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Sources of Capital Structure: Evidence from Transition Countries

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Karin Jõeveer*

Abstract

This study explores the significance of firm-specific, country institutional and macroeconomic factors in explaining the leverage variation of a sample of firms from nine Eastern European countries. Country-specific factors are the most prominent determinants of leverage variation for small unlisted companies while firm-specific factors explain most of the leverage variation in listed and large unlisted companies. Half of the leverage variation related to country factors is explained by known macroeconomic and institutional factors while the other half by unquantifiable institutional differences.

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Non-technical Summary

This paper evaluates the importance of firm-specific, country institutional and macroeconomic factors in explaining capital structure variation. The analyses are based on firm-level data from nine Eastern European countries over the period 1995–2002. The period studied is just after the modern financial markets had emerged in Eastern Europe. Hence, the market inefficiencies assumed in capital structure theories are especially pronounced and provide an excellent set up for studying capital structure.

The centrepiece of the empirical analysis is an Analysis of Variance (ANOVA). The ANOVA analysis evaluates the significance of firm-characteristics and country factors in explaining leverage variation. For comparison with existing capital structure studies the results of a regression analysis are provided. I use two leverage measures — the broad leverage is a ratio of total liabilities to total assets and the narrow leverage is a ratio of debt to the sum of debt and shareholders funds. The narrow leverage has a smaller value than the broad leverage, 20% and 65% respectively. Compared to Western European firms both leverage measures are smaller for Eastern European firms, which might be explained by the lower volume of credit provided by the Eastern European financial markets.

The results of the ANOVA analysis are robust for the leverage measure and size classes of firms for listed but not for unlisted firms. For listed firms, industry explains the largest share of leverage variation. The most that industry manages to explain about unlisted firms is largest firms broad leverage measure. Country factors dominate the smallest firms' broad leverage as well as the narrow leverage measure (for all size classes). Hence, I observe that small, unlisted firm leverage depends more on the country of incorporation. The unquantifiable country institutional factors explain less than 10% of the leverage variation for listed firms (both measures). For unlisted firms, the unquantifiable country institutional differences explain 26% of narrow leverage variation and 11% of broad leverage variation. These findings from the ANOVA analysis are very similar to results found based on Western European firms by Jõeveer (2005). Hence, the smallest firms leverage variation is, irrespective of the efficiency of their local financial markets, more dependent on country of incorporation factors. Regression analysis confirms the findings of existing studies on firms from transition countries and on small firms.

Contents

1. Introduction

Modigliani and Miller (1958) showed that in the case of efficient financial markets, the firm's capital structure is irrelevant.[1] The follow up theoretical work in the field takes into account the imperfections of markets and shows that capital structures emerge from three sources: firm-specific, country institutional and macroeconomic factors. The empirical research has focused on finding the best set of determinants of leverage (Titman and Wessel (1988); Frank and Goyal (2004)). Lack of comparable firm-level cross-country data has somewhat hindered the exploration of the significance of country factors. In the current paper I have evaluated the significance of all three sources.

The importance of the country of incorporation for firm leverage is only valued in few cross-country studies. Booth et al. (2001) show on a sample of firms from ten developing countries that country fixed effects explain a large share of leverage variation, but they do not evaluate what is behind the country effects. Using a sample of firms from developing Asian and South American countries Schmukler and Vesperoni (2001) explore the relationship between leverage and financial liberalization. Giannetti (2003) shows using Western European firms that financial development and creditor protection are significant determinants of leverage. Also using Western European firms, Jõeveer (2005) shows that half of the country-based explanatory power is determined by six country macro and institutional factors, while the other half is explained by unquantifiable institutional differences. Desai et al. (2004) use US affiliates data to show how a country's tax rate explains the level of firm leverage.

