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EN The purpose of this paper is to test how firm characteristics affect SMEs' capital structure using a unique dataset of micro, small, and medium-sized firms (SMEs) in Central and Eastern Europe (CEE). We carry out a panel data analysis of 3175 SMEs from seven CEE countries during the period 2001–2005, modeling the leverage ratio as a function of firm specific characteristics hypothesized by capital structure theory. By using the cash flow as an explanatory variable, we test some of the predictions of the pecking order theory. According to this theory, firms with more available internal funds should use less external funding. We do find strong evidence in favor of the pecking order theory, given that there is a negative and significant correlation between profitability and leverage. When we control for other firm specific characteristics such as future growth opportunities, liquidity, sales growth, size and assets structure, the cash flow is found to be a strong determinant of firm leverage. We also argue that the determinants of firm leverage may be considerably different depending on firms' size and age. The empirical results show that cash flow coefficient remains negative and statistically significant only for medium-sized firms, thus suggesting that larger firms with sufficient internal funds use less external funding than comparable smaller firms. We obtain similar results when we estimate the model by firm age; older firms demonstrate similar behavior as larger firms.
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On the Determinants of SME Capital Structure in Central and Eastern Europe: A Dynamic Panel Analysis

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ABSTRACT

The purpose of this paper is to test how firm characteristics affect SMEs' capital structure using a unique dataset of micro, small, and medium-sized firms (SMEs) in Central and Eastern Europe (CEE). We carry out a panel data analysis of 3,175 SMEs from seven CEE countries during the period 2001–2005, modelling the leverage ratio as a function of firm specific characteristics hypothesized by capital structure theory. By using the cash flow as an explanatory variable, we test some of the predictions of the pecking order theory. According to this theory, firms with more available internal funds should use less external funding. We do find strong evidence in favour of the pecking order theory, given that there is a negative and significant correlation between profitability and leverage. When we control for other firm specific characteristics such as future growth opportunities, liquidity, sales growth, size and assets structure, the cash flow is found to be a strong determinant of firm leverage. We also argue that the determinants of firm leverage may be considerably different depending on firms' size and age. The empirical results show that cash flow coefficient remains negative and statistically significant only for medium-sized firms, thus suggesting that larger firms with sufficient internal funds use less external funding than comparable smaller firms. We obtain similar results when we estimate the model by firm age; older firms demonstrate similar behavior as larger firms.

Keywords: small and medium-sized enterprise, capital structure, leverage, panel data analysis

JEL classification: L25, L26, C23

1. Introduction

This paper explores the main determinants of capital structure in small and medium-sized enterprises in Central and Eastern Europe. An increasing body of literature indicates that small and medium-sized enterprises (SMEs) are of major importance for macroeconomic growth. During much of the past decade SMEs in Europe have seen an impressive growth. Between 2002 and 2008, SMEs in the EU-27 grew strongly and turned out to be the job engine for much of the European economy. The number of SMEs increased by 2.4 million (or 13 percent), whereas the number of large enterprise increased by only 2,000 (or 5 percent).[1] This growth was also reflected in employment figures; in absolute numbers, 9.4 million jobs were created in the SME-sector in the same period.[2]

There are regional differences in SME presence in Europe. The old Member States (EU-15) account for 80 percent of the total number of enterprises in EU-27 and the new Member States (EU-12) for 20 percent. In both regions, SMEs make up the vast majority of enterprises in the non-financial business economy. Differences in the employment share of SMEs and in average enterprise size are quite small. However, across individual countries there is a large diversity in average firm size, as well as in the employment share of SMEs (EC 2010, p.18). The determinants of this diversity include differences in per capita income, sector structure, outsourcing and off-shoring, and culturally or institutionally-based occupational preferences for self-employment.[3] Although the average enterprise size is similar in the two regions, the discrepancy in average enterprise size across countries within both groups is large (varying between 3 and 12 occupied persons per enterprise in EU-15, and between 3 and 18 in EU-12).

Despite the importance of SMEs for job creation and production, most of the SME literature points to the fact that small and medium firms face higher barriers to external financing than large firms, which limits their growth and development (Ardic *et al.*, 2011). Numerous studies that use firm-level survey data demonstrate that access to finance and the cost of credit do not only pose barriers to SME financing, but also constrain SMEs more than large firms (Pissarides, 1999). Small firms find it difficult to obtain commercial bank financing, especially long-term loans, for a number of reasons, including lack of collateral, difficulties in proving creditworthiness, small cash flows, inadequate credit history, high risk premiums, underdeveloped bank-borrower relationships and high transaction costs (IFC, 2009). A recent study by Beck *et al.* (2008)

[1] See 'European SMEs under Pressure', Annual Report on EU SMEs 2009, European Commission, p.6.

[2] The typical European firm is a micro firm. There are about 1.4 million small enterprises, representing 7 percent of the stock. About 1 percent (or 226,000) of enterprises are medium-sized. On average, an enterprise in the EU provides work for 6.4 persons; by comparison, the number of occupied persons per enterprise in the US is 5, while it is 11 in Japan.

[3] The general tendency over the period 2002-2008 is that both the average firm size and the number of SMEs in EU-12 increases and the average enterprise size of large firms in this region decreases, signalling a higher importance of small scale. This latter trend is probably related to the rapid transition that most of these economies went through in the past two decades, creating many new market opportunities for emerging entrepreneurs.

finds that smaller firms and firms in countries with underdeveloped financial and legal systems use less external finance, based on data from a firm-level survey in 48 countries.[4]

A growing body of research literature deals with debt policy decisions of firms. Although there are many previous empirical studies on financing decisions of large and listed companies, much less attention is paid to the small firms sector, especially in transition economies, given that their growth and prosperity are potentially subjected to different constraints and contingencies, related to the specific economic conditions in these countries (see e.g., Hutchinson and Xavier, 2006 for Slovenia, Klapper *et al*., 2006 for Poland, and Gatti and Love, 2008 for Bulgaria). This paper, therefore, adds to the existing empirical literature by investigating the specific determinants of debt policy decisions of firms in transition economies. By doing so, we explain how firm characteristics affect SMEs' capital structure. Previous research finds that whilst capital structures vary from country to country this might be due to variations in the determinants of capital structure that operate at the firm level, rather than real differences between countries. This is similar to the argument proposed by Myers (1984) that differences in capital structure between firms in different industries are likely to be due to firm-specific attributes rather than industry differences.[5]

The pecking-order theory, originally developed by Myers (1984) and Myers and Majluf (1984) says that, due to information asymmetries between firms and their (potential) investors regarding the firms*'* current operations and future prospects, the investors will ask a return on the capital that is lent – in case of debt finance, or invested – in case of equity finance. As a result, firms find external finance (debt or equity) less attractive than internal finance (personal savings or retained earnings). And because information asymmetries are the highest for small and new firms, leading potential financiers to ask even greater returns on capital, the preference for internal finance is greatest among these firms.[6] By using cash flow as an explanatory variable, we are able to test some of the predictions of this theory. We do find strong evidence in favour of the pecking order theory, given that there is a negative and significant relationship between cash flow and leverage. When we control for other firm specific characteristics such as future growth opportunities, liquidity, sales growth, size and assets structure, the cash flow coefficient

[4] Studies that focus on a specific country report similar results. Binks and Ennew (1997) find that the main constraints to growth of SMEs in the UK include management, labor skills, regulation and lack of access to finance; Hutchinson and Xavier (2006) compare the cases of a leading transition country, Slovenia and an established market economy, Belgium, and find that the SME sector in Slovenia remains underdeveloped, mainly due to the inability to raise external finance. Studies by Anderson and Kegels (1997), Budina *et al.* (2000), Gros and Suhrcke (2000), and Konings *et al.* (2003) all indicate that this appears to be the case in most of Central and Eastern Europe.

[5] Hall *et al.* (2004) find that there are variations in both SME capital structure and the determinants of capital structure between European SMEs. The variations could well be due to differences in attitudes to borrowing, disclosure requirements, relationships with banks, taxation and other national economic, social and cultural differences. These, in turn, are likely to be related to different levels of agency, information asymmetry and signalling costs between countries.

[6] The empirical evidence supporting the pecking-order theory is abundant; see Klapper *et al*. (2006) for empirical evidence on SME financing in Poland, Mac an Bhaird and Lucey (2007) for Ireland, Michaelas *et al*. (1999) and Kitching *et al*. (2009) for the UK, Cassar (2004) for Australia, Ramalho and Vidigal da Silva (2009) for Portugal, and Carpenter and Petersen (2002) for the US.

remains negative and statistically significant only for firms that rely more on short-term debt financing. We also find that SMEs in transition economies seem to follow the maturity matching principle, as they try to finance their fixed assets with long-term debt and their current assets with short-term debt.

The rest of the paper is organized as follows: section 2 studies how the existing capital structure theories can be used to explain the financing decisions in the small and medium-sized firms. Also, we present the empirical hypotheses extracted from the theoretical background that will be tested using a large sample of SMEs from Central and Eastern Europe. Section 3 presents the dataset and all the variables used in the econometric model. In section 4 we discuss the empirical results of our study with their implications. Some concluding remarks are offered in the final section.

2. Theoretical discussions and empirical hypotheses

In the corporate finance literature, there are two theories of capital structure that are relevant: the trade-off theory and the pecking order theory. The trade-off theory argues that firms choose their optimal level of debt by trading off the benefits of debt financing against its costs. The benefits of debt include tax deductibility of interest expenses and reduction of agency costs of equity derived from excess free cash flows. The costs of debt includes higher interest rates and bankruptcy costs, either direct or indirect, and these may occur in a situation of excessive debt. According to this theory, there is an optimal level of debt which occurs when the marginal benefit equals the marginal cost of an additional unit of debt (Bradley *et al.*, 1984).

