The Collateral Channel:

Evidence on Leverage and Asset Tangibility

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Abstract

We test the effect of collateral laws by observing the relationship between leverage and asset tangibility, using thousands of firm-level observations of small, privately held firms in emerging market settings that are likely to face credit constraints. We employ a number of econometric procedures and a battery of control variables, and find that the linkage between leverage and fixed assets as a portion of total assets varies, such that in countries with better collateral laws, the relationship between these variables is much tighter. Our findings have clear implications for policy-makers.

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In this study, we consider how legal codes relating to collateral affect the linkage between asset tangibility and leverage. The purpose of collateral is well-known to economists: banks unable to perfect a claim may be less likely to extend credit to a firm in the first place. The ability of firms with high levels of fixed assets relative to current assets to obtain credit is indicative of the willingness of creditors to rely on collateral in the event of bankruptcy.

In this paper, we examine whether the link between leverage (long-term debt as a portion of total assets) and asset tangibility (fixed assets as a portion of total assets) is related to the national legal and institutional environment. Specifically, we examine two types of collateral regimes: rules relating to secured transactions, and to the tradability of land. We hypothesize that the link between asset tangibility and leverage is tighter in countries that have such legal rules in place, relative to countries where no such rules exist. We find that the linkage between asset tangibility and leverage (and, to a lesser extent, debt maturity) is significantly stronger in countries with laws relating to secured transactions and land tradability. We extend these findings to examine alternate assessments of collateral rules.

This paper proceeds as follows. We begin with a literature review on the importance of credit provision to growing firms. We then summarize our data, and discuss the models we will use to examine our hypotheses. We present the findings of our initial empirical tests thereafter. Following an examination of empirical results generated using an alternate definition of collateral laws and regulations, we conclude and offer policy recommendations.

I. LITERATURE

A. Financing of Privately-held Firms in the Emerging Market Context

Constraints on the financing of relatively small, privately held firms seem to be more prevalent in emerging market contexts than in the developed-market setting.[1] For this reason, Central and Eastern Europe provides an ideal setting for examining how variation in collateral laws affects the linkage between asset tangibility and leverage.[2] **MORE**

B. Collateral and Leverage: Empirical Evidence

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[1] Although equity market development seems to be related to long-run economic performance (Levine, 1998), the equity of most firms in most countries is not listed on public exchanges. The financing constraints of small and medium-sized firms relative to large firms have been studied in other contexts (Beck, et al., 2004, 2005, Demirguc-Kunt et al. 2002), and the result is that access to highly liquid public equity markets is the exception rather than the rule for the vast majority of small and medium size firms in most countries. Indeed, given the relatively low level of liquidity, transparency, and viability of many national stock markets, from the perspective of the majority of individual firms around the world, "external" finance essentially boils down to two categories: private equity investment from a small group of relatively wealthy investors (such as a wealthy family) or other (often, industrial) firms, or debt investment (either in the form of loans from financial institutions such as banks, or, more rarely, corporate bond markets).

[2] Previous studies that have considered external finance and legal development in Central and Eastern Europe (Slavova, 1999; Köke and Schröder, 2003; Pistor, Raiser, and Gelfer, 2000, Krkoska, 2001, Berglöf and Bolton, 2002) tend to do so at the aggregate level, examining stock market development or banking assets as a portion of GDP, but eschewing examination of individual firms. The factors associated with capital structure of individual firms are therefore difficult to determine.

As far as we know, there has been little research on the linkage between collateral laws and leverage in an emerging market setting. **MORE**

C. Hypothesis

One mechanism that relates the legal system and firm-level leverage concerns whether tangible assets can be easily used as collateral. Many emerging market countries do not have specific legal provisions relating to the tradability of land or the ability of assets to be used to secure debt. Institutions such as collateral registries, land titles, deeds, VIN (vehicle identification number) tags, etc., are nascent or nonexistent. We divide the countries in our sample into two groups based on this distinction, and examine the sensitivity of leverage and debt maturity to asset tangibility in countries with and without such provisions. Our hypothesis is that in countries without such legal provisions, the relationship between asset tangibility and our dependent variables will be less pronounced.

II. DATA AND MODELS

A. Data and Descriptive Statistics

We begin with the Amadeus database of firms for all of the major countries in Central and Eastern Europe (this portion of the database is described in Klapper, et al, 2002).[3] We extract data from sixteen nations during the years 1997 - 2001, and eliminate all firms with no reported SIC code and all firms with

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[3] The version of the Amadeus database we use includes firms with operating revenue in excess of €10 million; or total assets above €20 million, or 100 or more employees, except for Russia and Ukraine where the respective cut-offs are €15 million, or €30 million, or 150 employees.

