Taxes and Corporate Debt Policy : Evidence for unlisted firms of sixteen European Countries

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ABSTRACT

This paper investigates the capital structure choices for a sample of 19,752 unlisted firms for the period 1994- 2004 using a rich data set of unlisted Western European firms. To the best of my knowledge, this is the first large sample study to examine how firm's characteristics and institutional factors affect corporate debt policy for both SMEs and large unlisted european 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. The empirical results support three main findings. First, there is a significant debt tax shield impact on the capital structure choice for non-listed firms. Second, the traditional variables used to model bankruptcy risk (collateral), agency problems and ownership structure were generally significant for unlisted firms. Third, institutional factors such as country legal system have an important impact on the capital structure for both SMEs and large unlisted firms.

Keywords: Capital Structure, Debt, Trade-off Theory, Western Europe

JEL classification codes: G3, G32

Preliminary Version: January, 10, 2006

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1 Introduction

Can the existing knowledge regarding the determinants of firm's capital structure choices with frictions such as tax advantage of debt, bankruptcy, agency/asymmetric information and institutional charateristics of national financial systems be used to describe the SMEs behaviour? Or are these firms so different that we have to build a new theory to be applied to them?

Since the seminal work of Modigliani and Miller [1958] several authors have attempted to explain the determinants of firm's capital structure choices in a national and international sceneries introducing the mentioned frictions. However the ongoing research regarding capital structure financing choices derives from large listed firms and very little it is known about the relative importance of equity, debt and inter-financing for SMEs, especially in an international setting. These firms differs from large listed ones regarding agency and asymmetric information problems and this gives rise to different finance sources for small-medium sized and to large listed firms. [1] An international setting study regarding small-medium sized firms is much more important then those carried out for large listed firms. SMEs tend to operate locally and are financed by local financial institutions while large listed firms are often partly financed by international financial markets being not clear whether the use of large firms samples across countries is a good test for the factors determinining the capital structure.

Most of the research comes from single country analysis. However there are some few studies who focus on international samples to test capital structure models as it is the case of Rajan and Zingales (1995), Wald (1999), Booth et al (2001) and more recently Aggarwal and Jamdee (2003) and Gaud et al (2005). However all of these studies focus on large listed firms. In Rajan and Zingales (1995) the sample was from large listed firms for the G7 countries. They found that the determinants of capital structure in US are the same for the other countries. They also find that debt levels do not differ among bank-oriented countries and market-oriented ones. Wald (1999), with a sample for G5 countries find that the mean leverage among countries appear to be similar. However he highlights that some of the differences can occur because of the differences in tax policies, agency problems, information asymmetries and shareholder/creditors conflicts. Booth et al (2001), find for 10 developing countries that

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[1] For a discussion of differences between small-medium sized and large listed firms see Bartholdy and Mateus [2005]

capital structure choices are affected by the same variables as in developed countries. Aggarwal and Jamdee (2003), using the same sample as Rajan and Zingales (1995) but with more recent data found that the overall leverage in 2001 is lower than in 1991 and the determinants of capital structure in US lose some of the explanatory power overseas. Finally and more recently Gaud et al (2005) using a sample of listed provide evidence that neither the trade-off or pecking order model offer a suitable description of the capital structure policies in Europe. They also document that the national environment do matter for capital structure decisions.

In this paper a traditional trade-off model in the form of a target adjustment model is estimated for a sample of 19,752 unlisted european firms from sixteen countries in the period 1994 to 2004 (155,401 firm-year observations). According to this model the objective of the firm is to find an optimal capital structure where the marginal benefits from debt shall be equal to their marginal costs.

This paper as three main objectives: First to test the impact of the debt tax shield on the capital structure choices for unlisted SMEs. Second to test whether the same factors determining the capital structure of large listed firms also apply for small-medium sized firms. Third, if institutional factors such as country legal system have an important impact on firm's capital structure.

The remainder of the paper proceeds as follows. In section 2 the data sources, sample selection and financial information are presented. In section 3 the target adjustment model used to test for tax effects and the variables used in the empirical analysis are discussed. The empirical analysis results are presented in section 4 and section 5 concludes.

2 Data Sources, Sample Selection and Financial information

2.1. Data Sources and Sample Selection

The primary financial data is from the 2004 version of Amadeus (Analyse Major Database from European Sources) database by Bureau Van Dijk. Amadeus is a comprehensive pan-European database containing financial information on 7 million both public and private firms in 38 European countries combining data from 35 information providers (IPs). The information is provided in a comparable and uniform format for realistic cross-border searching and analysis. The format comprises 23 balance sheet items, 25 profit and loss account items and 26 standard ratios. Amadeus is a modular product being possible to choose the level of coverage required – the top 250,000 firms, the top 1.5 million or all firms. In this study the top 250,000 firms is used. The data is provided in consolidated balance sheets (if available) and unconsolidated ones otherwise. Several selection criteria were imposed for inclusion in the sample. First, countries from Eastern Europe are excluded and from Western Europe only the ones that are part of OECD are included. With this procedure the sample was reduced to 187,365 firms from sixteen OECD European countries allowing provide a new analysis of the general financing patterns of private firms across a large sample of Western European countries. The sixteen countries in alphabetic order are: Austria, Belgium, Denmark, Finland, France, Greece, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

The economic data is from Datastream database which contains a vast number of economic data. The data series are supplied by various sources such as IMF, OECD and EUROSTAT amongst others. Information on stocks and bonds is often supplied by national stock exchanges, interest rates might be supplied by larger banks and exchange rate information often comes from national sources or news agencies like WM/Reuters.

[PLEASE insert Table 1 here]

Table 1 shows the number of firms of the sixteen countries with the successive steps presented in 8 different columns. The first column presents the total number of firms that Amadeus database provides to these countries without any restriction (187,365 firms). In column 2 only the firms that belongs to the manufacturing sector

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were included. I follow the NACE Rev. 1.1, a 2 to 4 digit activity code developed by the European Union (codes 1500 to 3799). The number of firms was reduced to one fourth. The largest reductions were of Denmark, Ireland and Netherlands with the exclusion of more than 85 percent of the firms. On the opposite side there are countries such as Austria, Germany and Greece with a loss less than 70 percent. Firms with less than 25 employees (column 3) in the last year of firm's available information were also excluded. For the firms with no available information Amadeus estimates automatically the number of employees using the known turnover and total assets from firms of the same sector and country. Belgium and Norway were the countries with the highest reduction in the number of firms (more than 10 percent). In the next step (column 4) I only include limited firms such as Aktien Gesellschaften (AG, Germany), Sociétés anonymes (SA, France), Società per azioni (SpA, Italy), etc; and limited liability firms such as Gesellschaften mit beschrankte Haftung (GmbH, Germany), Sociétés anonymes à responsibilité limitée (SARL, France) or Societá responsabilità limitata (SRL, Italy), etc. All other legal forms including namely cooperative companies, limited partnerships, state institutions, etc, are so excluded. Column 5 presents the number of firms when the type of accounts are taken in consideration. In this study only firms with unconsolidated accounts are included since for those who provide only consolidated accounts it is not possible to identify the country effect because those firms even if they are settle down in a specific country the accounts reflect their business in a multiplicity of countries. With this step the total number of firms was reduced to 24,071. Listed firms were also excluded, because the paper focus is unlisted firms. The overall impact was very low with a total reduction of only 247 firms (column 6). Finally in column 7 I exclude the firms: 1) with few available financial information (not enough to construct the variables), 2) with less than 4 complete continuos years of observations (required for estimation purposes), 3) with less than one million euros (or equivalent) in total assets, 4) where total assets it is not equal to current liabilities plus non current liabilities plus shareholder's funds (difference allowed 10,000 euros) and 5) the firm year observations in the most extreme one percent value in either tail of the dependent variable distribution are also removed. The final sample consists of 19,752 firms and 155,401 firm year observations.

[PLEASE insert Table 2 here]

In Table 2 firms are divided into small, medium and large according with the established by the European Comission. Throughout this paper the European convention of defining the SME's was used. Firms are considered of small-sized if the number of employees is less than 100, medium-sized if the number is between 100 and 250 and large-sized when the number of employees excedds 250.

Overall the percentage of small, medium and large firms are 34, 39 and 27, respectively. Austria, Germany and United Kingdom are the ones with the lowest percentage of small firms (10, 14 and 18, respectively) and the highest for large firms (63, 55 and 42, respectively). On the other side are countries such Belgium, Finland, Sweden, Greece and Norway with a percentage of small firms between 52 and 43 percent. If small and medium sized firms are aggregated (SMEs) only for Austria and Germany the number of large firms still larger. For the others and excluding United Kingdom and France (with a percentage of 57 and 64, respectively) the percentage of SMEs are over 70 percent.

2.2. Micro Financial Information

Table 3 reports the structure of panel data showing the number of firm-year observations by country.

[PLEASE insert Table 3 here]

To reduce survival bias, firms are allowed to leave and enter the dataset over time. Therefore, the panel data set is unbalanced as there are more observations for some firms than for others. On average the sample supplies close to 8 years of continuous observations by firm. Greece, Italy, Norway, Portugal, Spain and United Kingdom have an average higher than the whole sample. Austria, Denmark and Germany are on the opposite side with an average below 6 firm year continuous observations. The reasons are different. For Austria and Germany there are few firms with the necessary available financial information to construct the variables used in this study and also some of them have missing years. In the case of Denmark, the Danish legislation do not allow firms to provide more than 5 years of on-line information.

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The lowest number of firms appears in 1994 and 2004 with 8930 and 809 observations respectively. This is not a surprise given that Amadeus on-line database allows only to have 10 years of continuous observations. Therefore when the year 2004 is included 1994 is excluded. The years between 1999 and 2002 are the ones with the highest number of firms above 17,500 firms.

[PLEASE insert Table 4 here]

Table 4 (panel A to C) reports the average common-size balance sheets scaled by total assets for the year 2000 divided in all sample (18,107 firms, panel A), small firms (6,177 firms, panel B) and large firms (4,830 firms, panel C). . This year was choosen because is the one with the highest number of firms. In fact close to 92 percent of the firms has the year 2000 available.[2]

In Panel A (all firms) the amount of fixed assets as a percentage of total assets is between 35% (France) and 60% (Netherlands and Norway)[3]. Regarding the percentage of tangible assets, countries like Denmark, Ireland and Portugal have a value above 30% while Belgium, France, Netherlands, Norway and United Kingdom the percentage is below 20%. Given tangible assets are often used as collateral for debt, it appears that Denmark, Ireland and Portugal have the opportunity for a slightly higher debt levels compared with the countries with lower percentage of tangible assets. The other assets such as stocks and debtors ranges between 7%-19% (stocks) and 3%-33% (debtors). The amount of cash and cash equivalents is between 3%-7%, excluding Finland, France and Spain with values between 9%-10%.

On the liability side of the balance sheet equity varies from 28% in Italy to 52% in Ireland and Netherlands. The amount of current liabilities ranges from 43%-55% in Belgium, Denmak, France, Greece, Italy, Portugal, Spain and United Kingdom and between 33%-39% the remaining ones. Another interesting result is that trade credit is a more common source of financing for south Europe countries. In fact the amount of creditors as a percentage of total assets is between 16%-24% for these countries.

