Country governance structure and financial development as determinants of firms' capital structure

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ABSTRACT

This paper investigates the determinants of capital structure for a sample of 13,070 small medium sized enterprises (SMEs) and 67,449 firm-year observations from Eastern European countries over the period 1994-2004. The use of a sample of SMEs in our analysis rather than large listed firms provide an effective way to test whether country specific factors are important drivers of firm's capital structure, since SMEs do not have access to international capital markets, being less likely to be influenced by international standards.

We employ usual firm-specific financial variables and country-specific factors that describe the degrees of governance structure and financial development of each country. Factor analysis on both the governance structure and financial development indicators adopting the Principal Component Analysis is used to avoid the problems of multicollinearity. Our results indicate that firm ownership concentration and country governance structure are insignificant explanatory variables to the degree of leverage of the firms in our sample. On the other hand, indicators of country financial development are robust determinants of capital structure. However, the marginal explanatory power of country-specific variables is small. We conclude that firm-specific characteristics are decisive in capital structure.

Keywords: Capital Structure; Ownership Structure; Country Governance; Financial Development.

JEL Classification Codes: G32, F30, O52

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1. Introduction

What is the importance of country governance structure and financial development as determinants of firms' capital structure? Are the differences between firm's financial decisions just driven by their own characteristics or is there an important role of country-specific measures of governance and financial development?

In order to address these questions we investigate the determinants of capital structure for a sample of 13,070 unlisted firms from Eastern European countries over the period 1994-2004. The sample is constituted by countries that had a different history in the last two decades regarding their governance structure and financial development.

To the best of our knowledge, this is the first paper to examine how the firm-specific financial variables as well as country-specific variables that describe the degrees of governance structure and financial development of each country affect corporate debt policy for a large sample of unlisted firms in transition economies many of them belonging to the former USSR.

Most of the empirical research on capital structure has involved large listed firms in developed countries based in the analysis for a single country. That is the case of Titman and Wessels (1988) for the US, Bevan and Danbolt (2002), Ozkan (2001) and Bennet and Donnelly (1993) for the United Kingdom and Miguel and Pindado (2001) for Spain. Recently a few studies have been carried out in a multi country setting comparing differences in the capital structure between countries. Rajan and Zingales (1995), using a sample of large firms for the G7 countries show that the determinants of capital structure in US are the same for the other countries and debt levels do not differ among bank-oriented and market oriented countries. Wald (1999) for a sample with France, Japan, United Kingdom and United States suggests that tax policies, agency problems, information asymmetries and shareholder/creditors conflicts are determinant for differences among countries. Demirgüç-Kunt and Maksimovic (1999) use both developed and developing countries in their sample and find that institutional differences among develop and developing countries help to explain capital structure in particular the variation in the use of long-term debt. In addition, Booth et al (2001) find for a sample of 10 developing countries that capital structure choices are affected by the same variables as in developed countries. More recently Fan, Titman and Twite (2003) find that institutional factors are important determinants of firm's debt maturity. Finally, Jong, Kabir and Nguyen (2008) contributed to the international analysis of capital structure by finding that conventional firm-specific factors explain leverage relatively well in both developed and developing countries and that the impact of firm-specific factors is not the same across countries due to the indirect impact of country specific factors.

One possible reason for the lack of evidence in support of country institutional factors influencing capital structure is that most previous studies are from samples made up of large listed firms [Giannetti (2003), Bartholdy and Mateus (2008)]. Contrasting with large listed firms, small and medium sized enterprises (SMEs) tend to operate locally and are funded by local financial institutions whilst large listed firms are often partly financed by international financial markets making it difficult to identify national differences in determining the capital structure of large firms. Therefore, using SMES rather than listed firms should provide an effective way to test whether country specific factors are important drivers of firm's capital structure, since SMEs do not have access to international capital markets, being less likely to be influenced by international standards. Some studies have investigated capital structure decisions for unlisted firms in an international setting but with focus in developed countries. Gianetti (2003) finds significant differences in how leverage and maturity are determined across countries. Hall, Hutchinson and Michaelas (2004) using a sample of SMEs across eight European countries find that differences in SME capital structures between countries are due to firm-specific factors. More recently Bartholdy and Mateus (2008), with a sample of 19,752 unlisted European firms from sixteen European countries find that besides firm-specific characteristics, regulatory environment for business and measures of the impact of laws and

regulations on business activity as well as macroeconomic factors do affect SMEs capital structure. Indeed, countries where laws are designed to expand the access to credit have SMEs with higher debt levels.

The aim of this paper is twofold: First, to test using a unique dataset from non-listed firms from Eastern European countries the traditional firm-specific variables as determinants of capital structure, including ownership structure as one of the firm specific variables. Secondly, examine whether country-specific measures of governance and financial development have important effects on firm's capital structure. In this paper a panel data analysis is used with firm-specific explanatory variables including industry, year, and a measure of ownership concentration (degree of independence) and country-specific variables such as country dummies, governance structure and financial development factors.

We use factor analysis for the governance structure and financial development indicators given that in multiple regressions the simultaneous inclusion of highly correlated exogenous variables would implicate in high multicolinearity and, consequently, in high variance and covariance of the estimated coefficients.

The results suggest that most of firm characteristics variables are in line with the previous literature evidence and also indicates partial support for both the Static Trade-Off and Pecking Order theories. Furthermore, we find that shocks to leverage are persistent, an indication of high adjustment costs. However, we find that ownership concentration and country governance structure do not play a relevant role for unlisted firm's financial decisions. Finally, the degree of financial development is positively correlated with leverage, a strong indication that the financial institutional environment of a country is important for the financial decisions taken by its firms.

The remaining of the paper is structured as follows: the next section presents the details of our sample, data sources, explanatory variables and principal component analysis approach. Session 3 discuss the empirical model used with different specifications. Section 4 presents our empirical results and comments the estimation results. Section 5 concludes the paper.

2. Data, Variables, and Methodology

2.1. Data Sources and Collection Procedures

The sampling for this study focused initially on 16 countries from Eastern Europe and the former Soviet Union. The countries by alphabetical order are: Bosnia-and-Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Republic of Macedonia, Romania, Russia, Serbia-and-Montenegro, the Slovak Republic, Slovenia, and Ukraine. Due to sample selection criteria and no available information the following countries were excluded from the sample: Bosnia-and-Herzegovina, Bulgaria, Croatia, Republic of Macedonia, Russia, Serbia-and-Montenegro, and Slovenia. We employ yearly observations during the period 1994-2004 and the unit of analysis is each firm.

Data on country-level governance structure and financial development is taken, respectively, from the World Bank's "Governance & Anti-Corruption" website[1] described in detail in Kaufmann, Kraay and Mastruzzi (2006) and from the Financial Development Database[2] explained in Beck, Demirgüç-Kunt, and Levine (2000).

The initial sample comprises private, unlisted firms, whose accounting data is available in the Amadeus (Analyse Major Databases from European Sources) Database by Bureau Van Dijk. Tables 1 and 2, shows that 43,873 firms and 169,941 observations are found in the initial sample.

