This study reconsiders the findings of Miller *et al.* (1994) under a full-dividend imputation system as used in Australia. This system is designed to remove any tax-bias that may lead firms to favour the use of debt over equity. The remainder of this paper comprises the following sections. Section 2 discusses the Australian dividend imputation system. Section 3 develops the research questions to be addressed. Section 4 outlines the methodology to be employed. Section 5 reports results of statistical testing, while Section 6 provides a summary of our findings, conclusions

and directions for future research.

2. Imputation

The impact of taxation on capital structure has been widely debated since the time of Modigliani and Miller (1958). Internationally, as Rajan and Zingales (1995) note, since that time numerous papers have been written on the issue and that, while we have a sound theoretical understanding, we still lack empirical evidence. In Australia, a number of papers have addressed this issue with one of the earliest being by Allen (1991, p 120) who surveyed Australian listed companies. He found that corporate borrowers "*were not consciously trading off the tax shields on interest payments against the potential cost of bankruptcy when setting debt levels*". However, tax issues were found to be very significant in making capital structure decisions. Allen's survey predated the introduction of the dividend imputation system in Australia and following his paper the focus of the debate in Australia changed to that of considering the impact of the imputation system on the cost of capital and capital structure decisions.

The dividend imputation system as used in Australia is significantly different from the classical taxation system. Under a classical taxation system dividends are taxed twice, once in the hands of the company as income and again in the hands of the shareholder. The dividend imputation system provides shareholders with a credit for the income tax paid by a company on its taxable income.[1] Hence, profit distributed as dividends is effectively taxed only once at the personal level with the company being used as a

vehicle for collection of all or most of the tax. The system that is currently in use in Australia requires that company income is taxed at the company income tax rate t_c (currently 36 percent).

Dividends paid out of a company's after tax profits are called franked dividends and each dollar of franked dividend carries with it an imputation tax credit of $t_c /(1 - t_c)$, which is equal to the amount of tax paid by the company. Shareholders include the amount of the dividend and the imputation tax credit in their assessable income, in other words, the gross pre-tax company profit. This amount is taxed at the investor's marginal tax rate but the shareholder receives a tax credit of $\$t_c/(1-t_c)$ which is equal to the tax paid by the company on their behalf. The company profit distributed as franked dividends is effectively taxed at the shareholder's tax rate. As Brailsford and Davis (1995, p 14) note "*franked dividends attract less tax at the shareholder level and corporate income generated for distribution to shareholders attracts less tax overall*". Because the system reduces the total taxation on equities while leaving the tax treatment of debt unchanged it should result in companies using a higher proportion of equity finance than they did under a classical tax system.

If all profits are distributed as franked dividends, the firm has earnings on which Australian tax has been fully paid, and investors are taxable, then Howard and Brown (1992) show that a dollar of earnings before interest and tax, distributed as either interest to lenders or franked dividends to shareholders, will yield the same after tax return.[2] This is like Modigliani and Millers' (1958, p 268) familiar proposition 1, the "no-tax" case, where the choice of capital structure does not affect a company's value.

Furthermore, with respect to retained profits, Peirson *et al.* (1998) show that for investors on the highest marginal tax rate (currently 47 percent) the total tax burden on debt and equity will be equal if the capital gains tax rate is equal to 17.2 percent. Thus, the policy of retaining all profits will suit high tax rate investors only if the tax rate on capital gains is less than 17.2 percent. At capital gains tax rates less than this there is a bias towards equity rather than debt, as using debt would reduce the company's value if debt was bought by investors who were in the top tax bracket.

In summary, Howard and Brown (1992, p 57) state "*reducing company tax by borrowing will not produce benefits for investors because any company tax that is paid can effectively be recovered by shareholders through the tax credits attached to franked dividends.*" Nicol (1992) notes that exceptions to the above exist, namely, tax exempt, non-tax paying and foreign investors. For these investors, debt will still provide a greater return because they are unable to obtain any value from franking credits. Overall, *ceteris paribus*, there should be no bias towards the use of debt finance in the case of companies owned by tax paying Australian resident investors.