The current study uses firm-level data from nine Eastern European countries over the period 1995–2002. Such a capital structure study based on firms from less developed economies is interesting since the country-specific determinants of capital structure noted in the theory (e.g. adjustment costs of capital, the asymmetric information between owners and investors) are expected to be especially significant. Therefore, firms from Eastern European countries, where modern financial markets only emerged in the last decades, are an excellent sample to study. The leverage of firms from transition countries in the early stages of transition has been studied by Cornelli et al. (1998), while Nivorozhkin (2005) and Haas and Peeters (2004) have studied the same for the later stages. This study complements existing studies by providing an in depth exploration of other country factors in leverage determination besides firm characteristics.

The empirical methodology of this paper is borrowed from Jõeveer (2005). First, an Analysis of Variance (ANOVA) was performed in order to detect the

[1] Rubinstein (2003) reminds us that already in 1938 Williams expressed the same idea.

importance of the size, industry-, and country factors for leverage variation. Second, a regression analysis was used to compare the direction of the effect of the various leverage determinants in transition countries with the effects found in existing capital structure studies.

The paper is organized as follows. The next section provides an overview of related studies. Section three introduces the data and the estimation strategy. Section four contains the results and the last section concludes.

2. Capital Structure in Transition Economies

The importance of studying the capital structure of firms in transition economies was first pointed out by Cornelli et al. (1998). Modern financial markets emerged in those countries in the early 1990's. In terms of capital structure theories, it means that local country factors could be doubly significant in explaining firm leverage. For example, the trade-off theory argues that firms balance the tax benefits of loans with the potential bankruptcy costs to achieve an optimal leverage level. In the case of transition economies, the cost of adjusting capital structure might be very high and hence, the firm's leverage might be distorted. Based on the pecking order theory of capital structure, firms prefer internal funds to outside sources since the latter are poorly priced due to the asymmetry of information between owners and investors. This asymmetry of information is expected to be especially large in transition economies and therefore firms are less likely to turn to outside sources of finance even if the investment opportunities exceed the internal funds.

Cornelli et al. (1998) use data on Hungarian and Polish firms from the early 1990's to report stylized facts about firm leverage in transition countries. They find that levels of leverage are lower than in Western economies and the proportion of short-term financing dominates long-term debt. They estimate simple static leverage regression, where the explanatory variables were tangibility, size, profitability and a dummy for state ownership. Contrary to studies on Western firms they found that tangibility is negatively related to leverage. They offer several explanations for this. First, they claim that pre-transition firms financed fixed assets with equity and therefore the relationship to debt is negative. Second, they argue that the book value of fixed assets might differ from the market values. Cornelli et al. (1998) lack the country-specific variability in their study to measure the significance of institutional and macroeconomic differences for firm leverage.

Later studies by Nivorozhkin (2005) and Haas and Peeters (2004) explore the dynamic capital structure of firms in transition countries. Both of those papers use data from the Amadeus database provided by Bureau Van Dijk,

and have adopted the methodology from Banerjee et al. (2004). In a dynamic capital structure framework, actual leverage is allowed to deviate from optimal because of adjustment costs. Banerjee et al. (2004) allow both the leverage target and the adjustment speed to vary across firms and over time. Haas and Peeters (2004) analyse ten countries over the period 1993–2001. Nivorozhkin (2005) analyses five countries over the period 1997–2001. Both papers show that firms are moving towards their leverage targets. Haas and Peeters (2004) used both firm- and country-specific variables in the target leverage estimation.

In a recent paper, Roberts (2002) claimed that a time-varying adjustment speed complicates the model statistically and the economic interpretation is difficult. This is one reason why a simple model is preferred in this paper. Another reason for using a simple static leverage model in this paper is that I am interested in the sources of capital structure not the dynamics of leverage per se. The cross-country yearly firm-level data used in this study are an excellent basis for evaluating the importance of the firm-specific, country institutional and macroeconomic factors for determining a firm's capital structure.

3. Data and Methodology

I have used firm-level data from the same source as Nivorozhkin (2005) and Haas and Peeters (2004) — the Amadeus database provided by Bureau Van Dijk. My analyses are based on eight years of data (1995–2002) from nine countries (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia). The database consists not only of stock-market-listed firms but, importantly, also covers unlisted companies. Klapper et al. (2002) show that 86% of Eastern European firms in the Amadeus sample in 1999 had less than 250 employees. Hence, the data covers small and medium sized firms besides large companies.