The pecking order theory is an alternative and more recent theory of capital structure. This theory argues that a pecking order in financing exists if there are information asymmetries in companies between the insiders, either shareholders or managers, and outsiders, mainly investors. In such case, the cost of issuing new securities is the most important issue and it goes beyond a discussion of benefits and costs of debt. The main prediction of this theory is that there is a hierarchy of financing sources. Hence, firms prefer to use retained earnings as their first financing source, followed by debt and, lastly, by equity. Equity is less interesting to firms, given that it entails larger information asymmetry costs, making its issuance more expensive relative to other funding sources (Baskin, 1989).

The seminal work of Modigliani and Miller (1958) set up the basis for the development of a growing body of theoretical work on firm capital structure issue. Its main proposition establishes that the valuation of a company will be independent from its financial structure. While this conclusion is correct under the assumptions made by Modigliani and Miller (1958), the later development of the theory has been produced by relaxing these fundamental assumptions also with the aim of approximating the theory to the firm reality. From this point of view, we can categorize capital structure theory under different stances, depending on which economic aspects and firm characteristics we focus on.

The conventional analysis of capital structure states that firms determine their leverage level trading off the benefits against the shortcomings that debt employment provides (Scott, 1976, and Bradley *et al.*, 1984). The so-called trade-off theory emerges under this line of reasoning and includes fiscal, financial distress and agency conflicts issues. Concerning the fiscal approach of trade-off theory, Modigliani and Miller corrected their

original paper in 1963 (Modigliani and Miller, 1963), concluding that firms would prefer debt to other financing resources due to the tax deductibility of interest payments.[7] This would induce firms to be completely financed by debt. However, as this is not usually observed, several authors, including Modigliani and Miller themselves, argued that bankruptcy costs, and other costs associated with debt, could explain why firms were not totally financed by debt. This discussion on the benefits and costs of debt is central to the trade-off theory of capital structure.[8]

From a financial distress perspective, Warner (1977), Ang *et al.* (1982), and Pettit and Singer (1985) state that larger firms tend to be more diversified and fail less often, so size can be an inverse proxy for the probability of bankruptcy. Likewise, small companies usually have bigger bankruptcy costs in relative terms (Ang *et al.*, 1982). Thus one may expect that firm size is positively related to debt level. The restriction of maturity length of credits offered by lenders may explain partially debt structure used by SMEs. In this context, small and medium-sized firms may use less long-term debt, but probably more short-term debt financing, than larger firms. Following Bevan and Danbolt (2000b) and Hall *et al.* (2000), this would suggest the following relationship between firm leverage and size:

H 1(a): Long-term debt is positively related to firm size, and
H 1(b): Short-term debt relates negatively to firm size.

Agency theory investigates the conflict of interests between the various stakeholders of the firm. Basically, this theory considers the conflict of interest, on the one hand, between shareholders and debtholders and, on the other hand, between shareholders and managers.[9] SMEs are not likely to suffer from this second problem due to the fact that their property identifies almost exactly with their management, and thereby there will be a unique financial objective for these two groups. Notwithstanding, the agency conflict between shareholder/owners and debtholders may be particularly severe for small firms, increasing both the moral hazard and adverse selection problems (Van der Wijst, 1989, and Ang, 1992).

The existence of debt agency costs like risk shifting, and the potential problems of adverse selection and moral hazard, may induce creditors to require guarantees to their lending, materialized in collateral assets (Myers, 1977; Scott, 1977, Harris and Raviv, 1991). This kind of assets will retain value in case of a potential liquidation of the firm,

[7] Some authors, for example Pettit and Singer (1985), have pointed out that this fiscal approach cannot be applied in the small firms context, because SMEs are less likely to be profitable or at least to have abundant benefits, and are therefore less likely to use debt in order to get tax shields because they will not need them.

[8] According to this theory, there are forces leading firms to less leverage, for instance bankruptcy costs, and forces leading to more leverage, among them the above mentioned tax benefits of debt and the agency costs of free cash flow. The combination of these forces results in the existence of a target leverage at which the value of firms is maximized.

[9] In the agency models of Jensen and Meckling (1976) and Jensen (1986), the interests of managers and shareholders are not aligned and managers tend to waste free cash flow in perquisites and/or bad investments. In such situations, the existence of debt payments helps to reduce agency costs of equity as these payments reduce excess cash in the firm.

and could be sold in the market to meet the firm's payment commitments. Thus we hypothesize that firm leverage is positively related to asset tangibility. Myers' (1977) debt overhang problem deals with the fact that firm managers may forego profitable investments (with NPV > 0) if these projects were to benefit exclusively creditors. In fact, firm owners will try to embark on those investments that generate short-term cash flows (managers myopia); however, creditors will only be willing to lend resources at a greater degree of seniority, such as, for example, short-term debt. According to this view and the maturity matching principle of Brealey and Myers (2000), our second hypothesis could be enlarged in the following way:

H 2(a): If firms aim to match maturities of their assets and liabilities, there will be a positive relationship between tangible assets and long-term debt, and
H 2(b): The relationship will be negative if leverage is short-term.

The main predictions of trade-off theory on firm leverage are related with the profitability of firms. In fact, profitability has a positive impact on leverage for three main reasons (Bonfim and Antão, 2012). First of all, as profitability increases bankruptcy costs decrease pushing firms to higher levels of debt. Second, as DeAngelo and Masulis (1980) argue, more profitable firms face higher expected tax rates than less or non-profitable firms. This asymmetric taxation of profits and losses drives more profitable firms to higher levels of debt as they would benefit more from the resulting tax benefits of debt. Third, more profitable firms tend to have more free cash flow, that is, more excess earnings over profitable investments.

Besides profitability, there are other characteristics of firms that help to explain target leverage ratios, such as depreciation, research and development expenses, investment deductions, etc., that could substitute the fiscal role of debt (DeAngelo and Masulis, 1980). For example, the existence of depreciation expenses helps to explain low levels of leverage as these expenses result in tax benefits. Also, in contrast with the agency models, firms with more investments would have less free cash flow available for managers to allocate for their own benefit. Hence, for firms with more investments, debt is not as important as a way to monitor and constrain the actions of managers. Finally, according to capital structure theory, bankruptcy costs are expected to be lower for firms with more tangible assets as these could be used as collateral, in contrast to firms with more intangible assets.

Growth is likely to put a strain on retained earnings and push the firm into borrowing. However, as Myers (1977) has argued, growth opportunities can produce moral hazard situations and small firms will have an incentive to take risks to grow. The benefits of this growth, if realised, will not be employed by lenders, who will only recover the amount of their loans, resulting in a clear agency problem, which will be reflected in increased costs of long-term debt. One of the possible solutions to this problem could be the increased use of short-term debt by the firm. According to Myers (1977) assertions, there should be a negative relationship between debt and growth opportunities; however authors like Michaelas *et al.* (1999) have propounded a positive relationship between these two variables because SMEs mainly use short-term debt financing. However, growth opportunities are very difficult to value for outsiders, causing informational asymmetries

to be more severe, which would suggest a negative relationship between growth and leverage. Thus, our third hypothesis is:

H 3(a): Long-term debt is negatively related to growth opportunities, and
H 3(b): Short-term debt relates positively to growth opportunities.

The existence of informational asymmetries between investors and managers takes us to the pecking order theory. In this context Myers (1984) and Myers and Majluf (1984) argue that there exists a hierarchy in the financing of firms. Due to informational asymmetries, firms will prefer internal to external sources of capital. This suggests that highly profitable firms will tend to finance their investments primarily with retained earnings rather than employing debt. It is worth stressing that this way of financing could easily be applied to SMEs using the following reasoning: SME managers that are at the same time shareholders of these firms, do not like to lose their property and control over their own firms, and therefore, the acceptance of new shareholders will be almost insignificant, thus preferring internal to external sources of financing of their activities (Holmes and Kent, 1991, and Hamilton and Fox, 1998). If external capital is needed, SMEs would choose debt that does not reduce managers' flexibility, that is, short-term debt, which is not likely to include restrictive covenants. Based on this last theoretical stance, we propose the following two hypotheses:

H 4(a): Long-term debt is negatively related to firm profitability, and
H 4(b): SMEs employ predominantly short-term debt as debt financing.

Since small firms usually have a higher proportion of current liabilities in their capital structure compared to large firms, a firm capability to sustain short-term liquidity is expected to be positively related to its growth. Thus, firms with more growth opportunities will keep higher liquidity levels and thus will face less severe financing constraints. These firms will employ lower (short-term) leverage ratios. So, our last hypothesis is:

H 5(a) Long-term debt is negatively related to firm liquidity, and
H 5(b) Short-term debt relates positively to firm liquidity.

Some predictions of the pecking order theory are at odds with those of the trade-off theory. In the first place, there is no target leverage as each firm chooses its leverage ratio based on financing needs. Firms choose to use debt only when internal funds are not enough to meet their investment needs and not because there are benefits and costs from using debt. Secondly, profitable firms use less amount of debt than less profitable ones. This effect derives from the fact that more profitable firms can finance a larger portion of their activities with internally generated funds. Finally, holding profitability constant, leverage is higher for firms with higher investments, as firms need to issue debt when investment exceed internally generated earnings.

Although the two theories are in contradiction as far as the prediction of the impact of profitability on leverage is concerned, they agree on the impact of volatility on leverage

ratios. For the trade-off theory, the impact of volatility is negative as it increases bankruptcy costs. For the pecking order theory, firms with more volatile cash flows are also less likely to have debt in order to lower the possibility that they will have to issue new risky securities or forego future profitable investments when cash flows are low.

Against this setting, we empirically test whether leverage decisions of firms follow the trade-off or the pecking order theory predictions. Hence, we study (i) how the level of leverage is related to firm profitability and other firm characteristics, and (ii) if firms prefer to finance their fixed assets with long-term debt and their current assets with short-term debt.

3. Dataset and model variables

In this study we have adopted the European Commission's SME definition. According to it, SMEs are defined as enterprises in the non-financial business economy (NACE C-I, K) that employ less than 250 persons.[10] The enterprises that employ 250 or more persons are defined as large scale enterprises (LSEs). Within the SME sector, three size classes can be distinguished: micro enterprises, employing less than 10 persons (including self-employed), small enterprises, employing at least 10 but less than 50 persons (including self-employed), and medium-sized enterprises that employ between 50 and 250 persons (including self-employed). In general, SMEs range from the self-employed bookkeeper without personnel to the fast growing, innovative, and much internationalised ICT firm, and everything in between.