[1] http://www.worldbank.org/wbi/governance
[2] http://siteresources.worldbank.org/INTRES/Resources/FinStructure_60_05_final.xls

Table 1: Sample of Firms by Country

Country	Initial Sample	Inconsistencies	Total Assets < US$ 1M	Sub-Total	Continuous Obs. < 3	Final Sample	% of Initial Sample	% of Total Final Sample
Czech Republic	7,460	947	4,188	4,319	1,728	2,591	34.73%	19.82%
Estonia	2,231	69	1,880	792	366	426	19.09%	3.26%
Hungary	3,898	570	2,872	2,867	1,073	1,794	46.02%	13.73%
Latvia	948	55	753	495	189	306	32.28%	2.34%
Lithuania	1,204	59	825	628	459	169	14.04%	1.29%
Poland	6,659	2,943	4,623	5,270	1,751	3,519	52.85%	26.92%
Romania	16,190	2,033	10,561	4,479	2,910	1,569	9.69%	12.00%
Slovak Republic	872	568	437	427	295	132	15.14%	1.01%
Ukraine	4,411	3	2,283	3,067	503	2,564	58.13%	19.62%
TOTAL	43,873	7,247	28,422	22,344	9,274	13,070	29.79%	100.00%

Czech Republic (7,460 firms and 27,338 observations), Poland (6,659 firms and 39,721 observations), and Romania (16,190 firms and 35,388 observations) stand out in the sample. A few selection procedures were taken in order to assure a homogenous and consistent sample. First, in order to exclude very small firms and keep the sample homogenous, we dropped all firms whose value of total assets was under US$1,000,000. Next, we filtered the accounting database to weed off observations that presented substantial differences in the main groups and subgroups of the Balance Sheet (accounting inconsistencies).

Table 2: Sample of Observations by Country

Country	Initial Sample	Inconsistencies	Total Assets < US$ 1M	Sub-Total	Continuous Obs. < 3	Final Sample	% of Initial Sample	% of Total Final Sample
Czech Republic	27,338	1,191	9,063	17,571	3,069	14,502	53.05%	21.50%
Estonia	11,298	83	8,557	2,689	557	2,132	18.87%	3.16%
Hungary	23,081	696	10,627	12,108	1,919	10,189	44.14%	15.11%
Latvia	4,802	62	2,658	2,106	320	1,786	37.19%	2.65%
Lithuania	3,471	67	1,813	1,643	789	854	24.60%	1.27%
Poland	39,721	5,157	14,205	20,830	3,393	17,437	43.90%	25.85%
Romania	35,388	3,389	20,738	11,933	4,845	7,088	20.03%	10.51%
Slovak Republic	2,799	957	992	1,114	492	622	22.22%	0.92%
Ukraine	22,043	3	8,408	13,632	793	12,839	58.25%	19.04%
TOTAL	169,941	11,605	77,061	83,626	16,177	67,449	39.69%	100.00%

In order to do that, we computed the differences between each accounting group and the sum of its subgroups. The observations were dropped wherever such difference was larger than US$10,000.[3] Both procedures resulted in the exclusion of 21,529 firms and 86,315 observations. Finally, after imposing the filters described above, we kept in the sample only firms with at least three consecutive yearly observations. This last filter excluded 9,274 firms and 16,177 observations

Therefore, the final sample consisted of the following 9 countries: Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, and Ukraine. The final sample is comprised of 13,070 firms (29.79 percent of the initial sample) and 67,449 observations (39.69

[3] This amount represents a maximum of 1% of the value of the total assets of the firms in the sample.

percent of the initial sample), organized as an unbalanced panel since not all firms have observations for every year in the sample period.

Tables 1 and 2, also depicts the distribution of firms and observations among the countries in this study. Poland, Czech Republic, and Ukraine present the biggest number of observations in the final sample, while Estonia, Latvia, Lithuania, and the Slovak Republic possess the lowest number of observations.

Table 3: Number of Observations by Year and Country

Year	1996	1997	1998	1999	2000	2001	2002	2003	TOTAL
Czech Republic	1,218	1,290	1,414	1,658	1,972	2,415	2,471	2,064	14,502
Estonia	0	0	275	293	360	400	401	403	2,132
Hungary	331	1,000	1,203	1,374	1,485	1,600	1,652	1,544	10,189
Latvia	93	147	195	236	264	296	292	263	1,786
Lithuania	31	48	68	89	128	159	167	164	854
Poland	88	88	2,151	2,558	2,971	3,319	3,263	2,999	17,437
Romania	0	0	609	775	1,206	1,531	1,535	1,432	7,088
Slovak Republic	46	62	80	98	118	117	67	34	622
Ukraine	0	0	1,107	1,997	2,333	2,549	2,496	2,357	12,839
TOTAL	1,807	2,635	7,102	9,078	10,837	12,386	12,344	11,260	67,449
% of TOTAL	2.68%	3.91%	10.53%	13.46%	16.07%	18.36%	18.30%	16.69%	100.00%

Regarding the distribution of observations throughout the sample period, presented in Table 3, 1996 is the year with the least number of observations (only 1,807). The number of observations increase until they reach a maximum in 2001 (12,386), declining to 12,344 in 2002 and 11,260 in 2003.

2.2. Variables and Statistics Analysis

In this paper firm's debt levels (dependent variable) is measured by three different leverage ratios: Total Liabilities to Total Assets (henceforth LR1); Total Debt to Total Assets (LR2); and Long Term Debt to Total Assets (LR3).

Firm-specific determinants of capital structure choice are chosen from those frequently employed in the literature. The set of firm-specific explanatory variables is the following: size, growth opportunities, profitability, business risk, tangibility, the tax rate, and firm age. The size of the firm is measured by the natural logarithm of Total Assets. The growth opportunities[4] of the firm are assessed by Intangible Fixed Assets over Total Assets. Profitability is measured by Earnings before Interests and Taxes over Total Assets. Business Risk[5] is proxied by Gross Profit over Earnings before Interest and Taxes. The degree of tangibility of assets, an indicator of collateral value is given by the amount of Tangible Fixed Assets over Total Assets. The effective average corporate tax rate of the firm is used as a proxy for the effect of tax shields and is measured as Earnings before Taxes minus Net Earnings divided by Earnings before Taxes.[6] Finally, the age of

[4] According to the literature, growth opportunities could be associated to intangible assets of the firm.

[5] Strictly speaking, operational leverage is usually measured as the ratio of change in revenues to the change in operating profits. However, data limitations prevented us to use this indicator. We then adopted the ratio of Gross Profit to EBIT as a second-best alternative. Since operating leverage is rooted on the amount of fixed costs in the cost structure of the firm, our indicator although imperfect is a reasonable approximation.

[6] In case the numerator and denominator are both negative, the quotient is multiplied by -1 (minus one) to obtain a negative tax rate, since the firm had compensated previous losses. If the numerator is positive and the denominator is negative the quotient is also multiplied by -1 to obtain a positive tax rate, because the firm paid taxes even though its earnings before taxes were negative. In all other cases, there is no need to modify this ratio.

the firm is measured by the natural logarithm of the difference between the Year of Financial Statement and Year of Incorporation.

Tables 4, presents the descriptive statistics for the dependent and explanatory variables

Table 4: Descriptive Statistics

	LR1	LR2	LR3	Size	Growth	Profitability	Business Risk	Tangibility	Tax Rate	Ln (Age)
Mean	0.5404	0.1340	0.0791	8.5558	0.0113	0.0806	5.5748	0.4576	0.2577	2.1902
Median	0.5175	0.0361	0.0000	8.3222	0.0008	0.0503	1.5282	0.4494	0.0608	2.0794
Maximum	20.5093	9.2011	9.2011	17.4140	137.6547	319.2755	19,969.9800	153.0324	795.7779	6.1181
Minimum	(8.0333)	(0.4078)	(0.4078)	6.9078	(0.1189)	(8.7496)	(13,943.4900)	(1.9898)	(392.9998)	0.0000
Std. Deviation	0.3741	0.2118	0.1795	1.1626	0.5334	1.7270	229.7334	0.6346	5.6800	0.9772
Nr. Obs.	67,448	66,488	56,749	67,449	66,949	64,912	39,721	67,433	64,705	62,581

From table 4 it is highlighted that total liabilities, total debt and long term debt accounts for 54.04%, 13.40% and 7.91% of total assets, on average. However, the dispersion around their average for the different measures of leverage is quite large.[7] Long term debt for a large number of firm-year observations is equal to zero (shown by a median value of zero), which might indicate firm's difficulties in raising long term debt from financial institutions. In what respect to some of the explanatory variables, tangible assets represents 45.76% of total assets, the average tax rate paid is 25.77% and earnings before interests and taxes are 8.06% of total assets, on average.