Panel B and C of table 4 reports the average balance sheets for the year 2000 dividing firms in small and large (less than 100 and more than 250 employees). Some important differences can arise from this analysis. Excepting for 2 countries the amount

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[2] However if instead the year 2000 the average of all years was choosen the results are similar.
[3] Switzerland was excluded in this analysis given the lower number of observations/firms (8).

of fixed assets as a percentage of total assets is much higher for the larger firms than to smaller ones. The percentage of other assets such as stocks and debtors are higher for small firms and also cash and cash equivalents are significantly higher for most of the countries when the comparison among small firms and large firms is made. On the liability side of the balance sheet there is not a pattern regarding the percentage of equity. In fact in some of the countries the small firms have more equity in their capital structure while in other countries the opposite is verified. If a comparation is made with the distribution of equity and debt in Berger and Udell [1998] for a US sample of SMEs and the average for small firms from panel B the results are quite different. In Berger and Udell [1998] small businesses depend 49.6% on equity while for the European countries 12 up to 16 countries have a percentage of equity below 40%. The exceptions are Netherlands, Sweden, Finland and United Kingdom with 42%, 44%, 59% and 63% respectively.

If we look to trade credit (creditors) the values are higher for small firms. That is not a surprise given that small firms have fewer financing sources and therefore rely more in trade credit to finance their operations. Poutziouris et al [2005] also document for a sample of 10,000 UK small-medium sized firms that trade credit is probably the most fundamental element of small firm financial management system being trade credits equivalent to 11% of total assets.

As written in the previous section few work as been done in an international setting to test capital structure models for large listed firms. Rajan and Zingales [1995] and Aggarwal an Jamdee [2003] are two important exceptions. These papers analyse capital structure choices across G7 countries (US, Japan, UK, Germany, France, Italy and Canada) for large listed firms for the years 1991 and 2001, respectively. Comparing the balance sheets structures among these studies and large no-listed firms for the some countries (UK, Germany, France and Italy) it is possible to highlights important differences. First, it is important to remember that the average balance sheets provided in this paper reports to unconsolidated accounts where in Rajan and Zingales [1995] and Aggarwal an Jamdee [2003] consolidated accounts are used. As reported by Rajan and Zingales [1995] and Aggarwal an Jamdee [2003] (in brackets) United Kingdom has the highest percentage of tangible assets among the european countries, namely 41.3% (31.6%) and France the lowest 24.4% (19.1%). The same results happens for no listed firms with the highest percentage to UK (47%) and the lowest to France (35%). The percentage of intangible assets is between 2% in France and 6% in Italy for unlisted

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firms whereas for listed firms it ranges from 0.9% (16.9%) in UK and 8.5% (16.9%) in France .

On the liability side of the balance sheet unlisted firms on average for the countries analysed have significantly less equity. Another important difference is that unlisted firms rely more on trade credit than listed counterparts. That is not a surprise given that listed firms have access to the stock exchange and therefore different financing sources.

2.3. Macroeconomic Information

Table 5 reports the average institutional macroeconomic information values over the period 1994-2004 for the countries in the sample. The annual inflation rate is on averge 3.5 percent over the countries and years with the highest average for Greece and Italy (5.61 and 4.37 percent, respectively). I use CIBOR, LIBOR, BIBOR, LISBOR, etc for the short term interest rate (3 months risk free rate). A comparation among the sixteen countries shows that the average rate is 4.9 percent. For the determination of long term interest rate the 10-year benchmark bond interest rate is used. The average is around 5.6 percent which gives an average spread between short and long term interest rate about 1.2 percent. Finally the nominal GDP growth rate over the sample period is 2.25 percent being Ireland the country with the largest growth average (11.75 percent).

3. Model, Variables Specification and Statistics Analysis

3.1 Model

The basic empirical model is a static trade-off model in the form of a target adjustment model. As discussed previously debt has benefits in terms of a tax shield. The disadvantages of debt include the potential bankruptcy costs as point out by Kraus and Litzenberger [1973] and Kim [1978] and the agency costs between shareholders and debtholders (Jensen and Meckling [1976]; Myers [1977])[4]. The optimal or target capital structure is determined by the equality of marginal benefits with marginal costs. Myers [1984] argued that the trade-off approach implied that the rate of firm's indebtedness reverts to a optimal level, or target. 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. In a perfect world, without transaction and adjustment costs, firms would automatically adjust debt levels in response to any variation of their objective. Thus changes in the current debt ratio, defined as debt over total assets, is given by a partial adjustment to the deviations of the current ratio from the target:

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

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_{it}^{*} 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 equal to one indicates that firm's adjust automatically the real debt to the objective. As more the value of γ is close to one more rapid is the 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 related to corporate tax rates, bankruptcy costs, agency/asymmetric information, corporate governance/ownership structure types and macroeconomic factors. The (unobserved) target level for firm i at time t it is given by:

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

$$D^*_{it} = \alpha + \beta_{TAX}\,TAX_{i\,t} + \beta_{BANK}\,BANK_{i\,t} + \beta_{AGEN}\,AGEN_{i\,t} + + \beta_{GOV}\,GOV_{i\,t} +$$
$$\beta_{MACRO}\,MACRO_t + \beta_{COUNT}\,COUNT + \beta_{IND}\,IND_{i\,t} \quad (2)$$

where, D^*_{it} is the (unobserved) target debt level for firm i at time t, α is intercept term, TAX_{it} is a set of tax variables for firm i at time t, $BANK_{i\,t}$ is a vector of bankruptcy variables such as tangible assets and size, $AGEN_{i\,t}$ is a vector of agency/ asymmetric information variables which includes intangible assets, profitability, firm growth and years of incorporation, $GOV_{i\,t}$ is a vector of governance variables like firm independence, family versus no family firms and ultimate owner, $MACRO_t$ is a vector of macroeconomic factors by year and country such as inflation, short and long term interest rate, growth in GDP and interest rate spread, $COUNT_{i\,t}$ is a dummy variable representing the different countries and $IND_{i\,t}$ is a dummy variable for the industry types. These variables representing taxation, bankruptcy costs, agency/asymmetric information, ownership structure and macroeconomic factors, have been some of them identified and used by Graham [1996], Rajan and Zingales [1995], Frank and Goyal [2005], among others. Substituting the equation (2) into (1) yields:

$$\Delta D_{it} = \gamma\,(\alpha + \beta_{TAX}\,TAX_{i\,t} + \beta_{BANK}\,BANK_{i\,t} + \beta_{AGEN}\,AGEN_{i\,t} + \beta_{GOV}\,GOV_{i\,t} +$$
$$\beta_{MACRO}\,MACRO_t + \beta_{COUNT}\,COUNT + \beta_{IND}\,IND_i - D_{i\,t-1}) + e_{i\,t}$$

$$D_{it} = \gamma\,\alpha + \gamma\,\beta_{TAX}\,TAX + \gamma\,\beta_{BANK}\,BANK_{i\,t} + \gamma\,\beta_{AGEN}\,AGEN_{i\,t} + \gamma\,\beta_{GOV}\,GOV_{i\,t} +$$
$$\gamma\,\beta_{MACRO}\,MACRO_t + \gamma\,\beta_{COUNT}\,COUNT + \gamma\,\beta_{IND}\,IND_i + (1-\gamma)\,D_{i\,t-1} + e_{it} \quad (3)$$

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.

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3.2 Variables Specification and univariate statistics analysis

In this sub-section the chosen variables (dependent and explanatory) and their statistical analysis (mean, standard deviation, etc) are presented. The aim is to have a group of variables that can explain capital structure determinants controlling for both firm-specific and institutional factors. The choice between debt and equity will depend in considerations regarding corporate taxes, bankruptcy costs, agency/asymmetric information, ownership structure and macroeconomic factors and the specificity of each country and industries.

3.2.1 Measuring Debt

Private firms and specially SMEs main financing sources are bank loans, trade credit and internally generated equity (retained earnings). The measure of short term debt and long term debt has some problems because firms may roll over short-term debt and use it for long term financing due to lower rates for the purpose of more flexibility. This suggests that some of the times short-term debt is therefore in practice long-term debt. One suggestion could be using the sum of short and long term debt. However some part of short-term debt has probably nothing to do with capital structure decisions and its amount is determined by working capital requirements. Scholes and Wolfson [1988 p.170] pointed out to the potential importance of short-term debt. According to them firms facing uncertainly in their tax status might prefer to use short-term debt when their tax rate is high. Therefore, short-term debt will be less costly and the easy way to adjust debt levels temporarily towards firm's optimum. Some of the studies have excluded short term debt on their leverage calculation. That is the case of Bradley, Jarrel and Kim [1984], Givoly, Hayn, Ofer and Sarig [1992] and Graham [1996] among others. In this paper the debt measure is calculated as long term debt plus short term debt plus creditors minus debtors plus other current liabilities. This is an attempt to both include short term debt and to remove the impact of working capital requirements.

[PLEASE insert Table 6 here]

Table 6 reports the percentage of firm-year observations with positive debt in their capital structure. It is shown that on average 42.99% of firm year observations report long term debt with the highest percentage to Belgium, Portugal and Spain (72.28%, 74.58% and 79.77%, respectively) and the lowest to France, Italy and Netherlands (17.53%, 10.68% and 13.02%, respectively). On average 40.54% of small firms and 46.25% of large firms year observations report long term debt. Therefore, large firms use long term debt more often (12 of the 16 countries) and so there is a distinct difference in the use of long term debt between small and large firms. In what respect to short term debt on average 74.38% of firm year observations report the use of this kind of debt, being the highest percentage to France, Greece, Italy and United Kingdom (86.96%, 84.83%, 86.24% and 92.02%, respectively) and the lowest to Germany, Netherlands and Sweden (20.63%, 27.95% and 24.88%, respectively). The results show that firms use more often short term debt than long term debt and countries like France and Italy are the ones with lowest percentage of long term debt and the highest of short term debt. On average small firms use less short term debt (70.86%) than the large firms (76.83%). So, in both long and short term debt large firms use it more often than small firms. In the case of trade credit, 94.63% of firm year observations report the use of this financing source which highlight the importance of creditors as a financing source. Thre is not a clear distinction in this case among large and small firms.

[PLEASE insert Table 7 here]

On Table 7 the summary statistics for debt levels is presented. The results are divided in whole sample, small and large firms. On average, *TOTALLOANS* acounts for 28.17 percent of total assets but there is a large dispersion around this number (standard deviation of 23.86 percent). Austria, Denmark and United Kingdom are the countries with the highest level of *TOTALLOANS*. On the other side are Netherlands and Norway. Small firms have lower values for *TOTALLOANS* compared with larger firms (26.88% and 31.51%, respectively).