However, firms with loss carryforwards that borrow will have no immediate tax saving at the company level even though imputation may remove the tax disadvantage of equity for tax paying (non-loss carryforward) companies. Hence debt has a tax disadvantage for non-tax paying (loss carryforward) companies and these firms should have lower levels of debt than tax paying (non-loss carryforward) companies. When a loss making company issues equity, shareholders will not pay any additional tax if dividends are not paid and from the company's point of view the losses can be carried

forward indefinitely. If debt financing is used, interest will still have to be paid and debt providers will have to pay tax on interest received while the loss can be carried forward. This tax disadvantage may be a bigger burden on IPOs than seasoned companies, because a large proportion of IPOs fail in their early years. Seasoned firms can carryforward losses indefinitely and can use these losses to reduce later years tax bills while IPOs may not survive long enough to take advantage of the carryforward losses.

3. Research Questions

The marginal tax rate can be defined as the amount of tax imposed on an additional dollar of income. As stated above some firms can postpone the payment of taxes on current income by using tax loss carryforwards, thus resulting in lower marginal rates of tax. Under a classical tax system firms with low marginal tax rates should have less incentive to finance with debt and hence, should have less debt in their capital structure relative to firms with high marginal tax rates. However, under a system of dividend imputation such as that used in Australia this bias towards the use of debt should be eliminated. Miller *et al.* (1994) find that the proportion of debt in the capital structure of IPOs with low marginal tax rates is lower than the proportion of debt in the capital structure of IPOs with high marginal tax rates. This finding is consistent with what one would expect given the tax incentive to issue debt. The finding also justifies further investigation, especially given the imputation system currently in use in Australia.

Consistent with Miller *et al.* (1994) the following hypotheses stated in the null form

are tested:

H1: The proportion of debt in the capital structure of seasoned firms with low marginal tax rates is not significantly different from the proportion of debt in the capital structure of seasoned companies with high marginal tax rates.

H2: The proportion of debt in the capital structure of IPOs with low marginal tax rates is not significantly different from the proportion of debt in the capital structure of IPOs with high marginal tax rates.

4. Methodology

The sample of 213 IPOs represents all industrial IPOs made in Australia during the 1995 to 1997 calendar years. Information on seasoned companies was collected from the annual reports of the largest 500 (by market capitalisation) industrial firms listed on the Australian Stock Exchange. Financial institutions were excluded because of their unusually high level of debt and mining companies were excluded because of their traditionally very low levels of debt especially in their formative years.[3]

Like Miller *et al.* (1994) this study employs a proxy for tax status or marginal tax rate, operating profit before tax and abnormal items. To distinguish the loss carryforward firms which have low marginal tax rates from non-carryforward firms with higher marginal rates we used the following procedure. Three years of data centred on the year the IPO went public, t = 0, were collected from prospectuses and annual reports. If a firm paid tax in all three years, it is categorised in the group of taxable firms (non-loss carryforward). We include the year t=+1, the year after the IPO went public.

This is because a firm with a small loss carryforward would be classified as a loss carryforward firm even though significant profits in the year following listing may mean that it would in fact be a non-loss carryforward firm. This treatment is consistent with Miller *et al.* (1994).

Given the above, IPOs are classified into the following two groups:

Group 1. If firms have positive net operating profit before tax and abnormals in all 3 years and no retained losses they are classed as taxable firms (non-carryforward).

Group 2. Firms are classified as non-taxable if they have taxable income (operating profit before tax and abnormals) offset by a loss carryforward in all 3 years; if they have a loss in t = -1, and either no provision for tax in t = 0 or t = +1 or have taxable income offset by a loss carryforward in t = 0 or t = +1.

Firms falling between the 2 groups are excluded so the sample is clearly split on tax status as per Miller *et al.* (1994). This procedure gives 18 IPOs in the loss carryforward position at the time of going public, and 37 clearly taxable, non-loss carryforward firms.

For seasoned companies we classified firms by tax status as with the IPO sample (in brief):

Group 1. Those companies with no loss carryforwards, that is, they paid tax (made a profit) in all 3 years. This group comprised 133 firms in total.

Group 2. Those companies that have 3 consecutive years of operating loss before tax and abnormals and loss carryforwards. There were 19 seasoned companies included in this group.

As in Miller *et al.* (1994) leverage is defined as the debt to asset ratio, where the market value of debt is approximated by its book value. Market value of assets is approximated by the market value of ordinary shares, calculated as the share price times number of shares outstanding, plus book value of debt. Share prices in the case of the IPOs are the closing price on the first day of trading. We calculate the debt to asset ratio both before the IPO (pre ratio) and after the firm is listed (post ratio).

5. Results

We investigate the hypotheses cross-sectionally for the whole sample. Following Miller *et al.* (1994) this study controls for company history by investigating the capital structure decisions of IPOs. Table 1 presents descriptive statistics for the sample of IPOs and seasoned companies. The table indicates that the loss making companies are consistently smaller for both IPOs and seasoned firms, indicating the need to conduct non-parametric tests of the hypotheses (reported in Appendix 1).