The sample is unbalanced and the representation across countries varies.[2] The greatest number of firms is available from Romania. The largest firms are from Poland and the Czech and Slovak Republics, while the smallest are from Bulgaria, Estonia and Romania (see Appendix 1).

The methodology used in this paper is adopted from Jõeveer (2005). Hence, the results of the current study are directly comparable to the findings based on Western European firms analysed in Jõeveer (2005). The analysis is divided into two parts. The first part involves the Analysis of Variance (ANOVA),

[2]For Czech Republic and Estonia the size distribution of all firms across industries was known. I compared this with the size distribution of the Amadeus sample and I found that the representation of firms in the Amadeus sample across sizes and industries is very good.

which helps to measure the share of different sources in explaining leverage variation. The second part is a regression analysis.

I consider four sets of explanatory variables in the ANOVA analysis — size, industry, country and year. Size and industry represent the firm-specific factors while country dummies capture the effect of the local financial market.[3] I have split firms into five size classes based on total assets.[4] Firms from 51 industries are represented (NACE 2 digit classification).[5] Altogether I have firms from nine countries and data covering eight years.

Regression analysis focuses on an estimation of the following two specifications:

$$Y_{ijt} = \alpha + \beta_j + \gamma_t + \delta X_{ijt} + \varepsilon_{ijt} \tag{1}$$

$$Y_{ijt} = \alpha + \beta_j + \gamma_t + \delta X_{ijt} + \zeta C_{jt} + \varepsilon_{ijt} \tag{2}$$

where i, j and t are the index for firm, country and year, respectively. The difference between those two equations is that the second one includes country-specific time-variant variables (C_{jt}) in addition to country fixed effects (β_j). I use six country variables to capture the measurable country effects: GDP growth (proxies growth opportunities), inflation (proxies cost of capital),[6] domestic credit provided by banking sector to GDP (proxies funds available in the local market), stock market capitalization to GDP (proxies the development of the financial sector), share of foreign owned banks (proxies the financial sector flexibility), and government consumption to GDP (proxies resident's tax burden).[7] X_{ijt} represents firm-specific variables: profitability, tangibility, size (logarithm of assets) and median industry leverage. γ_t is the year effect and ε_{ij} is the random disturbance.

I use two leverage measures as in Jõeveer (2005). Broad leverage is defined as total liabilities over total assets, while narrow leverage is defined as debt (both long-term and short-term) over the sum of debt and shareholders funds. The two leverage measures differ greatly from each other (see Appendix 1).

[3] I experimented by adding the firm age dummies into the ANOVA analysis, but it did not change the pattern of results.

[4] The size classes are as follows: total assets up to $1 million, between $1–2 millions, between $2–5, between $5–50 million and above $50 million.

[5] Firms from the financial intermediation sector are excluded from the study due to their specific liability structure.

[6] I considered interest rates as well as a proxy for the cost of capital, but due to a high correlation with inflation it was left out of the final specification.

[7] The country-specific variables are from the World Development Indicators except for the share of foreign owned banks, which is adopted from the EBRD Transition Report.

The broad leverage is around 60%, while the mean narrow leverage reaches 40% only for Latvian and Polish firms and remains even as low as 5% for Hungarian firms. Compared to Western European firms in Jõeveer (2005), both leverage measures are smaller for Eastern European firms. The smaller indebtedness among firms in Eastern Europe compared to Western Europe might be explained by the fact that domestic credit provided by the banking sector (to GDP) is around 40% in the former and more than 100% in the latter region. Lower leverage also means that firms in Eastern Europe are relying more on shareholder funds, which according to the pecking order theory might suggest that firms from Eastern Europe face highly asymmetrical information compared to firms from Western Europe.