The sample of SMEs considered in our study has been extracted from AMADEUS database[11] and includes 5,000 companies from seven Central and Eastern European (CEE) countries.[12] We only consider the time period 2001 - 2005, as the dataset covers a substantially lower number of firms with complete data in the previous years and we want to work with comparable sample sizes in all the years under analysis. For the purpose of this paper, we apply some filters to the data. Firstly, we remove from the dataset observations with a negative value of assets and observations with missing or non-positive value of operating revenues, in order to enhance the quality of data used for our analysis. Secondly, we remove observations for which there are less than four consecutive years of accounting data and without a full record for each variable over the period of examination. Finally, we clean the dataset from spurious outlier observations in order to arrive at an economically meaningful sample. We end up with a total number of 13,059

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[10] This definition is mostly used for statistical reasons. In the European definition of SMEs three additional criteria are added: the economic unit to be more or less autonomous, annual turnover to be less than EUR 50 million, and/or balance sheet total to be less than EUR 43 million (Commission Recommendation 2003/361/EC).

[11] For more details see http://www.bvdep.com/en/AMADEUS.html. The AMADEUS database allows us to choose among a huge variety of public and private companies in 43 European countries. For the scope of our research we selected only micro, small and medium-sized companies.

[12] The original number of CEE countries included in the sample was 13: Bosnia and Herzegovina (BA), Bulgaria (BG), Croatia (HR), Czech Republic (CZ), Hungary (HU), Macedonia (MK), Montenegro (ME), Poland (PL), Romania (RO), Serbia (RS), Slovakia (SK), Slovenia (SI), and Ukraine (UA). In order to obtain non-spurious regression results we applied some filters to the data to remove companies with missing observations or lack of full data record; thus our sample was limited to companies from only seven CEE countries.

observations for the period from 2001 to 2005. These observations correspond to about 3,175 firms.

Table 1 presents the debt structure of all the firms included in the dataset. We observe that bank loans (both long-term and short-term) are an important source of external financing for the firms included in our sample, accounting for more than 19 percent of total debt. Other long-term debt, including debt securities, represents a smaller amount of total firms' debt (less than 12 percent, on average), thus illustrating the low importance of raising funds in debt markets in Central and Eastern Europe. Other current liabilities (trade credits included) are the largest source of financing for SMEs in transition economies, accounting for more than 69 percent of firms' total debt, and its importance has slightly increased during the sample period.[13] Whereas trade credits represent the largest share of micro firms' total debt (77.2 percent), bank loans (both long-term and short-term) are the main source of external funding (19.8 percent) for medium-sized firms. Small firms in our sample rely both on trade credits and short-term bank loans (84.9 percent in total). Table 1 also displays summary statistics for the leverage ratio, defined as long-term or short-term debt to total assets. When long-term leverage is considered, the leverage ratio decreases from 27.5 percent to around 4.2 percent, showing the diminishing importance of this source of funding for SMEs in our sample. At the same time, short-term leverage ratio remains relatively stable over the sample period (except for 2001), standing at around 5 percent.

[Insert Table 1 Here]
[Insert Table 2 Here]

Table 1 also shows significant changes in different types of debt (particularly, long-term bank loans, other long-term debt, and other current liabilities) over the period 2001 – 2005. In order to investigate how this sharp shift from long-term debt to other sources of financing occurs, we performed an analysis on how each individual source component grows over time compared to total book value of assets (see Appendix I). The results show that the change in leverage (long-term debt + short-term bank loans) is not a result of deleveraging, but of increased usage of non-debt financing. The predominant source of financing has been equity; however, trade credits and other types of liabilities also play a crucial role in asset growth of SMEs over the period 2001-2005.

In Table 2 we present relevant macroeconomic data and leverage ratios across countries, included in our sample. The largest number of firms in our sample is from the Czech Republic (37.2 percent), a transition country with the largest GDP per capita ($6,772.9), followed by Romania (32.7 percent) and Serbia (11.1 percent), transition economies with relatively low income per capita. Table 2 displays great variability with respect to GDP, credit volume, FDI flows and tax rates across the CEE countries,

[13] For comparison, a research on Portuguese SMEs (Bonfim and Antão, 2012) shows that bank loans are the main source of external financing, accounting for more than 55 percent of total debt. Trade credit accounts for slightly less than one fifth of firms' debt, though its importance has declined during the sample period. Debt securities represent a smaller amount of firms' debt (less than 10 percent), even for the larger firms in the sample, thus illustrating the low importance of raising funds in debt markets for Portuguese firms.

showing that these countries are at different stage of their transition to market economy. Data in Table 2 show that the proportion of total assets consisting of short-term debt is between 6 and 8 percent for most countries with Bulgaria (14.3 percent) and Romania (3.2 percent) being the outliers. Greater variability is displayed with respect to long-term debt, with Poland the most heavily reliant (9.4 percent), and Hungary (2.2 percent) hardly at all.

We group the firms in our sample in three size classes (following the European Commission's SME definition), taking into account their annual sales, scaled by total assets (see Table 3, Panel A). A relatively small percentage of all companies in the sample are micro firms (3.6 percent), having less than 10 employees and annual sales of 2.7 of total assets. As it would be expected, some of these firms do use external financing, more specifically short-term loans and trade credits. The median leverage ratio for this group is 0.9 percent during the sample period. Medium-sized firms represent the largest share of all firms in our sample (82.4 percent) and are the most leveraged ones (with a median leverage ratio of 4.1 percent). Small firms account for only 14.1 percent of the total sample, with a median leverage ratio of 2.6 percent. We also group firms according to their age in four classes (see Table 3, Panel B). The average age of a firm in our dataset is 15 years. We observe that leverage ratio seems to be (non-linearly) increasing with firm age. Finally, we also examine differences between economic sectors (see Table 3, Panel C), observing that the most leveraged sectors (taking into account their median values) are agriculture, fishing & mining (10.5 percent), manufacturing (5.5 percent), public administration and education (4.5 percent), and wholesale and retail trade (3.1 percent).[14]

[Insert Table 3 Here]

Dependent Variable

In Section 2 we formulated a number of empirical hypotheses in order to test which of the two most relevant capital structure theories (trade-off and pecking order theory) better explains the capital structure of SMEs in Central and Eastern Europe. We begin by analysing the main determinants of the leverage ratio. Although there is little agreement in the existing literature on how to measure those attributes, previous empirical work can help us to define objectively the proxy variables to be used in our study. The variable which we intend to explain is debt capital structure. Following Jordan *et al.* (1998), Michaelas *et al.* (1999), Sogorb-Mira (2005), and Bonfim and Antão (2012), we measure it by total leverage ratio (TOT_LEV), that is, total debt to total assets. However, as argued by Van de Wijst and Thurik (1993), Chittenden *et al.* (1996), Barclay and Smith (1999), and Bevan and Danbolt (2000a), any analysis of leverage determinants based only on total liabilities may screen the important differences between long-term and short-term debt. Consequently, in order to shed some light on this question and to get a better understanding of capital structure and its determinants, we consider the following two measures of leverage: (i) Long-term leverage ratio (LT_LEV), defined as long-term debt

[14] Following Berger *et al.* (1997) we excluded financial firms and utilities due to the marked differences in leverage and corporate governance between these industries and other sectors of the economy.

to total assets, and (ii) Short-term leverage ratio (ST_LEV), defined as short-term debt to total assets .

Explanatory Variables

We have selected several proxies for explanatory variables that have been widely used in the empirical literature. Tables 4 shows a summarized description of both dependent and explanatory variables.

The main variable of interest in our study is cash flow ratio (CF_RATIO), which is computed as net earnings before provisions and depreciation, scaled by a firm's total assets.[15] The estimated coefficient of this variable will play a central role in testing the pecking order theory, given that only negative (and significant) values will be considered as evidence in favour of this theory. In order to accurately estimate our model, we need to control for relevant firm characteristics which may also affect a firm's leverage. We use a set of control variables, which includes future growth opportunities, current liquidity, sales growth, size and assets structure. All these variables are firm-specific and time-varying.

[Insert Table 4 Here]

Future growth opportunities (INTA_ASSETS) are defined as the ratio between intangible assets and total assets (Michaelas *et al.*, 1999, and Sogorb-Mira, 2005). Intangible assets include research and development expenditures, trademarks, patents and copyrights. The trade-off theory predicts a negative relationship between growth opportunities and leverage (Myers, 1977). Assets structure (TAN_ASSETS) is measured by the share of a firm's tangible assets (fixed assets and inventories) in total assets (Michaelas *et al.*, 1999, Bevan and Danbolt, 2000(a,b), and Sogorb-Mira, 2005). This variable is used to control for assets structure of the firm, and also for the collateral potentially available for debt contracts. Firms whose assets are mostly comprised of intangibles may find it harder to obtain bank financing, thus displaying lower leverage ratios. In fact, as bankruptcy costs play a prominent role in the trade-off theory, assets structure is predicted to have a positive impact on leverage.

Current liquidity (CURR_RATIO) is constructed by taking the ratio of current assets to current liabilities and is used to control for short-term liquidity effects. In line with previous research (Bonfim and Antão, 2012), we expect short-term liquidity to be negatively correlated with a firm's leverage ratios. Firm growth (G_OPREV) is defined as one-year change in sales revenues, and is included in the regressions to control for firm growth. A negative relationship between firm leverage and sales growth is consistent with the trade-off theory. Size (TOT_ASSETS) is obtained using the natural logarithm of a firm's total assets, with the aim of controlling a possible non-linearity in the data and the

[15] Alternatively, we use in our analysis a profitability measure defined as earnings before interest and taxes over assets (Michaelas *et al.*, 1999, and Fama and French, 2002). The results obtained are similar to those if cash flow ratio is used.

consequent problem of heteroskedasticity (Cardone-Riportella and Cazorla-Papis, 2001, Fama and French, 2002, and Sogorb-Mira, 2005). [16]

The correlation matrix of dependent and explanatory variables is presented in Table 5 and is used to examine the possible degree of collinearity among these variables. As we can see from the data in Table 5, the correlation coefficients are not sufficiently large to cause collinearity problems in the regressions and are statistically significant at the usual levels of significance.

