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Debt and Taxes: Evidence from bank-financed unlisted firms

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ABSTRACT

This paper analyzes the capital structure decision of non-listed bank-financed firms using a rich and unique new data set of Portuguese firms. These firms are rarely studied in capital structure contexts and differ from large listed firms in terms of agency and asymmetric information problems and funding sources. It is argued that the solution of agency and asymmetric information problems for large firms shows up on the balance sheet (as restrictions on debt) whereas for small firms these problems are solved by financial institutions and are therefore less apparent on the balance sheet. This makes it easier for small firms to exploit tax advantages of debt. The empirical analysis shows that debt tax shields and provisions for tax loss carry-forwards have an important impact on the capital structure of small firms. It is also found that the balance sheet variables used for large listed firms in different countries to model agency costs and asymmetric information do not work well for small non-listed firms. The only significant variables (besides tax variables) for small firms are bankruptcy (collateral) variables.

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JEL classification codes: G3, G32

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Debt and Taxes: Evidence from bank-financed unlisted firms

This paper analyzes the capital structure decision of non-listed bank-financed firms using a rich and unique new data set of Portuguese firms. These firms are rarely studied in capital structure contexts and differ from large listed firms in terms of agency and asymmetric information problems and funding sources. It is argued that the solution of agency and asymmetric information problems for large firms shows up on the balance sheet (as restrictions on debt) whereas for small firms these problems are solved by financial institutions and are therefore less apparent on the balance sheet. This makes it easier for small firms to exploit tax advantages of debt. The empirical analysis shows that debt tax shields and provisions for tax loss carry-forwards have an important impact on the capital structure of small firms. It is also found that the balance sheet variables used for large listed firms in different countries to model agency costs and asymmetric information do not work well for small non-listed firms. The only significant variables (besides tax variables) for small firms are bankruptcy (collateral) variables.

1. Introduction

Modigliani and Miller [1958, 1963] demonstrate that capital structure is irrelevant to the value of the firm in a perfect, frictionless world without taxes. The introduction of deductibility of interest payment introduces benefits to debt financing over equity financing in the form of a tax shield and the capital structure therefore becomes important for the value of the firm. But increasing debt is not "a free lunch". Expected bankruptcy costs and agency costs increase, which reduces the value of the firm. The objective for the firm is then to find the optimal capital structure where the marginal benefits from debt are equal to the marginal costs. Given the sizeable tax rates facing many corporations in various countries, the role of taxes for the capital structure is potentially important. However, Stewart Myers [1984] in his presidential address to the American Finance Association states (p. 588), "I know of no study demonstrating that a firm's tax status has predictable, material effects on its debt policy. I think the wait for such a study will be protracted". Gordon and Lee [2001] state that (p. 1) "Surprisingly, economists have had great difficulty providing evidence that taxes in fact lead to higher debt-equity ratios". Although there is increasing evidence that taxes do matter (Graham [1996a], [1996b]) for the capital structure, the primary source of the evidence is

obtained using listed US firms from the Compustat tapes[1]. In general, these firms are relatively large, listed on a stock exchange, financially sophisticated and have access to debt markets. What remains to be established is whether the impact of taxes has general applicability to other countries and smaller unlisted firms with different financing sources. The first aim of this paper is therefore to analyze the impact of corporate taxes on the capital structure of small unlisted firms financed by financial institutions. To secure a sample of companies that differ from the large US firms on Compustat, a sample of smaller unlisted Portuguese firms is obtained from the Central Bank of Portugal. The advantage of using Portuguese firms is that Portugal is one of the poorest countries in the OECD, and the economic and institutional development therefore differs from that of the US, providing an independent setting for testing the capital structure theories.

Small firms and large listed firms differ with respect to agency and asymmetric information problems and this gives rise to different finance sources for small and large firms. Small non-listed firms are in general informationally opaque when compared with larger firms and have different governance structures. Smaller firms are often owner-managed and this reduces the agency problems between equity holders and managers but exacerbates other problems between shareholders and creditors such as risk shifting. Although the proportion of debt in the capital structure is the same for small firms as for all firms, (at least in the US at around 50%, Berger and Udell [2000,p. 1]) the source of debt differs. Large firms are often financed by commercial papers, syndicated banks loans or loans from several banks and public bond issues, whereas small firms are in general financed by non-traded debt such as bank loans and trade credit[2].

[1] See Graham [2003] for an excellent survey of the implications of taxes on corporate finance in general and for the capital structure of corporations in particular.
[2] For a discussion of small firm financing in the USA see Berger and Udell [1998].

Listed firms are required to submit information to the stock exchange and the newspapers monitor these firms on regular basis, whereas non-listed firms are only required to produce a straightforward annual report once a year and rarely appear in the press. The exposure of listed firms reduces the information opacity of these firms compared to non-listed firms. Of course non-listed firms can provide similar levels of information to that required in, for example, 10 K forms, but the product is not credible since there is no organization like the SEC to impose penalties for "wrong" information. The availability of public information, together with credit ratings, makes it possible to finance these firms with various forms of traded debt. Being listed and providing information as well as obtaining credit ratings entails a large proportion of fixed costs and this financing form is therefore more attractive for large firms compared to small firms. Yet, financial institutions are particularly good at gathering information about firms for which they are the sole banker. Through the payment system financial institutions have proprietary information about a firm's cash flow which is not available to financial markets. Thus financial institutions may have advantages over financial markets and rating agencies in solving the asymmetric information problem. However, these advantages are smaller for large firms because, as argued by Mester et al. [2004], large firms often have several banking relationships, which reduce the advantage that can be obtained from financial intermediary knowledge of the firm's transactions accounts. Financial institutions charge a higher interest rate than financial markets from their customers as compensation for monitoring whereas financial markets charge a lower rate on loans but a high fixed cost for credit ratings, listing requirements etc. Due to asymmetric information, it is overall cheaper for small non-listed firms to borrow from banks than financial markets and for large firms to access financial markets[3].

[3] See Faulkender and Petersen [2004] for a further discussion.

Agency and governance problems associated with debt financing are also solved differently by financial institutions and financial markets. For a bond issue the contract is negotiated up front and it is very difficult to change the terms of the contract, including covenants, maturity date and amount of the loan or interest, once the bond is sold since all lenders have to agree. For firms with higher agency costs, financial markets will charge higher interest rates and reduce the size of the issue as well as demanding the inclusion of strict covenants in the debt contract. Thus the presence of agency problems in large listed firms increases interest rates, which reduces the amount of debt on the balance sheet and, to the extent that the amount of debt is restricted, firms may be prevented from pursuing the optimal amount of debt for the purpose of maximizing the value of the tax shield. Financial institutions, on the other hand, solve these problems by continuous monitoring. For instance they use the payment system and "continuous" re-negotiation of the debt contract. In particular, the bank manager has the ability to withhold new credit and to change the conditions of the loan as well as cancel old credit. The ability of the manager to do this is a credible threat and the incentive of managers/owners to exploit moral hazard problems is reduced. Thus under bank financing the *amount* of debt is not the primary tool to control agency problems. The bank uses monitoring and the *threat* of withdrawing future debt or increasing the price of future debt to control agency problems.

Financial markets can also increase interest rates on future debt to reflect a new situation when debt is re-negotiated, but the original lenders in financial markets cannot recover their losses since the firm can sell new (and dearer) debt in a competitive market to new lenders, which just reflects the current conditions. The situation is different for financial institutions; they can charge a higher rate than is warranted, i.e. impose a penalty and recover the original losses, because it is costly for the firm to change its banker. Thus, a financial

institution can more easily recover its losses. Financial markets therefore have to protect themselves ex-ante, whereas financial institutions have a credible threat that they can exercise ex-post. This scenario has two consequences for borrowers from financial institutions. First, both the borrower and the financial institution are interested in maximizing the value of the firm and with a credible threat in hand the financial institution is likely to allow the firm to exploit potential tax benefits of debt. Second, since the solution to the agency problem does not involve the actual amount of debt supplied by a financial institution, we are less likely to find a relationship between proxies (derived from the balance sheet) for agency problems and small firm capital structure. On the other hand, we are more likely to find a tax effect for small firms compared to large firms (as discussed above). Thus the factors determining the capital structure for non-listed firms financed by financial institutions and large listed firms may be different.

In the trade-off model the optimal level of capital structure is determined by the factors influencing the marginal benefits (tax shield) and costs (expected bankruptcy costs and agency costs) of debt financing. Rajan and Zingales [1995], Wald [1999], Booth et al. [2001] and Aggarwal and Jamdee [2003] have, among others, studied these factors in an international setting and have found that the same set of factors determining the capital structure used in US studies also applies to large non-US listed firms. However, all of these papers use listed firms which are also the largest firms in their respective countries; Rajan and Zingales [1995] and Aggarwal and Jamdee [2003] look at the G7 countries, Wald [1999] at the G5 countries and Booth et al. [2001] at 10 developing countries. To some extent it is not surprising that the same factors explain the capital structure in the largest listed firms in various countries. These large firms are often important players in international trade and therefore have to adjust their balance sheet to international standards. Moreover, due to their large size and scope of

operations, they are often partly financed by international financial markets and institutions which impose a common structure on the balance sheet. It is therefore not clear whether the use of large firms across different countries constitutes an independent test of the factors determining the capital structure. Smaller firms, on the other hand, tend to operate locally and are financed by local financial institutions and these firms are therefore less likely to be influenced by international standards. Thus a sample of these firms provides a potentially stronger test of the robustness of the factors determining capital structure, including the impact of taxation, than the use of large listed firms. A secondary aim of this paper is therefore to test whether the factors relevant to large listed firms are also relevant to smaller non-listed firms. For this purpose we use data from Portugal, a smaller OECD country. The advantage of using this data is that Portugal is one of the least developed countries in the OECD and so its banks and financial markets are less likely to mimic those of the large and more developed countries (G7), thereby providing a quite different institutional setting to that existing in the G7 countries.