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3.2.2 The Impact of Taxes

Several tax variables are used to capture different aspects of the relation among taxes and firm's leverage such as: the effect of firm's negative earnings, non-debt tax shields, tax loss carry-forwards, change in statutory tax rate and a measure to capture whether firms use debt conservatively or aggressively i.e. if firms use debt to minimize taxes. Next the tax variables are presented in more detail.

a) Tax Dummy

One of the tax variables that have been more commonly used to measure of tax status in the literature is a dummy variable with a value equal to one if earnings after taxes (EAT) are negative and zero otherwise. If EAT is negative then the tax shield from increasing the amount of debt is smaller than for firms with positive EAT. Given that this variable proxies, for firms financing decisions after negative EAT, the variable is defined lagged one period (one year). This variable only captures the effect on debt levels of firms with positive earnings versus the ones with negative. Another approach can be made using the value of the statutory tax rate by country in each year when the firm's earnings are positive (instead of one) and zero when the earnings are negative. This measure captures both the statutory tax rate variation among countries, years and the difference between firms. A final approach can be made taking in account the value of tax loss-carry forwards. This variable is equal to the top statutory tax rate if the firm has positive earnings equal to one half of this tax if either the taxable income is positive and there are tax loss carry-forwards from previous years or the firm has negative earnings but there are no tax-loss-carry forwards and zero otherwise. This last measure captures the statutory tax rate changes among countries and both the effect of negative earnings and tax loss carry forwards from previous years[5]. For the first approach a negative relation with debt levels is expected while for the second and third approaches a positive relation one.

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[5] A drawback in this approach is that it is assumed that for the first year observation to each firm the amount of tax-loss carry forwards are equal to zero.

b) Statutory Tax Rate

This tax variable is equal to the top statutory tax rate for each year in the sixteen different countries. Given that differences in the tax code can generates different corporate finance decisions I include this variable in the regression analysis. The information on the corporate taxes rates were taken from various issues of "*Corporate taxes: Worldwide Summaries*" published by PricewaterhouseCoopers.

There are some variation among countries and years during the sample period and the average value ranges between 32-33 percent. It is than more likely to find statistical and economic effect of the statutory tax rate on firm's leverage when both the variation by years and by countries are included. The countries can be divided in three different groups: Finland, Ireland, Norway and Sweden with an average top statutory tax rate that is less than 28 percent for the period 1994-2004; Belgium, France, Germany, Greece, Italy, Portugal and Spain with a value at least of 35 percent and the middle group with the remaining countries (Austria, Denmark, Netherlands, Switzerland and United Kingdom). Two macroeconomic tendencies can be identified: one is the reduction in the top statutory tax rate from 1994 to 2004 in almost all the countries; the other one is that the countries from south Europe have higher statutory tax rates than the central Europe ones and those than the Scandinavian countries. One should keep in attention that for several countries small firms have different regimes of tax exemptions and also different tax rates than those applied to the average size firm. These differences may depend from the region where the firm is located and the sector. However even with these shortcomings and given that the statutory tax rate had decreased for almost all the countries in the sample period, a decrease in debt levels is expected since with a decrease in the statutory tax rate the tax shield of debt will be less attractive to the firms. Bartholdy [1989] have used this variable before and a positive relation between this variable and debt levels is expected.

[PLEASE insert Table 8 here]

Table 8 shows the average statutory tax rate for each country and the average debt level by country for whole years. A simple correlation among this two variables demontrate a positive relation among them (around 0.35).Therefore, all else being equal,

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countries with higher statutory tax rate have higher debt ratios measure by *TOTALLOANS*.

c) NDTS - non-debt tax shields

DeAngelo and Masulis [1980] argue that firm's non-debt tax shields should be negatively related to firm debt. The intuition behind this statement is if a firm has a large amount of non-debt tax shields such as depreciation and investment tax credits, the probability of having negative taxable income is higher. Therefore if a firm has a large amout of non-debt tax shields then it is less likely that the firm will increase the amount of debt for tax reasons. Following this argument it is expected that debt levels are inversely related to the level of non-debt tax shields. However, firms with large amounts of depreciation are probably firms with historically good investment opportunities and profitable operations. If these firms used debt to finance their new investments it is possible that a spurious relation between debt levels and depreciation exists, this is unrelated to tax shield issues. In this line Mackie-Mason [1990] argued that the negative relation with debt levels holds only for firms which are more likely to be close to tax exhaustion. Therefore two different approaches are made to proxy non-debt tax shields: total depreciation over total assets and then interaction of total depreciation divided by total assets and a dummy variable equal to one if Cash Flow is negative in the previous year and zero otherwise. Nevertheless, a negative relation with debt levels in both approaches is expected. This negative relation can also occur because small firms are financed predominantly with internal generated equity (retained earnings).

d) 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 is 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 is positively related, and kink is negatively related with debt levels.

e) Effective Tax Rate

This variable is calculated as corporate taxes paid over earnings before taxes. As for the statutory rate a positive relation with debt levels is expected. However since this variable do not capture the dynamics of taxation this could bias the results. As an example a firm can pay a small amount of taxes even though it has large profits due a negative earnings in the previous years (tax loss carry-forwards). So it can be found lower tax bill with high debt levels which could bias the results. Booth et al [1999] as made a different approach calculating an average tax rate on both earnings before and earnings after taxes. They argued that this measure has the advantage to include the impact of tax-loss carryforwards and find that this tax measure is closely correlated with the statutory tax rate. In this paper both variables are calculated.

[PLEASE insert Table 9 here]

In table 9 the summary statistics for the tax variables are presented. The mean value for the tax dummy variable shows that for close to one fifth of the firm year observations the earnings after taxes are negative. The median values for the dichotomous and trichotomous variables suport the evidence that for more than one half of the firm year observations firms do pay the statutory tax rate. Depreciation and amortization form 5.54 percent of total assets. The mean value of Kink indicates that the average firm could increase total interest deductions 1.87 times before the marginal benefit begins to decline.[6] The value of the statutory tax rate is 34.30 percent with a maximum value of 48.38 percent and a minimum of 12.50 percent and a standard

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[6] The maximum kink value was limited to eight. The benefit function for a firm in kink equal to 1,5 is downward sloping for interest deductions greater than 1,5 times those actually taken. Firms with negative EBIT have a benefit curve which is downward-sloping for the first euro of interest expenses.

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deviation of 0.0373 percent. Finaly, on average corporate taxes represents 31.86 percent of EBT.

3.2.3. Bankruptcy measures

The theories about capital structure suggest among others as firm's bankruptcy measures the collateral value of assets, size, volatility of earnings and bankruptcy probability. However there are disagreements regarding basic facts. According to Harris and Ravid [1991] leverage increases with fixed assets and size and decreases with volatility of earnings and banrkuptcy probability. However Titman and Wessels [1988] do not find empircal evidence on debt ratios from collateral and volatility of earnings. In the sense to find which factors are reliably important Frank and Goyal [2005] analyse a vast number of factors. They found that seven from a set of 36 factors explain 32 percent of the variation in leverage. In fact for bankruptcy measures the important factors are the collateral value of assets and size. In this paper those two factors are used.

A firm with a high percentage of tangible assets in relation to total assets can support higher debt levels because these assets can be used as collateral for loans reducing the expected bankruptcy costs. This suggests a positive correlation between debt and fixed assets. This variable is calculated as tangible assets over total assets. Frank and Goyal [2005] find a positive relation among collateral and leverage.

Given that there are fixed costs associated with bankruptcy and large firms in general have lower probability for bankruptcy compared to small firms, it is expected that large firms have more debt in their capital structure than smaller firms. Titman and Wessels [1988], Rajan and Zingales [1995], Graham ([1996a] , [1998]), Booth et al. [2001], Giannetti [2003] and Frank and Goyal [2005] found positive statistical significant effect of firm's size on leverage. These studies have used the logharitm of total assets or sales to define the dimension of the firm. In this paper neither of this approaches as been used for the reason that the European Commission established as criterion for being a SME to have less than 250 employees. Therefore, the value of one is given to firms with less than 100 employees (small sized firms), value of two for firms between 100 and 250 employees (medium sized firms) and value of three to the ones with more than 250 (large sized firms). Marsh [1982] survey of the literature concludes that large firms more often choose long-term debt while small firms choose short-term debt. Is it expected a positive correlation among size and debt levels. The average tangible assets are 25.22 percent of total assets.

3.2.4 Agency/Asymmetric information measures

In this sub section several variables to model agency costs and asymmetric information are presented. Previous studies sugested as agency/asymmetric information variables such as: profitability, growth, intangible assets and firm's age.

The relationship between leverage and profitability of the firm is one of the main theoretical controversies. Myers and Majluf [1984] and Myers [1984] shows that asymmetric information result in a pecking order for external finance – firms prefer using internal sources of financing first, then debt and finally external equity obtained by stocks issues – and therefore a negative relationship among debt levels and profitability is expected. Harris and Ravid [1991], Rajan and Zingales [1995] and Booth et al. [2001] among others found this relationship. Empirical evidence from previous studies examining SMEs is consistent with Pecking order arguments with leverage being found to be negatively related to profitability Chittenden et al [1996] and Michaelas et al [1999] are good examples. However according to the trade off theory more profitable firms should prefer debt to benefit from the tax shield and so a positive correlation with leverage is expected

Firms with greater growth opportunities will have a greater potencial problem of underinvestment associated with debt financing, and therefore, a smaller debt level. Thus agency theory suggests a negative relationship between debt and growth. To the extend that there is more asymmetric information for high growth firms then also predicts a negative relationship. This variable is defined as the change of the natural logarithm of total assets. Another alternative measure for asymmetric information is the amount of intangible assets. These assets are very opaque to external creditors and in general have a poor value as collateral for loans. Therefore, in the same line as the previous variable a negative correlation is expected between the amount of intangible assets and debt. Titman and Wessels [1988] and Gianneti [2003] have found a negative empirical relation between leverage and growth opportunities.

As time goes firms can retain more earnings and therefore increase their ability to finance new projects using internal generated funds. According to Petersen and Rajan [1994] leverage decreases with age as young firms are externally financed (mainly family sources) while old firms finance via retained earnings following a pecking order

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of borrowing over time. So, the need for new debt is lower as the firm gets older. Another view can be made if firm's age is used as a proxy for the amount of available information about the firm. Given that for young firms there is very little available information it is difficult for them to obtain loans of any kind if the firm does not have a financial history. Therefore a positive relation between this variable and debt levels is expected. I calculate this variable as in Giannetti [2003] as the natural logarithm of the number of years since the date of incorporation of the firm.

[PLEASE insert Table 10 here]

In table 10 the summary statistics for the agency/asymmetric information variables are presented. The average amount for intangible assets is 2.25 percent of total assets. Earnings before interest and taxes are 7.72 percent of the total assets on average. Firms have an average growth measured as the change in the natural logarithm of total assets of 8.97 percent. Regarding the number of years from the incorporation of the firm the average value is 22 years with a maximum of 318 years.