Table 6 presents summary statistics for the whole sample of 3,175 firms. We can see that the sample is made up of micro, small and medium-sized firms with average assets of €7.08 million and average sales revenues of 1.61 times total assets (see also Table 3). The median growth rate in revenues is 14.3 percent, and represents a relatively high growth achieved by sample firms during the period 2001 – 2005. SMEs in our sample exhibit low degree of leverage, with the ratio of long-term debt to total assets (a mean of 6.9 percent) slightly higher than short-term leverage ratio. The current ratio, used as a proxy for short-term liquidity, is relatively high (a median of 1.21), and shows that the average firm in our sample has no problem with meeting its current obligations. At the same time the ratio of intangible assets to total assets (used as a proxy for a firm's future growth opportunities) is relatively low (a median of 0.0005). The reason may be that small and medium-sized firms invest fewer funds in R&D, patents and copyrights than large firms. The statistics for internally generated funds by the firms in our sample shows that €1 invested in total assets generates €0.19 of free cash flow, on average. The data for assets structure reveal that, on average, the share of tangible assets in a firm's total assets is 37.2 percent.

[Insert Table 5 Here]
[Insert Table 6 Here]

4. Empirical tests and results

The panel character of our data allows us to use a panel data methodology for our empirical research. This type of analysis can control firm heterogeneity, and reduce collinearity among the variables that are contemplated (Arellano and Bover, 1990). Likewise, this technique enables us to eliminate the potential biases in the resulting estimates due to correlation between unobservable individual effects and the explanatory variables, included in the study. Our panel data model may be represented as follows:

$$\frac{D}{A_{it}} = \alpha_i + \beta_1 + \beta_2 \frac{CF}{A_{it}} + \beta_3 X_{it} + \eta_t + \varepsilon_{it} \qquad (1)$$

[16] In addition, we include *country* dummies (COUNTRY) and *time* dummies (TIME) in order to control for specific country characteristics and different time periods that might serve as an incentive for an increase in production and growth. On the one hand, country dummies control for those sample countries that experience a greater increment in growth because of increased market demand or the fact that they form part of fast growing transition economies. Time dummies, on the other hand, control for growth in production that is attributable to general economic growth.

Our dependent variable is $\frac{D}{A_{it}}$, the leverage ratio, defined as long-term or short-term debt to total assets. The main variable of interest is $\frac{CF}{A_{it}}$, which is computed as cash flow (net earnings before provisions and depreciation), scaled by firms' total assets. In order to accurately estimate β_2, we need to control for relevant firm characteristics, which may also affect firm leverage. Thus, vector X_{it} refers to the set of control variables, which includes future growth opportunity, liquidity, sales growth, size and assets structure, as defined in Table 4. Moreover, in all regressions presented below we control for time and firm fixed effects.

To estimate the dynamic regression model (1) using panels containing many firms and a small number of time periods, we use GMM-system estimator developed by Arellano and Bover (1995), and Blundell and Bond (1998). This estimator controls for the presence of unobserved firm-specific effects and for the endogeneity of explanatory variables. The instruments used depend on the assumption made of whether the variables are endogenous or predetermined, or exogenous. Instrument validity is tested using the Sargan test of overidentifying restrictions. The GMM estimators reported here generally produced more reasonable estimates of the autoregressive dynamics than the basic first-differenced estimators.

The results for GMM estimators are presented in Table 7 (total sample). We run the regression for two different model specifications using long-term and short-term leverage as dependant variables. At the beginning, we present the results for a simple estimation, in which we consider as explanatory variable only the cash flow ratio, which is our main variable of interest (see Model specifications 1 and 3). We control, as in all other regressions, for time and firm fixed effects. When we run the model for long-term leverage ratio, we obtain negative but statistically insignificant coefficient for cash flow variable. The relationship between short-term leverage and cash flow ratio is found to be statistically significant at 1 percent level of significance. Thus, we may conclude that firms that have sufficient internal funds will use less (short-term) debt to finance their investment activities and growth. At the same time the availability of internal funds has no significant effect on a firm's decision to use long-term debt. These preliminary results do support the pecking order theory according to which firms with more available funds tend to use less external funding than other comparable companies.

[Insert Table 7 Here]

However, this specification is clearly insufficient for more definite conclusions to be reached, given that several other firm characteristics are also likely to be important in explaining leverage ratios. Hence, in Table 7 we present another regression, in which we include the control variables specified above (see Model specifications 2 and 4). The results obtained with this specification show that the coefficient associated with cash flow ratio is statistically significant only for firms that use predominantly short-term debt in their capital structure. The negative coefficient on cash flow implies evidence for the pecking order theory, which predicts that more profitable firms tend to use lesser debt

when financing their activities. This result supports our hypotheses (H 4a and 4b) that leverage is negatively related to firm profitability, and that SMEs employ predominantly short-term debt if external funds are needed.

The coefficients we obtained for the control variables are all statistically significant at 1 and 5 percent of significance (except for INTA_ASSETS variable in Model specification 4). The results show that firms with significant sales growth employ lower leverage ratios, even though this effect is relatively small. If this variable is seen as a proxy for firms' growth opportunities, this negative coefficient is consistent with the trade-off theory, as risk tends to be higher for these firms, pushing up bankruptcy costs (hypothesis H 3a). However, it is also consistent with the complex view of the pecking order theory, which argues that firms would rather maintain low-risk debt capacity to avoid foregoing future investments or having to finance them with new risky securities (Bonfim and Antão, 2012). In contrast to Hall *et al*. (2004) we do not find evidence in support of our hypothesis (H 3b) that short-term debt is positively related to firm growth.

The results in Table 7 show that leverage ratios are positively correlated with a firm's assets structure. Remember that SMEs are more likely to suffer from moral hazard and adverse selection problems, therefore the collateral value of their tangible assets could help to reduce this sort of problems. As we can see from Table 7 the relationship between leverage and assets structure significantly depends on the type of leverage firms employ. Specifically, we find that long-term debt ratio is positively correlated with assets structure, whereas this relationship becomes negative if leverage is short-term (thus we prove hypotheses H 2a and 2b). Similar results are obtained by Van der Wijst and Thurik (1993), Chittenden *et al.* (1996), Hall *et al.* (2004), and Sogorb-Mira (2005).

As mentioned before, the assets structure variable measures the ratio of tangible assets to total assets, made up mainly by fixed assets, which tend to be long term in nature. The negative correlation between assets structure and short-term debt ratio means that short-term debt (current liabilities) is used to finance non-fixed assets, consisting basically of current assets. These results confirm the so-called maturity matching principle, and lead us to accept the hypothesis that firms with more tangible assets (and hence with more collateral potentially available for credits) are also more indebted than other firms, as the trade-off theory predicts.

Firm size seems to be extremely important in explaining leverage ratios (see Model specifications 2 and 4), as larger firms show much higher leverage ratios than other firms, other firm characteristics being controlled for. This is consistent with the view that larger firms tend to be more diversified and, hence, less volatile, as discussed by Fama and French (2002). Regarding the decomposition of debt structure, we observe strong positive relationship between firm size and leverage (both long-term and short-term). Thus we have to reject our hypothesis (H 1b) that short-term debt relates negatively to firm size. We may conclude that larger firms seem to employ more debt independently of its maturity, perhaps because they can hold a greater bargaining power towards creditors.[17]

[17] For the purpose of robustness check we run again same model specifications as in Table 7, limiting total assets to \$100,000 (99th percentile), and then again, to \$70,000 (95 percentile). We find that results persist - the significance level and signs of the explanatory variables in model (1) are almost the same with negligible fluctuations.

In general, SMEs with more growth opportunities will include more debt in their capital structures. In line with previous research (Sogorb-Mira, 2005) we find evidence for a significant (and positive) correlation between future growth opportunities (as measured by the ratio of intangible assets to total assets) and firm leverage only for firms that use predominantly long-term debt to finance their investments. For firms that rely more on short-term debt this relationship is negative but statistically insignificant. Finally, we find evidence in support of our last hypotheses (H 5a and 5b) that there is a strong relationship between leverage and firm liquidity. In contrast to our preliminary expectations, the results show that SMEs that keep higher liquidity levels rely mainly on long-term debt to support their growth, whilst firms with higher proportion of current liabilities in their capital structure use more short-term debt. The results of the Arellano-Bond and Sargan tests (shown at the bottom of the table) confirm that all models are well specified.

Nevertheless, the results for this second specification may be seriously affected by simultaneity issues. In fact, it is possible that there are some unobserved time-varying variables which simultaneously affect the leverage ratio and other firm-specific variables, thus leading to potentially serious endogeneity problems (Bonfim and Antão, 2012). In order to minimize this potential problem, we consider an alternative specification (not presented here), in which all explanatory variables are lagged by one year. The results show that the estimated coefficient for cash flow variable is statistically significant only for model specifications 3 and 4; thus we are able to provide further evidence in favour of the pecking order theory. For all other control variables, the results are generally consistent with those observed in the previous regressions.

The results obtained so far suggest that the determinants of firm leverage may be considerably different depending on firms' size and age. In order to better explore these possible differences, we estimate model (1) for different size and age samples. The results of these estimations are displayed in Table 8. First, we observe that the estimated coefficients for cash flow ratio are negative and statistically significant only for medium-sized firms. Thus, we may conclude that larger firms with sufficient internal funds use less external sources of capital (in this case, short-term debt) than other (smaller) firms; for micro and small firms the cash flow coefficient is negative but statistically insignificant. Within the group of medium-sized firms, the availability of internal funds has no significant effect on a firm's decision to use long-term debt, whilst the shortage of cash induces these firms to borrow extensively on a short-term basis (see Model specifications 1 and 3).