Portugal is a bank-oriented country with a small stock exchange and a universal bank system. The banking system which was completely privatized at the end of 1985, comprises the central bank and 90 commercial banks (62 domestic and 28 foreign including Madeira's off-shore banks). The banking system is strongly concentrated in five financial groups having more than 75% of all bank assets. Banks have established subsidiaries for leasing, insurance, factoring, underwriting, corporate services, etc. In 1999 domestic banks accounted for 93% of total bank assets. Thus the influence of foreign banks is very small. Compared to market-based economies like US, UK and Canada, the ratio of stock market capitalization to GDP (which is a good approximation of the equity market importance) is 51.75% in Portugal

whereas it is 180, 203 and 126%, respectively for US, UK and Canada[4]. Domestic bank credit to the private sector as a fraction of GDP is in line with the above countries, with 121% comparable with 145, 123 and 83%, respectively. Thus the financial system and the financing of firms differ significantly from those of the US.

A target adjustment model representing the traditional trade-off of capital structure is estimated for a sample of 998 non-listed Portuguese firms for the period 1990 to 2000 (7,765 firm-year observations). The two main results of the paper are as follows. First, there are significant tax effects on capital structure. Second, the traditional variables used for modeling agency costs and asymmetric information in large listed firms by, e.g. Rajan and Zingales [1995] for the G7 countries, do not work well for smaller non-listed firms. The main determining factor, besides taxes, for the level of debt in small firms is the availability of collateral. The remainder of the paper proceeds as follows. In section 2 the target adjustment model used to test for tax effects is discussed. In section 3 data and variables used in the empirical analysis are discussed. The empirical analysis is presented in section 4 and section 5 concludes.

2. Target adjustment model

The basic model used to test for a tax effect is a static trade-off model in the form of a target adjustment model. As discussed in the introduction, debt has benefits in terms of a tax shield, but as debt increases, so do the expected bankruptcy and agency costs between shareholders and debtholders[5]. The optimal or target capital structure is determined by the

[4] Merrill Lynch: "Size & Structure of the World Bond Market: 2002", International Financial Statistics and World Bank Group: "World Development Indicators Database".

[5] The agency costs between shareholders and management may decrease as a consequence of the increase in debt. However, in this paper we focus on small and medium size firms where this conflict is reduced since the shareholders often operate the firm.

equality of marginal benefits with marginal costs. Due to various transactions costs Taggart [1977] and Jalilvand and Harris [1984] suggest that managers adjust the current capital structure towards the optimal structure over time. Thus changes in the current debt ratio, defined as debt over total assets, are given by a partial adjustment to the deviations of the current ratio from the target:

$$\Delta D_{it} = \gamma \left(D_{it}^{*} - D_{i,t-1} \right) + e_{it} \qquad (1)$$

where ΔD_{it} is the first difference of debt level for firm i at time t, γ the target adjustment coefficient with $0 < \gamma < 1$ indicating positive adjustment costs, $D^{*}_{i\,t}$ is the target debt level for firm i at time t and e_{it} represents random shocks to the current capital structure. A value of γ close to one indicates a rapid adjustment of the current capital structure towards the target or optimal capital structure.

The target or optimal capital structure is determined by the marginal benefits and costs of debt financing. Few of these benefits and costs can be measured directly and it is therefore necessary to use a set of proxies, such as corporate marginal tax rate, collateral value of assets, size and profitability. The (unobserved) target level for firm i at time t is given by:

$$D^{*}_{it} = \alpha + \beta_{TAX}\, TAX_{i\,t} + \beta_{Z}\, Z_{it} \qquad (2)$$

where D^{*}_{it} is the (unobserved) target debt level for firm i at time t, α is the intercept term, TAX_{it} is the tax variable and Z is a vector of variables some of which are identified by Rajan and Zingales [1995] (size, profitability, bankruptcy risk, etc.). Substituting equation (2) into (1) yields:

$$\Delta D_{it} = \gamma\, (\alpha + \beta_{TAX}\, TAX_{i\,t} + \beta_{Z}\, Z_{it} - D_{i\,t-1}) + e_{i\,t} \quad \Leftrightarrow$$

$$D_{it} = \gamma\, \alpha + \gamma\, \beta_{TAX}\, TAX + \gamma\, \beta_{Z}\, Z_{it} + (1 - \gamma)\, D_{i\,t-1} + e_{it} \qquad (3)$$

Equation (3) can be estimated as a "linear model". The parameters, $\gamma\beta$, are estimated jointly but the value of β can be retrieved by dividing by one minus the parameter estimate in front of the lagged dependent variable.

3. The data sample

The primary data source is the Bank of Portugal Statistical Department's database. This database contains balance sheet and income statement data for 3,083 non-listed firms with 17,737 non-continuous firm-year observations. Several selection criteria were imposed for inclusion in the sample. Only manufacturing firms with more than 100 employees in all the years (in the period 1990-2000) are included. Firms with negative net worth, negative taxes, equity less than 2,000 euros (minimum amount allowed by law) and less than four continuous data years (required for estimation purposes) are not included in the sample. The final sample consists of 998 firms and 7,765 firm-year observations. On average the number of continuous observations for a firm is between 7 and 8 years.

[PLEASE insert Table 1 here]

Table 1 shows the number of observations by year and industry. The lowest number of firms appears in 1990 and year 2000 with 523 and 597 observations respectively. Industry class 2, textiles and clothing, has the most observations over the sample period and the smallest industry is class 5, heavy industry.

To reduce survival bias, firms are allowed to leave and enter the data set over time. More than one third of the firms in the sample have 10 years or more of continuous data. 25%

of the sample has between 7 and 9 years of continuous data and 38% of the sample has between four and six years of continuous data.

[PLEASE insert Table 2 here]

Table 2 reports the average common-size balance scaled by total assets for a number of years between 1990 and 2000. The amount of tangible assets as a percentage of total assets is between 34% (2000) and 43% (1990). Of the G7 countries in 1991 and 2003 (in brackets) Canada had the highest percentage of tangible assets, namely 51.6% (46.2%), the UK 41.3% (31.6%) and France the lowest with 24.4% (19.1%) (as reported by Rajan and Zingales [1995] and Aggarwal and Jamdee [2003]). Canada is out of line with the other G7 countries primarily due to the influence of the oil and exploration industry which is dominated by firms with high levels of fixed assets. Thus it appears that the percentage of tangible assets is slightly higher in Portugal compared to the G7 countries, but the trend of falling fixed assets as a percentage of the total assets is the same as for the G7 countries. The percentage of intangible assets is between 1% and 4% over the period, whereas for the G7 countries it ranges from 0.8% (1.7%) in Japan to 8.5% (16.9%) in France. Since fixed assets are used as collateral for debt, it appears that Portugal has the opportunity for slightly higher debt levels compared to the G7 countries and we would expect the amount of debt to fall over the sample period due to the fall in tangible assets during the nineties. The other assets, such as inventories and debtors are equivalent to those in the G7 countries, but cash and cash equivalents are significantly lower in Portugal at between 2% and 6% whereas for the G7 countries they are between 8.2% (10.1%) for Canada and 18.4% (15.2%) for Japan. Thus Portuguese firms have fewer reserves compared to G7 countries available for meeting interest payments and for replacing short-term debt in case of liquidity squeeze. Financing through financial institutions is often

undertaken through a credit line and as long as this line is not fully utilized, there is less demand for holding cash compared to firms without credit lines or with relatively smaller credit lines. Since small firms rely more on financial institutions and credit lines, they are also likely to have less demand for holding cash compared to larger firms. On the other hand large firms are more diversified and therefore have a smaller demand for precautionary balances.

On the liability side of the balance sheet Portuguese firms have significantly more equity; nearly 50% of the balance on average is equity, whereas for the G7 countries it is from 28% (Germany) to 42% (UK) for 1991. For the year 2001 the figures have changed for the G7 countries where France now has 11.9% in equity and the UK 47%. The amount of current liabilities in Portugal ranges from 33% to 40%, whereas for the G7 countries it ranges from 23% (23.1%) for Canada to 43.2% (37.6%) for Italy and 43%.4 (66%) for France. Thus Portugal has slightly more current liabilities than the average G7 country (treating France as an outlier) which reflects the higher use of trade credits in Portugal. The main difference is in terms of long-term debt where the Portuguese firms only have between 13% and 16%, compared with the G7 countries' range of 18% (18%) for the UK to 42% (26.2%) for Germany. The Portuguese firms also use more equity finance compared with the G7 countries, whereas long-term debt is more prevalent in the G7 countries. This is consistent with the view that large firms use financial markets to raise long-term debt, whereas smaller firms rely more on trade credit and bank debt. However if the comparison is made with the distribution of equity and debt presented in Berger and Udell [1998], the results are quite similar. Their US sample of SMEs showed that small businesses depend on both equity (49.6%) and debt (50.4%). These values are quite close to the Portuguese sample. In fact in Portugal total equity varies between 46% and 49% and debt between 51% and 54%. For trade credit and bank financing the values are very similar as well. In Berger and Udell [1998]

financial institutions and trade credit represent 18.8% and 15.8% respectively, whereas in Portugal values range from 16% to 23% (bank loans) and 10% to 14% (trade credit). Using a sample of 10,000 UK SMEs Poutziouris et al. [2005] also document that trade credit is an important part of small firm financing, amounting to 11% of total assets. Although the Portuguese financial system differs from the US financial system, the financing of smaller firms seems to be similar, whereas there are significant differences between the financing of large listed and smaller non-listed firms. Thus it appears that being large and listed is a significant factor for determining the capital structure and it is therefore not clear whether results derived from a sample of these firms carry over to smaller non-listed firms.

3.1 Measuring debt

The three main financing sources for Portuguese firms are bank loans, trade credit and internally generated equity. In general, we view trade credit as part of working capital and the focus of the paper is therefore on bank loans. Data is available for both long-term and short-term liabilities[6] and three different ways of measuring debt (dependent variables) are constructed:

a) *TOTALLOANS* equal long-term bank loans plus short-term bank loans plus creditors minus debtors plus other current liabilities over the book value of total assets;
b) *LONGBANKLOANS* equal the book value of total long-term bank loans over book value of total assets;
c) *SHORTBANKLOANS* equal the book value of total short-term bank loans over book value of total assets.

[PLEASE insert Table 3 here]

[6] Long-term debt is defined as debt with a maturity longer than one year and short-term debt has a maturity of less than one year.