I performed the analysis on listed and unlisted firms separately. I considered being listed as a good signal for financiers from home as well as from abroad. Hence, I expected local institutions to be less important for the capital structure of listed firms.

4. Results

I presented the results for listed and unlisted firms separately across two leverage measures. Appendix 2 presents the results from the ANOVA analysis for listed firms. Industry dummies explain most of the leverage variation for both leverage measures (Panel A and B). In the second column, in addition to the four sets of discrete variables, firm tangibility and profitability are included. This increases adjusted R^2 and decreases the explanatory power of the other variables. In the last column, in addition to the firm characteristics, measurable time-variant country factors are also included. Half of the country effects can be explained by known country characteristics. Hence, unquantifiable institutional differences between countries explain less than 10% of firm leverage variation. For listed firms the ANOVA results are robust for the leverage measure used.

Results from the ANOVA analysis of unlisted firms are presented in Appendix 3. The results are not robust for the leverage measure used. In the case of a broad leverage variation industry characteristics are more explanatory than country characteristics. In the case of a narrow leverage the results are the opposite – country characteristics explain more. Even after controlling for other firm- and country-specific factors (last column), 26% of the narrow leverage variation is explained by unquantifiable institutional differences. In the case of the broad leverage, the comparable number is only 11%. Hence, for unlisted firms it is really important which leverage measure is used. The main difference between the two measures comes from the current liability

side – narrow leverage only takes into account short-term debt (not all short-term liabilities). Narrow leverage captures the loan capacity of the firm and this seems to be highly country-specific for unlisted firms. Broad leverage on the other hand also captures the non-debt liabilities, such as trade credit, which is a particularly important source of funds for financially more constrained firms (Petersen and Rajan (1997) 1997). Trade credit is also a more important source of funds for Eastern European firms compared to Western European firms. Trade credit represents 43% of total liabilities in my Eastern European sample and only 24% in Jõeveer (2005) sample of firms from ten Western European countries.

The different results obtained for listed and unlisted firms could be explained by the fact that listed firms are larger. To see whether the results are different due to the size differences, I conducted an ANOVA analysis in each of the five size classes. Appendix 4 presents the results for listed firms. In the case of both leverage measures, industry factors are the most explanatory for all size classes.[8] For unlisted firms (Appendix 5) the results are different for firms from different size classes. Country factors are the most explanatory for the smallest firms broad leverage variation. In the case of firms from the four larger size classes the industry factors dominate in explaining leverage variation. This confirms the hypothesis that smaller firms rely more on the local financial market. In the case of the narrow leverage of unlisted firms, the country factors are the most explanatory for the four smallest size classes. The explanatory shares of country and industry factors are even for the largest firms. Those results on the basis of size classes confirm that for the smallest unlisted firms country factors are the most significant leverage determinants for both leverage measures.[9] Hence, those firms are more constrained by their local financial market compared to other firms.

The results of the ANOVA analysis are comparable to the findings from Western European countries presented in Jõeveer (2005). Exactly as for the listed firms in Eastern Europe, industry factors were the most significant determinants of leverage variation irrespective of size also for the listed firms in Western Europe. For unlisted Western firms, country factors always explained the largest share of narrow leverage variation irrespective of size. In the case of broad leverage among unlisted Western firms, country factors mattered the most for the four smaller size classes while for the largest size class industry factors turned out to be the most significant. The average firm in Western Europe is larger than in Eastern Europe, which might explain why I observe a twist in the explanatory power of country and industry factors in the smaller size classes in the Eastern European sample. The firms in size classes 2 to 4

[8] I combined the smallest three size classes due to lack of observations.

[9] Different size classification does not change the findings.

are relatively larger than the average firm in the Eastern European sample than in the Western European sample.