[Insert Table 8 Here]

We obtain similar results when we run the regressions by firm age: SMEs with more than 10 years of existence seem to employ more short-term debt than comparable firms with shorter period of existence, in case of insufficient internal funds (see Model specifications 1 and 3). For both age samples, we do not find evidence for significant relationship between cash flow ratio and long-term debt. When we consider other control variables, the results in Table 8 are broadly consistent with those previously obtained. In both samples, future growth opportunities as represented by the ratio of intangible assets to total assets are found to have a significant effect on leverage only for firms that use

mainly long-term debt to finance their investments and growth; the remaining variables hold the same signs and magnitude, when statistically significant. The main finding is that for larger and older SMEs, firm characteristics such as liquidity, sales growth, size, and assets structure are significant determinants of their capital structure as compared to smaller (or younger) firms where the opposite holds.

For robustness purposes, we also estimate the regression for different industries. In Table 9 we present the results for manufacturing firms (compared with other industries), as these firms represent the largest part of our sample (41.5 percent). The results are broadly consistent with those previously obtained and there is a slight improvement in the model's adjustment quality. For both types of firms, the results show that SMEs that generate sufficient internal funds use less external financing (mainly short-term debt). Firm size, sales growth and liquidity do play a significant role in explaining SMEs' capital structure. Firms with stronger growth opportunities show higher leverage ratios independently of the industry they operate in. Assets structure is found to have a marginally statistically significant effect on firm leverage only for manufacturing firms. The results of the Arellano-Bond and Sargan tests (shown at the bottom of the table) confirm that all models are well specified.

In order to test our hypothesis that firms prefer to finance their fixed assets with long-term debt and their current assets with short-term debt we run another model specification with short-term and long-term leverage as explanatory variables (see Table 10). The results show that firms do follow the maturity matching principle, that is, they use predominantly long-term financing to support their growth in fixed assets and short-term debt to finance their current assets growth. The results of the Arellano-Bond and Sargan tests (shown at the bottom of the table) confirm that all models are well specified.

[Insert Table 9 Here]
[Insert Table 10 Here]

5. Conclusion

This paper investigates the main determinants of SMEs' capital structure. In other words, we discuss whether the leverage of firms follows more closely the predictions of trade-off theory or pecking order theory. Using panel data analysis for a set of 3,175 SMEs in Central and Eastern Europe, we find that firm leverage is determined not only by the availability of internally generated funds, but also depends on other firm specific characteristics such as liquidity, sales growth, size and assets structure. If cash flow is used as the only explanatory variable in the regressions, the results do support the pecking order theory according to which firms with more available funds use less external sources of financing than other comparable firms.

However, this specification is clearly insufficient for more definite conclusions to be reached, given that several other firm characteristics are also likely to be important in explaining leverage ratios. Including future growth opportunities, liquidity, sales growth, firm size and assets structure as control variables provides evidence in support of our hypothesis that SMEs prefer internal sources of capital to external ones. If external funds are needed they will employ mainly short-term debt. In line with previous research (Sogorb-Mira, 2005) we find evidence that the relationship between leverage and firms'

assets structure significantly depends on the type of leverage employed. Specifically, long-term debt is positively correlated with assets structure, whereas this relationship becomes negative if firms employ short-term debt.

Our results confirm the so-called maturity matching principle, according to which firms with more tangible assets (and hence with more collateral potentially available for credits) are also more indebted than other firms, as the trade-off theory predicts. Firm size seems to be extremely important in explaining capital structure as larger firms show much higher leverage ratios than smaller firms, other firm characteristics being controlled for. This is consistent with the view that larger firms tend to be more diversified and, hence, less volatile (Fama and French, 2002). Also, we find that larger firms seem to employ more debt independently of its maturity, perhaps because they can hold a greater bargaining power towards creditors.

In line with Sogorb-Mira (2005) we find evidence for a significant correlation between future growth opportunities (as represented by the ratio of intangible assets to total assets) and leverage ratios only for firms that rely more on long-term debt to finance their investment activities. Finally, our results show that firms that keep higher liquidity levels rely mainly on long-term debt to support their growth, whereas firms with higher proportion of current liabilities in their capital structure use more short-term debt.

The results we obtained suggest that the determinants of firm leverage may be considerably different depending on firms' size and age. In order to better explore these possible differences, we estimated our model for different size and age samples. We observe that the estimated coefficients for cash flow ratio are negative and statistically significant only for larger and older firms. When we control for other firm specific characteristics we obtain similar results for both types of SMEs: sales growth, liquidity, size and assets structure are found to be significant determinants of capital structure for larger and older firms as compared to smaller (or younger) firms, for which the opposite holds. We also test our results for different industry sectors and find no significant differences in the estimated coefficients if compared with those obtained in our general model.

Our results are relevant for policy makers and firm managers of SMEs in transition economies. The evidence shows that small and medium-sized firms in these countries still rely on internally generated funds to support their investment activities and growth, and find it very difficult to obtain external financing. There are significant differences in the way micro, small and medium-sized firms finance their activities. If micro and small firms need external capital they will use mainly short-term bank loans and trade credits. At the same time, banks are the main source of long-term debt for medium-size firms in Central and Eastern Europe, as access to capital markets is, to some extent, limited to larger firms. Governments in these countries should pay an increased attention to these differences with a strong emphasis on policy actions that will remove unnecessary administrative burdens for small and medium firms and will facilitate their access to external (bank) financing.

Also, we observe that there are variations in the effects of the determinants on firms' capital structure between countries. According to Hall *et al.* (2004) these variations are due to differences in attitudes to borrowing, disclosure requirements, relationships with banks, taxation and other national economic, social and cultural differences. Further

research can provide more explanations by considering additional country-specific variables that determine SMEs capital structure. Furthermore, the analysis could be enriched by considering a broader time period in order to elucidate whether capital structure in this sort of companies changes during different economic cycles.

References:

Anderson, R., Kegels, C., 1997. Finance and investment in transition: Czech enterprises, 1993–1994. IRES-Institut de Recherches Discussion Paper No. 9715, Department of Economics, Université Catholique de Louvain, Louvain-la-Neuve, France.

Ang, J.S., 1992. On the theory of finance for privately held firms. The Journal of Small Business Finance 1(3), 185-203.

Ang, J.S., Chua J.H., McConnell, J.J., 1982. The administrative costs of corporate bankruptcy: A Note. The Journal of Finance 37(1), 219-226.

Ardic, O.P., Mylenko, N., Saltane, V., 2011. Small and Medium enterprises: a cross-country analysis with a new data set. World Bank Policy Research Working Paper No. 5538, The World Bank Group, Washington D.C.

Arellano, M., Bover, O., 1990. La econometrıra de datos de panel. Investigaciones Econormicas 14(1), 3-45.

Arellano, M., Bover, O., 1995. Another look at the instrumental variable estimation of error-components models. Journal of Econometrics 68, 29-51.

Barclay, M.J., Smith, C.W., 1999. The capital structure puzzle: another look at the evidence. Journal of Applied Corporate Finance 12(1), Spring, 8-20.

Baskin, J., 1989. An empirical investigation of the pecking order hypothesis. Financial Management 18, 26-35.

Beck, T., Demirgüç-Kunt, A., Maksimovic, V., 2008. Financing patterns around the world: are small firms different? Journal of Financial Economics 89, 467-487.

Berger, P.G., Ofek, E., Yermack, D.L., 1997. Managerial entrenchment and capital structure decisions. The Journal of Finance 52(4), 1411-1438.

Bevan, A.A., Danbolt, J., 2000(a). Capital structure and its determinants in the United Kingdom: a decompositional analysis. Working Paper Series 2000/2, Department of Accounting and Finance, University of Glasgow, Glasgow, UK.

Bevan, A.A., Danbolt, J., 2000(b). Dynamics in the determinants of capital structure in the UK. Working Paper Series 2000/9, Department of Accounting and Finance, University of Glasgow, Glasgow, UK.

Binks, M., Ennew, C., 1997. The relationship between UK banks and their small business customers. Small Business Economics 9, 167-178.

Blundell, R., Bond, S., 1998. Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics 87, 115-143.

Bonfim, D., Antão, P., 2012. The dynamics of capital structure decisions. Banco De Portugal Working Paper Series No. 6, Economics and Research Department, Banco de Portugal, Portugal.

Bradley, M., Jarrell, G.A., Kim, E.H., 1984. On the existence of an optimal capital structure: theory and evidence. The Journal of Finance 39(3), 857-878.

Brealey, R.A., Myers, S.C., 2000. Principles of corporate finance, sixth ed. McGraw-Hill, New York.

Budina, N., Garretsen, H., Eelke de Jong, 2000. Liquidity constraints and investment in transition economies: the case of Bulgaria. Economics of Transition 8(2), 453–475.