3.2.5 Ownership Structure measures

Amadeus database provides information regarding firm's ownership structure. One of the information is the *BvD Independence Indicator*. This indicator divides the firms in three different categories: A, B and C. Level A indicates a independent firm with known recorded shareholders, none of which having more than 24.9% of direct or total ownership. In level B are the firms with known recorded shareholders, none of which having more than 49.9% of direct or total ownership, but having one or more shareholders with an ownership percentage above 24.9%. By last, level C reports the firms with known recorded shareholder, with an ownership (direct or total) with more than 49.9%. Another available information is the existence or not of an *Ultimate owner*. A shareholder is qualified as an *Ultimate Owner* of a company when it owns more than 24.9% of this company with no other single shareholder owning a larger percentage. If such a shareholder is itself a company, to be the *Ultimate Owner*, this company must be itself an "Independent company" (i.e. a company with an Independence Indicator A, meaning that it has no single shareholder with a percentage of ownership higher than 24.9%). Finally, it is also possible to know the *Ultimate Owner* type: Bank, Employees/Managers, Financial company, Foundation, Individual(s) or family(ies),

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Industrial company, Insurance Company, Mutual & Pension fund/Trust/Nominee and State/Public authority.

[PLEASE insert Table 11 here]

Table 11 reports the percentage of firms by size (all, small and large firms) with independence indicator A, B and C and for the ones that a *Ultimate Owner* does exist its type. In what respect to the independence indicator 65.03% of all firms have a recorded shareholder with more 49.9% of firm's ownership. This value is more reduced for the small firms sub-sample rather than the large firms one (53.49% and 82.72%, respectively). Therefore, for this sample of European unlisted firms ownership is more concentrated for large firms. Another interesting result is that there are few firms with a recorded shareholder with more than 24.9% but less than 49.9% of firm's ownership (only 4.99%). Regarding the type of shareholder, the most common ones are industrial company and individual(s) or family(ies) (65.85% and 28.14% of the total respectively). If divided by small and large firms, the results are quite diferente. Despite in both cases the type "industrial company" be the most important (57.78% and 74.06%, respectively) it is more common to found a individual(s) or family(ies) ownership type in small firms (more of the double if compared with the large companies).

Three variables are contructed to capture the ownership effect on debt levels following the equation presented is section 3.1. In relation to the independence indicator the variable will assume the value of 1 if category A, 2 if B and 3 if C. Also a dummy variable is used to divide firms with *Ultimate Owner* of the one which do not have. Finally a last dummy variable divide firms which the *Ultimate Owner* its a individual(s) or family(ies) from all the other types.

3.2.6 Macroeconomic measures

Five variables are constructed to analyse the effect of macroeconomic factors on firm's financial decisions. The variables used are: Annual Inflation rate, short and long term interest rate (3 months risk free rate and 10-year benchmark bond interest rate, respectively), GDP growth and interest rate spread. Since nominal interest rates are closely related to inflation rates these variables capture the same effects and therefore only one should be used in the analysis. As an increase in nominal interest rates increases the cost of borrowing it is expected that for this reason firms will borrow less.

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Therefore a negative relation among nominal interest rate /inflation rate with firm's debt level is expected.

A strong growth in the economy is a sign of healthy firms, more growth opportunities and an increase in the amount of debt in firm's capital structure. Therefore a positive correlation between GDP growth and firm's debt levels is expected.

The interest rate spread is calculated as short term minus long term interes rate. 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.

Table 12 provides some basic institutional information on macroeconomic variables.

[PLEASE insert Table 12 here]

On average the inflation rate during the years and across countries was of 3.17%. During the same period short term interest was on average of smaller value than long term interest rate. The average nominal growth in GDP was of 5.15%.

[PLEASE insert Table 13 here]

Table 13 describes the variables used in this study, broken down into five sets of characteristics: tax, bankruptcy, agency/asymmetric information, ownership and macroeconomic variables.

4. Results

4.1 Testing for a tax effect on leverage

In section 3 the basic test equation for the target adjustment model is presented as:

$$D_{it} = \gamma \alpha + \gamma \beta_{TAX} TAX + \gamma \beta_{BANK} BANK_{i\,t} + \gamma \beta_{AGEN} AGEN_{i\,t} + \gamma \beta_{GOV} GOV_{i\,t} +$$

$$\gamma \beta_{MACRO} MACRO_t + \gamma \beta_{COUNT} COUNT + \gamma \beta_{IND} IND_i + (1 - \gamma) D_{i\,t-1} + e_{it} \quad (3)$$

This equation is estimated using a pooled sample across firms and time periods from 1994 to 2004. 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 19,752 firm-year observations are lost.

The model is estimated once for each tax variable, including the mesaures of Bankruptcy, Agency/Asymmetric Information, Macroeconomic and Ownership. Also Country and Sectors dummy variables are included as well as a Law Origin dummy variables (in this case excluding the country dummy variables from the regressions). This generates a total of 8 regressions reported in Table 14 panels A to E.[7]

[PLEASE insert Table 14 here]

Tax measures

For table 14 panel A except for the variable *EFFECTIVE* all the other tax variables are strongly significant. Therefore there is a strong tax effect in the sample. The impact in debt levels of firm's negative earnings is negative as expected. In fact, all else being equal, if a firm as negative earnings that will result in a 3.48 percent decrease in the firm's average debt level. On the other hand when the statutory tax rate is included in the analysis (*DICHOTOMOUS* variable) the effect in firm's debt level is positive, as expected. Regarding the variables *NDTS* and *NDTS*EXHAUSTION* both

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[7] Short term and long term interest rate variables are excluded due high correlation among them and with *DIFFINTEREST* variable.

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are statistical significant with the predicted sign. On average a ten percent increase in *NDTS* will result in a 5.77 percent decrease in firm's debt level. Another very important result is the statutory tax rate variation effect on debt levels. Prior studies did not find any effects of this variable in firm's debt level. The major reason was related to single-country analysis with few variations of this variable across years. Using both country and years variation allows to identify a very strong effect of changes in the statutory tax rate in firm's debt level. On average a one percent increase in *STATUTORY* will result in a 1.1 percent increase in firm's debt level, *ceteris paribus*. This result is very important because it establishes a link between taxation policies and firm's financial decisions with great impact in firm's capital structure. On average the target adjustment coefficient for the 8 regressions is 17 percent and the adjusted R-squared is around 69 percent.

Bankruptcy measures

The measures for bankruptcy effects used are *TANGIBLE* and *SIZE*. Table 14 panel B shows that both variables are stongly significant and with the predicted relation with firm's debt level. As in previous studies a increase in the 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 reducing the expected bakruptcy costs. Regarding the variable *SIZE* larger firms have lower bankruptcy costs and therefore the positive realation with firm's debt levels is verified. These results highlight the importance of the percentage of tangible assets and firm's size in capital structure as point out in Frank and Goyal [2005] who considered that these two factors are of the most important in capital structure decisions. By last it can be concluded that these factors are not only important when large listed firms are analysed, but also for SMEs and larger unlisted firms in a multi-country setting.

Agency/Asymmetric Information measures

The measures of Agency/Asymmetric Information used in this paper are all statistical significant, except to *AGE* which is significant only in 3 of the 8 regressions. From table 14 panel B the variable *PROFIT* is negative and statistical significant for one percent level in all the regressions. On average a one percent increase in firm's earnings before interest and taxes will result a 1.05 percent decrease in firm's debt level. That is a very important result given the relationship between leverage and profitability of the firm is

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one of the main theoretical controversies. This result is consistent with the Pecking Order arguments and is in line with previous studies examining SMEs (Chittenden et al [1996] and Michaelas et al [1999]). Other studies with focus in large listed firms also find evidence of the Pecking Order. That is the case of Frank and Goyal [2005] who find that profits are a reliable factor for debt levels being its sign inconsistent with the trade-off theory. Their results point out that firms that have more profits tend to have less levarage. 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 variable *AGE* is positive and statistical significant for 5 and 10 percent level in 3 of the regressions (in all the other regressions it is positive but not statistical significant). The argument so that the coefficient of this variable is positive can be that the youngest firms are usually small and as the time moves forward become larger.[8] If that is the case when firms get older and therefore larger more information is available being less difficult to them to obtain loans of any kind because they have a financial history.

Finally *INTANGIBLE* and *GROWTH* variables. Both variables are significant at one percent level with positive coefficients for all the regressions. Agency theory suggests a negative relationship between debt and growth. However a fast growing firm is often seen as a healthy firm with lower probability of bankruptcy and *GROWTH* variable is then expected to be positively correlated with debt levels. Therefore, it seems that this variable is picking up more the second effect than the first one which rejects the theory of underinvestment by Myers [1977].[9] The variable *INTANGIBLE* also rejects the theory above being positive correlated with the *GROWTH* variable. Thus the agency-based measures from the balance sheet are not significant determinants of the capital structure of SMEs and larger unlisted fims. This lack of significance of the "agency variables" does not imply that agency and asymmetric information problems are not important. Only that it might not be possible to test for agency problems based on balance sheet data of unlisted firms because financial institutions solve these problems differently from financial markets.[10]

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[8] That is confirmed by the correlation matrix which shows a positive relation between *AGE* and *SIZE* variables.

[9] A strong conclusion can be obtained dividing the sample in two sub-samples: high growth firms vs. Low growth firms.

[10] For a discussion see Bartholdy and Mateus [2005].

Ownership Structure measures

To capture the ownership effect on firm's capital structure 3 variables are used and and defined previously (Table 14, panel, B). The *INDEPENDENCE* variable coefficient is positive and statistical significant for one percent level. This means that when firm's are loosing independence (more concentrated in one shareholder such as a family, other industrial firm, etc) the average debt level as a percentage of total assets increases what can maybe indicate that financial institutions appreciate ownership concentration. The notion that large, concentrated shareholders are inherently less efficient is not a universal view (Anderson and Reeb [2003] and Demsetz and Lehn [1985] among others). The same effect it is verified when the firms are separate in the ones that have an Ultimate Owner of the ones that do not have. In fact for all the regressions the *ULTIMATE* variable coefficient is positive and statistical significant in 3 of the 8 regressions. However, when the Ultimate Owner is a individual or family the effect on firm's debt level is negative for all the regressions. Anderson and Reeb [2003] find that founding family ownership is related both statistically and economically to a lower cost of debt financing. Also they argue that family firms perform better than nonfamily firms but when family members serve as CEO, the cost of debt financing is higher relative to family firms with an outside CEO. Moreover, this higher cost is primarily attributable to founder descendents rather than founder CEOs. Therefore, financial institutions attribute a higher risk when the CEO position is from a family descendent. Given the sample used in this study is from unlisted firms and most of then SMEs (76% of total) with an average years of incorporation close to 25 years it is expected that in most of the firms the founder CEO is not any more in the position. Usually, these firms try to find a CEO inside the family. The results shows that maybe the financial institutions grade worst firms in these conditions and therefore debt levels are lowest for family firms if compared with no family firms. A similar conclusion can be made assuming that family firms are more profitable.[11] If they are more profitable and given the consistent of the Pecking Order arguments for this sample family firms prefer using internal sources of financing first and only after that debt. Therefore a negative relation between *FAMILY* and firm's debt levels is expected and verified to this sample.

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[11] The correlation between *FAMILY* and *PROFIT* confirms this relation.