The results of the regression analysis are presented in Appendix 6. The results for listed firms are reported in Panel A. The coefficient in front of tangibility has a negative sign and it is statistically significant. This confirms the results from previous studies on transition countries (Cornelli et al. (1998) 1998), but contradicts the predictions of theoretical studies and empirical findings from Western countries (Rajan and Zingales (1995) 1998). It is surprising that profitability is estimated imprecisely. Hence, the profitability of Eastern European stock-market-listed firms does not explain the leverage level. The logarithm of firm size is positively related to leverage, so the larger the listed firms the higher the leverage. Age is only a significant determinant of leverage at the 10% level for the broad leverage measure estimation – firms established in the early years of transition are more leveraged than firms established before 1987 or after 1995. The country-specific macro and institutional factors are included in addition to the country fixed effects in column 2 and 4. The significance and the direction of the effect of country-specific factors vary across leverage measures.

For unlisted firms (Appendix 6 Panel B) the tangibility is measured imprecisely. Profitability is only statistically significant for the narrow leverage measure. Hence, more profitable unlisted firms are likely to have less credit. Similarly to Jõeveer (2005), the logarithm of size enters with a negative sign into the broad leverage regression and with a positive sign into the narrow leverage regression. This finding stresses once again that for unlisted firms the two leverage ratios measure different things. Age dummies included in the regression tell us that the youngest firms are more leveraged than the older firms. One explanation for this finding is that older firms have enough internal funds and they do not need debt finance. I find country factors to be more significant and have larger coefficients for narrow leverage than for broad leverage.

The results of the regression analysis are in line with previous studies on firms from transition countries. It is interesting that the firm-specific factors, tangibility and profitability, are weakly related to leverage. From the country-specific factors, the positive significant coefficient in front of domestic bank credit is notable in the narrow leverage regression for both listed and unlisted firms. This result confirms the hypothesis that less local credit causes lower leverage levels in firms.

5. Conclusions

In this paper I have studied the importance of firm-specific, country institutional and macroeconomic factors for the determination of capital structure in firms. The analyses are based on firm-level data from nine Eastern European countries over the period 1995–2002. I use two leverage measures.

I find that the largest share of listed firm leverage variation (irrespective of leverage measure) is explained by industry factors. The unquantifiable country institutional factors explain less than 10% of leverage variation. For unlisted firms, the results are not robust for the leverage measure used. In the case of broad leverage, the industry factors are the most explanatory while for narrow leverage the country factors dominate. Also, the unquantifiable country institutional differences explain as much as 26% of narrow leverage variation, while only 11% of broad leverage variation. The results across size classes show that in the case of the smallest unlisted firms, the country factors are the most significant explanatory factors for both leverage measures. Those results show that for small and unlisted firms the leverage definition is very important. Also, those firms seem to be more constrained by the financial markets in their country of incorporation.

The results of this study are very similar to the findings of Jõeveer (2005) on the basis of a sample of Western European firms. Hence, the capital structure variation for small and medium sized firms is more dependent on country institutional factors irrespectively of the development of the local financial markets.

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Appendix 1. Summary Statistics at 2000

Country	Leverage 1	Leverage 2	Total assets	Number of Firms
Bulgaria				
Mean	0.59	0.12	1386	13189
Median	0.58	0	211	
St. dev.	0.36	0.25	12977	
Czech Republic				
Mean	0.61	0.28	10058	7374
Median	0.63	0.16	2100	
St. dev.	0.31	0.33	83557	
Estonia				
Mean	0.62	0.31	1677	5224
Median	0.63	0.21	332	
St. dev.	0.3	0.33	12575	
Hungary				
Mean	0.62	0.05	5738	7923
Median	0.63	0	907	
St. dev.	0.3	0.14	40254	
Latvia				
Mean	0.65	0.4	3699	2178
Median	0.69	0.35	744	
St. dev.	0.28	0.35	22422	
Lithuania				
Mean	0.53	0.34	6693	1143
Median	0.54	0.3	1091	
St. dev.	0.26	0.26	41957	
Poland				
Mean	0.59	0.4	16283	10933
Median	0.59	0.35	3365	
St. dev.	0.37	0.32	114655	
Romania				
Mean	0.76	0.2	1628	23274
Median	0.81	0	161	
St. dev.	0.31	0.32	34299	
Slovak Republic				
Mean	0.59	0.3	10770	1312
Median	0.62	0.17	2120	
St. dev.	0.32	0.34	58098	