Table 3 reports the percentage of firm-year observations with positive bank loans. It is shown that 54.26% percent of firm-year observations report long-term bank loans, 76.32% have short-term bank loans and 81.88% report short- and/or long-term bank loans. The distinction between short-term and long-term bank loans is not clear since firms often have "current accounts" with an open authorized amount provided by the bank. These are per definition short-term loans, but are rolled over and can therefore be interpreted and reported as long-term loans. Indeed, the number of firms that report non-zero levels of long-term bank loans plus short-term bank loans is similar to previous studies (Graham et al. [1998]). Dividing the sample into 5 size groups based on the number of employees (not reported separately) shows that the percentage of firm-year observations with strictly positive levels of debt is higher for large firms than for small firms. Around 83% of large firms have some kind of debt with 58% reporting long-term bank loans and 80% reporting short-term bank loans. For small firms, 80% report the use of debt but only 49% report long-term bank loans. This is in spite of the fact that the percentage of some kind of debt is quite similar across both small and large firms. Large firms use long-term debt more often and so there is a distinct difference in the use of bank debt between small and large firms. A relatively large number of small firms rely solely on short-term debt (32%) and fewer small firms in general report the use of long-term debt only (7%).

3.2 Tax variables

In order to test for tax effects, a measure for the corporate marginal tax rate is required. Here the three measures developed by Graham [1998,2000] are utilized[7]:

[7] In the existing literature other proxies have also been used: statutory tax rates, non-debt tax shields, tax loss carry-forwards and dummy variables (Bradley et al. [1984], Titman and Wessels [1988], Bartholdy et al. [1989], Mackie-Mason [1990] and Scholes et al. [1990]). The results from these variables are consistent with the analysis presented in the paper and the results for these variables are available upon request.

a) MTREBIT: *Before-financing marginal tax rate,* a simulated marginal tax rate based on income after depreciation but before interest expenses are deducted;

b) KINK: Adapted from Graham [2000] and calculated as earnings before interest and taxes over interest[8];

c) STAND: Standardized Kink is defined as kink time interest over the standard deviation of earnings before interest.

3.2.1. MTREBIT - before-financing marginal tax rate

The marginal tax rate is defined as the present value of current and expected future taxes paid on an additional unit of income earned today. The methodology used here follows Graham ([1998], [2000]) for calculating firm specific marginal tax rates and involves three sets of inputs: the current tax rules, in particular how losses are treated, the statutory tax rate and expected future earnings[9].

[PLEASE insert Figure 1 here]

Figure 1 shows the distribution of the before-financing marginal tax rate for 5,828 firm-year observations.[10] For about 89% of the observations (firm-year) of *MTREBIT,* the income before interest and taxes is positive and the before-financing marginal tax rate is therefore equal to the statutory tax rate. The remaining 11% have negative earnings before interest and taxes and from this group 22% have a marginal tax rate of zero (could not offset the losses against the profits in the five or six following years). The years 1993 and 1996 are the ones where the percentage of marginal tax rate of zero is higher when compared with the number of observations with negative earnings before interest and taxes (around 28%), while

[8] An alternative measure based on bank interest paid was also used with similar results.
[9] For details of the calculations see appendix.
[10] Years 1990, 1991 and 1992 are excluded due the marginal tax rate calculation.

1998 is the one with the lowest value (14%). The remaining 78% of the firms have a marginal tax rate ranging between zero and the statutory tax rate. The annual average marginal tax rates from 1993-2000 are: 33.7%, 34.2%, 34.08%, 33.88%, 32.48%, 32.3%, 32.00% and 29.2%, respectively. Part of this variation is generated by the change in the statutory tax rate over the years. To the extent that the earnings forecasts are biased upwards as suggested in the Appendix and Table A1, these numbers may be biased upwards as well.

One way to avoid the endogeneity problem between tax rates and debt policy is to measure tax rates before the financing decision is taken, as in Graham [1998] the marginal tax rate is based on income before interest is deducted. However, as argue in Graham [2003], this approach does not completely solve the problem and therefore the lagged value of the before-financing marginal tax rate is used as well.

A higher marginal tax rate implies that an increase in debt will decrease taxes more for a firm with high marginal tax rates than for firms with low marginal tax rates. Thus the marginal tax should have a positive correlation with the level of debt.

3.2.2. Kink

This variable is adapted from Graham [2000] and measures whether firms use debt conservatively or aggressively, i.e. if firms use debt to minimize taxes. An aggressive firm with positive earnings before interest and taxes would issue just enough debt to ensure that earnings after interest but before tax are zero, whereas a conservative firm would issue less debt and therefore face positive taxes. Firms with positive earnings after interest payments could increase their level of debt and interest payments and achieve a marginal tax benefit which is equal to the statutory tax rate. For firms with negative earnings after interest

payments, the marginal benefits of increasing debt are smaller than the statutory tax rate. To measure these effects, a variable labeled kink is defined as the ratio between earnings before interest and taxes (equal to the amount of interest payments required to make earnings equal to zero) and actual interest paid. If kink is less than one, then earnings before tax are less than the actual interest paid and earnings after interest are therefore negative. This represents an aggressive debt policy, whereas if kink is above one then earnings after interest are positive and the firm uses debt more conservatively. Thus conservatism and kink are positively related, and kink is negatively related with debt levels. Also kink is positively correlated with the marginal tax rate. Figure 2 shows the relation between the marginal tax benefit of debt and the kink variable.

[PLEASE insert Figure 2 here]

3.2.3. Standardized kink

As referred by Graham [2000] firms with large values of kink use debt conservatively. However, the degree of conservatism is also a function of the degree of volatility of the earnings. If two firms have the same value of the kink variable but one has more volatile earnings than the other, then the firm with more volatile earnings has a less conservative policy since the probability of being on the downward sloping part of the benefit function (aggressive debt policy) in the future is higher for this firm than for the firm with lower volatility. To capture this, a standardized kink variable is constructed as interest multiplied by Kink divided by standard deviation of earnings before interest and taxes. This is a measure of the flat part of the benefit curve in Figure 2 per unit of earnings volatility. If the probability of the firm staying in the "flat" part is lower (low standardized kink values), then there is less

advantage to using debt as a tax shield. Thus a positive relation between this variable and debt levels is expected.

[PLEASE insert Table 4 here]

Table 4 shows a summary of the tax variables and their expected relationship with debt levels.

3.3 Agency, asymmetric information and bankruptcy variables

The secondary purpose of this paper is to analyze whether the factors identified by Rajan and Zingales [1995] (as well as other factors) as being relevant for large firm capital structure in the G7 countries are also relevant to the capital structure decision of smaller non-listed firms. The theories (agency theory, asymmetric information and bankruptcy) and previous empirical work on capital structure suggest that collateral value of assets, profitability and size, volatility of earnings, growth, bankruptcy probability, nominal interest rates, inflation rate, interest rates spread, unemployment rate, years of incorporation and financial distress (among others) may have an influence on the capital structure.

A firm with a high percentage of tangible assets in relation to total assets can support a higher debt level because these assets can be used as collateral for loans and thus reduce the expected bankruptcy costs. On the other hand a high percentage of fixed assets also implies higher operating leverage which increases the probability of bankruptcy, suggesting a negative relation between fixed assets and debt. Thus under the bankruptcy theory, the parameter can be either positive or negative. High levels of fixed assets reduce agency costs associated with increases in risk and risk shifting. Finally, the problem of underinvestment (Myers [1977]) is reduced if a large proportion of the firm's assets is fixed. Thus agency

theory suggests a positive correlation between debt and fixed assets. Rajan and Zingales [1995] found that this factor is positive and significant for all the G7 countries except Italy.

Profitable firms in general generate more cash than less profitable firms. For a given debt level profitable firms therefore have a smaller probability of default and expected bankruptcy cost. As Jensen [1986] argued, the generation of cash may entice managers to build empires and undertake projects with negative NPV. Increasing the level of debt for profitable firms serves as a bonding mechanism to reduce the possibilities for managers to waste funds on negative NPV projects. These two arguments suggest a positive relation between debt and profitability. However, Myers and Majluf [1984] argue that informational asymmetries cause firms to prefer internally generated funds over debt, referred to as the pecking order theory. Since profitable firms generate more cash than less profitable firms, they are expected to have less debt under the pecking order theory. Titman and Wessels [1988] find a negative relation between profitability and leverage, whereas Rajan and Zingales [1995] find mixed evidence: a negative and significant effect for USA, Japan and Canada, yet insignificant effect for France, UK and Italy and a positive yet insignificant effect for Germany. Given that this sample consists of primarily bank-financed firms where banks are capable of solving the ex-ante asymmetric information problem through continuous monitoring and renegotiation of debt contracts, it is expected that asymmetric information is not a major problem when the firm wants to add additional debt from the same bank to its balance sheet. We therefore expect a positive relation between profitability and leverage. This variable is defined in the same way as in Titman and Wessels [1988] and Rajan and Zingales [1995] i.e. as earnings before interest and taxes divided by book value of assets. An alternative measure defined as return on assets (ROA) calculated as earnings after taxes and interest over total assets is also utilized.

In general intangible assets have poor value as collateral for loans, which leads to a negative correlation between debt and the amount of intangible assets. Intangible assets may also be a measure of asymmetric information, since these assets are very opaque to external creditors, and thus are negatively correlated with debt. Finally, these assets may represent future growth opportunities or real options and, in line with Myers [1977], the increased debt may lead to underinvestment. Thus a negative correlation is expected.

Given that there are fixed costs associated with bankruptcy and large firms in general have lower probability of bankruptcy compared to small firms, it is expected that large firms have more debt in their capital structure than smaller firms. Rajan and Zingales [1995] found a significant positive effect for the size variable for USA, Japan, UK and Canada, a positive insignificant effect for France and Italy and a negative significant effect for Germany. This variable is calculated as the natural logarithm of the book value of total assets. Another interpretation is that larger firms have more diluted ownership and less control over their managers and so the board uses increased debt to control management.

As an increase in business risk raises the probability of bankruptcy, it is expected that the level of business risk is negatively correlated with the amount of debt. The standard deviation of return on assets is used as a business risk proxy.

A fast-growing firm is often seen by the banking sector as a healthy firm with smaller probability of bankruptcy and growth is therefore expected to be positively correlated with debt levels. An alternative interpretation is that high-growth firms have more real options for future investments than low-growth firms. If high growth firms decide to issue debt then this

may, as discussed by Myers [1977], lead to underinvestment. Also the potential for risk shifting and other agency problems between shareholders and creditors increases with high growth. Thus agency theory suggests a negative relationship between debt and growth. To the extent that there is more asymmetric information for high-growth firms, asymmetric information theory also predicts a negative relationship. This variable is defined as the percentage change in total assets.