Macroeconomic measures

The three variables used to measure the macroeconomic effects in firm's debt levels have all the correct sign. *INFLATION* coefficient is negative and strongly statistical significant for one percent level for all the regressions. Regarding GDP growth is positive but not statistical significant. The coefficient of *DIFFINTEREST* variable can assume both a negative or positive value depending either short or long term debt is analysed. 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. That is the case for this sample and therefore the coefficient is positive and statistical significant for one percent level for all the regressions. A one percent increase in the spread will result a 1.2 percent increase in firm's debt level, on average.

Countries, Law origin and Sectors

Table 14, Panels C to E shows that there is a important effect of countries and sectors in firm's debt level. In fact taking Italy as the basis country with exception to Austria, Germany, Ireland and Netherlands all the others are statistical different. That differences could arise from development differences in the banking sector, the type of main activity sector in each country, proportion among SMEs and large firms in the sample, legal and institutional environments, etc. In terms of sectors (Food and Products and Beverages basis case) around one half of them are statistical different. Finally when the countries are divided in civil and common law families (French, German, English and Scandinavian origin) the results confirm that differences in financial, legal and institutional environments are very important in financial decisions (LaPorta et al [2002], [1998] , [1997] and Demirguç-Kunt and Maksimovic [2002].

4.2 Robustness of the Results

As first robustness check the correlation matrix was calculated between the tax, bankruptcy, Agency/Asymmetric Information, Ownership and Macroeconomic variables. The results from Table 15 confirms that multicollinearity is not a problem in this sample. As expected high correlation among three of the tax variables (*TXDUMMY, DICHOTOMOUS and TRICHOTOMOUS*). From the correlation matrix one can highlight the negative correlation among *SIZE* and *PROFIT* (larger firms are less profitable) and positive between *TANGIBLE* and *NDTS* indicating that a higher

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proportion of tangible on total assets and consequently higher depreciation values will reduce the tax bill (no debt tax shields). Also as the firms become older (*AGE*) they are more profitable and have a lower growth rate. Finally when the Ultimate Owner is an individual or family, firm uses debt more conservatively (higher *KINK*) given conservatism and kink are positively related. Also family firms are more young and of smaller size.

As a final robustness check we apply the so-called "global sensitivity analysis" advocated by Leamer [1985]. To analyze whether the results may be driven by one country, year or industry I estimated the model for each tax variable dropping one of the countries at a time making a loop of 16 regressions. For each of these loops first one industry at a time was dropped and then all the observations from one year were dropped. The resulting average parameter estimates and t-statistics did not change (same coefficient sign and statistical significance).[12]

The conclusion regarding the robustness of the tax effect is that the results reported in Table 14 (panels A and B) are robust to different estimation techniques and model specifications.

5. Conclusions

The aim of this paper was twofold: First to test for an impact of the debt tax shield on the capital structure choice of SMEs and large non-listed firms and second to test whether the same factors determining the capital structure of large listed firms are also relevant for 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.

Considering these differences the question remains therefore whether the same factors are responsible for the capital structure choice in these two types of firms. First, I found that there is a significant debt tax shield impact on the capital structure choice for small non-listed firms. Second, I found that the traditional variables used to model

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[12] Results not reported. Available upon request.

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bankruptcy risk (collateral), agency problems and ownership structure were generally significant for unlisted firms. Third, I found that institutional factors such as country legal system have an important impact on the capital structure for both SMEs and large unlisted firms.

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Table 1: Number of Firms by country

Countries	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Austria	3,262	992	983	918	290	284	**116**
Belgium	8,776	2,004	1,783	1,755	1,582	1,581	**1,510**
Denmark	5,282	778	765	741	523	522	**421**
Finland	3,262	918	895	885	504	502	**410**
France	25,393	5,699	5,497	2,083	1,882	1,859	**1,710**
Germany	26,021	8,430	8,272	7,901	1,722	1,705	**619**
Greece	2,360	797	742	742	752	608	**565**
Ireland	3,885	454	413	241	165	163	**138**
Italy	19,050	7,298	6,885	6,685	5,680	5,675	**5,060**
Netherlands	11,778	1,696	1,557	1,490	624	623	**423**
Norway	5,823	1,032	897	897	650	648	**562**
Portugal	3,172	793	788	762	724	715	**628**
Spain	16,028	3,609	3,485	3,427	3,011	2,995	**2,763**
Sweden	9,437	1,677	1,600	1,600	1,136	1,136	**1,024**
Switzerland	3,690	991	981	976	224	223	**9**
United Kingdom	40,146	7,036	6,825	6,825	4,602	4,585	**3,794**
All	187,365	44,204	42,368	37,928	24,071	23,824	**19,752**

Table 2: Number of small, medium and large firms by country

Size	Small	Medium	Large
Countries			
Austria	12	30	74
Belgium	786	447	277
Denmark	105	201	115
Finland	188	134	88
France	464	638	608
Germany	88	187	344
Greece	249	207	109
Ireland	42	70	26
Italy	2038	2157	865
Netherlands	158	187	78
Norway	244	206	112
Portugal	196	239	193
Spain	1033	1125	605
Sweden	455	345	224
Switzerland	1	1	7
United Kingdom	680	1493	1621
All	6739	7667	5346

Table 3: 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 country.

Number of firm year observations by country

	Observations											
Years	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	All
Countries												
Austria	17	35	55	62	67	76	71	70	68	55	2	578
Belgium	1023	1155	1223	1296	1332	1365	1398	1371	1328	1270	81	12,842
Denmark	---	---	---	---	12	294	411	421	414	398	93	2,043
Finland	16	231	271	301	310	317	319	328	318	305	40	2,756
France	64	1276	1387	1473	1547	1582	1563	1499	1487	1338	71	13,287
Germany	134	214	278	280	320	422	470	450	449	309	18	3,344
Greece	---	425	470	499	516	531	552	546	541	535	46	4,661
Ireland	51	64	73	82	82	108	118	121	119	102	5	925
Italy	3038	3520	4174	4436	4474	4647	4738	4565	4508	3828	4	41,932
Netherlands	215	268	312	340	352	358	347	340	330	268	6	3,136
Norway	---	345	423	460	493	532	552	554	553	532	10	4,454
Portugal	410	454	496	522	535	541	550	542	552	464	---	5,066
Spain	1909	2120	2234	2328	2451	2527	2613	2567	2542	2294	20	23,605
Sweden	---	---	18	854	903	957	1004	997	977	960	83	6,753
Switzerland	2	7	7	7	7	8	8	7	7	7	3	70
United Kingdom	2051	2481	2669	2921	3098	3267	3393	3359	3319	3064	327	29,949
All	8930	12595	14090	15861	16499	17532	18107	17737	17512	15729	809	155,401

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Table 4: Average Balance Sheets Item as a Fraction of Total Assets
Panel A: All Sample Year 2000 (18,107 firms)

Countries	AT	BE	DK	FI	FR	GE	GR	IE	IT	NL	NO	PT	ES	SE	SW	UK
Number of Observations	71	1398	411	319	1563	470	552	118	4738	347	552	550	2613	1004	8	3393
Assets																
Fixed Assets	**0.45**	**0.57**	**0.49**	**0.48**	**0.35**	**0.45**	**0.39**	**0.45**	**0.37**	**0.60**	**0.60**	**0.45**	**0.46**	**0.41**	**0.20**	**0.44**
Intangible assets	----	0.03	0.03	0.03	0.03	----	0.08	0.02	0.05	0.04	0.04	0.02	004	0.04	0.00	0.05
Tangible Assets	0.29	0.17	0.31	0.29	0.16	0.27	0.28	0.30	0.23	0.15	0.13	0.36	0.27	0.23	0.07	0.15
Other Fixed Assets	0.16	0.37	0.15	0.16	0.16	0.18	0.03	0.13	0.09	0.41	0.43	0.07	0.15	0.14	0.13	0.24
Current Assets	**0.55**	**0.43**	**0.51**	**0.52**	**0.65**	**0.55**	**0.61**	**0.55**	**0.63**	**0.40**	**0.40**	**0.55**	**0.54**	**0.59**	**0.80**	**0.56**
Stocks	0.11	0.13	0.17	0.11	0.15	0.17	0.18	0.17	0.19	0.08	0.10	0.16	0.14	0.12	0.11	0.07
Debtors	0.00	0.18	0.13	0.12	0.27	0.03	0.33	0.15	0.25	0.28	0.23	0.32	0.30	0.09	0.59	0.07
Other Current Assets	0.44	0.12	0.21	0.29	0.23	0.35	0.10	0.26	0.19	0.04	0.07	0.07	0.10	0.38	0.10	0.42
Cash and Cash Equivalents	0.04	0.04	0.06	0.09	0.10	0.03	0.05	0.07	0.04	0.04	0.06	0.04	0.09	0.03	0.03	0.04
Shareholders's Funds and Liabilities																
Shareholders's Funds	**0.43**	**0.32**	**0.34**	**0.48**	**0.32**	**0.30**	**0.39**	**0.52**	**0.28**	**0.52**	**0.38**	**0.43**	**0.38**	**0.44**	**0.27**	**0.42**
Capital	0.06	0.15	0.09	0.15	0.14	0.12	0.28	0.05	0.13	0.07	0.14	0.21	0.12	0.04	0.05	0.13
Other Shareholder's Funds	0.37	0.17	0.24	0.33	0.18	0.18	0.11	0.47	0.15	0.45	0.24	0.22	0.26	0.40	0.22	0.29
Liabilities	**0.57**	**0.68**	**0.66**	**0.52**	**0.68**	**0.70**	**0.61**	**0.48**	**0.72**	**0.48**	**0.62**	**0.57**	**0.62**	**0.56**	**0.73**	**0.58**
Non Current Liabilities	0.21	0.25	0.19	0.16	0.15	0.37	0.11	0.18	0.17	0.13	0.23	0.14	0.17	0.17	0.13	0.12
Long Term Debt	0.02	0.20	0.15	0.14	0.02	0.09	0.08	0.15	0.01	0.01	----	0.13	0.13	0.03	0.00	0.11
Other Non Current Liabilities	0.19	0.05	0.04	0.02	0.13	0.28	0.03	0.03	0.16	0.12	----	0.01	0.04	0.14	0.13	0.01
Current Liabilities	0.36	0.43	0.47	0.36	0.53	0.33	0.50	0.30	0.55	0.35	0.39	0.43	0.45	0.39	0.60	0.46
Loans	0.11	0.13	----	0.01	0.09	0.02	0.18	0.05	0.11	0.02	----	0.10	0.08	0.01	----	0.32
Creditors	0.08	0.15	0.09	0.06	0.24	0.10	0.20	0.11	0.22	0.04	0.07	0.16	0.16	0.09	0.02	0.06
Other Current Liabilities	0.17	0.15	----	0.29	0.20	0.21	0.12	0.14	0.22	0.29	----	0.17	0.21	0.29	0.02	0.08

Panel B: Small firms Year 2000 (6,177 firms)