Table 5 reports statistics for dependent and explanatory variables by country. Firms from Lithuania, and Ukraine present, on average, low values of total leverage (measured by LR1), while the firms from the remaining countries are clustered together near the overall average of 0.5404. In terms of total debt (LR2) and long-term debt (LR3), Hungary, Romania, and Ukraine possess relatively low leverage, while firms from the Czech Republic, Estonia, Latvia, and the Slovak Republic are more intensively indebted.

[7] The variables are obtained from financial ratios and may be the case that extreme values are a result of measurement or recording errors. Regression analysis will be undertaken with and without outliers being the criterion to trim the top and bottom 0.5 percent of the observations of the variables that presented extreme values.

Table 5: Descriptive Statistics for Dependent and Explanatory Variables

Country	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Poland	Romania	Slovak Republic	Ukraine
LR1									
Mean	0.5776	0.5381	0.5238	0.5715	0.5017	0.5597	0.6531	0.6205	0.4177
Std. Deviation	0.3315	0.2692	0.3549	0.3218	0.2376	0.3550	0.3662	0.2933	0.4546
Maximum	5.4975	2.2415	16.5223	2.8890	1.8128	9.0411	5.9200	1.6778	20.5093
Minimum	-0.3394	0.0005	-8.0333	0.0026	0.0008	0.0001	0.0001	0.0000	0.0000
Observations	14,502	2,132	10,188	1,786	854	17,437	7,088	622	12,839
LR2									
Mean	0.2188	0.2293	0.119	0.2624	0.1916	0.1632	0.1110	0.2493	0.0674
Std. Deviation	0.2295	0.2220	0.0540	0.2805	0.1830	0.1987	0.1789	0.2116	0.2194
Maximum	3.3932	1.0598	0.9294	2.8138	1.1636	3.0178	1.7729	0.9568	9.2011
Minimum	-0.4078	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0167	-0.0003	0.0000
Observations	14,502	2,132	10,183	1,786	854	16,482	7,088	622	12,839
LR3									
Mean	0.1303	0.1362	0.0071	0.1744	0.1060	0.1008	0.0458	0.1598	0.0308
Std. Deviation	0.1960	0.1731	0.0455	0.2624	0.1491	0.1622	0.1290	0.1915	0.1972
Maximum	3.3932	1.0081	0.9294	2.8138	1.0981	1.5943	1.1723	0.8247	9.2011
Minimum	-0.4078	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0003	0.0000
Observations	14,502	2,132	6,883	1,786	791	10,107	7,088	622	12,838
SIZE									
Mean	8.7063	8.1491	8.5654	8.1211	8.1202	8.7054	8.3017	8.5196	8.4742
Std. Deviation	1.2061	0.9246	1.2262	0.9417	0.8861	1.1007	1.0449	1.1480	1.2127
Maximum	14.7628	14.2054	17.4139	13.5372	11.5124	14.3952	15.9156	12.9260	13.8951
Minimum	6.9080	6.9093	6.9078	6.9086	6.9097	6.9078	6.9078	6.9280	6.9078
Observations	14,502	2,132	10,189	1,786	854	17,437	7,088	622	12,839
GROWTH OPPORTUNITIES									
Mean	0.0071	0.0049	0.0244	0.0094	0.0044	0.0146	0.0069	0.0099	0.0057
Std. Deviation	0.0266	0.0253	1.3645	0.0412	0.0155	0.0495	0.0424	0.0454	0.0336
Maximum	0.7301	0.4720	137.6547	0.6940	0.1911	0.8560	0.8991	0.5006	0.9964
Minimum	-0.1189	-0.0183	0.0000	0.0000	0.0000	0.0000	-0.0004	0.0000	0.0000
Observations	14,502	2,132	10,182	1,786	854	16,944	7,088	622	12,839
PROFITABILITY									
Mean	0.0665	0.0928	0.1638	0.0644	0.0868	0.0603	0.1151	0.0434	0.0380
Std. Deviation	0.1261	0.1475	4.2225	0.1399	0.1187	0.1639	0.1769	0.1038	1.3973
Maximum	1.1481	1.1002	319.2755	1.6783	0.7866	3.1083	1.2262	0.4505	130.4637
Minimum	-2.2384	-1.3463	-3.7384	-1.0480	-0.6052	-2.4271	-1.8484	-0.6328	-8.7496
Observations	14,502	2,132	9,598	1,786	824	17,420	7,088	622	10,940
BUSINESS RISK									
Mean	2.8643	1.7494	29.6815	4.8500	4.3676	2.8323	9.6960	0.1344	6.6621
Std. Deviation	73.2986	21.5108	600.9704	37.0763	82.2591	87.1720	165.4209	64.6021	327.0068
Maximum	7508.3319	278.8708	18175.1832	1212.0348	1741.5258	3023.9999	3511.1897	381.9538	19969.9806
Minimum	-1931.5950	-772.3413	-8540.1359	-314.1009	-968.4603	-3552.003	-2577.6171	-1494.3571	-13943.4934
Observations	14,319	2,129	2,103	1,705	824	5,757	1,380	600	10,904
TANGIBILITY									
Mean	0.4208	0.4803	0.4252	0.4682	0.4012	0.4344	0.4402	0.4485	0.5606
Std. Deviation	0.2218	0.2424	1.5327	0.2067	0.2055	0.2421	0.2141	0.2140	0.2373
Maximum	1.0000	0.9863	153.0324	0.9767	0.9088	0.9984	0.9980	0.9313	4.4132
Minimum	-1.9898	0.0000	0.0000	0.0000	0.0106	0.0000	0.0000	0.0000	0.0000
Observations	14,502	2,132	10,188	1,786	854	17,422	7,088	622	12,839

Country	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Poland	Romania	Slovak Republic	Ukraine
TAXE RATE									
Mean	0.0566	0.0172	0.1248	0.3660	0.1317	0.3428	0.2469	0.5548	0.5330
Std. Deviation	4.2381	0.5201	3.7142	2.0055	0.8564	5.3417	1.7896	2.1447	10.3342
Maximum	78.8572	10.4914	211.3004	45.1411	22.4677	568.0000	111.7989	32.4833	795.7779
Minimum	-392.9998	-13.5226	-290.3734	-16.6473	-7.0360	-55.0000	-23.8541	-4.9091	-0.1324
Observations	14,399	2,112	9,581	1,775	824	17,412	7,083	617	10,902
AGE									
Mean	7.0000	12.0000	7.0000	6.0000	6.0000	25.0000	7.0000	5.0000	26.0000
Std. Deviation	5.6433	15.3114	3.5132	2.8245	2.7697	34.0357	3.2420	2.7776	34.1698
Maximum	58.0000	105.0000	54.0000	12.0000	13.0000	259.0000	13.0000	13.0000	454.0000
Minimum	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	13,914	2,129	9,046	1,759	854	15,792	6,546	622	12,571

In terms of the explanatory variables, Hungarian firms are, on average, more profitable, riskier, and have more growth opportunities (larger share of intangible assets) than those form the other countries. Profitability is minimal in Slovak Republic, Ukraine, Romania and Czech Republic with values between 3.8 and 6.65 percent. In terms of average effective tax rate the values varies significantly across countries. By last Ukraine average firm is by far larger than firms in the other countries of the sample. [8]

Table 6 shows the correlations among the dependent and explanatory variables. Correlation among dependent variables reveals that LR1 is moderately correlated to the other two leverage variables. It indicates that this variable indeed measures a different aspect of capital structure, as expected from the construction of this variable. LR2 and LR3, on the other hand, are strongly correlated.