If bankruptcy is costly, then the amount of debt should be a decreasing function of the probability of bankruptcy. A modified version of Altman's [1968] discriminant function predictor of bankruptcies is used in this paper. A negative correlation is expected between the modified version of Altman's Z-Score and debt levels. This variable is defined as:

$$3{,}3\frac{\text{EBIT}}{\text{Total Assets}}+1{,}0\frac{\text{Sales}}{\text{Total Assets}}+1{,}4\frac{\text{Retained Earnings}}{\text{Total Assets}}+1{,}2\frac{\text{Working Capital}}{\text{Total Assets}}$$

An increase in nominal interest rates raises the cost of borrowing and it is expected that the firms will borrow less. Since nominal rates are closely related to inflation rates, these two variables may capture the same effects and therefore only one of the two should be used in analysis.

The difference between short- and long-term interest rates can be either positively or negatively related to debt levels. It is calculated as the difference between short-term and long-term interest rates (given by the three-month risk-free rate and ten-year Treasury bond rate respectively). A decrease in the spread makes long-term financing relatively more expensive and so it is expected that firms will make more use of short-term finance and roll it

over as required. Thus it is expected that the spread variable is positively related to long-term debt and negatively related to short-term debt.

The age of the firm can be used as proxy for the amount of available information about the firm. For young firms there is very little information available. In general it is difficult to obtain bank loans of any kind if the firm does not have a financial history and a positive relation between this variable and debt levels is expected. This variable is calculated as in Giannetti [2003] as the natural logarithm of the number of years since the date of incorporation of the firm.

[PLEASE insert Table 5 here]

Table 5 summarizes the expected impact on capital structure of the agency, asymmetric information and bankruptcy variables. The expected theoretical relation to debt levels and references to authors who have used these variables in previous research are shown. As seen from the table it is difficult to distinguish clearly between the three theories based on the above variables, but the variables for bankruptcy risk can be used to test the bankruptcy theory and the growth variable can be used to distinguish between bankruptcy theory and agency theory. Finally the age variable can be used to test the agency and asymmetric information theories and the probability variable to distinguish between asymmetric information theory on one side and the bankruptcy and agency theories on the other side.

3.4 Descriptive statistics

[PLEASE insert Table 6 here]

Panel A of Table 6 reports summary statistics for the levels of the different debt measures. On average, long-term bank loans account for 7.04% of total assets, short-term bank loans for 10.23% and both short- and long-term bank loans for 17.27%. If firm-year observations with no debt are excluded, then the average long-term bank loans account for 12.85% of total assets, short-term bank loans for 13.38% and short- and long-term bank loans for 20.99%.

In Panel B the summary statistics for the tax variables are presented. The value of the lagged before-financing marginal tax rate (*MTREBIT*) is 33.83% with a maximum value of 36% (maximum value for the statutory tax rate) and a standard deviation of 0.0618%. The mean value of Kink indicates that the average firm could increase total interest deductions 2.32 times before the marginal benefit begins to decline. The average firm has a standardized kink of 1.56. Firms with standardized kink values between 1.5 and 7.0 have benefit functions which are more than two standard deviations in length[11] (table not reported). This means that firms with high kink values can stay in the flat part of their benefit function in most of the scenarios and therefore use the full benefits of debt.

Panel C provides the sample statistics for the agency, asymmetric information and bankruptcy variables. The average intangible and tangible assets are 1.13 and 39.18% of total assets. Earnings before interest and taxes are 34.90% of the total assets on average. Firms have an average growth measured as the percentage change in total assets of 10.81%. The

[11] These results are in line with Graham [2000].

measure of financial distress, Z-Score, averages about 1.58 for all firm-year observations, but there is a large dispersion around this number (standard deviation of 0.97). The macroeconomics variables, short-term interest rate, interest rate spread, inflation and unemployment rate, are on average 8.48, -0.29, 5.40 and 6.22 percent, respectively. Regarding the number of years from the incorporation of the firm, the average value is 22 years with a standard deviation of 2.3 years and a maximum of 243 years.

[PLEASE insert Table 7 here]

Table 7 reports the correlation matrix for the tax and agency, asymmetric information and bankruptcy variables. The lagged before-financing marginal tax rate is positively correlated with all the other tax variables with a correlation coefficient around 0.16. The relatively low correlation coefficients indicate that the variables may be catching different aspects of the tax effect or are at best noisy proxies for the underlying tax effect. If the proxies are noisy, then it may be difficult to find tax effects but, worse, these proxies may capture other effects that have nothing to do with tax effects. From the correlation matrix it appears that multicollinearity is (probably) not a problem in this sample. The correlation matrix also shows that there is a positive correlation between MTREBIT and PROFITABILITY (more profitable firms pay more taxes) and also that there is a negative correlation between MTREBIT and TANGIBLE indicating that a higher proportion of tangible assets and consequently higher depreciation values reduce the tax bill (no debt tax shields). Also as firm age and increase in size (AGE and SIZE), they are less profitable and therefore have a lower marginal tax rate.

4. Results

4.1 Testing for a tax effect on leverage

In section 2 the basic test equation for the target adjustment model is presented as:

$$D_{i\,t} = \gamma\,\alpha + \gamma\,\beta_{TAX}\,TAX + \gamma\,\beta_{Z}\,Z_{it} + (1-\gamma)\,D_{i\,t-1} + e_{i\,t} \qquad (3)$$

Z contains the variables discussed above and a set of industry dummy variables. This equation is estimated using a pooled sample across firms and time periods from 1990 to 2000. The main estimation problem is the lagged dependent variable on the right hand side of the equation. If there is auto-correlation in the residuals, then the lagged dependent variable is correlated with the error term leading to biased and inconsistent estimation. A simple application of the Hausmann test confirms this. In order to avoid this problem an instrumental variables (IV) estimator is utilized. The dependent variable lagged for two periods is used as an instrument for the lagged dependent variable. Unfortunately, with this procedure 998 firm-year observations are lost[12].

[PLEASE insert Table 8 here]

Table 8 (Panels A and B) presents the results from the pooled time series cross-sectional IV regressions for the three different mesures of debt levels. The measures short-term and long-term debt have problems given that some firms may roll over short-term debt and use it for long-term financing due to lower rates or more flexibility. Also some short-term bank debt is technically short-term debt, but gets renewed each year and is therefore for practical purposes long-term debt. This suggests using the sum of short- and long-term debt as a measure, but parts of short-term debt have nothing to do with capital structure decisions since the amount is determined by working capital requirements. Thus neither the sum of

[12] We also removed the most extreme 0.5% values in either tail of the distribution. This procedure reduced the sample to 6730 observations and 898 firms. However the main results did not change so they are not reported.

long- and short-term debt nor each of them stated separately will provide a good measure of the amount of debt. The alternative measure TOTALLOANS can avoid these problems, being calculated as long-term bank loans plus short-term bank loans plus creditors minus debtors plus other current liabilities over the book value of assets. This is an attempt to remove the impact of working capital requirements from short-term debt. The results for this measure are also presented in Table 8. In terms of explanatory power the R-squared for both short- and long-term bank debt regressions is around 57% whereas for TOTALLOANS the R-squared is around 75% thus providing a significantly better fit.

The model is estimated once for each tax variable, including the control variables, and this generates a total of three regressions for each of the three different measures of debt. The nine regressions are reported in Table 8, as are the target adjustment coefficient and the adjusted R-squared. The control variables used in each regression are: *INTANGIBLE*, *TANGIBLE*, *PROFITABILITY*, *SIZE*, *BUSINESS RISK*, *GROWTH, Z-SCORE*, *INTEREST*, *AGE* and *ROA*. The control variables *DIFFINTEREST*, *INFLATION* and *UNEMPLOYMENT* are left out due to high correlation with *INTEREST*[13].

Tax variable

For the total leverage, TOTALLOANS (Table 8, Panel A), all the tax variables are strongly significant; thus there is evidence of a strong tax effect in the sample with a stronger effect for short-term debt than for long-term debt (Table 8, Panel B). On average a 10% increase in MTREBIT will result in a 6.74% increase in the firm's average debt level. Part of the explanation for this may be that it is easier to adjust the amount of short-term debt; if earnings are high, then the firm increases the amount of short-term debt to take advantage of

[13] The regressions were also run with *INFLATION, DIFFINTEREST* and *UNEMPLOYMENT* instead of *INTEREST*. The results do not differ from the ones with the variable *INTEREST* included and are therefore not reported here. These variables are, however, included in the robustness test at the end of the paper.

the tax shield and if earnings are low, then they reduce the amount of short-term debt since the tax shield has little value.

For long-term bank loans (Table 8, Panel B) KINK and STAND are significant with the predicted signs whereas MTREBIT is not significant. On average the target adjustment coefficient is 20% and the adjusted R-squared is around 57%[14]. As discussed in the Appendix, the estimates of MTREBIT **may** be biased upwards since the estimates of future earnings used to construct MTREBIT may be too high. The high earnings estimates increase the estimates of the marginal tax rate and the statutory tax rate is assigned as the marginal tax for "too many firms". Under "normal circumstances", if an explanatory variable is scaled upwards in a regression, for example changing the measurement from cents to dollars, then the estimate of the parameter will be reduced without affecting the significance of the parameter. However, in this case we may have too high earnings estimates which mean that too many firms are assigned the statutory tax rate as the marginal tax but the statutory tax rate is constant across firms. This reduces the variation in this variable and influences both the parameter estimate as well as reducing the significance level of the variable. As discussed in the Appendix it is not possible to ascertain if the procedure produces biased estimates of earnings or whether the high earnings is due to statistical chance. However, we do know that if it is biased then it will be towards making MTREBIT insignificant.