Appendix 2. Anova Results for Listed Firms

PANEL A – BROAD LEVERAGE

Source	SSR		SSR		SSR	
Size	4.97	12%	4.00	7%	4.24	8%
	(5)		(5)		(5)	
Industry	25.86	63%	27.64	51%	27.17	49%
	(47)		(47)		(47)	
Country	8.30	20%	8.50	16%	4.91	9%
	(9)		(9)		(9)	
Year	5.88	14%	3.69	7%	0.50	1%
	(8)		(8)		(8)	
Model	41.22		54.00		55.38	
Total	223.16		223.16		223.16	
Firms ch.	No		Yes		Yes	
Country ch.	No		No		Yes	
Adj. R^2	0.17		0.23		0.23	
Obs.	3512		3512		3512	

PANEL B – NARROW LEVERAGE

Source	SSR		SSR		SSR	
Size	7.54	26%	6.29	20%	6.58	19%
	(5)		(5)		(5)	
Industry	9.36	32%	10.67	33%	10.16	30%
	(46)		(46)		(46)	
Country	6.10	21%	6.38	20%	2.53	7%
	(9)		(9)		(9)	
Year	2.29	8%	2.46	8%	1.17	3%
	(8)		(8)		(8)	
Model	28.89		31.94		33.87	
Total	126.16		126.16		126.16	
Firms ch.	No		Yes		Yes	
Country ch.	No		No		Yes	
Adj. R^2	0.21		0.24		0.25	
Obs.	2905		2905		2905	

NOTES: Numbers in cells refer to partial sum of squares (SSR). The numbers in parentheses refer to number of indicators. Broad leverage is defined as total liabilities to total assets. Narrow leverage is defined as debt to debt plus shareholders funds. Industry is 3-digit NACE. Firm size classes: Class 1 total assets (TA) smaller than $1 million, Class 2 TA between $1 and 2 million, Class 3 TA between $2 and 5 million, Class 4 TA between $5 to 50 million, and Class 5 TA above $50 millions. Firm characteristics are tangible assets to total assets and profit to assets ratios. Country characteristics are GDP growth rate, Inflation, Savings to GDP, total market capitalization to GDP, share of foreign owned banks' assets and government consuption to GDP.

Appendix 3. Anova Results for Unlisted Firms

PANEL A – BROAD LEVERAGE

Source	SSR		SSR		SSR	
Size	268.71	6%	266.35	6%	255.70	5%
	(5)		(5)		(5)	
Industry	1469.74	34%	1412.97	31%	1418.39	30%
	(51)		(51)		(51)	
Country	1093.85	25%	1107.77	24%	547.39	11%
	(9)		(9)		(9)	
Year	949.34	22%	915.03	20%	48.99	1%
	(8)		(8)		(8)	
Model	4295.34		4629.87		4770.03	
Total	41696.58		41696.58		41696.58	
Firms ch.	No		Yes		Yes	
Country ch.	No		No		Yes	
Adj. R^2	0.10		0.11		0.11	
Obs.	379324		379324		379324	

PANEL B – NARROW LEVERAGE

Source	SSR		SSR		SSR	
Size	285.51	8%	279.61	8%	282.90	8%
	(5)		(5)		(5)	
Industry	578.33	16%	575.23	16%	578.77	16%
	(51)		(51)		(51)	
Country	1892.11	53%	1890.64	53%	972.83	26%
	(9)		(9)		(9)	
Year	118.71	3%	114.33	3%	55.86	1%
	(8)		(8)		(8)	
Model	3563.85		3585.06		3730.67	
Total	29763.80		29763.80		29763.80	
Firms ch.	No		Yes		Yes	
Country ch.	No		No		Yes	
Adj. R^2	0.12		0.12		0.13	
Obs.	330292		330292		330292	

