International Review of Financial Analysis 20 (2011) 103–112

Contents lists available at ScienceDirect

International Review of Financial Analysis

Can corporate tax shields explain the long-term borrowing behaviour of Chinese listed firms?

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ARTICLE INFO

Article history:
Received 25 March 2010
Received in revised form 17 February 2011
Accepted 17 February 2011

JEL classification:
G32

Keywords:
Capital structure
Tax shields
Chinese listed companies
Manufacturing firms

ABSTRACT

This paper tests whether or not the well-documented corporate tax shields explanation of capital structure is applicable to firms listed on the Shanghai Stock Exchange over the period 2002–2007. A Tobit regression model is applied to examine this issue from a debt-capacity perspective. This is applied, first, in relation to all market sectors and then secondly, in relation to the manufacturing sector. It is found that Chinese firms' managers make commercially rational decisions in that they only borrow when the costs of borrowing are significantly lower than the returns generated. However, contrary to theoretical expectations, no evidence is found to indicate that listed firms in China make efficient use of tax shields. The tax shields, equivalent to several hundred billion US dollars per year, are out there, so why don't Chinese firms take advantage of them? This paper tentatively suggests that cultural attitudes towards borrowing and also high levels of government shareholdings can be considered as possible explanations. It is identified however that further research would be required in order to confirm this.

1. Introduction and background literature

It has been well documented in the literature by, amongst others, Miller (1998) that higher levels of debt finance can increase the total market value of a firm through tax shield effects; this, provided that the additional funds generate income greater than the costs of borrowing. Although the existence of higher bankruptcy risk and agency costs may reduce tax shield benefits, these costs are rarely high enough to eliminate tax benefits. It would appear to the present authors that Miller's words are particularly relevant in relation to China in the context of its double-digit economic growth. During economic-boom times bankruptcy risk is usually significantly reduced and taxable profits tend to increase rapidly. In such circumstances the financial benefits associated with increasing borrowing to take advantage of a tax shield are likely to considerably outweigh any additional costs.

The literature exploring the impact of rapid economic growth on Chinese firms' capital structures is relatively limited. In particular, we can find little credible research that attempts to examine industry-related differences. This issue is of particular interest here given that much of China's economic growth has been dominated by the manufacturing sector (which is a sector generally acknowledged to have a high debt capacity).

It is also not clear from the current literature whether or not the capital structure theories developed from a Western economic perspective can be applied to present-day China. Recent evidence appears to suggest that the capital structure paradigm has strong explanatory power in widely different types of economic environment. Deloof and Overfelt (2008), for example, cite evidence to the effect that the same capital structure model can be applied to firms in Belgium in both the present-day and the pre World War I economic environments. This would appear to indicate the robust nature of capital structure theories. However, are they applicable across different cultures as well as across time? We are particularly interested in examining the applicability of tax shield theory to explain Chinese firms' capital structure decisions. In exploring this issue, this paper addresses the questions:

1. Can the gearing (or leverage) levels of Chinese firms over the period 2002–2006 be explained, at least partly, by tax shield effects?
2. Given that manufacturing industry normally has higher debt capacity,[1] is there evidence that greater use is made of tax shields in this sector?
3. As personal tax could constrain the size of the corporate tax shield, do firms quoted solely on the Shanghai 'A' index (available to local

[1] This is because, in general, manufacturing firms have more tangible assets that can be easily resold than do firms from other industries. In addition, the higher-than-average growth potential of this sector in China should make it easier for them to obtain borrowing as perceived risks of default are lower. The debt capacity of Chinese manufacturing firms was 0.8513 (estimated as: FA/(Equity + LTD) as at November 25th 2008. It can be noted that a large number of Chinese companies are financed to a significant degree through short term bank loans).

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1057-5219/$ – see front matter © 2011 Elsevier Inc. All rights reserved.
doi:10.1016/j.irfa.2011.02.011

investors only) exhibit different borrowing behaviour for firms also listed on the Shanghai 'B' index (available to foreign investors)?

We see this paper as making an empirically based contribution to the literature and also a theoretical contribution. The latter given that unlike the majority of papers in this literature, our paper uses a series of different variables to identify a range of *potential* of tax shield effects—we call this a debt-capacity approach.

Modigliani and Miller (1958) argued that in perfect capital markets it should be the case that the capital structure does not affect a firm's total market value. Since this seminal paper the literature has focused on two main areas: first, what are the determinants of capital structure and second, what impact 'market imperfections' have on capital structure decisions and firms' market values.

The key focus of the 'market imperfection' literature is identifying the impact of taxation on capital structure. Modigliani and Miller (1963) showed that there are tax saving benefits associated with borrowing, and that by making use of these, a firm can increase its market value. It was argued that if it is assumed that the tax shield is fixed and indefinite, then the value of total benefits will be equivalent to DT_c (where D is the amount of borrowing and the T_c is the corporate tax rate). Subsequent work found in the literature, for example Cooper and Nyborg (2006), has suggested that tax shields can be estimated somewhat differently. It was found by Graham (2000) that the process of estimating the size of tax shields can be problematical because of the potentially complex taxation-code related issues relating to individual firm's different taxation statuses. However, the Graham (2000) study did find that, on average, firms enjoyed tax benefits of 9.7% of their market value. It was also argued that this benefit could potentially be doubled by issuing further debt until the point where the marginal tax benefit starts to decline. From papers such as this, it can be identified that the key question posed in the literature appears to be how large corporate tax benefits are, rather than whether or not these benefits exist.