The results for short-term bank loans differ from the long-term bank loan case. The main difference is with *MTREBIT* which is now statistically significant at the 1% level and has the predicted sign. If scaled by one minus the target adjustment coefficient all else being equal, the results indicate that an increase of 10% in *MTREBIT* will result in a 3.71% increase

[14] Without the lagged dependent variable the adjusted R-squared drops to around 11%, which is in line with results from analogous studies based on panel data and/or first difference specifications e.g. Graham ([1996a], [1998]) and Alworth and Arachi [2001].

in the firm's short-term bank loans ratio. Therefore it appears that an increase in the marginal tax rate will induce firms to increase short-term bank loans to use the tax benefits of debt. Compared to the long-term bank debt, the coefficients on the tax variables are larger, which indicates that tax considerations are more important for short-term debt than for long-term debt. The potential importance of short-term debt in capital structure has been highlighted by Scholes and Wolfson [1988]. They argue (p. 170) that firms facing uncertainly in their tax status might prefer to use short-term debt when their tax rate is high. In this setting, short-term debt will be the least costly and easiest way to adjust debt levels temporarily to a firm's optimum, and the potential cost of retiring outstanding debt in the future is avoided. Therefore a correct measure of debt to capture the tax effects in capital structure should include short-term debt as part of its calculation.

Bankruptcy measures

The primary measures of bankruptcy effects are TANGIBLE, SIZE, BUSINESS RISK ZSCORE and ROA. Except for SIZE these variables are all significant for long-term bank debt with the predicted signs. However, for short-term debt only TANGIBLE and ROA are significant. Thus it appears that bankruptcy considerations are not as important for short-term debt as for long-term debt. For TOTALLOANS (Table 8, Panel A) all the variables, except for SIZE and BUSINESS RISK, are significant but SIZE has the "wrong sign" since it is negative. The evidence points toward bankruptcy and the availability of collateral as important factors in the determination of capital structure for non-listed firms. This is consistent with Frank and Goyal [2004] who demonstrates that collateral availability is one of the most reliable factors in capital structure decisions for US firms. Thus firms that have more collateral tend to have more leverage.

Agency/asymmetric information variables

The agency variables are INTANGIBLE, PROFITABILITY, GROWTH and AGE. If the variable PROFITABILITY has a negative sign, it follows the asymmetric information (pecking order) theory which states that more profitable firms can finance more of their expenditures from internally generated funds. PROFITABLE is positive for long-term loans and negative for short-term loans. However, the coefficients are not statistically significant. For TOTALLOANS the parameter is positive and significant, rejecting the pecking order theory. In Rajan and Zingales [1995] the pecking order theory is supported by a negative significant coefficient for USA, Japan and Canada but it is insignificant for the other countries. The rejection of the pecking order theory in this paper is surprising since the general intuition is that smaller firms (and high-growth firms) operating in a less-developed financial system are more likely to suffer from adverse selection problems than larger listed firms. The firms in this sample are solely financed by bank loans and trade credits whereas the large listed firms used in Rajan and Zingales [1995] raise part of their funding in financial markets. The main difference between bank financing and market financing is that banks monitor the firms continuously, thus reducing the adverse selection problem, but charge a higher interest rate than financial markets. Firms can therefore obtain additional financing from banks much easier than if they have to approach the market where the lenders will first want to perform a credit evaluation (charging a fixed cost but lower interest rates). Thus the Pecking Order theory is more likely to be found in market-financed firms than in bank-financed firms. Since large firms are often market-financed and smaller firms bank-financed, these results are consistent with Frank and Goyal [2003] who find that for US firms the pecking order theory is more likely to be valid for large firms than for smaller firms. The evidence in Rajan and Zingales [1995] is mixed; US and Canada are both market-oriented countries and have a negative, significant coefficient on PROFITABILITY and Germany is

bank-based and has a positive, although insignificant, coefficient on profitability. Japan, which in general is considered a bank-based country, has a negative significant coefficient. However, PROFITABILITY may be a noisy proxy for testing the pecking order theory and an alternative method is to use the methodology developed by Shyam-Sunder and Myers [1999], a task left for future research.

The finding that PROFITABILITY is positive is consistent with the view that these firms have a lower bankruptcy probability and therefore have a higher debt capacity. It is also consistent with the view that debt is used as a bonding mechanism to restrain management from generating large amounts of (free) cash-flows as suggested by Jensen [1986]. However, this sample deals with firms where managers and owners are often the same persons reducing the need for a mechanism to restrain the activities of managers.

GROWTH is positive and significant for all three debt definitions, which rejects the underinvestment theory by Myers [1977]. Finally INTANGIBLE is only significant for short-term loans with a negative sign and AGE is not significant at all.

Thus the agency-based measures from the balance sheet are not significant determinants of the capital structure of smaller non-listed firms. But this is not the same as saying that they are not important *ex-ante,* only that we do not observe the implications of these factors *ex-post* on the balance sheet. Before the loan is issued, these smaller non-listed firms are more prone to agency and asymmetric information problems compared to the large listed firms in the G7 countries. If the solution to these problems were the same for non-listed and listed firms, then we would observe the same implications on the balance sheet, but the argument put forward here is that banks solve these problems differently to financial markets.

The solution used by financial markets for large listed firms is based on restricting the amount of debt and debt covenants, i.e. these solutions will appear on the balance sheet primarily in the form of a correlation between measures of agency problems and the amount of debt. Financial institutions, on the other hand, solve these problems primarily off the balance sheet by continuous monitoring and the threat of renegotiation/withdrawal of the debt contract if problems arise. Thus the lack of significance of the "agency variables" does not imply that agency and asymmetric information problems are not important but merely that it may not be possible to test for agency problems based on balance sheet data for smaller bank-financed non-listed firms.

4.2 Robustness of tax results

By definition we know that debt ratios are censored below zero and above one. We have therefore re-estimated the model using a Tobit regression with double censoring. The results are similar to those reported in Table 8 and are therefore not reported separately. Also the analysis has been repeated for firms with strictly positive debt, again without qualitative differences, and several tests for parameter stability over time have been undertaken.

As a final robustness check we apply the so-called "global sensitivity analysis" advocated by Leamer [1985]. The analysis undertaken above has several problems: (1) it involves running a large number of regressions and there is always the risk that the results reported are outliers chosen because of the significance of the focus variable (here the tax variables). (2) The results may be driven by outliers where the significance of the tax variables is driven by one industry or a few firms and therefore the results are not generally applicable. (3) The proxies for the tax variables may capture other effects that are not related

to the tax effect. To analyze whether these problems have an influence on the results reported in the paper, we estimated the model for each tax variable dropping one of the control variables at a time, making a loop of 10 regressions as well as adding control variables not included in Table 8 but used in earlier regressions. For each of these loops first one industry at a time was dropped, then one firm at a time and in the end all the observations from one year were dropped. Finally the whole procedure was repeated without industry dummies leading to slightly more than 14000 regressions. The resulting parameter estimates and t-statistics are presented in Figure 3 for the MTREBIT variable. The results for the other tax variables are similar to the results for the MTREBIT variable.

[PLEASE insert Figure 3 here]

As seen from Figure 3, the results reported in Table 8 are close to the mean taken over the 14000 regressions. Thus the result reported is not dependent on a specific specification of the model in terms of which variables, firms or industries that are included in the sample.

Conclusions

The purpose of this paper was twofold: first to test for an impact of the debt tax shield on the capital structure choice of small non-listed firms and second to test whether the factors determining the capital structure of large listed firms are also relevant for small non-listed firms. The existing literature has primarily focused on testing various determinants of capital structure using listed firms that are large in their respective countries. The sources of capital differ between these two types of firms. Large listed firms have access to domestic as well as international financial markets whereas small non-listed firms are primarily financed using owner provided equity and debt financing from financial institutions. Finally asymmetric information and agency problems also differ between these two types of firms. Considering

these differences, the question therefore remains whether the same factors are responsible for the capital structure choice in these two types of firms. First, we found that there is a significant debt tax shield impact on the capital structure choice for small non-listed firms. Second, we found that the traditional variables used to model agency problems were generally not significant for small non-listed firms except for the variables used to model bankruptcy risk (collateral). We attributed this result to the fact that banks have an *ex-post* credible threat of withdrawing funds and increasing interest rates in cases where firms exploit moral hazard/agency problems whereas financial markets restrict the amount of debt and increase interest rates *ex-ante* to control for agency/moral hazard problems. Thus in studies of capital structure one is more likely to find significant effects of proxies for agency problems that are based on balance sheet variables for large firms than for small non-listed firms. This, of course, does not mean that agency problems and asymmetric information do not course problems for small non-listed firm, only that the solution to these problems differs between these two types of firms. Considering that one of the primary functions of banks is to solve asymmetric information and agency problems, another interpretation of the results in this paper is that Portuguese banks are indeed able to do this.

Appendix

Estimation of the marginal tax rate

In order to avoid spurious correlations the marginal tax rate is calculated prior to the capital structure decision. Consider the case of two firms with identical earnings distributions: one with debt and one without debt in the capital structure. If the firm with debt faces losses and the firm without debt has positive earnings, then the marginal tax is lower for the firm with debt due to carry-forward, whereas for the firm without debt the marginal tax rate is higher, thus producing a negative correlation between the *ex-post* marginal tax rates and debt. To minimize this problem, income after depreciations, but before interest, is used for calculating the marginal tax rates before the financing decision is taken.

Two different methodologies are used to estimate expected future income. The first method follows Shevlin [1990], used by Graham ([1998], [2000]), and is based on the assumption that pre-tax income follows a random walk with drift:

$$\Delta I_{it} = \mu_i + \varepsilon_{it} \quad (4)$$

where ΔI_{it} is the first difference in pre-tax income of firm i in year t, μ_i is the drift estimated as the sample mean of ΔI_{it} and ε_{it} is a normally distributed random variable with mean zero and variance equal to that of ΔI_{it} over the sample years[15].