Countries	AT	BE	DK	FI	FR	GE	GR	IE	IT	NL	NO	PT	ES	SE	SW	UK
Number of Observations	6	721	104	156	403	73	240	36	1893	129	237	162	966	445	1	605
Assets																
Fixed Assets	**0.31**	**0.39**	**0.45**	**0.56**	**0.29**	**0.40**	**0.33**	**0.46**	**0.26**	**0.51**	**0.63**	**0.39**	**0.41**	**0.41**	**0.63**	**0.34**
Intangible assets	----	0.02	0.03	0.02	0.03	----	0.03	0.02	0.02	0.00	0.01	0.01	0.04	0.01	0.00	0.00
Tangible Assets	0.25	0.23	0.33	0.24	0.17	0.20	0.27	0.24	0.20	0.06	0.09	0.33	0.24	0.30	0.50	0.03
Other Fixed Assets	0.06	0.14	0.09	0.30	0.09	0.20	0.03	0.20	0.04	0.45	0.53	0.05	0.13	0.10	0.13	0.31
Current Assets	**0.69**	**0.61**	**0.55**	**0.44**	**0.71**	**0.60**	**0.67**	**0.54**	**0.74**	**0.49**	**0.37**	**0.61**	**0.59**	**0.59**	**0.37**	**0.66**
Stocks	0.24	0.18	0.17	0.11	0.20	0.11	0.18	0.13	0.21	0.15	0.08	0.21	0.16	0.22	0.05	0.02
Debtors	0.00	0.27	0.16	0.09	0.30	0.04	0.42	0.16	0.36	0.31	0.20	0.35	0.33	0.18	0.24	0.02
Other Current Assets	0.45	0.16	0.22	0.24	0.21	0.45	0.07	0.25	0.17	0.03	0.09	0.05	0.10	0.19	0.08	0.62
Cash and Cash Equivalents	0.15	0.09	0.05	0.07	0.09	0.19	0.04	0.13	0.06	0.04	0.05	0.03	0.10	0.06	0.01	0.02
Shareholders's Funds and Liabilities																
Shareholders's Funds	**0.24**	**0.30**	**0.35**	**0.59**	**0.33**	**0.27**	**0.36**	**0.38**	**0.26**	**0.42**	**0.22**	**0.37**	**0.39**	**0.44**	**0.21**	**0.63**
Capital	0.10	0.16	0.10	0.16	0.13	0.12	0.22	0.12	0.09	0.02	0.08	0.17	0.12	0.09	0.10	0.07
Other Shareholder's Funds	0.14	0.15	0.25	0.43	0.20	015	0.14	0.26	0.17	0.40	0.14	0.20	0.27	0.35	0.11	0.56
Liabilities	**0.76**	**0.70**	**0.65**	**0.41**	**0.67**	**0.63**	**0.64**	**0.62**	**0.74**	**0.58**	**0.78**	**0.63**	**0.61**	**0.56**	**0.79**	**0.37**
Non Current Liabilities	0.11	0.16	0.20	0.15	0.16	0.47	0.07	0.33	0.12	0.20	0.16	0.15	0.17	0.23	0.43	0.03
Long Term Debt	0.00	0.14	0.14	0.11	0.07	0.10	0.05	0.30	0.01	0.00	----	0.14	0.15	0.13	0.20	0.03
Other Non Current Liabilities	0.11	0.02	0.06	0.04	0.09	0.37	0.02	0.03	0.11	0.20	----	0.01	0.02	0.10	0.23	0.00
Current Liabilities	0.65	0.54	0.45	0.26	0.51	0.26	0.57	0.29	0.62	0.38	0.62	0.48	0.44	0.33	0.36	0.34
Loans	0.18	0.15	----	0.02	0.10	0.02	0.25	0.02	0.20	0.01	----	0.14	0.12	0.01	0.00	0.32
Creditors	0.16	0.23	0.10	0.05	0.26	0.06	0.25	0.10	0.28	0.02	0.06	0.22	0.18	0.13	0.13	0.01
Other Current Liabilities	0.31	0.16	----	0.19	0.15	0.18	0.07	0.17	0.14	0.35	----	0.12	0.14	0.19	0.23	0.01

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Panel C: Large firms Year 2000 (4830 firms)

Countries	AT	BE	DK	FI	FR	GE	GR	IE	IT	NL	NO	PT	ES	SE	SW	UK
Number of Observations	45	255	114	57	571	246	108	23	815	63	111	177	574	221	6	1444
Assets																
Fixed Assets	**0.45**	**0.62**	**0.50**	**0.50**	**0.35**	**0.46**	**0.43**	**0.59**	**0.41**	**0.62**	**0.63**	**0.46**	**0.48**	**0.40**	**0.20**	**0.47**
Intangible assets	----	0.03	0.04	0.03	0.02	----	0.12	0.00	0.06	0.07	0.04	0.01	0.04	0.05	0.00	0.04
Tangible Assets	0.28	0.15	0.28	0.35	0.17	0.27	0.28	0.39	0.23	0.23	0.13	0.36	0.27	0.21	0.07	0.19
Other Fixed Assets	0.17	0.44	0.18	0.12	0.16	0.19	0.03	0.24	0.12	0.32	0.46	0.09	0.17	0.14	0.13	0.24
Current Assets	**0.55**	**0.38**	**0.50**	**0.50**	**0.65**	**0.54**	**0.57**	**0.41**	**0.59**	**0.38**	**0.37**	**0.54**	**0.52**	**0.60**	**0.80**	**0.53**
Stocks	0.10	0.11	0.16	0.10	0.14	0.17	0.18	0.11	0.19	0.08	0.08	0.14	0.14	0.11	0.11	0.08
Debtors	0.00	0.15	0.12	0.14	0.27	0.02	0.28	0.12	0.21	0.26	0.22	0.32	0.28	0.08	0.60	0.07
Other Current Assets	0.45	0.12	0.22	0.26	0.24	0.35	0.11	0.21	0.19	0.04	0.07	0.08	0.10	0.41	0.09	0.38
Cash and Cash Equivalents	0.03	0.03	0.05	0.12	0.11	0.03	0.06	0.05	0.03	0.04	0.06	0.05	0.09	0.03	0.03	0.04
Shareholders's Funds and Liabilities																
Shareholders's Funds	**0.44**	**0.32**	**0.33**	**0.48**	**0.31**	**0.30**	**0.39**	**0.54**	**0.28**	**0.50**	**0.44**	**0.44**	**0.37**	**0.44**	**0.27**	**0.37**
Capital	0.06	0.14	0.08	0.14	0.13	0.12	0.31	0.04	0.14	0.17	0.17	0.22	0.12	0.04	0.05	0.15
Other Shareholder's Funds	0.38	0.18	0.25	0.34	0.18	0.18	0.08	0.50	0.14	0.40	0.27	0.22	0.25	0.40	0.22	0.22
Liabilities	**0.56**	**0.68**	**0.67**	**0.52**	**0.69**	**0.70**	**0.61**	**0.46**	**0.72**	**0.50**	**0.56**	**0.56**	**0.63**	**0.56**	**0.73**	**0.63**
Non Current Liabilities	0.22	0.26	0.19	0.12	0.15	0.37	0.13	0.21	0.18	0.16	0.22	0.12	0.18	0.16	0.13	0.14
Long Term Debt	0.02	0.21	0.15	0.10	0.01	0.08	0.10	0.20	0.00	0.02	----	0.11	0.13	0.01	0.00	0.13
Other Non Current Liabilities	0.20	0.05	0.04	0.02	0.14	0.29	0.03	0.01	0.18	0.14	----	0.01	0.05	0.15	0.13	0.01
Current Liabilities	0.34	0.42	0.48	0.40	0.54	0.33	0.48	0.25	0.54	0.34	0.34	0.44	0.45	0.40	0.60	0.49
Loans	0.10	0.14	----	0.00	0.09	0.02	0.16	0.06	0.08	0.05	----	0.09	0.05	0.01	0.00	0.34
Creditors	0.07	0.13	0.09	0.07	0.24	0.10	0.18	0.05	0.21	0.05	0.06	0.16	0.15	0.09	0.08	0.07
Other Current Liabilities	0.17	0.15	----	0.33	0.21	0.21	0.14	0.14	0.25	0.24	----	0.19	0.25	0.30	0.52	0.08

Table 5: Macroeconomic Information
(in percentage)

	Inflation	Short term interest rate	Long term interest rate	Growth in GDP	Interest rate spread
Countries					
Austria	1.51	3.56	5.26	3.29	-1.70
Belgium	1.65	3.57	5.43	3.95	-1.86
Denmark	1.96	3.98	5.61	4.41	-1.63
Finland	1.75	3.54	5.61	5.53	-2.07
France	1.41	3.80	5.26	3.61	-1.47
Germany	1.11	3.55	5.07	2.44	-1.52
Greece	5.61	6.49	5.78	9.20	0.71
Ireland	3.73	4.20	5.08	11.75	-0.89
Italy	4.37	5.08	6.34	9.59	-1.27
Netherlands	3.72	3.50	5.13	4.99	-1.63
Norway	3.53	5.45	5.90	6.75	-0.45
Portugal	3.86	4.87	6.16	6.33	-1.29
Spain	3.67	4.70	6.06	7.41	-1.36
Sweden	1.72	4.70	6.07	4.65	-1.36
Switzerland	0.76	1.81	3.35	1.98	-1.54
United Kingdom	2.51	5.65	5.78	5.46	0.13

Table 6: Percentage of Firm year observations with Debt in their capital structure

	LT DEBT			ST DEBT			CREDITORS		
	All	*Small*	*Large*	*All*	*Small*	*Large*	*All*	*Small*	*Large*
Countries									
Austria	0.3927	0.2000	0.4176	0.4291	0.4727	0.4415	0.9291	0.7272	0.9707
Belgium	0.7228	0.7207	0.7529	0.6299	0.6068	0.6979	0.9967	0.9969	0.9949
Denmark	0.6471	0.5712	0.6703	----	----	----	0.9819	0.9669	0.9766
Finland	0.6898	0.6982	0.6538	0.4536	0.4841	0.3039	0.9586	0.9597	0.9484
France	0.1753	0.1572	0.1945	0.8696	0.8679	0.8728	0.9937	0.9951	0.9905
Germany	0.5826	0.5475	0.5890	0.2063	0.2066	0.1855	0.9482	0.9298	0.9471
Greece	0.5512	0.4970	0.6163	0.8483	0.8514	0.8359	0.9968	0.9960	0.9989
Ireland	0.4886	0.4910	0.4529	0.5989	0.5812	0.6059	0.7816	0.7653	0.8647
Italy	0.1068	0.0944	0.0954	0.8624	0.8544	0.8568	0.9772	0.9670	0.9853
Netherlands	0.1302	0.0376	0.1910	0.2795	0.1242	0.4372	0.6474	0.5109	0.8571
Norway	----	----	----	----	----	----	0.9189	0.9549	0.8249
Portugal	0.7458	0.6624	0.7677	0.8064	0.7835	0.8200	0.9654	0.9489	0.9789
Spain	0.7977	0.7802	0.8012	0.7986	0.7657	0.8142	0.9278	0.8921	0.9635
Sweden	0.4415	0.5445	0.2722	0.2488	0.3010	0.1917	0.9809	0.9860	0.9857
Switzerland	0.4714	1.0000	0.4118	0.4000	0.0000	0.5490	0.8286	1.0000	0.7647
United Kingdom	0.5431	0.4737	0.5599	0.9202	0.8978	0.9322	0.8936	0.8972	0.8834
All	0.4299	0.4054	0.4625	0.7438	0.7086	0.7633	0.9463	0.9424	0.9437

Table 7: Summary Statistics for Debt Levels (Average 1994-2004)

The sample consists on 155,401 observations for firms on Amadeus database with NACE Rev. 1.1 activity code between 1500 and 3799 over the period 1994-2004. The countries are (in alphabetic order): Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom. Total Assets is the book value of total assets. Totalloans is defined as long term debt plus short term debt plus creditors minus debtors plus other current liabilities over total assets.