SIC codes beginning with a 6.[4] Table 1 presents descriptive statistics for the two

dependent variables in our study: leverage defined as long-term debt over total

assets, and maturity defined as long-term debt over total debt.

One potential drawback of using firm-level data is that industry

characteristics may distort the level of average company leverage, irrespective of

country-level institutional factors. In addition, there are many industries with

hardly any tangible assets (service firms, financial firms) that would not use

collateral laws whether or not they existed.

To address this issue, we restrict our data set following the SIC code

selection of Fan, Titman, and Twite (2003), and include only firms with codes as

follows: business services (SIC 73), chemicals (SIC 28), construction (SIC 15, 16,

17), food and beverage (SIC 20), communication (SIC 48), metal fabrication (SIC

33, 34), resources (SIC 10, 12), newspapers (SIC 27), paper and pulp (SIC 26),

wholesale (SIC 50, 51), and retail (SIC 52-59). Table 1 presents summaries of the

firm-level variables used in our multivariate regression analysis, broken down by

country, following this narrowing of firm-years. We only include observations

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[4] Meaning, we exclude financial services firms, which have very different leverage characteristics
than typical companies that manufacture goods or provide non-financial services. Note that
Amadeus information is primarily in the form of unconsolidated financial statements. Although it
may seem preferable to use consolidated statements, they are available for only a very small
portion of firms contained in the database. In any event, studies of spin-offs (Dittmar, 2004;
Mehrotra, et al, 2003) indicate that firms allocate leverage to their spin-offs based on attributes
important at the consolidated firm level in previous studies. Thus, asset tangibility of a spin-off is
positively related to its leverage. The same is true (higher leverage) for spin-off firms with assets
that have lower liquidation costs. Differences in leverage, however, are positively related to
differences in profitability. Nevertheless, as will be explored in more detail below, in most
specifications we found ROA was negatively related to leverage and debt maturity, leading us to
believe that our unconsolidated statements are not grossly distorting relationships that hold for
publicly-traded firms for which consolidated statements exist.

that had data on all variables contained in that specification; it is not necessary

that data be available for all years in the sample period of 1997 – 2001 for a firm-

year to be included in a given specification. (See the Appendix for more

information on our variables, their construction, and sources.)

Another potential drawback of large datasets containing thousands of

firm-year observations is that the quality of certain data points is sometimes

inconsistent. The literature contains two approaches for dealing with such

situations: truncation and winsorization. Truncation refers to omitting

observations with "strange" or nonsensical values. Winsorization refers to

replacing values above, for example, the 99th percentile with the value of the 99th

percentile.[5] Given the large number of firms with total debt greater than total

assets (more than five percent of firm-year observations had a debt/asset ratio

greater than one[6]), for the empirical tests that follow, we truncated all

observations with total debt to total assets greater than 0.99.[7]

B. Models

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[5] "It is particularly common to winsorize each tail at 0.5% or 1%. In essence this procedure amounts to saying: 'I do not believe the data are correct, but I know that the data exist. So instead of completely ignoring the data item, I will replace it with something a bit more reasonable.' Frank and Goyal (2005, p. 36).

[6] For maximum values by country, see Table 2. Note that no firms located in Croatia or Slovenia had long-term debt, so the maximum values for LTD/TA and LTD/TD are zero. We did not exclude firms from these countries, however, because the number of observations is small, and it seemed arbitrary to simply throw them out. Results for all of our estimations excluding these countries are available from the authors by request, and the findings are very consistent with those reported in the paper.

[7] We ran other estimations without truncation with similar results. Note that it is not impossible for firms to have negative book equity (Welch, 2004). Nevertheless, given the fact that our firms are unlisted, market values for either debt or equity are generally unavailable.

Our baseline model includes a number of controls that previous studies have found to be related to leverage and debt maturity:

$$(LTD/TA)_{j,i,t} = \alpha + \beta 1 \, TANG_{j,i,t} + \beta 2 \, EFFTAX_{j,i,t} + \beta 3 ROA_{j,i,t} +$$

$$\beta 4 LNTA_{j,i,t} + \beta 5 ASSETSPEC_{j,i,t} + \beta 6 LNPCGDP_{i,t} + \beta 7 M3/GDP_{i,t} +$$

$$\beta 8 TIMETREND_t + \beta 9 GROWTH_{i,t} + \beta 10 RULELAW_t + \varepsilon \qquad (1)$$

where the dependent variable of leverage (long-term debt/total assets) is indexed on firm j in country i in year t.