Table 2 shows that for the seasoned firms, the non-loss carryforward group had a mean debt ratio of 0.197 and the loss carryforward group had a corresponding figure of 0.234. There was no significant difference between mean debt ratios of these tax paying and non-tax paying firms. This supports hypothesis 1 and, more importantly,

supports our earlier contention that under an imputation system there should be no preference between the use of debt or equity finance.

Under a classical taxation system, it may be expected that IPOs with non-loss carryforwards would have larger amounts of debt in their capital structure than IPOs with loss carryforwards. This bias should still be expected to exist under an imputation system. With respect to hypothesis 2, the results reported in Table 2 show that the mean debt ratio prior to going public is 0.283 for all non-loss carryforward IPOs. Following the IPO these same firms have a mean debt ratio of 0.193. The average debt ratio for all loss carryforwards in the IPO group is 0.145 prior to going public and 0.065 afterwards.

Both the pre and post debt ratios for loss carryforward IPOs are significantly different from the debt ratios for non-loss carryforward IPOs (columns 11 and 12) at the 1 and 10 percent levels respectively. These results suggest that the second hypothesis can be rejected in a cross sectional analysis of the sample of IPOs in accordance with Miller *et al.* (1994). Further, the capital structures of IPOs are consistent with the tax incentive hypothesis and consistent with our earlier argument that even under imputation debt has a tax disadvantage for loss carryforward companies as they have no immediate tax savings at the company level. Like Miller *et al.* (1994), an attempt was made to divide our sample on the basis of industry groups to control for industry effects. We were unable to obtain any meaningful results due to the limited sample size of industry groups for our IPO samples.

To test the consistency of our results we considered three additional measures of financial leverage. These measures were:

1. Interest bearing debt to book value of total assets.
2. Interest bearing debt to book value of total assets less intangibles assets.
3. Total liabilities to total assets.

Results for seasoned firms are given in table 3 below and are consistent with the results in table 2. All of the three additional measures of financial leverage fail to reject hypothesis 1. In summary, our results imply that the proportion of debt in the capital structure of seasoned firms with low marginal tax rates is not significantly different from the proportion of debt in firms with high marginal tax rates. In all our tests the mean differences are very close to zero in all cases.

For IPOs we calculated these ratios using audited figures as presented in the prospectus rather than proforma figures that may or may not be correct given the outcome or success of the listing. Using the three additional measures of leverage we find no significant difference in the mean debt ratios between loss carryforward and non-loss carryforward groups. This result is at odds with the results reported in table 2, that is, there was a significant difference in the pre and post listing debt ratios of loss carryforward and non-loss carryforward groups. The difference in the results between the pre and post ratios calculated in table 2 and the three additional measures shown in table 3 may be attributed to the difference in the denominator used in the various ratios. In the former ratios the market price of equity was in the calculation of the proxy for the market value of assets while in the latter book value of assets was

used. Given that many asset values date quickly more store could be placed on the accuracy of the pre and post measures than the three additional measures of leverage.

6. Summary and Conclusions

Miller *et al.* (1994) examined the relationship between tax status and capital structure by arguing that when compared to seasoned companies the capital structure of IPOs is not affected by the history of decisions and experiences to the same extent as seasoned firms. Thus any link between tax optimisation and capital structure is more likely to be identified in IPO firms. However, Australia unlike the US introduced a full dividend imputation system in 1987. This should have removed any bias between the use of debt and equity. Conducting a similar analysis to that of Miller *et al.* (1994) we recognise that in general there should be no bias towards the use of debt finance for companies that are owned by Australian resident investors. This proposition is qualified by the fact that loss carryforward companies that borrow will have no immediate tax saving at the company level, even though imputation may remove the tax disadvantage of debt for non-loss carryforward companies. For seasoned firms, our results consistently find no bias towards the use of debt for profit making (non-loss carryforward firms). These results are consistent with Modigliani and Miller (1958) proposition 1, the no tax case where capital structure does not affect firm value.

We did not get the same result for our sample of IPOs where we find that loss making IPOs have lower levels of debt than profit making IPOs. This is consistent with US

evidence reported by Graham (1996) who noted that high tax rate companies issue more debt than their low tax counterparts. In addition to the fact that loss carryforward companies have a tax disincentive to issuing debt, a possible reason for our results is that IPOs that are not making profits are restricted as to the amount of financing that they will be able to raise and hence will have lower gearing. Simply stated, it is difficult for newly listing loss-making firms to borrow money.