Statistics	*Mean*			*Median*			*Std. Deviation*		
Size	All	Small	Large	All	Small	Large	All	Small	Large
Countries									
Austria	0.4382	0.5541	0.4173	0.4234	0.5940	0.4026	0.2727	0.4679	0.2268
Belgium	0.3293	0.3208	0.3788	0.3288	0.3194	0.3774	0.2387	0.2431	0.2331
Denmark	0.4326	0.4130	0.4637	0.4354	0.3901	0.4596	0.2284	0.2815	0.2047
Finland	0.3384	0.3181	0.3391	0.3250	0.3009	0.3262	0.2244	0.2316	0.2092
France	0.2349	0.2364	0.2439	0.2048	0.2015	0.2146	0.2209	0.2332	0.2116
Germany	0.3925	0.4228	0.3622	0.3932	0.4290	0.3549	0.2647	0.2775	0.2596
Greece	0.2224	0.2040	0.2695	0.2191	0.2060	0.2684	0.2190	0.2108	0.2368
Ireland	0.2756	0.2811	0.3240	0.2367	0.2443	0.2905	0.2999	0.3185	0.3073
Italy	0.2430	0.2580	0.2380	0.2284	0.2427	0.2177	0.2131	0.2217	0.2093
Netherlands	0.1791	0.1941	0.1459	0.1476	0.1535	0.1181	0.2739	0.3006	0.2348
Norway	0.1586	0.1625	0.1578	0.1323	0.1360	0.1198	0.2311	0.2345	0.2309
Portugal	0.2676	0.2624	0.2662	0.2651	0.2501	0.2677	0.2257	0.2147	0.2329
Spain	0.2238	0.2183	0.2403	0.2092	0.2056	0.2230	0.2319	0.2373	0.2266
Sweden	0.2874	0.2895	0.2825	0.2571	0.2633	0.2419	0.2094	0.2135	0.2064
Switzerland	0.1107	0.2467	0.0949	0.1010	0.2787	0.1091	0.1959	0.1148	0.2146
United Kingdom	0.3909	0.3676	0.4179	0.3718	0.3276	0.4109	0.2935	0.3205	0.2769
All	0.2817	0.2688	0.3151	0.2659	0.2511	0.3003	0.2386	0.2408	0.2391

Table 8: Statutory Tax rates and Debt Levels

	Statutory Tax Rate (Average)	Debt Level
Countries		
Austria	0.3400	0.4382
Belgium	0.3961	0.3293
Denmark	0.3218	0.4326
Finland	0.2800	0.3384
France	0.3600	0.2349
Greece	0.3741	0.3925
Germany	0.3500	0.2224
Ireland	0.2827	0.2756
Italy	0.3591	0.2430
Netherlands	0.3491	0.1791
Norway	0.2800	0.1586
Portugal	0.3720	0.2676
Spain	0.3500	0.2238
Sweden	0.2800	0.2874
Switzerland	0.1847	0.1107
United Kingdom	0.3118	0.3909

Table 9: Summary Statistics for the Tax Variables

Statistics	Mean	Median	Std Dev.	Min	Max
Variables					
Tax Dummy	0.2179	0.0000	0.4128	0.0000	1.0000
Dichotomous	0.2681	0.3400	0.1452	0.0000	0.4838
Trichotomous	0.2672	0.3300	0.1245	0.0000	0.4838
NDTS	0.0554	0.0438	1.3646	-0.5790	455.27
NDTS*Tax Exhaustion	0.0032	0.0000	0.0160	-0.5790	1.3202
KINK	2.8788	1.5874	3.1294	0.0000	8.0000
Statutory	0.3430	0.3500	0.0373	0.1250	0.4838
Effective	0.3186	0.3059	12.3714	-1309.00	2484.05

Table 10: Summary Statistics for the Agency/Asymmetric InformationVariables

Statistics	Mean	Median	Std Dev.	Min	Max
Variables					
Intangible	0.0225	0.0026	0.0628	-0.3761	1.0000
Profitability	0.0727	0.0595	0.1299	-8.3667	10.8103
Growth	0.0897	0.0546	0.3866	-5.8594	18.4212
Age	3.0036	3.0045	0.8026	0.0000	5.7620

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Table 11: Independence Indicator and Ultimate Owner type by Firm Size
(in percentage)

Size	All	Small	Large
Independence Indicator			
A	29.98	40.21	14.16
B	4.99	6.29	3.12
C	65.03	53.49	82.72
Ultimate Owner			
Bank	1.53	1.19	1.72
Employees/Managers	0.50	0.26	0.33
Financial company	0.72	0.57	0.52
Foundation	0.36	0.04	0.59
Individual(s) or family(ies)	28.14	37.73	18.53
Industrial company	65.85	57.88	74.06
Insurance Company	0.38	0.22	0.59
Mutual & Pension fund/Trust/Nominee	0.53	0.35	0.52
State, Public authority	2.00	1.76	3.15

Table 12: Summary Statistics for the Macroeconomic Variables

Statistics	Mean	Median	Std Dev.	Min	Max
Variables					
Inflation	0.0317	0.0271	0.0291	-0.0155	0.1586
Short Term interest rate	0.0426	0.0369	0.0171	0.0021	0.1369
Long Term interest rate	0.0516	0.0487	0.0083	0.0231	0.0935
Growth in GDP	0.0515	0.0482	0.0220	-0.0050	0.1910
Interest rate Spread	-0.0090	-0.0114	0.0123	-0.0318	0.0486

Table 13: Variables Definition and expected relationship with debt levels

Variables	Definition	Expected relationship with Debt Levels
TaxDummy	Equal to 1 if $EAT_{t-1} < 0$ and 0 otherwise	Negative
Dichtomous	Equal to 0 if $EAT_{t-1} < 0$ and equal to the statutory tax rate if EAT > 0	Positive
Trichotomous	Equal to 0 when both if $EAT_{t-1} < 0$ and $EBT_{t}-1 < 0$ (both negative earnings and TLCF) and equal to ½ if only one is true and the statutory tax rate if $EAT_{t-1} > 0$	Positive
Statutory	Top statutory corporate tax by year and country	Positive
NDTS	Depreciation/Total Assets	Negative
NDTS*Tax Exhaustion	total depreciation/total assets multiplied by a dummy variable equal to 1 if Cash $Flow_{t-1} < 0$ and zero otherwise.	Negative
Kink	EBIT/ Interests Paid, limited to 8, Kink<0 equal to 0,EBIT>0 and Int=0 equal=8, EBIT<0 and INT=0 equal to 0	Negative
Effective	Taxes/EBT	Positive
Tangible	Tangible Assets/Total Assets	Positive
Size	Equal to 1 if nr. employees ≤ 100; equal to 2 if 100 < nr. employees ≤ 250 and equal to 3 if nr. Employees > 250	Positive
Intangible	Intangible Assets/Total Assets	Negative
Profitability	EBIT/Total Assets	Positive
Growth	(Natural logarithm Total Assets t)- (Natural logarithm Total Assets t-1)	Negative
Age	Natural logarithm (Current year – Incorporation Year)	Positive
Independence	Equal to 1 if type A, equal to 2 if type B and equal to 3 if ype C	Positive
Ultimate Owner	Equal to 1 if ultimate owner does exist, 0 otherwize	?
Family	equal to 1 if firm ultimate owner its a family, 0 otherwise	Negative
Inflation	Annual Inflation Rate by country	Negative
Short term interest rate	Average 3 months Risk Free Rate by year and country	Negative
Long term interest rate	Aveage 10 year treasury bonds by year and country	Negative
Growth in GDP	Percentage change by year and country	Positive
Interest rate spread	3 months Risk Free Rate-10 Years Treasury Bonds by year and contry	Negative (short term) Positive (long term)
Industry	Industry dummy (24 sectors)	----
Country	Contry dummy (16 countries)	----
Law Origin	Law origin dummy (French, English, German and Scandinavian)	----

Table 14: Instrumental Variables (IV) Regressions

The sample consists on 155,401 observations for firms on Amadeus database with NACE Rev. 1.1 activity code between 1500 and 3799 over the period 1994-2004.
The following regression is estimated:

$$D_{it} = \gamma\,\alpha + \gamma\,\beta_{TAX}\,TAX + \gamma\,\beta_{BANK}\,BANK_{it} + \gamma\,\beta_{AGEN}\,AGEN_{it} + \gamma\,\beta_{GOV}\,GOV_{it} + \gamma\,\beta_{MACRO}\,MACRO_t + \gamma\,\beta_{COUNT}\,COUNT + \gamma\,\beta_{IND}\,IND_i + (1-\gamma)\,D_{it-1} + e_{it}$$

D_{it} is the debt level of firm i in year t. α is the constant term. γ is the target adjustment coefficient. TAX are taxation proxies to account the effect of corporate taxes on capital structure (previously defined) and used one of each time. $BANK_{it}$ is a vector of bankruptcy variables such as tangible assets and size, $AGEN_{it}$ is a vector of agency/ asymmetric information variables which includes intangible assets, profitability, firm growth and years of incorporation, GOV_{it} is a vector of governance variables like firm independence, family versus no family firms and ultimate owner, $MACRO_t$ is a vector of macroeconomic factors by year and country such as inflation, short and long term interest rate, growth in GDP and interest rate spread, $COUNT_{it}$ is a dummy variable representing the different countries and IND_{it} is a dummy variable for the industry types.
The countries are (in alphabetic order): Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom. Totalloans is defined as long term debt plus short term debt plus creditors minus debtors plus other current liabilities over total assets. D_{it-1} is the debt level of firm i in year t – 1. e_{it} is the error term. White heteroskedasticity - consistent standard errors & covariance. t-statistics in parenthesis. Superscript * indicate statistical significance at 0,01(*), 0,05 (**) and 0,10 (***) percent levels. Two stage least square estimation procedure is used. Countries, Law origin and Sectors dummy variables were included in the regressions.