Table 6: Correlation Matrix for dependent and explanatory variables

	LR1	LR2	LR3	Size	Growth	Profitability	Business Risk	Tangibility	Tax Rate	Ln (Age)
LR1	1.0000									
LR2	0.4998	1.0000								
LR3	0.4500	0.8426	1.0000							
Size	-0.0093	0.0764	0.0502	1.0000						
Growth	-0.0014	-0.0007	0.0302	0.0097	1.0000					
Profitability	-0.0225	-0.0124	-0.0074	0.0012	-0.0005	1.0000				
Business Risk	0.0019	-0.0063	-0.0040	0.0064	-0.0024	-0.0002	1.0000			
Tangibility	-0.0887	0.0163	0.0337	0.0413	-0.0030	-0.0073	-0.0001	1.0000		
Tax Rate	-0.0026	-0.0030	-0.0014	-0.0003	-0.0003	-0.0002	0.0434	-0.0002	1.0000	
Ln (Age)	-0.0895	-0.0728	-0.1094	0.1279	-0.0013	-0.0122	0.0082	0.0175	0.0106	1.0000

In terms of explanatory variables, Table 6 indicates a positive association between Size and Firm Age, suggesting that older firms tend to be larger. In general, correlations among explanatory variables are close to zero, suggesting that multicollinearity should not be a problem in the regression analysis. Besides the above variables, the sector of activity of each firm is also included as an explanatory variable, given the possible systematic effects that the nature of the firm's activities may have over its leverage, in particular the total leverage measures. The sector of activity is represented by a set of dummy variables based on the two first digits of the NACE[9] Primary Code.

[8] Results are not affected when one exclude in both tails of the distribution the 0.5 percent observations with larger and smaller values. Therefore, the averages provided are not driven by outliers.

[9] NACE – Nomenclature statistique des activités économiques dans la Communautê Européenne.

In our final sample, the firms are distributed along 26 sectors of activity, according to their 2-digit NACE Primary Code.[10] Manufacture of food products and beverages (16.17 percent of the firms and 16.31 percent of the observations) and Construction (14.56 percent of the firms and 14.04 percent of the observations) are the industries which dominates the sample. Least representative industries are manufacture of tobacco products, leather products, manufacture of coke, oil and nuclear fuel, manufacture of office machinery and computers, and recycling (less than 1 percent of firms and observations). In the remaining industries, firm participation in the sample varies between 1.61 percent (other transport equipment) and 9.00 percent (manufacture of machinery and equipment) of the total number of firms.

In order to capture the effect of events common to a given year or country, we included dummy variables for each year of the sampling period as well as for each particular country. This initial set of explanatory variables, i.e., firm-specific, industry, year, and country dummies become henceforth what we call the "basic model" for the regression analysis.

To address the main objective of this study, we refine the basic model by adding variables that proxy for firm ownership structure, country governance structure, and the level of financial development of each country. Firms are classified according to their ownership concentration, i.e., their degree of independence with respect to their shareholders, in the Amadeus database. The "Independence Indicator" signals the various levels of ownership concentration according to the following scale (in a decreasing order of independence): A^+, A, A^-, B^+, B, B^-, C and U.[11]

Thus, we created a set of dummy variables based on the above classification ("A", "B", "C" and "U"), which proxy for the ownership structure of the firm. The distribution of firm-year observations among the different levels of independence is presented in Table 7.

Table 7: Distribution of firm-year observations among different levels of ownership

	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Poland	Romania	Slovak Republic	Ukraine	TOTAL
A^+	0.1%	2.3%	1.1%	0.4%	3.7%	0.5%	6.4%	0.0%	39.1%	8.56%
A	0.0%	0.0%	0.1%	0.2%	2.6%	0.1%	0.1%	0.0%	0.1%	0.12%
A^-	0.6%	0.0%	0.3%	2.1%	1.3%	1.1%	2.1%	0.0%	2.1%	1.15%
B^+	1.9%	12.1%	6.1%	8.1%	28.9%	4.7%	14.8%	0.0%	18.6%	8.61%
B	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%
B^-	1.3%	0.7%	0.5%	0.2%	2.0%	1.5%	1.4%	0.0%	1.0%	1.14%
C	16.9%	68.6%	33.8%	40.4%	55.7%	56.4%	70.6%	8.0%	38.2%	42.02%
U	79.1%	16.3%	58.1%	48.6%	5.7%	35.8%	4.5%	92.0%	0.9%	38.39%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 7, shows that 43.33 percent of the firms and 42.02 percent of the observations are in category C – lower degree of independence; 36.73 percent of the firms and 38.39 percent of the observations are under level U – unknown degree of independence; 8.95 percent of the firms and 8.61percent of the observations are under level B^+ – medium degree of independence; 8.57 percent of the firms and 8.56 percent of the observations are under level A^+ – higher degree of independence; and the remaining firms under the other levels of independence (2.42 percent of the firms and of the observations). The data indicates, in general terms, a low level of independence (high level of ownership concentration) of the firms in the sample. Such evidence should not be surprising, given this study focuses in unlisted SMEs.

[10] A list of NACE industry codes contemplated in this paper, their respective description and number of firms per industry is provided upon request.

[11] For a detailed description of these variables, we refer the reader to Bureau Van Dijk (2005).

Regarding the variables that describe the governance structure in each country of the sample, we selected the following indicators from the World Bank and described by Kaufmann, Kraay and Mastruzzi (2006, p. 4): Voice and Accountability, Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption.

The range of these indicators are in the interval [–2.5, +2.5], the higher the grade, the better the quality of the indicator. Such indicators are available for the following years: 1996, 1998, 2000, 2002, 2003, and 2004. In order to avoid the exclusion of the intermediary years 1997, 1999, and 2001, for which no indicators are available, we computed the midpoint between the neighboring years, assuming a smooth linear transition between these years. Based on the mean values among the years, there are considerable differences between the countries in terms of governance structure. Hungary presents the highest average values for "Voice and Accountability", "Political Stability", "Rule of Law", and "Control of Corruption" indicators, and Estonia the highest mean values for "Government Effectiveness", and "Regulatory Quality". At the other end of the spectrum, Ukraine displays the lowest averages all governance indicators. In general, we observe that among the countries analyzed, the Czech Republic, Estonia, Hungary, and Poland exhibit the best governance structures; in an intermediary block are Latvia, Lithuania, and the Slovak Republic; and, finally, Romania, and Ukraine are the countries with the comparatively worst governance structure.

Table 8: Correlation Matrix of Country Governance Indicators

	Voice_Account	Political_Stabil	Gov_Effectiv	Regulatory_Quality	Rule of Law	Corruption
Voice_Account	1.000					
Political_Stabil	0.824(**)	1.000				
Gov_Effectiv	0.901(**)	0.865(**)	1.000			
Regulatory_Quality	0.870(**)	0.911(**)	0.921(**)	1.000		
Rule of Law	0.933(**)	0.900(**)	0.949(**)	0.929(**)	1.000	
Corruption	0.899(**)	0.853(**)	0.920(**)	0.883(**)	0.958(**)	1.000

** Correlation is significant at the 0.01 level (2-tailed)

The correlation matrix for these indicators, shown in Table 8, suggests that they are highly correlated. Correlation coefficients range from 0.824 to 0.958, all statistically significant at the 1% level.

In with respect to the financial development variables, we adopt the following indicators of financial development and structure across countries and over time, collected from the World Bank: "Deposit Money Banks versus Central Bank Assets", "Central Bank Assets to GDP", "Deposit Money Banks Assets to GDP", "Liquid Liabilities to GDP", "Private Credit by Deposit Money Banks and Other Financial Institutions to GDP", "Financial System Deposits to GDP", "Stock Market Capitalization to GDP", "Stock Market Total Value Traded to GDP", and "Stock Market Turnover Ratio"[12].