In the second method used for forecasting taxable income each firm's expected future income is given by its earnings before interest and taxes (EBIT) and is estimated in the following way: first the sample is divided into six industry sectors (defined previously). For

[15] For more details see Graham [2000].

the n_3 firms with four years of consecutive data in sector "i" the following model is estimate for each year "t";

$$\frac{\text{EBIT}_{i,j,t}}{\text{SALES}_{i,j,t}} = \alpha_i + \beta_{i,1} \frac{\text{EBIT}_{i,j,t-1}}{\text{SALES}_{i,j,t}} + \beta_{i,2} \frac{\text{EBIT}_{i,j,t-2}}{\text{SALES}_{i,j,t}} + \beta_{i,3} \frac{\text{EBIT}_{i,j,t-3}}{\text{SALES}_{i,j,t}} + \varepsilon_{i,j,t} \quad for\ j = 1, n_3 \quad (4a).$$

However, not all firms have four years of consecutive data available and in order to include these firms in the sample the following models are also estimated:

$$\frac{\text{EBIT}_{i,j,t}}{\text{SALES}_{i,j,t}} = \alpha_i + \beta_{i,1} \frac{\text{EBIT}_{i,j,t-1}}{\text{SALES}_{i,j,t}} + \beta_{i,2} \frac{\text{EBIT}_{i,j,t-2}}{\text{SALES}_{i,j,t}} + \varepsilon_{i,j,t} \quad for\ j = 1, n_2 \quad (4b)$$

$$\frac{\text{EBIT}_{i,j,t}}{\text{SALES}_{i,j,t}} = \alpha_i + \beta_{i,1} \frac{\text{EBIT}_{i,j,t-1}}{\text{SALES}_{i,j,t}} + \varepsilon_{i,j,t} \quad for\ j = 1, n_1 \quad (4c)^{16}.$$

The next step is to simulate at set of earnings forecasts for the next five or six years for each company. If the firm has four years of consecutive data available, then model 4a is used and if it has three years of data, then model 4b is used and so forth. The forecast for t+1 is generated by:

$$\frac{\text{EBIT}_{i,j,t+1}}{\text{SALES}_{i,j,t}} = \alpha_{i,t} + \beta_{i,t,1} \frac{\text{EBIT}_{i,j,t}}{\text{SALES}_{i,j,t}} + \beta_{i,t,2} \frac{\text{EBIT}_{i,j,t-1}}{\text{SALES}_{i,j,t}} + \beta_{i,t,3} \frac{\text{EBIT}_{i,j,t-2}}{\text{SALES}_{i,j,t}} + e_{i,t} \quad for\ j = 1, n_3$$

where e is a random draw with mean 0 and using the variance of the error term for the individual firms from the estimation of equations 4a-4c. The forecast for "t+1" is then used to generate a forecast for year "t+2" and so forth.

In order to test the efficiency of the above forecast procedure vis-à-vis the one used by Graham [1998, 2000], the following model is estimated:

$$\frac{\text{Real}_{j,t,f}}{Sales_{j,t}} = \alpha_t + \beta_t \frac{Forecast_{j,t,f}}{Sales_{j,t}} + \varepsilon_{j,t,f} \quad for\ f = 1,..,5 \quad (5)$$

[16] Notice that $n_1 > n_2 > n_3$. Thus the firms with four years of consecutive data are also used to estimate the model (4b) and 4(c).

where $Real_{j,t,f}/Sales_{it}$ is the known EBIT at time t+f divided by sales for firm j, $Forecast_{i,f\,t}$ is earnings forecast "f" years ahead made at time "t". All variables are scaled by total sales at time "t". An unbiased forecast requires β_1 to be one and the constant term zero. To undertake this test, a sample of firms with EBIT available for at least nine consecutive years is selected: four years to estimate the coefficients and five years of forecasts in the future to compare the estimated results with those that the firm actually obtained.

[PLEASE insert Table A1 here]

As seen from Table A1 neither approach provides good forecasts since β is below one in general, but the constant term is not significant. The forecasts are therefore too large compared to the actual numbers over the period. Notice that the periods are overlapping and that the results should therefore be interpreted with care, i.e. they do not constitute a statistical test of the forecast ability of the models. In particular it is not clear whether these results indicate a systematic bias or are just specific to the present period. However, the method used in this paper performs slightly better than the method used by Graham ([1998], [2000]). For one-, two-, three- and four-year forecasts the method in this paper outperforms Graham's method since β is closer to one whereas it performs slightly worse for the five-year forecasts.

Under Portuguese tax rules with no tax loss carry-backs a firm with positive income has a marginal tax rate equal to the statutory tax rate. For a firm with negative income the marginal tax rate is below the statutory rate due to the availability of tax loss carry-forwards. If the firm has negative taxable income, then an additional unit of income reduces the losses that can be carried forward and used to offset taxable income in future years, thus increasing future taxes. If the losses carried forward fully offset positive income the next year, year 1,

then an additional unit of income at year 0 is fully taxed in year 2 (provided that tax losses carried forward do not fully offset the positive income in year 2). Thus the marginal tax rate in year 0 of an additional unit of income is the statutory tax rate discounted for two periods and therefore smaller than the statutory tax rate at time 0. If the firm is not able to generate positive income in the subsequent five or six years to offset the losses carried forward, then it is assumed that the marginal tax rate is zero[17]. Briefly, the marginal tax rate for a given firm in a given year is estimated by first estimating the expected income by simulation of equation (4a-c) for the next five or six years. For each simulation, taxes and tax loss carry-forwards are calculated for each year. Next, the net present value of the expected taxes over the next five or six years is calculated. Then one unit of income is added to the reference year and the present value of the tax bill is recalculated (always taking into account the loss carry-forward provisions). Taking the difference between these two present values and calculating the average over the simulations provide an estimate of the marginal tax rate.

[17] Before 1996 the tax loss carry-forward provision was five years and six years after 1996. During the period covered by the sample the statutory tax rate changed twice from 36 to 34% (1997) and from 34 to 32% (2000).

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Table 1: The Structure of Panel Data

The panel data set is unbalanced as there are more observations for some firms than for others.
The table shows the number of observations by year and industry type. The industry type classes are: Class 1: food and drinks; Class 2: textiles and clothes; Class 3: wood and paper paste; Class 4: chemical products; Class 5: heavy industry and Class 6: machinery production and equipment.

Number of Observations by Year and Industry Type

Years	OBSERVATIONS						
	Industry 1	**Industry 2**	**Industry 3**	**Industry 4**	**Industry 5**	**Industry 6**	**TOTAL**
1990	83	168	44	97	35	96	523
1991	94	216	51	105	40	111	617
1992	104	243	58	115	44	121	685
1993	111	276	65	125	49	135	761
1994	111	281	65	125	55	141	778
1995	113	284	71	132	55	137	792
1996	113	275	72	134	56	138	788
1997	116	282	67	132	63	133	793
1998	112	262	64	124	59	128	749
1999	99	235	61	114	57	116	682
2000	83	199	51	102	56	106	597
TOTAL	1139	2721	669	1305	569	1362	7765

Table 2: Balance Sheets

Average Balance Sheets Item as a Fraction of Total Assets

	1990	1992	1994	1996	1998	2000
Number of Observations	523	685	778	788	749	597
Assets						
Fixed Assets	**0.52**	**0.53**	**0.54**	**0.50**	**0.51**	**0.47**
Intangible Assets	0.01	0.01	0.04	0.04	0.03	0.02
Tangible Assets	0.43	0.42	0.40	0.37	0.39	0.34
Investments	0.08	0.10	0.10	0.09	0.09	0.11
Current Assets	**0,48**	**0.47**	**0.46**	**0.50**	**0.49**	**0.52**
Stocks (Liquidity)	0.02	0.01	0.01	0.02	0.01	0.01
Debtors	0.24	0.24	0.26	0.29	0.26	0.30
Inventories	0.19	0.17	0.15	0.14	0.15	0.16
Cash and Cash Equivalents	0.02	0.03	0.03	0.04	0.06	0.04
Prepaid Expenses	0.01	0.02	0.01	0.01	0.01	0.01

	1990	1992	1994	1996	1998	2000
Number of Observations	523	685	778	788	749	597
Shareholders's Funds and Liabilities						
Shareholders's Funds	**0.49**	**0.47**	**0.46**	**0.48**	**0.49**	**0.46**
Capital	0.22	0.21	0.25	0.25	0.24	0.20
Reserves	0.23	0.25	0.19	0.21	0.22	0.21
Net Income of the Year	0.04	0.01	0.02	0.02	0.03	0.05
Provisions	**0.02**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
Liabilities	**0.49**	**0.52**	**0.53**	**0.51**	**0.50**	**0.53**
Non-Current Liabilities	0.16	0.15	0.14	0.15	0.13	0.13
Long-Term Debt	0.13	0.12	0.09	0.11	0.09	0.10
Bank Loans	0.10	0.10	0.07	0.09	0.08	0.09
Other	0.03	0.02	0.02	0.02	0.01	0.01
Other Non-Current Liabilities	0.03	0.03	0.05	0.04	0.04	0.03
Current Liabilities	0.33	0.37	0.39	0.36	0.37	0.40
Loans	0.10	0.13	0.12	0.08	0.08	0.09
Bank Loans	0.10	0.13	0.12	0.08	0.08	0.09
Others	<0.01	<0.01	<0.01	<0.01	<0.01	0.00
Creditors	0.10	0.10	0.12	0.12	0.12	0.14
Other Current Liabilities (Incl. Shareholder's)	0.09	0.09	0.09	0.09	0.10	0.10
Accrued Expenses	0.04	0.05	0.06	0.07	0.07	0.07

Table 3: Percentage of Firm-Year Observations with Debt in their Capital Structure

	Long Term	Short Term	Short and/or Long Term
BANK LOANS (Whole Sample, 7765 obs)	54.26	76.32	81.88
BANK LOANS (Small Firms Sample, 1308 obs)	48.85	72.78	80.20
BANK LOANS (Large Firms Sample, 1721 obs)	57.47	79.78	82.50

Figure 1: Before-Financing Marginal Tax Rates (*MTREBIT*)