Panel A: Tax Variables

Tax Variables	Tax Dummy	Dichotomous	Trichotomous	NDTS	NDTS*Tax Exhaustion	KINK	Statutory	Effective
	-0.0348*	0.1034*	-0.2200*	-0.5767**	-2.1710*	-0.0133*	1.1084*	0.0000
	(-4.2231)	(4.4901)	(-6.7780)	(-1.8970)	(-4.8485)	(-10.3047)	(5.7288)	(0.0301)

Other Variables								
TOTALLOANS$_{t-1}$	0.8320*	0.8320*	0.8279*	0.8351*	0.8403*	0.8288*	0.8304*	0.8304*
	(156.0674)	(156.1971)	(156.3058)	(176.9023)	(193.6491)	(153.3867)	(152.792)	(152.2905)
Target Adjustment Coefficient	0.1680	0.1680	0.1711	0.1649	0.1597	0.1712	0.1696	0.1696
Adjusted R-Squared	0.690	0.690	0.691	0.696	0.703	0.689	0.689	0.688

Panel B: Bankruptcy, Agency/Asymmetric Information, Macroeconomic and Ownership variables

Variables	Tax Dummy	Dichotomous	Trichotomous	NDTS	NDTS*Tax Exhaustion	KINK	Statutory	Effective
Tangible	0.1748*	0.1752*	0.1580*	0.2475*	0.1903*	0.1872*	0.1765*	0.1773*
	(0.8562)	(10.8748)	(10.0725)	(6.4855)	(11.4492)	(11.5378)	(10.8993)	(10.919)
Size	0.0157*	0.0157*	0.0144*	0.0192*	0.0185*	0.0146*	0.0166*	0.0166*
	(4.6765)	(4.6753)	(4.4106)	(5.3438)	(5.3497)	(4.3464)	(4.8359)	(4.8212)
Intangible	0.28167*	0.2827*	0.2443*	0.3434*	0.3025*	0.2841*	0.2938*	0.2881*
	(4.5830	(4.5986)	(4.0869)	(5.9944)	(5.7683)	(4.6896)	(4.7954)	(4.7011)
Profit	-1.0514*	-1.0528*	-0.8751*	-0.9291*	-1.1576*	-0.7960*	-0.8999*	-0.8951*
	(-15.7226)	(-15.8024)	(-13.3687)	(-7.6018)	(-16.4261)	(-7.1323)	(-7.7981)	(-7.8104)
Growth	0.3181*	0.3182*	0.3138*	0.3380*	0.4256*	0.3135*	0.3135*	0.3123*
	(6.5062)	(6.5049)	(6.5727)	(6.5741)	(5.9565)	(6.5299)	(6.4926)	(6.4556)
Age	0.0047	0.0047	0.0054	0.0072**	0.0075**	0.0053	0.0061***	0.0060
	(1.3216)	(1.3247)	(1.5618)	(2.0448)	(2.1090)	(1.5196)	(1.7224)	(1.6952)
Inflation	-0.4258*	-0.4308*	-0.4065*	-0.4600*	-0.4666*	-0.3881*	-0.5027*	-0.4119*
	(-4.6444)	(-4.6986)	(-4.5508)	(-5.0237)	(-5.0797)	(-4.2335)	(-5.4402)	(-4.4366)
Diffinterest	1.2107*	1.1903*	1.2479*	1.2104*	1.1715*	1.0168*	0.8071*	1.1396*
	(4.6745)	(4.5990)	(4.9508)	(4.5899)	(4.3216)	(3.9255)	(3.0737)	(4.3777)
GDP	0.1241	0.1147	0.1923	0.0707	0.0998	0.1076	0.0018	0.1149
	(0.6048)	(0.5589)	(0.9600)	(0.3564)	(0.5419)	(0.5337)	(0.0087)	(0.5643)

Independence	0.0101*	0.0101*	0.0083**	0.0104*	0.0115*	0.0101*	0.0098*	0.0101*
	(2.9919)	(2.9933)	(2.5123)	(3.0649)	(3.3038)	(3.0080)	(2.9060)	(2.9782)
Ultimate	0.0104	0.0105	0.0096	0.0097	0.0117***	0.0101	0.0119***	0.0118***
	(1.5089)	(1.5152)	(1.4245)	(1.3830)	(1.6327)	(1.4851)	(1.7256)	(1.7095)
Family	-0.0177**	-0.0177*	-0.0129*	-0.0220*	-0.0204**	-0.0158***	-0.0190**	-0.0194**
	(-2.1639)	(-2.1622)	(-1.6165)	(-2.6269)	(-2.4064)	(-1.9535)	(-2.3235)	(-2.3700)
Constant	0.1975*	0.1612*	0.2413*	0.1804*	0.1745*	0.2066*	-0.2219*	0.1726*
	(8.8910)	(7.2540)	(11.2184)	(7.2062)	(8.0157)	(9.4255)	(-3.2773)	(7.3432)

Panel C: Countries				Panel D: Law Origin	
Countries		*Countries*		*Law Origin*	
Austria	-0.0509	Italy	----	French	----
	(-0.9750)				
Belgium	0.0784*	Netherlands	-0.0320	English	0.0976*
	(8.1191)		(-1.3541)		(11.1523)
Denmark	0.1645*	Norway	0.0687*	German	-0.0518**
	(7.0721)		(3.2979)		(-2.4514)
Finland	0.1556*	Portugal	-0.0651*	Scandinavian	0.0901*
	(7.7274)		(-4.9749)		(9.0027)
France	-0.0247**	Spain	-0.0519*		
	(-2.4073)		(-4.9765)		
Germany	-0.0328	Sweden	0.0434*		
	(-1.3797)		(3.1003)		
Greece	-0.0527*	Switzerland	-0.3266*		
	(-3.4520)		(2.5943)		
Ireland	0.1183	United Kingdom	0.0853*		
	(1.2090)		(8.4340)		

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Panel E: Sectors

Sectors		Sectors	
Food Products and Beverages	----	Basic Metals	-0.0244** (-1.9598)
Tobacco Products	0.1550* (2.9034)	Fabricated Metal Products, Except Machinery and Equipment	-0.0189** (-1.9763)
Textiles	-0.0086 (-0.7324)	Machinery and Equipment n.e.c.	-0.0002 (-0.0188)
Wearing apparel, Dressing and Dyeing of fur	0.0260 (1.5631)	Office Machinery and Computers	-0.0156 (-0.4083)
Tanning and dressing odf leather; manufacture of laggage, handbags, saddlery, harness and footwear	0.0639* (3.8526)	Electrical Machinery and Apparatus n.e.c.	-0.0509* (-3.5265)
Wood and Products of wood and Cork,except Furniture	0.0252*** (1.7418)	Radio, Television and Communication and Apparatus	-0.0411*** (-1.7585)
Pulp, Paper and Paper Products	-0.0422* (-3.0823)	Medical, Precision and Optical Instruments, Watches and Clocks	-0.0271 (-1.3758)
Publishing, Printing and Reproducction of Recorded Media	0.0054 (0.3946)	Motor Vehicles, Trailers and Semi-Trailers	-0.0320** (-2.1488)
Coe, Refined Petroleum Products and Nuclear Fuel	-0.0157 (-0.4794)	Other Transport Equipment	0.0728* (3.2811)
Chemicals and Chemicals Products	-0.0342* (-2.9076)	Furniture	0.0106 (0.7660)
Rubber and Plastic Products	-0.0313* (-2.7398)	Recycling	0.0158 (0.4380)
Other Non-Metalic Mineral Products	-0.0446* (-4.1059)		

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Table 15: Correlation Matrix

	TXDUMMY	DICHOTOMOUS	TRICHOTOMOUS	NDTS	NDTS*Tax Exhaustion	STATUTORY	EFFECTIVE	KINK	TANGIBLE	SIZE
TXDUMMY	1.0000									
DICHOTOMOUS	-0.9763	1.0000								
TRICHOTOMOUS	-0.8218	0.8518	1.0000							
NDTS	0.0447	-0.0322	-0.0375	1.0000						
NDTS*Tax Exhaustion	0.3613	-0.3510	-0.3362	0.1083	1.0000					
STATUTORY	0.0297	0.1606	0.1875	0.0544	-0.0226	1.0000				
EFFECTIVE	-0.0031	0.0042	0.0050	0.0020	-0.0044	0.0055	1.0000			
KINK	-0.2032	0.1989	0.2987	0.0217	-0.0920	-0.0070	0.0029	1.0000		
TANGIBLE	0.0612	-0.0807	-0.0987	0.3108	0.0416	-0.0950	-0.0040	0.0314	1.0000	
SIZE	0.0356	-0.0578	-0.0749	0.0593	0.0560	-0.1163	-0.0058	-0.0451	0.1093	1.0000
INTANGIBLE	0.0590	-0.0605	-0.0726	0.0349	0.0485	-0.0151	0.0042	-0.0153	-0.1139	0.0521
PROFIT	-0.3345	0.3146	0.4511	-0.0425	-0.2546	-0.0415	0.0032	0.2497	-0.0431	-0.0502
GROWTH	-0.0604	0.0655	0.0911	-0.0941	-0.0765	0.0324	0.0025	0.0569	-0.0435	-0.0580
AGE	-0.0373	0.0329	0.0337	-0.0241	-0.0313	-0.0194	-0.0012	-0.0082	0.0038	0.1404
INFLATION	0.0009	0.0200	0.0236	-0.0227	-0.0259	0.1053	-0.0025	0.0256	-0.0197	-0.0470
DIFFINTEREST	-0.0540	0.0167	0.0137	-0.0331	-0.0064	-0.1823	-0.0063	-0.0254	0.0514	0.0769
GDP	-0.0812	0.0740	0.0836	-0.0428	-0.0391	-0.0349	-0.0042	0.0253	0.0803	-0.0111
INDEPENDENCE	0.0053	-0.0497	-0.0554	0.0096	0.0617	-0.2296	-0.0066	-0.0124	0.0560	0.2390
ULTIMATE	-0.0148	-0.0392	-0.0459	-0.0061	0.0392	-0.2742	-0.0041	-0.0099	0.0547	0.1951
FAMILY	-0.0345	0.0257	0.0302	-0.0142	-0.0158	-0.0395	0.0001	0.0169	0.0137	-0.0203

Table 15: Correlation Matrix (cont.)

	INTANG	PROFIT	GROWTH	AGE	INFLATION	DIFFINTEREST	GDP	INDEPENDENCE	ULTIMATE	FAMILY
INTANGIBLE	1.0000									
PROFIT	-0.0504	1.0000								
GROWTH	0.0466	0.0709	1.0000							
AGE	-0.1080	0.0038	-0.0814	1.0000						
INFLATION	0.0034	0.0062	0.0233	-0.0463	1.0000					
DIFFINTEREST	-0.0300	0.0552	0.0616	-0.0452	-0.0863	1.0000				
GDP	0.0431	0.0575	0.0856	-0.0670	0.1878	0.3319	1.0000			
INDEPENDENCE	0.0205	0.0165	-0.0324	0.0300	-0.1803	0.1007	0.0413	1.0000		
ULTIMATE	0.0039	0.0195	-0.0192	0.0531	-0.1227	0.1367	0.0327	0.5663	1.0000	
FAMILY	-0.0154	0.0001	0.0269	-0.0182	-0.0160	0.0751	0.0825	0.2205	0.4545	1.0000