[12] For a detailed description of the Governance structure and Financial Development variables, we refer the reader to Kaufmann, Kraay, and Mastruzzi (2006) and Beck, Demirgüç-Kunt and Levine (2000), respectively.

The World Bank database[13] contains updated information and the initial year varies, by country, from 1992 to 1998. Descriptive statistics (for the sample period – 1996-2003) of these indicators are presented in Table 10. Average values of "Deposit Money Banks versus Central Banks Assets" suggest that almost all financial system assets are represented by deposit money banks (91.30 percent in Romania up to 99.86% in Lithuania), with the exception of Hungary, and Ukraine with 68.25 and 57.26 percent, respectively. Regarding "Central Bank Assets to GDP", it is usually small (from 0.03 percent in Lithuania to 10.44 percent in Ukraine) except for Hungary where it represents 22.53 percent of the country's output. The size of bank deposits relative to the economy as a whole is more representative in the Slovak Republic (74.81 percent) and in the Czech Republic (59.73 percent). On the other extreme are Lithuania, Romania and Ukraine, where bank assets represent on average only 17.06, 12.68 and 13.69 percent of GDP, respectively. "Liquid Liabilities to GDP", a measure of the importance of the financial sector as a whole, confirm the results discussed above indicating a greater importance of the financial system in both Slovak Republic and Czech Republic, and a lesser importance in Lithuania, Romania and Ukraine. The indicators "Private Credit by Deposit Money Banks and Other Financial Institutions to GDP" and "Financial System Deposits to GDP" are proxies for the level of activity of the financial system. Again the Slovak Republic and the Czech Republic display a relatively more intense level of financial activity contrasting to Lithuania, Romania and Ukraine. It comes as no surprise that financial activity is higher where the size of the financial system is bigger. The stock market size in relation to the size of the economy, a measure of its relative importance, is higher in the Czech Republic, Hungary, and Estonia. Regarding the level of activity and overall liquidity, the indicator "Stock Market Total Value Traded to GDP" suggests that Czech Republic, Hungary, and Estonia have the most active stock markets, while the values of "Stock Market Turnover Ratio" indicate that liquidity is higher in Hungary, and Slovak Republic.

[13] The database includes other indicators of size, activity, and efficiency of the financial system of each country, however we do not include them in this study for the following reasons: I) Data availability for the sample in the period of analysis; and, II) Reduced number of observations, which implicates in a substantial reduction in sample size. We also do not include the indicators "Private Credit by Deposit Money Banks to GDP", and "Bank Deposits to GDP", because the values are identical to "Private Credit by Deposit Money Banks and Other Financial Institutions to GDP" and "Financial System Deposits to GDP", respectively. The values for all the financial development indicators per country and year are available upon request.

Table 9: Correlation Matrix of Financial Development Indicators[14]

	DMB	LiqLiab	CBA	DMB	PCDM	FinSys	Stock	StockTV	Stock
DMB	1.000								
LiqLiab	0.117	1.0000							
CBA	-0.855(**)	0.935(**)	1.0000						
DMB	0.206	0.897(**)	0.010	1.0000					
PCDM	0.237(*)	0.984(**)	-0.027	0.933(**)	1.0000				
FinSys	0.148	0.376(**)	0.078	0.957(**)	0.880(**)	1.0000			
Stock	0.168	0.388(**)	-0.072	0.266(*)	0.413(**)	0.316(**)	1.0000		
StockTV	-0.086	0.294(**)	0.135	0.315(**)	0.345(**)	0.360(**)	0.751(**)	1.0000	
Stock	-0.004	0.952(**)	0.000	0.351(**)	0.246(*)	0.330(**)	0.102	0.549(**)	1.0000

The correlation matrix for financial development indicators, presented in Table 9, confirms that the level of financial activity (intermediation) is higher in those countries where the financial system is more important (larger) relative to the whole economy.

2.3. Factor Analysis

In order to avoid the problems of multicollinearity, we employ factor analysis on both the governance structure and financial development indicators adopting the Principal Component Analysis (PCA) recommended when the main concern is to determine the minimal number of factors that account for the maximum data variance for subsequent multivariate analyses.

2.3.1. Factor Analysis of Governance Structure Indicators

The first step consists in the evaluation of the sampling adequacy of factor analysis to the sample at hand. The sample of governance structure indicators comprises 72 observations (nine countries times eight years) and six variables, resulting in an observation-to-variable ratio of 12. Formal tests of sampling adequacy indicate the propriety of factor analysis to this sample. The null hypothesis that the variables are not correlated is rejected by the Bartlett's test of sphericity at 1 percent significance level, and the value of the KMO statistic (0.916) is above the critical value of 0.5. The results suggest that only one component (factor) has the eigenvalue larger than one, responding for 91.798 percent of total variance of the initial set. The remaining factors contribute marginally in explaining the variance of the data, thus being dropped in the study. The factor loadings of the remaining factor, i.e., its correlations with the indicators (variables) of the initial set are high, ranging from 0.931 ("Political Stability") to 0.987 ("Rule of Law"). We interpret this single factor (henceforth "Governance Factor") as a global index for country governance structure, given its large factor loadings. Since only a single factor has been extracted, it is not necessary to rotate the factors. Therefore, instead of utilizing the six original variables in the forthcoming regression analysis, only the factor extracted from the PCA analysis will be included. This procedure avoids multicollinearity problems and increases the degrees of freedom of the estimation. The countries in our sample according to the quality of their governance structure in the following decreasing order: Hungary, Estonia, the Czech Republic, Poland, Lithuania, the Slovak Republic, Latvia, Romania, and Ukraine.

[14] Where DMB represents "deposit money banks assets vs. central banks assets", LiqLiab "liquid liabilities to GDP", CBA "central bank assets to GDP", DMB "Deposit money banks assets to GDP", PCDM "private credit by deposit money banks and other financial institutions to GDP", FinSys "financial system deposits to GDP", Stock "stock market capitalization to GDP", StockTV "stock market total value traded to GDP", Stock "Stock market turnover ratio".

2.3.2. Factor Analysis of the Financial Development Indicators

We repeat the procedure laid down above to the financial development indicators. First, we check the sampling adequacy of factor analysis to the sample. The sample comprises 77 observations and nine variables resulting in an observation-to-variable ratio of 8.56. Formal tests of sampling adequacy indicate the convenience of factor analysis to this sample. The null hypothesis that variables are not correlated in the population is rejected at the 1% level by the Bartlett test of sphericity. Also, the KMO statistic presented a value (0.566) above the critical value of 0.5. Results for the PCA analysis reveal that only three factors have eigenvalues larger than one, responding for 85.749% of the initial variables sets total variance.[15] Therefore, we dropped the remaining factors from the study, given their low share in explaining the original data variance. Upon analyzing the initial matrix of components in Table 10, we identify some indicators with large loadings (correlations) in more than one factor, which could pose interpretation problems. So, we rotate the factors by the Varimax method, chosen because: I) it is an orthogonal method (since the objective is to obtain uncorrelated factors); II) this method minimizes the number of variables with large loadings in one factor, supporting the interpretation of the factors.