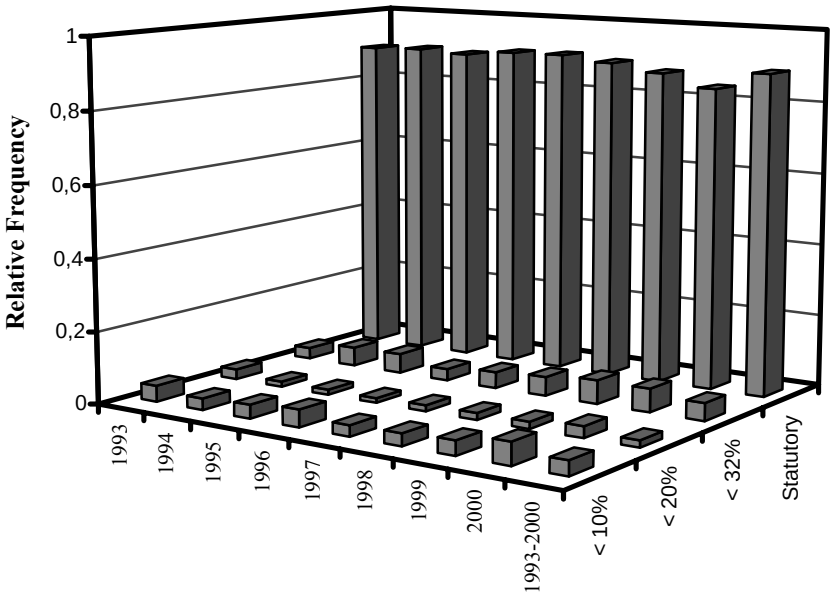

Figure 2: Marginal Tax Benefit and Kink

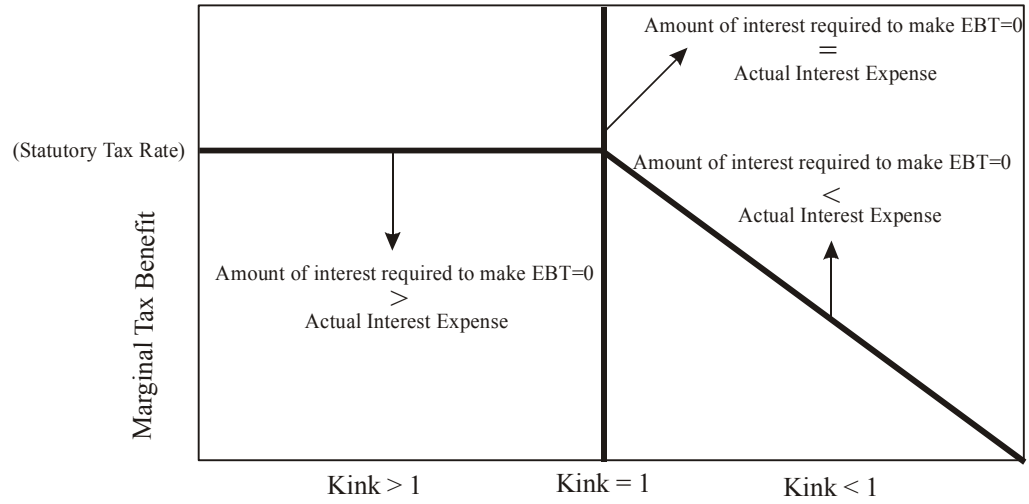

Table 4: Tax Variables and Debt Levels

Tax Variables	Expected Relationship with Debt Levels	Authors
▪ MARGINAL TAX RATE	POSITIVE	Graham et al.[1998], Alworth and Arachi [2001]
▪ KINK	NEGATIVE	Graham [2000]
▪ STANDARDIZED KINK	POSITIVE	Graham [2000]

Table 5: Agency, Asymmetric Information and Bankruptcy Variables and Debt Levels

Control Variables	Bankruptcy	Agency theory	Adverse selection	Authors
INTANGIBLE	-	-	-	Titman and Wessels [1988], Giannetti [2003]
TANGIBLE	?	+	+	Titman and Wessels [1988], Rajan and Zingales [1995] Shum [1996], Graham ([1996a], [1998]), Shyam-Sunder and Myers [1999], Gordon and Lee [2001], Booth et al. [2001], Giannetti [2003]
PROFITABILITY	+	+	-	Titman and Wessels [1988], Rajan and Zingales [1995], Shyam-Sunder and Myers [1999], Bevan and Danbolt [2002]
ROA	+	+	-	Giannetti [2003]
SIZE	+	+	+	Titman and Wessels [1988], Rajan and Zingales [1995], Graham ([1996a],[1998]), Alworth and Arachi [2001], Booth et al. [2001], Bevan and Danbolt [2002], Giannetti [2003]
BUSINESS RISK	-			Bradley et al. [1984], Titman and Wessels [1988], Bartholdy [1989], Shum [1996], Booth et al. [2001], Giannetti [2003]
GROWTH	+	-	-	Titman and Wessels [1988], Bartholdy [1989]
Z-SCORE: BANKRUPTCY PROBABILITY	-			Mackie-Mason [1990], Graham ([1996a],[1998]), Alworth and Arachi [2001]
AGE		+	+	Diamond [1991], Giannetti [2003]
Macro economic variables common to all three theories				
NOMINAL INTEREST RATE		-		
INTEREST RATE SPREAD		NEGATIVE (Short Term) POSITIVE (Long Term)		
INFLATION RATE		-		Bartholdy [1989], Booth et al. [2001]
UNEMPLOYMENT RATE		-		

Table 6: Summary Statistics

The sample consists of 7,765 observations for firms from the Bank of Portugal Statistical Department's database with CAE codes between 15000 and 36000 over the period 1990 through 2000. Total Assets is the book value of total assets. *LONGBANKLOANS* is the book value of total long-term bank loans over book value of total assets. *SHORTBANKLOANS* is the book value of total short-term bank loans over book value of total assets. *BANKLOANS* is the book value of both total short- and long-term bank debt over total assets. *TOTALLOANS* is defined as long-term bank loans plus short-term bank loans plus creditors minus debtors plus other current liabilities over the book value of assets. *MTREBIT* is the before-financing marginal tax rates simulated based on income after depreciation but before interest expenses are deducted. *KINK* is defined as the ratio of the amount of total interests required to make the tax function slope downward and the actual interest expenses. *STAND* is calculated as total interest times kink divided by the standard deviation of earnings before interest and taxes. *INTANGIBLE* is the book value of intangible assets divided by total assets. *TANGIBLE* is the book value of tangible assets divided by total assets. *PROFITABILITY* is the earnings before interest and taxes divided by the total assets. *SIZE* is the natural logarithm of total assets. *BUSINESS RISK* is the standard deviation of return on assets by firm. *GROWTH* is calculated as the percentage change in total assets. *ZSCORE* is a modified version of Altman's (1968) Z-Score. *INTEREST* is the three-month risk-free interest rate. *DIFFINTEREST* is the difference between long-term and short-term interest rates. *INFLATION* is the annual inflation rate. *UNEMPLOYMENT* is the annual unemployment rate. *AGE* is the natural logarithm of the number of years from the date of incorporation of the firm. *ROA* (return on assets) is defined as earnings after taxes and interests over total assets.

Panel A: Debt Levels

Variable	Mean	Median	Std Deviation	Min	Max
LONGBANKLOANS	0.0704	0.0148	0.1009	0.0000	0.8160
SHORTBANKLOANS	0.1023	0.0667	0.1121	0.0000	0.6891
BANKLOANS	0.1727	0.1522	0.1515	0.0000	0.9305
TOTALLOANS	0.1440	0.1420	0.2191	-0.8867	0.9459

Panel B: Tax Variables

Variable	Mean	Median	Std Deviation	Min	Max
MTREBIT	0.3383	0.3600	0.0618	0.0000	0.3600
KINK	3.3290	1.7689	3.0636	0.0000	8.0000
STAND	1.5550	0.9650	2.0154	0.0000	30.289

Panel C: Agency, Asymmetric Information and Bankruptcy Variables

Variable	Mean	Median	Std Deviation	Min	Max
INTANGIBLE	0.0113	0.0017	0.0361	0.0000	0.6266
TANGIBLE	0.3918	0.3826	0.1754	0.0023	0.9699
PROFITABILITY	0.3490	0.2978	0.2658	-0.5224	4.6165
SIZE	6.3052	6.2649	0.5529	4.5547	8.5109
BUSINESS RISK	0.0436	0.0349	0.0375	0.0003	0.4890
GROWTH	0.1081	0.0552	0.5639	-0.9911	2.2482
ZSCORE	1.5826	1.4617	0.9751	-1.7582	1.2537
INTEREST	0.0848	0.0726	0.0425	0.0304	0.1634
DIFFINTEREST	-0.0029	-0.0070	0.0171	-0.0174	0.0374
INFLATION	0.0540	0.0410	0.0348	0.0220	0.1340
UNEMPLOYMENT	0.0622	0.0650	0.0143	0.0380	0.0830
AGE	1.3439	1.3802	0.3614	0.0000	2.3856
ROA	0.0197	0.0125	0.0738	-1.1367	1.3484

Table 7: Correlation Matrix for Tax, Agency, Asymmetric Information and Bankruptcy Variables

	MTREBIT	*KINK*	*STAND*	*INTANGIBLE*	*TANGIBLE*	*PROFITABILITY*	*SIZE*	*BUSINESS RISK*	*GROWTH*	*ZSCORE*	*INTEREST*	*AGE*	*ROA*
MTREBIT	1.000												
KINK	0.160	1.000											
STAND	0.160	-0.137	1.000										
INTANGIBLE	-0.063	-0.067	0.033	1.000									
TANGIBLE	-0.130	-0.182	-0.034	-0.075	1.000								
PROFITABILITY	0.146	0.299	0.032	-0.046	-0.084	1.000							
SIZE	-0.037	0.126	-0.035	0.160	-0.114	-0.157	1.000						
BUSINESS RISK	-0.234	0.075	-0.425	0.019	0.050	0.091	-0.032	1.000					
GROWTH	0.075	0.064	0.062	0.045	-0.052	-0.039	0.081	-0.055	1.000				
ZSCORE	0.207	0.477	-0.033	-0.118	-0.291	0.593	-0.154	0.084	-0.021	1.000			
INTEREST	0.179	-0.173	0.023	-0.061	0.013	0.026	-0.124	0.035	0.029	-0.007	1.000		
AGE	-0.055	-0.012	-0.011	-0.002	-0.054	-0.118	0.191	-0.037	-0.045	-0.119	-0.030	1.000	
ROA	0.241	0.0653	0.066	-0.054	-0.182	0.381	0.121	0.020	0.116	0.608	-0.065	-0.028	1.000

Table 8: Instrumental Variables (IV) Regressions

The sample consists of 7765 firm-year observations over the period 1990 through 2000. The following regression is estimated: $D_{i\,t} = \gamma\,\alpha + \gamma\,\beta_{TAX}\,TAX + \gamma\,\beta_Z\,Z_{it} + (1-\gamma)\,D_{i\,t-1} + e_{i\,t}$. $D_{i\,t}$ is the debt level of firm i in year t. α is the constant term. γ is the target adjustment coefficient. TAX refers to taxation proxies that account for the effect of corporate taxes on capital structure (previously defined). Z_{it} is a vector of predetermined control variables used in past studies of capital structure, such as: collateral, profitability, size, business risk, growth, bankruptcy, nominal interest rate, interest rate spread, inflation rate, unemployment rate, age, return on assets. $D_{i\,t-1}$ is the debt level of firm i in year t – 1. e_{it} is the error term. White's heteroskedasticity-consistent standard errors and covariance are used. t-statistics are in parenthesis. Superscript * indicates statistical significance at 0.01(*), 0.05 (**) and 0.10 (***) percent levels. Two-stage least square estimation procedure is used. Industry dummy variables were included in the regressions but the coefficients are not reported.