NOTES: Numbers in cells refer to partial sum of squares (SSR). The numbers in parentheses refer to number of indicators. Broad leverage is defined as total liabilities to total assets. Narrow leverage is defined as debt to debt plus shareholders funds. Industry is 3-digit NACE. Firm size classes: Class 1 total assets (TA) smaller than $1 million, Class 2 TA between $1 and 2 million, Class 3 TA between $2 and 5 million, Class 4 TA between $5 to 50 million, and Class 5 TA above $50 millions. Firm characteristics are tangible assets to total assets and profit to assets ratios. Country characteristics are GDP growth rate, Inflation, Savings to GDP, total market capitalization to GDP, share of foreign owned banks' assets and government consuption to GDP.

Appendix 4. Anova Results for Listed Firms

BY SIZE CLASS

PANEL A – BROAD LEVERAGE

Source	Size<4		Size 4		Size 5	
Industry	16.43	75%	15.22	64%	9.11	64%
	(41)		(39)		(38)	
Country	0.65	3%	7.17	30%	2.72	19%
	(7)		(9)		(9)	
Year	4.67	21%	2.54	11%	0.75	5%
	(8)		(8)		(8)	
Model	21.91		23.71		14.26	
Total	84.72		100.74		35.69	
Adj. R^2	0.22		0.21		0.35	
Obs.	1156		1651		705	

PANEL B – NARROW LEVERAGE

Source	Size<4		Size 4		Size 5	
Industry	3.61	56%	7.26	58%	5.73	53%
	(40)		(36)		(35)	
Country	0.25	4%	3.40	27%	3.80	35%
	(7)		(9)		(9)	
Year	2.49	39%	0.96	8%	0.27	2%
	(8)		(8)		(8)	
Model	6.46		12.53		10.84	
Total	31.57		60.45		26.10	
Adj. R^2	0.17		0.18		0.35	
Obs.	1103		1283		519	

NOTES: Numbers in cells refer to partial sum of squares (SSR). The numbers in parentheses refer to number of indicators. Broad leverage is defined as total liabilities to total assets. Narrow leverage is defined as debt to debt plus shareholders funds. Industry is 3-digit NACE. Firm size classes: Class 1 total assets (TA) smaller than $1 million, Class 2 TA between $1 and 2 million, Class 3 TA between $2 and 5 million, Class 4 TA between $5 to 50 million, and Class 5 TA above $50 millions.

Appendix 5. Anova Results for Unlisted Firms

BY SIZE CLASS

PANEL A – BROAD LEVERAGE

Source	Size 1		Size 2		Size 3		Size 4		Size 5	
Industry	595.88	24%	232.97	62%	333.23	69%	477.56	81%	97.77	79%
	(51)		(50)		(50)		(51)		(51)	
Country	1163.07	46%	44.42	12%	46.37	10%	22.72	4%	6.14	5%
	(9)		(9)		(9)		(9)		(9)	
Year	658.33	26%	109.44	29%	99.52	21%	71.64	12%	8.70	7%
	(8)		(8)		(8)		(8)		(8)	
Model	2513.39		376.79		481.63		587.57		123.85	
Total	27180.28		4099.03		4877.94		4236.45		520.58	
Adj. R^2	0.09		0.09		0.10		0.14		0.23	
Obs.	242254		42335		46791		43126		4818	

PANEL B – NARROW LEVERAGE

Source	Size 1		Size 2		Size 3		Size 4		Size 5	
Industry	351.82	24%	81.26	22%	89.61	19%	141.80	24%	44.66	36%
	(51)		(50)		(50)		(51)		(51)	
Country	889.94	60%	297.46	79%	353.14	73%	348.26	59%	43.47	35%
	(9)		(9)		(9)		(9)		(9)	
Year	130.03	9%	21.46	6%	7.64	2%	24.17	4%	5.05	4%
	(8)		(8)		(8)		(8)		(8)	
Model	1473.35		403.09		454.02		516.17		96.89	
Total	17591.97		3542.17		3777.65		3523.31		411.44	
Adj. R^2	0.08		0.11		0.12		0.14		0.22	
Obs.	219906		35190		37293		34074		3829	

NOTES: Numbers in cells refer to partial sum of squares (SSR). The numbers in parentheses refer to number of indicators. Broad leverage is defined as total liabilities to total assets. Narrow leverage is defined as debt to debt plus shareholders funds. Industry is 3-digit NACE. Firm size classes: Class 1 total assets (TA) smaller than $1 million, Class 2 TA between $1 and 2 million, Class 3 TA between $2 and 5 million, Class 4 TA between $5 to 50 million, and Class 5 TA above $50 millions.