A number of papers have argued that the potential benefits associated with corporate tax shields are limited to some extent by bankruptcy risk and personal taxation issues. Leland (1994) and Leland and Toft (1996), for example, develop mathematical models which suggested that bankruptcy risk would reduce the likelihood of borrowing. This however, runs counter to the empirical findings of Graham (2000) that firms with lower expected distress costs borrow less. Even though at the theoretical level it can be shown that potential bankruptcy risk might restrict the size of tax shields, this is of limited significance in respect to this paper given that its focus is not to identify the optimal capital structure of Chinese firms. It should also be noted that our sampling procedures eliminate financially distressed firms and focus on the financial healthy and growing companies.

Other researchers have attempted to take into account the impact of personal taxes on corporate tax shield effects. For example, the widely cited paper, Miller (1977) presents a model which shows that personal taxes may reduce (but not eliminate) the corporation tax shield. Any reduction would occur if the tax rate on debt income is higher than the average tax rate on equity incomes; where the latter includes dividends and capital gains. Chinese personal tax rates on interest income and dividend income are both 20%. However, there was no capital gains tax on equity capital gains in China over the period of this study. The consequence of this is that the effective personal tax rate from equity income was lower than that on interest income and this made bonds investment less attractive from a taxation perspective. However, we consider that these personal tax effects are not central to this study as our focus is on corporate tax shields.[2] In any case, personal taxes could eliminate the borrowing tax shields only when the differential tax rates between interest income and equity incomes is extremely large. This is not the case in China. It is also important to note that there are always a group of investors who do not need to pay personal tax. A significant part of Chinese firms' long-term borrowing is largely in the form of bank borrowing rather than through the issuing of bonds. As a result these investors (i.e. the banks) are subject to corporate tax (no matter whether the income is from interest or dividends or capital gains). We do accept that a small personal tax effect could still exist; but to take account of this would over-complicate the empirical model and not add significantly to the paper.[3]

In a recent paper Bany-Ariffin, Nor, and McGowan (2010) examine a form of market imperfection which may lead to gearing in excess of optimal levels. Using a theoretical foundation which is essentially the classical agency problem, they examined how the separation of cash flow rights from control rights in a pyramidal ownership structure could affect individual firms' capital structure decisions. It was argued that the ultimate owner (UO) at the top end of the pyramidal structure may force lower-level firms to take up higher than optimal level of debts, i.e. higher gearing, to protect their ownership rights. It was also argued that the UO will direct lower-level firms to invest in high risk projects in order to generate higher returns; returns that the UO will benefit from as the cash will eventually stream through to them. It was also identified that if projects fail the impact on the UO is limited as the problem would be confined to the lower level firm and its debt-holders. This argument by Bany-Ariffin et al. (2010), and others such as Vera and Ugedo (2007), may go some way to explain excessive gearing in some circumstances; however, they have little bearing on tax shield effects. This is because tax shield benefits are enjoyed at the individual firm level no matter what the group structure is. It can also be noted that elsewhere in the literature applying the logic of agency cost theory in corporate finance has been heavily criticised; for example, by Tse (2004) in the context of dividends. A more detailed discussion of the interrelationship between capital structure and dividend decisions can be found in Aggarwal and Kyaw (2010).

A lot of empirical studies have provided strong support for the tax shield hypothesis within a developed-country context. For example, using UK data and taking account of UK-specific taxation policy, Ashton and Acker (2003) estimate that the maximum tax shields was 15%. It can be noted that this is exactly the same as the Modigliani and Miller (1963) estimate of DT_c. In addition to the individual country-based studies undertaken, some research has examined the main issues in an international context. For example, Hodder and Senbet (1990) show that Miller's (1977) analysis is robust even after incorporating different international tax rates and inflation rates.

Although a number of empirical studies have examined the tax shield issue (for example, as reviewed above), they tend to treat the tax shield as one of many loosely related determinants in a capital structure model, rather than treated it as being central to the modelling process. For example, *profitability* often is used as a single proxy for firms' debt capacity. We argue in this paper that profitability, as used in many of these capital structure models, is an inadequate measure of tax shield effects. This is because these effects depend on the *amount* of interest payable, and this in turn is determined by the *amount* of taxable profits and not profitability *per se*. In this paper we contribute to the literature by developing models that use a number of innovative proxies to more-fully measure potential tax shield effects. This avoids the mixing of tax shield and non-tax-shield variables in modelling procedures and should provide a clearer picture of the impact of tax shields on Chinese firms' capital structures.

The structure of the remaining sections of the paper is as follows. In Section 2 we present: the data description, research methodology and the models to be tested. Section 3 then reports on, and interprets,

[2] The investigation of personal tax effects will be held over to subsequent research.

[3] It can also be argued that the *expected* long term tax regime is what determines corporate financial structures. Capital gains tax was written into Chinese law, and was expected to be implemented, for a significant period before its actual implementation in 2009. It is possible to argue that, at least for the latter years of our data-set, corporate financial structures reflected the expectation that in the near future personal tax rates on interest income and equity incomes would be effectively the same and would therefore have no impact on any corporate tax shield.