The results of this study are based on a sample of IPOs that is smaller than normally used in studies of other markets such as in the US and Europe. The full dividend imputation system used in Australia warranted this study especially given the findings of Miller *et al.* (1994). Further research could be undertaken in ensuing years to expand the sample of IPOs enabling differences in capital structures across industries to be considered.

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Appendix 1

Due to violation of assumptions of normality given our figures in Table 2 for firm debt ratios and in particular the small sample of IPOs the above tests were repeated using Mann-Whitney U test which produced the results in Table 4.

Once again, we find these results support those of the t-tests reported in Table 2. Both the pre and post debt ratios for loss carryforward IPOs are significantly different from the debt ratios for non-loss carryforward IPOs (columns 11 and 12) at the 2.5 and 1 percent level respectively. Additionally, no statistical difference was found to exist between the debt ratios of seasoned firms in loss or non-loss groups at any level of significance.

TABLE 1

Descriptive Statistics for IPOs and Seasoned Companies (millions of dollars)

A. Initial Public Offerings

Loss Carryforward							Non-Loss Carryforward						
Offer Size				Market Value			Offer Size				Market Value		
N	Min	Mean	Max	Min	Mean	Max	N	Min	Mean	Max	Min	Mean	Max
18	1.000	15.277	76.775	4.200	85.403	556.879	37	1.875	483.833	14136.540	5.872	602.765	19418.962

B. Seasoned Companies

Loss Carryforward					Non-Loss Carryforward				
Market Value					Market Value				
N	Min	Mean	Max	Med	N	Min	Mean	Max	Med
19	24.020	169.233	881.976	79.541	133	5.872	1247.232	38729.941	180.171

TABLE 2

Mean Debt Ratios by Subgroup

IPO						Seasoned Firms			
Loss Carryforwards			Non-Loss Carryforwards			Loss Carryforwards		Non-Loss Carryforwards	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
N	Pre Ratio	Post Ratio	N	Pre Ratio	Post Ratio	N	Debt Ratio	N	Debt Ratio
18	0.145	0.065	37	0.283	0.193	19	0.234	133	0.198

Loss/Non-Loss Carryforwards		
(11)	(12)	(13)
(2) - (5)	(3) - (6)	(8) - (10)
-0.138**	-0.127*	0.036

* Significant at the 1% level for a two-tailed t-test.

** Significant at the 10% level for a two-tailed t-test.

TABLE 3

Mean Debt Ratios - Additional Variables

Seasoned Firms					
Variable	N	Loss Carryforwards	N	Non-Loss Carryforwards	Mean Difference
Interest Bearing Debt to Book Value of Total Assets	19	0.223	133	0.210	0.013
Interest Bearing Debt to Book Value of Total Assets	19	0.244	133	0.238	0.005
Total Liabilities to Total Assets	19	0.435	133	0.442	-0.007
IPOs					
Variable	N	Loss Carryforwards	N	Non-Loss Carryforwards	Mean Difference
Interest Bearing Debt to Book Value of Total Assets	11*	0.253	33	0.260	-0.007
Interest Bearing Debt to Book Value of Total Assets	11	0.301	33	0.284	0.017
Total Liabilities to Total Assets	11	0.542	33	0.694	-0.152

* 11 cases were used here as opposed to 18 in table 2 because of insufficient information being available to make all of the necessary calculations.

TABLE 4

Mann-Whitney U test Results for Differences in Mean Debt Ratios

Pre-listing IPOs (Table 2, col. 11)	Post-listing IPOs (Table 2, col. 12)	Seasoned Firms (Table 2, col. 13)
(2) - (5)	(3) - (6)	(8) - (10)
0.021**	0.004*	0.905

* Significant at the 1 percent level for an asymptotic two-tailed test.
** Significant at the 2.5 percent level for an asymptotic two-tailed test.

Endnotes

[1] A more detailed description of the dividend imputation system as used in Australia can be found in several sources notably Officer (1990), Howard and Brown (1992) and Nicol (1992).
[2] Howard and Brown (1992), Monkhouse (1993) and Hathaway (1995) and others recognise that company income before tax is effectively taxed at the shareholders personal tax rate.
[3] Foreign firms or firms with a high level of foreign earnings were excluded from the sample as they may have been taxed overseas rather than in Australia. Similarly we excluded firms that paid dividends that were only partially franked.