Cardone- Riportella, C., Cazorla- Papis, L., 2001. New approaches to the analysis of the capital structure of SMEs: empirical evidence from Spanish firms. Working Paper No

01-10, Business Economics Series 03, Departamento de Economía de la Empresa, Universidad Carlos III de Madrid, Madrid, Spain.
Carpenter, R.E., Petersen, B.C., 2002. Is the growth of small firms constrained by internal finance? Review of Economics and Statistics 84(2), 298-309.
Cassar, G., 2004. The financing of business start-ups. Journal of Business Venturing 19(2), 261-283.
Chittenden, F., Hall, G., Hutchinson, P., 1996. Small firm growth, access to capital markets and financial structure: review of issues and an empirical investigation. Small Business Economics 8, 59-67.
DeAngelo, H., Masulis, R.W., 1980. Optimal capital structure under corporate and personal taxation. Journal of Financial Economics 8, 3-29.
European Commission, DG Enterprise & Industry, 2010. European SMEs under pressure, Annual report on EU SMEs 2009, European Commission, available at http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/pdf/dgentr_annual_report2010_100511.pdf
Fama, E.F., French, K.R., 2002. Testing trade-off and pecking order predictions about dividends and debt. The Review of Financial Studies 15(1), 1-33.
Gatti, R., Love, I., 2008. Does access to credit improve productivity? Evidence from Bulgarian firms. CEPR Discussion Paper No. 6676, Centre for Economic Policy Research, London, United Kingdom.
Gros, D., Suhrcke, M., 2000. Ten years after: what is special about transition countries? EBRD Working Paper Series No. 56, European Bank for Reconstruction and Development, London, the UK.
Hall, G., Hutchinson, P., Michaelas, N., 2000. Industry effects on the determinants of unquoted SME's capital structure. International Journal of the Economics of Business 7(3), 297-312.
Hall, G., Hutchinson, P., Michaelas, N., 2004. Determinants of the capital structures of European SMEs. Journal of Business Finance & Accounting 31(5) & (6), 711-728.
Hamilton, R.T., Fox, M.A., 1998. The financing preferences of small firm owners. International Journal of Entrepreneurial Behaviour & Research 4(3), 239-248.
Harris, M., Raviv, A., 1991. The theory of capital structure. The Journal of Finance 46(1), 297-355.
Holmes, S., Kent, P., 1991. An empirical analysis of the financial structure of small and large Australian manufacturing enterprises. The Journal of Small Business Finance 1(2), 141-154.
Hutchinson, J., Xavier, A., 2006. Comparing the impact of credit constraints on the growth of SMSs in a transition country with an established market economy, Small Business Economics 27(2), 169-179.
International Finance Corporation, 2009. The SME banking knowledge guide, International Finance Corporation (IFC), The World Bank Group, Washington D.C.
Jensen, M.C., 1986. Agency cost of free cash flow, corporate finance, and takeovers. The American Economic Review 76, 323-329.
Jensen, M.C., Meckling, W.H., 1976. Theory of the firm: managerial behavior, agency costs, and ownership structure. Journal of Financial Economics 3, 305-360.

Jordan, J., Lowe, J., Taylor, P., 1998. Strategy and financial policy in UK small firms. Journal of Business Finance & Accounting 25(1) & (2), 1-27.

Kitching, J., Smallbone, D., Xheneti, M., 2009. Have UK small enterprises been victims of the 'credit crunch'? Paper presented at the RENT XXIII Conference: Entrepreneurial Growth of the Firm, Budapest, Hungary, November 19-20.

Klapper, L.F., Sarria-Allende, V., Zaidi, R., 2006. A firm-level analysis of small and medium size enterprise financing in Poland. World Bank Policy Research Working Paper No 3984, The World Bank, Washington, DC.

Konings, J., Rizov, M., Vandenbussche, H., 2003. Investment and credit constraints in transition economies: micro evidence from Poland, the Czech Republic, Bulgaria and Romania. Economics Letters 78(2), 253–258.

Mac an Bhaird, C.J., Lucey, B.M., 2007. Determinants of the capital structure of SMEs: a seemingly unrelated regression approach. SSRN Working Paper, available at SSRN: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1018383.

Modigliani, F., Miller, M.H., 1958. The cost of capital, corporation finance and the theory of investment. The American Economic Review 68(3), 261-297.

Modigliani, F., Miller, M.H., 1963. Corporate income taxes and the cost of capital: a correction. The American Economic Review 53(2), 433-443.

Michaelas, N., Chittenden, F., Poutziouris, P., 1999. Financial policy and capital structure choice in U.K. SMEs: empirical evidence from company panel data. Small Business Economics 12(2), 113-130.

Myers, S.C., 1977. Determinants of corporate borrowing. Journal of Financial Economics 5(2), 147-175.

Myers, S.C., 1984. The capital structure puzzle. The Journal of Finance 39(3), 575-592.

Myers, S.C., Majluf, N.S., 1984. Corporate financing and investment decisions when firms have information that investors do not have. Journal of Financial Economics 13(2), 187-221.

Pettit, R., Singer, R., 1985. Small business finance: a research agenda. Financial Management 14(3), 47-60.

Pissarides, F.,1999. Is lack of funds the main obstacle to growth? EBRD's experience with small- and medium-sized businesses in Central and Eastern Europe. Journal of Business Venturing 14(5) & (6), 519-539.

Ramalho, J.J.S., Vidigal da Silva, J., 2009. A two-part fractional regression model for the financial leverage decisions of micro, small, medium and large firms. Quantitative Finance 9(5), 621-636.

Scott, J.H., 1976. A theory of optimal capital structure. The Bell Journal of Economics 7(1), 33-54.

Scott, J.H., 1977. Bankruptcy, secured debt, and optimal capital structure. The Journal of Finance 32(1), 1-19.

Sogorb-Mira, F., 2005. How SME uniqueness affects capital structure: evidence from a 1994–1998 Spanish data panel. Small Business Economics 25(5), 447-457.

Van der Wijst, D., 1989. Financial structure in small business. Theory, tests and applications. Lecture Notes in Economics and Mathematical Systems, Vol. 320, Berlin: Springer-Verlag.

Van der Wijst, N., Thurik, R., 1993. Determinants of small firm debt ratios: an analysis of retail panel data. Small Business Economics 5(1), 55-65.
Warner, J.B., 1977. Bankruptcy costs: some evidence. The Journal of Finance 32(2), 337-347.

Table 1: Debt decomposition and leverage by firms and years, total sample

	Debt decomposition of the total sample (% of total debt)				Leverage (debt/total assets)		
	LT Bank Loans	Other LT Debt	ST Bank Loans	Other Current Liabilities	Long-term leverage	Short-term leverage	Total leverage
2001	24.62	25.81	10.97	38.60	0.275	0.132	0.407
2002	10.68	8.32	10.20	70.80	0.066	0.067	0.133
2003	8.61	10.37	8.43	72.60	0.045	0.049	0.094
2004	8.04	11.26	8.11	72.59	0.042	0.046	0.088
2005	8.17	11.33	8.59	71.91	0.042	0.050	0.092
Mean	*10.22*	*11.81*	*8.97*	*69.00*	*0.069*	*0.060*	*0.128*
Micro	6.29	7.58	8.89	77.24	0.048	0.068	0.116
Small	7.68	7.35	8.94	76.04	0.053	0.069	0.122
Medium	10.83	12.75	8.98	67.45	0.072	0.058	0.130
Mean	*10.22*	*11.81*	*8.97*	*69.00*	*0.069*	*0.060*	*0.128*
Number of observations	13,059						
Number of firms	3,175						

Source: AMADEUS database (2008); Authors calculations.

Note:
Leverage is taken as ratio of debt to total assets. Total leverage includes both long-term and short-term debt. Long-term leverage ratio is taken as long-term debt to total assets; short-term leverage ratio is taken as short-term debt to total assets. Reported values for leverage ratios are mean values. Leverage ratios include only financial debt, that is, non-financial debt like trade credit is excluded from the analysis.

Table 2: Macroeconomic data and leverage ratios by country, on average, 2001 - 2005

	Bulgaria	Czech Republic	Hungary	Poland	Romania	Serbia	Slovakia
Country data:							
% of total SMEs	3.94%	37.23%	0.09%	8.91%	32.72%	11.09%	6.02%
GDP, $US m.	15,768.21	69,287.52	62,817.33	170,963.44	48,430.60	14,312.08	34,331.70
GDP per capita, $US	1,977.54	6,772.93	6,159.58	4,471.85	2,232.01	1,937.37	6,382.00
Credit volume, $US m.	5,004.27	23,523.99	28,012.50	48,218.07	7,578.91	3,419.50	11,599.58
FDI, $US m.	2,103.22	5,966.34	3,817.11	6,702.40	3,290.38	871.67	2,474.85
Tax rate, %	21.20%	29.10%	20.23%	23.38%	22.86%	13.83%	22.48%
Leverage:							
LT Leverage	0.090	0.077	0.022	0.094	0.026	0.060	0.068
ST Leverage	0.143	0.082	0.068	0.087	0.032	0.083	0.080
Total Leverage	0.234	0.159	0.090	0.181	0.057	0.144	0.148
Number of observations	515	4,862	11	1,162	4,271	1,450	788
Number of firms	125	1,182	3	283	1,039	352	191

Source: AMADEUS database (2008); Authors calculations.

Note:

Leverage is taken as ratio of debt to total assets. Total leverage includes both long-term and short-term debt. Long-term leverage ratio is taken as long-term debt to total assets; short-term leverage ratio is taken as short-term debt to total assets. Reported values for leverage ratios are mean values. Leverage ratios include only financial debt, that is, nonfinancial debt like trade credit is excluded from the analysis.

Table 3: Sample breakdown by firm size, age and sector

	Annual sales scaled by Total Assets	Number of observations	Number of firms	Leverage ratio (median)
Panel A:				
Size (as of 2005)				
Micro (< 10 employees)	2.667	466	113	0.009
Small (< 50 employees)	2.453	1,838	447	0.026
Medium (< 250 employees)	1.497	10,755	2,615	0.041
Total sample	*1.611*	*13,059*	*3,175*	*0.038*
Panel B:				
Age				
< 5 years	1.716	408	99	0.001
5 - 10 years	1.838	2,798	680	0.005
11 - 20 years	1.674	9,180	2,121	0.049
> 20 years	0.637	1,448	275	0.074
Total sample	*1.611*	*13,059*	*3,175*	*0.038*
Panel C:				
Sector				
Agriculture, Fishing & Mining	0.690	675	164	0.105
Construction	1.874	1,169	284	0.004
Hotels and Restaurants	0.753	132	32	0.005
Manufacturing	1.411	5,424	1,319	0.055
Public Administration, Education, Health and Social Work	0.957	155	38	0.045
Real Estate, Renting and Business Activities	1.007	1,150	280	0.021
Transport, Storage and Communication	1.969	657	160	0.019
Wholesale and Retail Trade	2.701	3,272	796	0.031
Other	1.266	425	102	0.020
Total sample	*1.611*	*13,059*	*3,175*	*0.038*

Source: AMADEUS database (2008); Authors calculations.

Note:
Leverage ratio is taken as ratio of total debt to total assets. Total leverage includes only financial debt, that is, nonfinancial debt like trade credit is excluded from the analysis.