Panel A
Dependent Variable: *TOTALLOANS*

	TOTALLOANS		
Tax Variables	MTREBIT	KINK	STAND
	0.647*	-0.025*	0.011**
	(2.774)	(-3.819)	(2.167)
Control Variables			
BANKLOANS $_{(t-1)}$	0.847*	0.824*	0.839*
	(73.196)	(64.441)	(69.861)
INTANGIBLE	0.199	0.011	0.038
	(0.581)	(0.037)	(0.119)
TANGIBLE	0.309*	0.240*	0.263*
	(3.988)	(3.672)	(3.605)
PROFITABILITY	0.086	0.111**	0.100***
	(1.494)	(2.218)	(1.829)
SIZE	-0.034	-0.020	-0.029
	(-1.502)	(-1.037)	(-1.390)
BUSINESS RISK	-0.172	-0.182	-0.066
	(-0.310)	(-0.436)	(-0.125)
GROWTH	0.580*	0.521*	0.561*
	(5.123)	(5.296)	(5.234)
ZSCORE	-0.097*	-0.074*	-0.089*
	(-4.476)	(-4.276)	(-4.496)
INTEREST	-1.115*	-1.101*	-0.964
	(-4.704)	(-5.358)	(-4.502)
AGE	0.042	0.038	0.043
	(1.209)	(1.295)	(1.318)
ROA	-2.066*	-1.416*	-2.101*
	(-5.139)	(-3.703)	(-5.864)
Constant	0.194	0.384**	0.350**
	(0.964)	(2.513)	(2.033)
Target Adjustment Coefficient	0.153	0.176	0.161
Adjusted R-Squared	0.748	0.749	0.746

Panel B
Dependent Variables: *LONGBANKLOANS* and *SHORTBANKLOANS*

	LONGBANKLOANS			***SHORTBANKLOANS***		
Tax Variables	MTREBIT	KINK	STAND	MTREBIT	KINK	STAND
	-0.094	-0.010*	0.010*	0.371*	-0.015*	0.011*
	(-1.019)	(-5.350)	(3.513)	(3.474)	(-6.417)	(2.607)
Control Variables						
BANK LOANS $_{(t-1)}$	0.809*	0.793*	0.802*	0.830*	0.800*	0.815*
	(50.247)	(47.165)	(49.559)	(45.767)	(41.427)	(41.846)
INTANGIBLE	0.153	0.079	0.089	-0.324	-0.344**	-0.338**
	(0.750)	(0.432)	(0.461)	(-1.896)	(-2.467)	(-2.224)
TANGIBLE	0.059***	0.056***	0.064**	-0.131*	-0.139*	-0.129*
	(1.783)	(1.895)	(2.080)	(-3.322)	(-4.269)	(-3.622)
PROFITABILITY	0.009	0.006	-0.002	-0.040	-0.022	-0.034
	(0.453)	(0.312)	(-0.114)	(-1.456)	(-0.994)	(-1.371)
SIZE	0.012	0.018**	0.016	0.004	0.007	0.003
	(1.217)	(2.043)	(1.762)	(0.310)	(0.704)	(0.277)
BUSINESS RISK	-0.488*	-0.346*	-0.197	-0.082	-0.190	-0.043
	(-3.747)	(-3.295)	(-1.614)	(-0.371)	(-1.255)	(-0.217)
GROWTH	0.183*	0.161*	0.165*	0.184*	0.160*	0.169*
	(3.739)	(3.725)	(3.670)	(3.865)	(4.091)	(4.006)
ZSCORE	-0.026*	-0.022*	-0.026*	0.002	0.009	0.004
	(-4.333)	(-3.921)	(-4.463)	(0.161)	(1.037)	(0.403)
INTEREST	-0.237**	-0.370*	-0.304*	-0.407*	-0.384*	-0.281**
	(-2.007)	(-3.518)	(2.829)	(-2.698)	(-3.093)	(-2.114)
AGE	-0.007	-0.001	-0.001	0.014	0.016	0.017
	(-0.451)	(-0.076)	(-0.076)	(0.716)	(0.981)	(0.980)
ROA	-0.151***	0.064	-0.162**	-0.986*	-0.512*	-0.896*
	(-1.918)	(0.827)	(-2.174)	(-5.962)	(-4.055)	(-6.437)
Constant	0.095	0.045	0.006	0.093	0.220*	0.177**
	(1.174)	(0.675)	(0.088)	(0.877)	(2.693)	(1.991)
Target Adjustment Coefficient	0.191	0.207	0.198	0.170	0.200	0.185
Adjusted R-Squared	0.569	0.577	0.574	0.583	0.583	0.578

Figure 3: Leamer Histograms

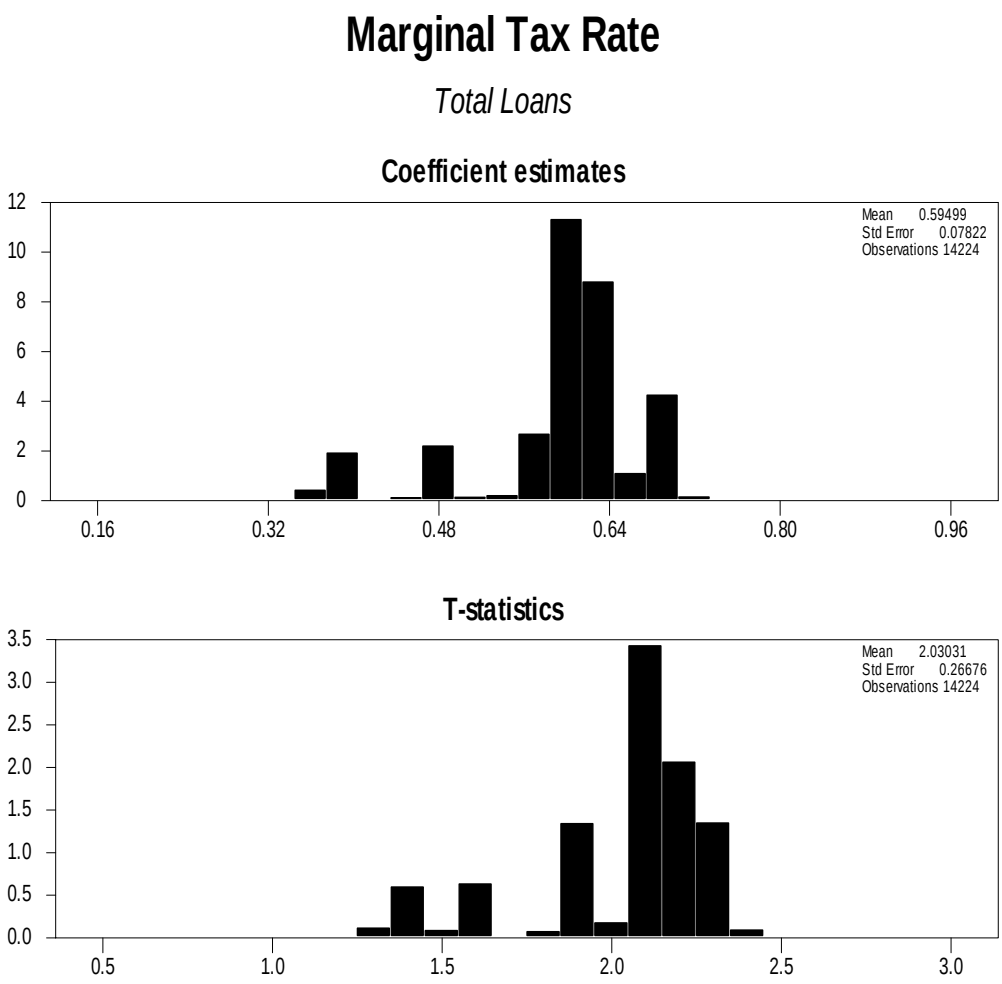

Table A1: Earnings Forecast vs. Real Earnings

The following model is used to test the properties of the forecasted earnings from one to five years ahead:

$$\frac{\text{Real}_{\text{j,t,f}}}{Sales_{\text{j,t}}} = \alpha_t + \beta_t \frac{Forecast_{j,t,f}}{Sales_{j,t}} + \varepsilon_{j,t,f} \quad for\ f = 1,..,5 \quad (5)$$

where $Real_{j,t,f}/Sales_{it}$ is the known EBIT at time t+f, divided by sales for firm j and $Forecast_{i,f,\ t}$ is earnings forecast "f" years ahead made at time "t". The sample consists of firms with nine years of consecutive data, four years for estimation and five years of forecasts. Three periods are used: 1990-1998, 1991-1999 and 1992-2000. The sample consists on 1072 nine-year periods. Superscript * indicate statistical significance at 0.01(*), 0.05 (**) and 0.10 (***) percent levels.

	Forecast method			
	Present paper		**Graham [1998,2000]**	
	α	**β**	**A**	**β**
One year forecast	0.0168***	0.7005*	0.0182**	0.6125*
	(1.7261)	(4.2996)	(2.0585)	(4.7136)
Two year forecast	0.0154**	0.7403*	0.0141***	0.5869*
	(1.6471)	(4.4418)	(1.6104)	(4.9489)
Three year forecast	0.0327*	0.5374*	0.0248*	0.3697*
	(6.9634)	(5.0406)	(2.6055)	(2.7823)
Four year forecast	0.0399*	0.2844*	0.0382*	0.2029*
	(6.2000)	(2.4548)	(5.8019)	(2.4924)
Five year forecast	0.0323*	0.3819*	0.0142**	0.4374*
	(5.9666)	(3.5447)	(2.2592)	(5.8114)
Forecasts for all five years	0.0280*	0.5278*	0.0243*	0.3970*
	(8.4013)	(8.2638)	(5.0373)	(5.8281)

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