Table 10: Results of the PCA analysis for Financial Development Indicators

Indicators	Initial Component Matrix			Rotated Component Matrix		
	Component			Component		
	1	2	3	1	2	3
Deposit money banks vs. central banks assets	0.2031	-0.9430	0.0983	0.1605	-0.0041	**0.9562**
Liquid Liabilities to GDP	0.9498	0.0646	-0.2435	**0.9522**	0.2383	-0.0458
Central Banks assets to GDP	0.0159	0.9439	-0.2016	0.0813	0.0155	**-0.9617**
Deposit money banks assets to GDP	0.9379	-0.0540	-0.2964	**0.9695**	0.1640	0.0600
Private credit by deposit money banks and other financial institutions to GDP	0.9253	-0.0962	-0.2067	**0.9179**	0.2277	0.1171
Financial system deposits to GDP	0.9450	0.0191	-0.2682	**0.9607**	0.2058	-0.0060
Stock market capitalization to GDP	0.5312	-0.0121	0.6612	0.1642	**0.8149**	0.1687
Stock market total value traded to GDP	0.5764	0.2959	0.7317	0.1629	**0.9565**	-0.1174
Stock market turnover ratio	0.4480	0.1621	0.3667	0.2222	**0.5552**	-0.0619

The three rotated factors (Table 10) can be interpret as follows: the first factor (henceforth "Intermediation Factor") is an index that measures financial sector development, in particular financial intermediation development (deposit money banks), in terms of importance (size) of the sector and its level of activity (deposit volume) in relation to the economy as a whole; the second factor (henceforth "Stock Market Factor") is an index that measures the development of the stock market in terms of importance (size) of this market to the economy as a whole, as well as its levels of activity and liquidity; the third factor (henceforth "Central Bank Factor") is a comparison between the relative importance (size) of the banking sector and the central bank to the economy as a whole. Small values of this factor indicate that the monetary authority has a relatively more relevant role in the economy, while large values of this factor indicate instead that banks are relatively more important. Based on these factors, we can rank the countries in our sample according to the development of their financial sector development (Intermediation Factor) in the following decreasing order: the Slovak Republic, the Czech Republic, Poland, Hungary, Estonia, Latvia, Lithuania, Ukraine, and Romania. Regarding the development of the stock market (Stock Market Factor), the decreasing order is the following: Hungary, the Czech Republic, Estonia, Poland,

[15] The tables with detailed information regarding the KMO and Bartlett's tests, Eigenvalues and total variance explanation for both governance and financial development indicators are available upon request.

Lithuania, the Slovak Republic, Latvia, Romania, and Ukraine. Finally, regarding the importance of the monetary authority in comparison to the banking sector (Central Bank Factor), the ranking is (now in increasing order): Hungary, Ukraine, Romania, Poland, the Slovak Republic, Latvia, the Czech Republic, Lithuania, and Estonia.

2.4. Outliers Exclusion Procedures

A handful of variables in the sample presented aberrant observations, i.e., extreme large or small values in relation to average values, as reported in Table 4. Such is the case of the dependent variables, LR1, LR2 and LR3, and some exogenous variables (Growth Opportunities, Profitability, Business Risk, Tangibility, and Tax Rate). As mentioned previously, these variables are obtained from financial ratios and may be case that extreme values are a result of measurement or recording errors. In such case, aberrant observations do not correspond to the true value of the variables and their exclusion would be justifiable, without prejudice to the integrity of the results. However, since we can not be sure about which observations are errors, their exclusion may not be an adequate solution. Given this tradeoff, we choose to perform the analysis both with and without outliers. The criterion for excluding outliers is to trim the top and bottom 0.5% of the observations of the variables that presented extreme values. This procedure resulted in the exclusion of 184 firms and 4,281 firm year observations, representing respectively 1.41 percent and 6.35 percent of our sample.[16].

3. Methodology

3.1 Panel data Analysis

Panel data analysis presents several advantages for the treatment of economic problems where cross-sectional variation and dynamic effects are relevant. Hsiao (1986) raises three advantages possessed by panel data sets: since they provide a larger number of data points, they allow increase in the degrees of freedom and reduce the collinearity among explanatory variables; they allow the investigation of problems that cannot be solely addressed by either cross-section or time series data sets; and they provide means of reducing the missing variable problem. Baltagi (1995) adds to these the usually higher accuracy of micro-unit data respective to aggregate data and the possibility of exploring the dynamics of adjustment of a particular phenomenon over time.

In principle, classic time series methods can be applied to panels simply by "pooling" all cross-section and time series observations together. Indeed, this approach is often used. Moreover, in a typical panel, there are a large number of cross-sectional units and only a few periods. This is the type of panel that is examined in this paper, where there are a large number of firms from different countries observed over a period of only eleven years. In such case, the econometric techniques should focus more on cross-sectional variation (heterogeneity) instead of time variation. Time variation that is common to all firms, in this case, can be controlled for by dummy variables. The main advantages of such method for the investigation of the problem proposed in this paper is that observations of firms from different countries can be pooled together in order to increase the degrees of freedom. Also, by pooling together countries (besides firms) we can infer in what extent the relationships among the variables hold across different countries and determine if country-specific factors help explain the variation observed by other authors. Pooling together firms, on the other hand, assumes that parameters (slopes and intercepts) are constant across firms. This is, of course, a very strong assumption and subject to potential biases (Hsiao, 1986). That would be the case if the effects of a given independent variable are different for different kinds of firms, for

[16] The sample distribution without outliers by year, industry and independence level, as well as their descriptive statistics and correlations are not reported for concision sake, but are available upon request

instance small and large firms. Moreover, it is not possible to use fixed-effects formulations that could potentially prevent intercept biases because we include key variables that are fixed for all years in a given firm (case of independence and industry dummies) and that are fixed for all firms of the same country in a given year (case of governance structure factor and financial development factors). Likewise, the usual procedure to use the Hausman test statistic for the difference between the fixed-effects and random-effects estimates, as suggested by Hsiao (1986), becomes moot. The careful choice of firm-specific variables (such as firm size) helps control for these possible biases. Nevertheless, this remains a limitation of this research.

Estimation of panel data models can be done by Ordinary Least Squares in the case of simple pooling formulation and by Generalized Least Squares for the random-effects formulation (Hall and Cummins, 1997).

3.2 Empirical Model

A Panel Data analysis is performed according to the following (augmented) model:

$$LR_{it} = \beta_0 + \sum_{k=1}^{K} \beta_{1k} Y_{ikt} + \sum_{l=1}^{L} \beta_{2l} Z_{ilt} + \upsilon_i + \varepsilon_{it}$$

Where LR_{it} is the stacked vector of the dependent variable (the i^{th}-firm leverage ratio on the t^{th}-period), Y_{ikt} is the matrix of K firm-specific explanatory variables (including industry, year, and degree of independence dummies), Z_{ilt} is the matrix of L country-specific variables, that is, country dummies, governance structure and financial development factors, β_0 is the intercept of the model, β_{1k} and β_{2l} are the matrices of coefficients, υ_i is the firm-specific error term in the random-effects model, and ε_{it} is a vector of error terms.

The regressions are run for five different specifications for each dependent variable, all based on the augmented model presented above. Standard errors are heteroskedasticity robust according to the method proposed by White (1980). The specifications are as follows:

- Specification I: basic model, that is, traditional firm-specific variables plus dummies for industry, year, and country.
- Specification II: basic model plus ownership dummies.
- Specification III: basic model plus governance structure factors.
- Specification IV: basic model plus financial development factors.
- Specification V: basic model plus ownership dummies, governance structure factors and financial development factors.

4. Empirical Results

4.1 Regression Analysis

Tables 11 to 13 present the results for the regression estimates of the three proxies of capital structure over the five specifications described in the previous section. Each specification is estimated as a simple pooling and with random effects.