Table 4: Dependent and explanatory variables

Variable	Definition	Explanation	Expected Sign
Dependant Variables			
LT_LEV	Long-term leverage ratio	Long-term debt to total assets, in period *t*	
ST_LEV	Short-term leverage ratio	Short-term debt to total assets, in period *t*	
Explanatory variables			
CF_RATIO	Cash flow/Total assets, proxy for internally generated funds	The ratio of net earnings plus depreciation to total assets in period *t*	-
INTA_ASSETS	Intangible assets/Total assets, proxy for future growth opportunities	The ratio of intangible assets to total assets in period *t*	-
CURR_RATIO	Current assets/Current liquidity, proxy for short-term liquidity	The ratio of current assets to current liabilities in period *t*	-/+
G_OPREV	Growth in operating revenues, proxy for firm profitability (in percent)	Log difference of firm's revenues in periods *t* and *t - 1*	-
TOT_ASSETS	Book value of total assets, proxy for firm size (in euro)	Log of firm's total assets in period *t*	+
TAN_ASSETS	Tangible assets/Total assets, proxy for assets structure	The ratio of tangible assets to total assets in period *t*	+
TIME	Temporal (year) dummy	A dummy used to control for different time periods	+/-
COUNTRY	Country dummy	A dummy used to control for country specific characteristics	+/-

Table 5: Correlation matrix of model variables

	LT_LEV	ST_LEV	CF_RATIO	INTA_ASSETS	CURR_RATIO	G_OPREV	TOT_ASSETS	TAN_ASSETS
LT_LEV	1.0000							
ST_LEV	0.1019***	1.0000						
CF_RATIO	0.3352***	0.0801***	1.0000					
INTA_ASSETS	0.3544***	0.1512***	0.6130***	1.0000				
CURR_RATIO	0.0650***	-0.0927***	0.0831***	0.0796***	1.0000			
G_OPREV	0.0152	-0.0494***	0.1849***	-0.0107	-0.0295***	1.0000		
TOT_ASSETS	-0.0211*	0.0384***	-0.2810***	-0.2042***	0.0193	-0.0602***	1.0000	
TAN_ASSETS	0.0557***	-0.1013***	-0.0489***	-0.1127***	-0.0363***	-0.0375***	0.0050	1.0000

* indicates that correlation is significant at the 10 percent level
** indicates that correlation is significant at the 5 percent level
*** indicates that correlation is significant at the 1 percent level

Note:
The dependant variables in model (1) are long-term leverage (LT_LEV) and short-term leverage (ST_LEV). The explanatory variables in model (1) are: Cash flow ratio (CF_RATIO), Future growth opportunities (INTA_ASSETS), Current ratio (CURR_RATIO), Sales growth (G_OPREV), Total assets (TOT_ASSETS) and Assets structure (TAN_ASSETS). Dummy variables for country and time effects are not included in the correlation matrix. All variables are taken as ratios except Sales growth (in percent) and Total assets (in Euros, thousands).

Table 6: Summary of sample statistics

Variable	Obs.	Percentile			Mean	Standard Deviation	Minimum	Maximum
		50th	75th	90th				
LT_LEV	13,059	0.0011	0.0577	0.2423	0.0686	0.1441	0	0.9943
ST_LEV	13,059	0.0000	0.0767	0.1982	0.0598	0.1108	0	0.9984
CF_RATIO	13,059	0.1115	0.2283	0.4523	0.1880	0.2777	-1.9862	1.9823
INTA_ASSETS	13,059	0.0005	0.0042	0.0312	0.0293	0.1120	0	0.9946
CURR_RATIO	13,054	1.2143	1.8983	3.3741	1.9316	4.3566	0	125
G_OPREV	9,462	0.1427	0.3252	0.6124	0.1970	0.3863	-1.9773	1.9999
TOT_ASSETS	13,059	3,386	6,913	14,702	7,085.61	13,738.09	3.0000	195,221
TAN_ASSETS	13,059	0.3512	0.5548	0.7186	0.3717	0.2448	0	0.9955
Number of observations	13,059							
Number of firms	3,175							

Note:

The dependant variables in model (1) are long-term leverage (LT_LEV) and short-term leverage (ST_LEV). The explanatory variables in model (1) are: Cash flow ratio (CF_RATIO), Future growth opportunities (INTA_ASSETS), Current ratio (CURR_RATIO), Sales growth (G_OPREV), Total assets (TOT_ASSETS) and Assets structure (TAN_ASSETS). All variables are taken as ratios except Sales growth (in percent) and Total assets (in Euros, thousands).

Table 7: GMM-system results for short-term and long-term leverage: total sample[1, 2, 3, 4, 5]

Explanatory variables	Model 1	Model 2	Model 3	Model 4
LT_LEV (lagged1)	0.438***	0. 468***		
	(0.000)	(0.000)		
LT_LEV (lagged2)	0.014**	0. 020***		
	(0.052)	(0.009)		
ST_LEV (lagged1)			0. 236***	0.264***
			(0.000)	(0.000)
ST_LEV (lagged2)			-0. 024***	-0.018*
			(0.008)	(0.066)
CF_RATIO	-0.002	0.003	- 0.061***	- 0.054***
	(0.824)	(0.760)	(0.000)	(0.000)
INTA_ASSETS	-	0.228**	-	-0.072
		(0.010)		(0.376)
CURR_RATIO	-	0.002***	-	- 0.002***
		(0.001)		(0.000)
G_OPREV	-	-0.006*	-	-0.007**
		(0.068)		(0.015)
TOT_ASSETS	-	0.014***	-	0.007**
		(0.000)		(0.031)
TAN_ASSETS	-	0.030**	-	-0.023*
		(0.036)		(0.084)
Number of observations	2,965	2,963	2,965	2,963
Arellano-Bond test - Prob > *z*	0.0000	0.0000	0.0077	0.0100
Sargan test - Prob > χ^2	0.0832	0.0548	0.8912	0.8774

Notes:

1) Models 1 and 3 include only cash flow ratio as explanatory variable; Models 2 and 4 include both cash flow ratio and control variables. We use two different types of dependent variables: long-term leverage (long-term debt to total assets) and short-term leverage (short-term debt to total assets). Leverage ratios include only financial debt, that is, nonfinancial debt like trade credit is excluded from the analysis.
2) *, **, and *** represent significance at 10, 5, and 1 percent, respectively. All regressions include dummies to control for time and firm fixed effects.
3) *P*-values in brackets.
4) For Arellano-Bond test Ho is: no autocorrelation. Rejecting the null hypothesis (p-value <0.05) of no serial correlation at order one in the first-differenced errors does not imply that the model is misspecified. Rejecting the null hypothesis at higher orders implies that the moment conditions are not valid.
5) For Sargan test Ho is: overidentifying restrictions are valid. If p-value >0.05, we confirm the null hypothesis that the overidentifying restrictions are valid. Rejecting the null hypothesis implies that we need to reconsider our model or our instruments.

Table 8: GMM-system results for short-term and long-term leverage: age and size samples[1, 2, 3, 4, 5]

	By Size						By Age					
	Micro and Small firms			Medium-sized firms			< 10 years			> 10 years		
Explanatory variables	**Model 1**	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**
LT_LEV (lagged 1)		0.446***			0.469***			0.277***			0.524***	
		(0.003)			(0.000)			(0.000)			(0.000)	
LT_LEV (lagged 2)		0.085***			0.024***			0.002			0.026***	
		(0.004)			(0.003)			(0.866)			(0.006)	
ST_LEV (lagged 1)	-0.023		-0.019	0.276***		0.318***	0.109		0.109	0.251***		0.295***
	(0.856)		(0.789)	(0.000)		(0.000)	(0.159)		(0.162)	(0.000)		(0.000)
ST_LEV (lagged 2)	-0.077**		-0.076**	-0.017*		-0.006	-0 036*		-0 031	-0.022**		-0.012
	(0.012)		(0.014)	(0.067)		(0.510)	(0.073)		(0.137)	(0.030)		(0.248)
CF_RATIO	-0.033	-0.031	-0.028	-0.066***	-0.008	-0.059***	-0.034*	-0.005	-0.024	-0.072***	0.006	-0.067***
	(0.305)	(0.236)	(0.425)	(0.000)	(0.504)	(0.000)	(0.068)	(0.706)	(0.203)	(0.000)	(0.657)	(0.000)
INTA_ASSETS		-0.132	-0.149		0.261***	-0.062		0.029	0.045		0.354***	-0.151
		(0.550)	(0.617)		(0.007)	(0.459)		(0.796)	(0.745)		(0.003)	(0.140)
CURR_RATIO		-0.001	-0.002		0.002***	-0.002***		0.000	-0.001*		0.003***	-0.003***
		(0.809)	(0.131)		(0.000)	(0.000)		(0.932)	(0.087)		(0.000)	(0.000)
G_OPREV		-0.006	-0.004		-0.005	-0.008**		-0.010**	-0.010**		-0.003	-0.007**
		(0.311)	(0.556)		(0.155)	(0.010)		(0.027)	(0.051)		(0.383)	(0.058)
TOT_ASSETS		0.015**	-0.000		0.014***	0.011***		0.003	-0.000		0.021***	0 012***
		(0.011)	(0.991)		(0.001)	(0.002)		(0.411)	(0.864)		(0.000)	(0.004)
TAN_ASSETS		-0.028	-0.031		0.041**	-0.016*		0.033	-0.001		0.031*	-0.029*
		(0.380)	(0.472)		(0.010)	(0.054)		(0.136)	(0.961)		(0.080)	(0.059)
Number of observations	392	392	392	2,573	2,571	2,571	729	729	729	2,236	2,234	2,234
Arellano-Bond test - Prob > *z*	0.0012	0.0499	0.0015	0.0263	0.0000	0.0271	0.0102	0.0154	0.0080	0.0127	0.0000	0.0325
Sargan test - Prob > χ^2	0.6389	0.9272	0.6601	0.9554	0.1043	0.5380	0.0504	0.1283	0.0453	0,2260	0.0838	0.2125

Notes:

1) Model 1 includes only cash flow ratio, and models 2 and 3 include both cash flow ratio and control variables as explanatory variables. Size samples include micro and small firms, and medium-sized firms. Age samples include firms with less than 10 years of existence, and firms with more then 10 years of existence. We use two different types of dependent variables: long-term leverage (long-term debt to total assets) and short-term leverage (short-term debt to total assets). Leverage ratios include only financial debt, that is, nonfinancial debt like trade credit is excluded from the analysis.
2) *, **, and *** represent significance at 10, 5, and 1 percent, respectively. All regressions include dummies to control for time and firm fixed effects.
3) *P*-values in brackets.