Appendix 6. Leverage Regression in 1995–2002

PANEL A – LISTED FIRMS

	Leverage 1		Leverage 2	
Const.	.038	.044	-.084	-.12
	(.055)	(.081)	(.047)*	(.078)
Tangibility	-.217	-.207	-.124	-.113
	(.035)***	(.036)***	(.025)***	(.026)***
Profitability	-.002	-.002	.0002	.0005
	(.002)	(.002)	(.001)	(.001)
Log assets	.022	.023	.029	.03
	(.006)***	(.006)***	(.005)***	(.005)***
Established 1987-95	.042	.043	.026	.027
	(.024)*	(.024)*	(.02)	(.02)
Established after 1995	1.00e-05	.002	-.008	-.006
	(.023)	(.024)	(.018)	(.018)
Industry leverage	.806	.794	.682	.656
	(.058)***	(.059)***	(.071)***	(.071)***
GDP growth		-.003		.005
		(.002)***		(.002)***
Inflation		-.00006		-.00003
		(.00003)***		(.00003)
Domestic bank credit		.0005		.001
		(.0004)		(.0004)***
Market capitalization		-.001		-.003
		(.001)		(.001)***
Share of foreign banks		.001		-.001
		(.0007)**		(.0006)**
Government consumption		-.002		-.002
		(.003)		(.003)
Obs.	3512	3512	2905	2905
R^2	.234	.238	.245	.258

NOTES: Leverage1 is defined as total liabilities over total asset. Leverage2 is defined as debt over debt plus equity. Standard errors are in brackets. ***, **, and * denote significance at the 1, 5 and 10 percent level respectively. Standard errors are based on clustering across firms. All regressions include country and year dummies.

PANEL B – UNLISTED FIRMS

	Leverage 1		Leverage 2	
Const.	.145	.371	-.129	-.182
	(.013)***	(.017)***	(.005)***	(.013)***
Tangibility	-.015	-.015	.0007	.0007
	(.014)	(.014)	(.0007)	(.0007)
Profitability	-.025	-.024	-.013	-.013
	(.016)	(.016)	(.007)**	(.006)**
Log assets	-.014	-.014	.023	.023
	(.0007)***	(.0007)***	(.0005)***	(.0005)***
Established 1987-95	.059	.065	.087	.091
	(.005)***	(.005)***	(.004)***	(.004)***
Established after 1995	.119	.123	.092	.096
	(.005)***	(.005)***	(.004)***	(.004)***
Industry leverage	.571	.57	.557	.548
	(.013)***	(.013)***	(.016)***	(.016)***
GDP growth		.00006		.007
		(.0002)		(.0002)***
Inflation		-.0001		.00002
		(5.88e-06)***		(5.30e-06)***
Domestic bank credit		-.00003		.002
		(.00008)		(.00008)***
Market capitalization		-.00009		.001
		(.0001)		(.0001)***
Share of foreign banks		.0009		-.0003
		(.00009)***		(.0001)***
Government consumption		-.011		-.002
		(.0004)***		(.0004)***
Obs.	379324	379324	330292	330292
R^2	.123	.126	.118	.123

NOTES: Leverage1 is defined as total liabilities over total asset. Leverage2 is defined as debt over debt plus equity. Standard errors are in brackets. ***, **, and * denote significance at the 1, 5 and 10 percent level respectively. Standard errors are based on clustering across firms. All regressions include country and year dummies.

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