Table 11: Estimation Results for Dependent Variable LR1

Model	I	II	III	IV	V
Constant	0.5384***	0.5794***	0.5277***	-0.2995**	-0.2468
	0.000	*0.000*	*0.001*	*0.041*	*0.131*
Size	0.0153	0.0151	0.0129	0.0746***	0.0742***
	0.248	*0.252*	*0.332*	*0.000*	*0.000*
Growth	-0.1998***	-0.2005***	-0.1842***	-0.3420***	-0.3279***
	0.000	*0.000*	*0.000*	*0.000*	*0.001*
Profitability	-0.3603***	-0.3603***	-0.3584***	-0.3886***	-0.3855***
	0.000	*0.000*	*0.000*	*0.000*	*0.000*
Business Risk	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
	0.242	*0.247*	*0.181*	*0.147*	*0.128*
Tangibility	-0.3177***	-0.3177***	-0.3172***	-0.2557**	-0.2548***
	0.000	*0.000*	*0.000*	*0.000*	*0.000*
Tax Effect	-0.0052***	-0.0052***	-0.0051***	-0.0017	-0.0016
	0.000	*0.000*	*0.000*	*0.128*	*0.143*
Firm Age	0.0027	0.0013	0.0054	-0.0060	-0.0020
	0.827	*0.917*	*0.678*	*0.707*	*0.905*
MA(1)	0.8911***	0.8903***	0.8909***	0.9093***	0.9104***
	0.000	*0.000*	*0.000*	*0.000*	*0.000*
Ownership Concentration A		-0.0777**			-0.0324
		0.043			*0.519*
Ownership Concentration B		0.0038			0.0130
		0.437			*0.217*
Ownership Concentration C		-0.0041			-0.0181
		0.725			*0.450*
Country Governance Factor			-0.0106		-0.0142
			0.907		*0.683*
Financial Intermediation Factor				0.1354***	0.1396***
				0.000	*0.000*
Stock Market Factor				0.0243***	0.0256***
				0.000	*0.000*
Central Bank Factor				0.0537	0.0576
				0.113	*0.130*
Adjusted R-Squared	0.8205	0.8206	0.8170	0.8580	0.8576
Wald p-value		*0.127*		*0.000*	
F p-value	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
Observations	36,672	36,672	34,539	24,256	23,256
Country Dummies	YES	YES	YES	YES	YES
Industry Dummies	YES	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES	YES

p-values in italic, *, ** and *** significant at 10, 5 and 1 percent, respectively

As noted earlier, there is no point in testing for fixed effects since some of the key variables of interest are either time or country invariant. Simple pooling estimation revealed the presence of positive autocorrelation in the residuals. In order to address such problem, we included an MA(1) term in the residuals by applying a Marquardt nonlinear least squares algorithm (Fair 1984, p. 210-214).

Table 12: Estimation Results for Dependent Variable LR2

Model	**I**	**II**	**III**	**IV**	**V**
Constant	-0.0382	-0.0283	-0.0344	-0.2369***	-0.1660***
	0.459	*0.582*	*0.720*	*0.000*	*0.000*
Size	0.0119	0.0117	0.0103	0.0366***	0.0353***
	0.287	*0.293*	*0.368*	*0.000*	*0.000*
Growth	-0.0948***	-0.954***	-0.0924***	-0.1348*	-0.1294
	0.000	*0.000*	*0.000*	*0.064*	*0.109*
Profitability	-0.1322***	-0.1321***	-0.1316***	-0.1290***	-0.1259***
	0.000	*0.000*	*0.000*	*0.000*	*0.000*
Business Risk	0.0000	0.0000	0.0000	0.0000	0.0000
	0.980	*0.992*	*0.929*	*0.908*	*0.998*
Tangibility	0.0219***	0.0219***	0.0189**	0.0732***	0.0722***
	0.003	*0.003*	*0.011*	*0.000*	*0.000*
Tax Effect	-0.0044	-0.0044	-0.0044	-0.0018	-0.0017
	0.023	*0.022*	*0.024*	*0.370*	*0.377*
Firm Age	-0.0073	-0.0072	-0.0068	-0.0053	-0.0044
	0.322	*0.320*	*0.335*	*0.286*	*0.379*
MA(1)	0.7824***	0.7823***	0.7797***	0.8135***	0.8124***
	0.000	0.000	*0.000*	*0.000*	*0.000*
Ownership Concentration A		-0.0199**			-0.0189
		0.038			*0.321*
Ownership Concentration B		-0.0023			-0.0075
		0.714			*0.523*
Ownership Concentration C		0.0012			-0.0051
		0.841			*0.670*
Country Governance Factor			-0.0048		0.0432
			0.962		*0.143*
Financial Intermediation Factor				0.0610***	0.0525***
				0.000	*0.000*
Stock Market Factor				0.0214***	0.0183***
				0.000	*0.000*
Central Bank Factor				-0.0033	-0.0075
				0.876	*0.766*
Adjusted R-Squared	0.6764	0.6764	0.6688	0.7411	0.7381
Wald p-value		*0.002*		*0.000*	
F p-value	*0.000*	*0.0000*	*0.000*	*0.000*	*0.000*
Observations	36,548	36,548	34,417	24,132	23,134
Country Dummies	YES	YES	YES	YES	YES
Industry Dummies	YES	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES	YES

p-values in italic, *, ** and *** significant at 10, 5 and 1 percent, respectively

There is little evidence that Business Risk and Tax Effects are relevant in explaining the degree of leverage of our sample. Such insignificance may perhaps be explained by their poor proxies, e.g., our proxy for the tax incentives to leverage does not consider the investor's tax rate while operating leverage as a proxy for business risk is also limited. It is also possible that the

inclusion of industry dummies may have captured most of these effects, since they are generally associated to the business characteristics of each activity.

Table 13: Estimation Results for Dependent Variable LR3

Model	I	II	III	IV	V
Constant	-0.0651**	-0.0592*	-0.0715	-0.1952***	-0.1784***
	0.046	*0.079*	*0.333*	*0.000*	*0.000*
Size	0.0082	0.0080	0.0075	0.0249***	0.0246***
	0.221	*0.236*	*0.273*	*0.000*	*0.000*
Growth	-0.0730**	-0.0737**	-0.0724***	-0.1294**	-0.1410**
	0.012	*0.011*	*0.000*	*0.039*	*0.046*
Profitability	-0.0585***	-0.0585***	-0.0588***	-0.0542***	-0.0544***
	0.000	*0.000*	*0.000*	*0.000*	*0.000*
Business Risk	0.0000	0.0000	0.0000	0.0000	0.0000
	0.605	*0.580*	*0.619*	*0.653*	*0.696*
Tangibility	0.0684***	0.0684***	0.0648***	0.1052***	0.1027***
	0.000	*0.000*	*0.000*	*0.000*	*0.000*
Tax Effect	-0.0017	-0.0017	-0.0017	0.0001	0.0001
	0.242	*0.237*	*0.268*	*0.957*	*0.934*
Firm Age	-0.0107	-0.0103**	-0.0105**	-0.0119***	-0.0114***
	0.018	*0.021*	*0.015*	*0.000*	*0.000*
MA(1)	0.7457***	0.7456***	0.7424***	0.7740***	0.7705***
	0.000	0.000	*0.000*	*0.000*	*0.000*
Ownership Concentration A		-0.0128***			-0.0041
		0.002			*0.563*
Ownership Concentration B		-0.0035			0.0016
		0.471			*0.825*
Ownership Concentration C		0.0052			0.0035
		0.324			*0.682*
Country Governance Factor			-0.0114		0.0111
			0.875		*0.637*
Financial Intermediation Factor				0.0321***	0.0311***
				0.000	*0.000*
Stock Market Factor				0.0119***	0.0119***
				0.000	*0.000*
Central Bank Factor				0.0069	0.0043
				0.563	*0.783*
Adjusted R-Squared	0.6321	0.6322	0.6267	0.6875	0.6833
Wald p-value		*0.000*		*0.000*	
F p-value	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
Observations	35,358	35,358	33,251	23,074	22,100
Country Dummies	YES	YES	YES	YES	YES
Industry Dummies	YES	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES	YES

p-values in italic, *, ** and *** significant at 10, 5 and 1 percent, respectively

Other firm-specific variables presented statistical significance. Firm Size has a positive effect on leverage, in line with the extensive evidence presented in the empirical literature regarding this determinant, and a result that usually is taken as supportive of the Static Trade-off Theory. Growth Opportunities negatively influence the degree of leverage. That is, firms with more growth opportunities (more intangible assets), resort to less debt. This evidence supports the Static Trade-off Theory under a bankruptcy cost argument: growth opportunities are of little value in the event of liquidation of the firm. Notice that for LR2, Growth Opportunities are negative and significant

before the introduction of Financial Development factors in the model, but become insignificant once such variables are included.