4) For Arellano-Bond test Ho is: no autocorrelation. Rejecting the null hypothesis (p-value <0.05) of no serial correlation at order one in the first-differenced errors does not imply that the model is misspecified. Rejecting the null hypothesis at higher orders implies that the moment conditions are not valid.
5) For Sargan test Ho is: overidentifying restrictions are valid. If p-value >0.05, we confirm the null hypothesis that the overidentifying restrictions are valid. Rejecting the null hypothesis implies that we need to reconsider our model or our instruments.

Table 9: GMM-system results for short-term and long-term leverage: sector sample[1, 2, 3, 4, 5]

	By Sector					
	Manufacturing			Other industries		
Explanatory variables	**Model 1**	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**
LT_LEV (lagged 1)		0.444***			0.467***	
		(0.000)			(0.000)	
LT_LEV (lagged 2)		0.027**			0.014	
		(0.022)			(0.180)	
ST_LEV (lagged 1)	0. 074*		0. 125***	0.404***		0.407***
	(0.055)		(0.002)	(0.000)		(0.000)
ST_LEV (lagged 2)	-0.009		0. 005	-0.029*		-0.030*
	(0.420)		(0.669)	(0.053)		(0.061)
CF_RATIO	-0.056***	-0.016	-0. 052***	-0.066***	0.017	-0.056***
	(0.000)	(0.381)	(0.000)	(0.000)	(0.216)	(0.000)
INTA_ASSETS		0.441**	-0.175		0.161*	-0.040
		(0.030)	(0.257)		(0.092)	(0.698)
CURR_RATIO		0.002***	-0.001***		0.001**	-0.004***
		(0.009)	(0.006)		(0.051)	(0.000)
G_OPREV		-0.000	-0.008*		-0.010**	-0.007*
		(0.916)	(0.063)		(0.011)	(0.078)
TOT_ASSETS		0.018***	0.017***		0.013***	0.002**
		(0.008)	(0.001)		(0.002)	(0.044)
TAN_ASSETS		0.043*	-0.016		0.019	-0.029
		(0.067)	(0.348)		(0.292)	(0.151)
Number of observations	1,195	1,195	1,195	1,748	1,748	1,748
Arellano-Bond test - Prob > *z*	0.0397	0.0000	0.0113	0.0229	0.0003	0.0480
Sargan test - Prob > χ^2	0.2313	0.0564	0.1004	0.0655	0.4776	0.1457

Notes:

1) Model 1 includes only cash flow ratio, and models 2 and 3 include both cash flow ratio and control variables as explanatory variables. Sector samples include firms from manufacturing industry and firms from all other industries. We use two different types of dependent variables: long-term leverage (long-term debt to total assets) and short-term leverage (short-term debt to total assets). Leverage ratios include only financial debt, that is, nonfinancial debt like trade credit is excluded from the analysis.
2) *, **, and *** represent significance at 10, 5, and 1 percent, respectively. All regressions include dummies to control for time and firm fixed effects.
3) *P*-values in brackets.

4) For Arellano-Bond test Ho is: no autocorrelation. Rejecting the null hypothesis (p-value <0.05) of no serial correlation at order one in the first-differenced errors does not imply that the model is misspecified. Rejecting the null hypothesis at higher orders implies that the moment conditions are not valid.
5) For Sargan test Ho is: overidentifying restrictions are valid. If p-value >0.05, we confirm the null hypothesis that the overidentifying restrictions are valid. Rejecting the null hypothesis implies that we need to reconsider our model or our instruments.

Table 10: GMM- system results for fixed assets and current assets[1, 2, 3, 4, 5]

Explanatory variables	**Model 1**	**Model 2**
FIX_ASSETS (lagged 1)	0. 389*	
	(0.086)	
FIX_ASSETS (lagged 2)	-0.001	
	(0.962)	
CUR_ASSETS (lagged 1)		0.171*
		(0.098)
CUR_ASSETS (lagged 2)		-0.015***
		(0.005)
LT_LEV	0.593***	-0.060
	(0.006)	(0.852)
ST_LEV	-0 017	0.283**
	(0.621)	(0.051)
Number of observations	2,965	2,965
Arellano-Bond test - Prob > *z*	0.0131	0.0014
Sargan test - Prob > χ^2	0.0512	0.8976

Notes:

1) Models 1 and 2 include short-term and long-tern leverage ratios as explanatory variables. We use two different types of dependent variables: fixed (tangible) assets and non-fixed (current) assets.
2) *, **, and *** represent significance at 10, 5, and 1 percent, respectively. All regressions include dummies to control for time and firm fixed effects.
3) *P*-values in brackets.
4) For Arellano-Bond test Ho is: no autocorrelation. Rejecting the null hypothesis (p-value <0.05) of no serial correlation at order one in the first-differenced errors does not imply that the model is misspecified. Rejecting the null hypothesis at higher orders implies that the moment conditions are not valid.
5) For Sargan test Ho is: overidentifying restrictions are valid. If p-value >0.05, we confirm the null hypothesis that the overidentifying restrictions are valid. Rejecting the null hypothesis implies that we need to reconsider our model or our instruments.

APPENDIX I

We searched for an explanation of the significant changes in the capital structure of the firms included in our sample, for the period 2001 - 2005. However, there is no relevant data for this geographical region that could give a meaningful explanation of this phenomenon. Instead, we decided to focus our analysis on the dataset itself. In order to investigate how this sharp shift from long-term debt to other sources of financing occurs, we performed an analysis on how each individual source component grows over time compared to total book value of assets. The focus, of course, will be on short- and long-term debt financing, equity, trade credits, and other liabilities. We define five variables to track the growth in book value of each of them if taken as stand-alone items. Table 1 below shows the main variables used in the analysis and their definitions.

Table 1

Variable	Definition	Explanation
Dependent variable		
D_TOTAS	First difference of logarithm of Total Assets	% change in assets
Explanatory variables		
D_LEV	First difference of logarithm of (Long-Term Debt + Short-Term Bank Loans)	% change in debt financing
D_EQUITY	First difference of logarithm of Total Equity	% change in equity financing
D_CRED	First difference of logarithm of Trade Credits	% change in trade credits
D_OLB	First difference of logarithm of Other Liabilities	% change in other liabilities

As the data in Table 2 show, the average total assets in the sample have more than doubled for the period 2001-2005. At the same time debt does not experience such a sharp growth. In 2002, while Total Assets grow by 71.46%, debt experiences a slight decline of 7.49% (on average). At the same time, we observe that equity has matched the growth in book value of assets. This provides evidence that firms have actually used equity financing to expand their asset base. Further we see very high increase in other liabilities and trade credits used by sample firms. This explains the decline in long-term debt to assets ratio and its decreased share of total liabilities. The pattern is observed throughout the whole period where equity, non-interest bearing financing, and assets grow by a considerable amount each year, while debt is less responsive. This can be explained by the limited access of SMEs in CEE countries to external financing in terms of interest-bearing (short- and long-term) debt (see Beck *et al.*, 2008, Pissarides, 1999, and IFC, 2009).

Table 2

Variable (% change)	2001	2002	2003	2004	2005
Total Assets	4,418.27	6,550.06	6,791.06	8,082.64	9,233.64
D_TOTAS		71.46%	13.29%	22.98%	18.45%
D_LEV		-7.49%	7.56%	13.85%	16.84%
D_EQUITY		86.40%	20.70%	27.87%	20.52%
D_CRED		23.20%	7.36%	12.51%	12.50%
D_OLB		58.93%	47.75%	25.76%	23.28%

Note: All values are mean values in percent, except Total Assets (Euro, thousand).

We can get further insights if we look at the correlation matrix (see Table 3) which shows that the changes in assets are highly and positively correlated with changes in equity, trade credits, and other liabilities. The coefficients are relatively large, which is consistent with our hypothesis that book value expansion has been financed mainly with equity. On the contrary, growth in debt financing (d_lev) is not that much correlated with growth in the asset base.

Table 3

Variables	d_assets	d_lev	d_equity	d_cred	d_olb
d_assets	1.0000				
d_lev	0.1737***	1.0000			
d_equity	0.4390***	0.0083	1.0000		
d_cred	0.4121***	0.0761***	0.0190	1.0000	
d_olb	0.3536***	-0.0649***	0.0732***	-0.0230	1.0000

Note: Significance level in superscript: *** p<0.01, ** p<0.05, and * p<0.1

We decided to extend our analysis of the drivers of this extraordinary asset base expansion by performing a linear regression of assets change (d_assets) on its main drivers. We used debt financing, equity financing, trade credits and other liabilities, as defined above, as explanatory variables in our model. In line with our preliminary expectations, this asset base growth is non-debt driven. About 26% of the changes in assets are driven by changes in equity, while only 6.5% - by debt changes (see Table 4). Trade credits and other liabilities also have statistically significant coefficients and show larger impact on asset growth than debt financing.

Table 4

Variables	(1) d_assets
d_lev	0.0648***
	(0.00274)
d_equity	0.259***
	(0.00663)
d_cred	0.155***
	(0.00448)
d_olb	0.0888***
	(0.00365)
Constant	0.0465***
	(0.00336)
Observations	3,718
R-squared	0.530

Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

We may conclude that the change in leverage (long-term debt + short-term bank loans) is not a result of deleveraging, but of increased usage of non-debt financing. The predominant source of financing has been equity; however, trade credits and other types of liabilities also play a crucial role in asset growth of SMEs over the period 2001-2005.