Profitability is robustly negative and significant across all dependent variables and specifications. Such result is in line with the findings of the mainstream of the empirical literature in capital structure and it is often interpreted as support for the Pecking Order Theory since more profitable firms have more internally generated cash-flow and thus avoid external funding.

Tangibility is usually a proxy of real collateral available to the firm that might raise its limits of credit. Our estimation yielded contradictory results: a negative and significant effect for LR1 and a positive and equally significant effect for LR2 and LR3. Such disparity may be explained by the nature of each proxy of capital structure: unlike LR2 and LR3, LR1 (total liabilities to total assets) is a broader measure of financing, including all sorts of trade, operating and fiscal credits. Strictly speaking, LR2 (debt to total assets) and LR3 (long term debt to total assets) are better proxies of capital structure, but given the nature of the firms in our sample (unlisted firms), we think it may contain information regarding the financing patterns of such firms. We explain this result as follows: LR1 measures the role of trade credit in the financing of the firm. Firms with more tangible assets resort to bank credit since they can offer collateral. Firms with a larger share of intangible assets, on the other hand, are (more) financially restricted by the market and therefore, once they have used up all their financial credit, turn more intensively to trade credit in their financing. Hence, this explains the negative coefficient captured in our analysis.

Another curious result regards Firm Age, a proxy for firm reputation. Although it is insignificant for LR1 and LR2, it is significantly negative for LR3. The logic behind reputation is that firms with better reputation have a lower degree of information asymmetry and thus may sustain higher levels of debt. Our results, though only for the long term measure of leverage, indicate exactly the opposite. The autoregressive error term is consistently positive and strongly significant, an indication that shocks to capital structure are persistent. Such evidence indicates that, for the firms in our sample, adjustment costs to a desired target level of capital structure are substantial.

Ownership Concentration, represented by the degree of independence proxy, is generally not significant. It suggests that either ownership structure is irrelevant to capital structure or that our proxy does not capture its true effect. Indeed, about half of our sample is classified under the "unknown" (U) degree of independence in the database.[17]

The Country Governance factor is robustly insignificant. It clearly suggests that country governance does not influence the capital structure decision of the firms – a result that questions the notion that institutions are important for financing. Also, it may be the case that institutional characteristics are captured by other variables in our model, or that the World Bank's governance indicators are not good measures. Alternatively, the characteristics of the sample (transition economies only) induce little cross-country institutional variation which may explain why the country governance factors are not significant in our regressions.

A different result emerges from the Financial Development factors. As expected, our results robustly show that more developed banking systems (Intermediation factor) and more developed stock markets (Stock Market factor) positively and significantly influence the degree of leverage of the firms. This indicates that more financial development relaxes the financial constraints that firms usually face in less developed markets. Moreover, when such indicators are included in the model, other variables become insignificant (Growth Opportunities, Tax Effects, and some Independence indicators). Variation of the Central Bank factor, on the other hand, does not seem to influence the capital structure of the firms in our sample. This evidence, combined with the results for the

[17] See our robustness checks below.

Governance factor, indicates that the *financial* institutional setting is more relevant to firm leverage than the *political and legal* institutional environment of the country. Moreover, our results indicate that stock market development has a positive impact even for unlisted SMEs firms, suggesting that more development of the stock market promotes the overall relaxation of financial restrictions in the economy.

A final word regards the small gain in explanatory power that country-specific variables aggregate to the model. As it can be observed across specifications, although adding country-specific variables does increase adjusted R^2, the gain is very small. It suggests that, despite the importance of country-specific factors such as financial development, firm-specific characteristics command most of the explanation of the capital structure decision. We perform a Wald test to assess the gains in explanatory power from one specification to the next, and we reject that there are any differences. Our results are summarized in Table 14

Table 14: Summary of Results

Independent Variables Dependent Variables	LR1	LR2	LR3	Conclusions
Size	Positive	Positive	Positive	Supports Static Trade-off Theory
Growth Opportunities	Negative	Negative	Negative	Supports Static Trade-off Theory
Profitability	Negative	Negative	Negative	Supports Pecking Order Theory
Business Risk	Insignificant	Insignificant	Insignificant	No Effect
Tangibility	Negative	Positive	Positive	Contradiction, suggests role for trade credit
Tax Effects	Insignificant	Insignificant	Insignificant	No Effect
Firm Age	Insignificant	Insignificant	Negative	No Effect
MA(1)	Positive	Positive	Positive	Slow adjustment to target level
Ownership Concentration A	Insignificant	Insignificant	Insignificant	No Effect
Ownership Concentration B	Insignificant	Insignificant	Insignificant	No Effect
Ownership Concentration C	Insignificant	Insignificant	Insignificant	No Effect
Country Governance Factor	Insignificant	Insignificant	Insignificant	No Effect
Financial Intermediation Factor	Positive	Positive	Positive	Intermediation development is important to leverage
Stock Market Factor	Positive	Positive	Positive	Stock Market development is important to leverage
Central Bank Factor	Insignificant	Insignificant	Insignificant	No Effect

4.2. Robustness Checks

A number of additional estimations are performed to verify the robustness of these results. First, we estimate the models with and without outlier observations, as mentioned above. Then, we redefine the Ownership Concentration variables in their various levels (A^+, A, A^-, B^+, B, B^-, C and U) to verify if these subtler definitions capture any new information. Next, we exclude all firms rated "U", that is, firms whose ownership is unknown. We also redefine the continuous variable Firm Age into a dummy variable (younger than 10 year and older than 10 years). We finally perform random effects estimation of the model.[18] None of these alternative estimations yielded very different results than those reported here. For the sake of concision, we omit such results, but they are available upon request to the authors. We conclude from these tests that the results reported here are robust.

[18] However, autocorrelation in the random effects estimation could not be circumvented.

5. Summary and Concluding Remarks

This paper investigates the determinants of capital structure for a sample of 13,070 small medium sized enterprises (SMEs) and 67,449 firm-year observations from Eastern European countries over the period 1994-2004.

The purpose of this paper is twofold: first, to test using a unique dataset from non-listed SMEs from Eastern European countries the traditional firm-specific variables as determinants of capital structure, including ownership structure as one of the firm specific variables. Secondly, examine whether country-specific measures of governance and financial development have important effects on firm's capital structure. The use of a sample of SMEs in our analysis rather than large listed firms provide an effective way to test whether country specific factors are important drivers of firm's capital structure, since SMEs do not have access to international capital markets, being less likely to be influenced by international standards.

Our findings indicate partial support for both the Static Trade-off Theory and Pecking Order Theory. Unlike other empirical studies, the size of the firm does not seem to be a relevant explanatory variable in our sample. However, the role of growth opportunities, profitability and tangibility is in line with previous evidence. We also document that shocks to the dependent variable are persistent, an indication of high adjustment costs. More important, we could not find a relevant role for ownership concentration nor country governance structure in capital structure. However, the degree of financial development is positively correlated with the degree of leverage, a strong indication that the financial institutional environment of a country is important for the financing of its firms. However, the marginal explanatory power of country-specific variables is small. Firm characteristics are the most important drivers of capital structure.

The main conclusion of this study is that the financial environment is an important determinant of capital structure, whereas political and legal institutions have not come out relevant. Policymakers should therefore prioritize the strengthening and development of the financial system.

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