The key relationship we consider in this paper is the coefficient on the independent variable TANG, which is asset tangibility measured by fixed assets as a portion of total assets. Our hypothesis will be confirmed if the coefficient is significantly larger in countries that have laws and regulations related to secured transactions and to land tradability.

The controls include firm-level and country-level variables; all are defined in the Appendix, which also specifies their sources. As in previous empirical leverage studies, our firm-level controls include the effective tax rate (EFFTAX, measured by taxes/net income), return on assets (ROA), and size (LNTA, the natural log of total assets).[8] We also include a measure of asset specificity following Acharya, et al (2004): the dummy variable ASSETSPEC takes a value

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[8] All variables are measured in U.S. dollars at current exchange rates, to allow comparability among firms in countries with different currencies. Exchange rates do not drive our results, since most of our firm-level variables are ratios (the only exception is log of total assets).

of 1 for firms in the mining, transportation, and manufacturing industries with high levels of asset specificity (meaning, fixed assets are more difficult to liquidate in the event of bankruptcy relative to the excluded industries of agriculture, wholesale, construction, services, and retail).

We also employ country-level control variables. The natural log of per capita output (LNPCGDP, calculated at purchasing power parity) measures the overall level of economic development of the country, which is presumably related to the sophistication of legal institutions, financial market depth, and the ability of firms to obtain leverage and longer maturity debt.[9] We also include a measure of the money supply relative to output (M3/GDP), which incorporates any inflationary results of monetary policy that could affect the level of credit in financial markets. We include GDP growth to account for cyclical economic expansions that are presumably associated with the quantity of commercial lending. We also generate a time de-trending variable (TIMETREND) to account for the general progress of reform in the economies we study during 1997-2001, which takes the value of 1 for 1997, 2 for 1998, etc., with a maximum value of 5 for the 2001 firm-year observations.

The level of legal and institutional development clearly affects credit markets. In fact, using aggregate data, Pistor, et al (2000) argue that legal effectiveness (enforcement) is more important than stipulated legal rules in

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[9] This is an important control especially for the legal origin variables, because per capita output is regionally heterogenous, with richer countries located in the north and west (with German legal heritage), and poorer countries in the south and east (with French and Eurasian legal heritage, respectively).

determining capital market characteristics. Therefore, in our estimations we include a measure for enforcement: the rule of law (RULELAW).

Our second set of empirical tests examines debt maturity, following the work of Rajan and Zingales (1995), Wald (1999), and Aggarwal and Jamdee (2003), who look at G-7 countries, as well as Booth, et al (2001) and Fan, Titman, and Twite (2003), who examine developing countries. We estimate the following model:

$$(LTD/TD)_{j,i,t} = \alpha + \beta1\ TANG_{j,i,t} + \beta2\ EFFTAX_{j,i,t} + \beta3ROA_{j,i,t} +$$

$$\beta4LNTA_{j,i,t} + \beta5ASSETSPEC_{j,i,t} + \beta6LNPCGDP_{i,t} + \beta7M3/GDP_{i,t} +$$

$$\beta8TIMETREND_t + \beta9GROWTH_{i,t} + \beta10TERMSPREAD_{i,t} +$$

$$\beta11RULELAW_i + \varepsilon \tag{2}$$

where the dependent variable is long-term debt divided by total debt and the independent variables are as defined for equation (1), above. We include an additional variable (TERMSPREAD) not included in equation (1); it measures the difference in long-term (lending) from short-term (deposit) rates of interest in the countries we consider, indexed by each country in each year.

C. Splitting the Sample Based on Collateral Laws

Under many legal systems, it is easier to perfect claims on tangible assets; if collateral laws and institutions do not function smoothly, even the most tangible

of assets may not provide a sufficient guarantee for a creditor in the event of liquidation. Thus, we may expect that asset tangibility have a tighter relationship with leverage in countries that possess efficient legal remedy for creditors. Similarly, the ability of land to be traded may also affect the relationship between asset tangibility and leverage.

To test for these possibilities, we split our sample along two lines, reflecting the existence or absence of secured transactions law and of land tradability. These assessments are based on qualitative information provided by the EBRD.[10] The categories for these variables are listed in the Appendix.

IV. RESULTS

Table II presents results of our baseline model, including all observations from all countries. Columns 1 and 2 include two variables based on income statements, return on assets and effective tax rates. Inclusion of these variables substantially limits the number of observations, since several countries do not report P&L data to Amadeus. Nevertheless, we
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In Table III, we present the results of GLS estimations for our two dependent variables (leverage and debt maturity), but divide firms into two sub-samples. Columns 1 and 3 include observations for firms located in countries

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[10] Our conjecture is that asset tangibility has a stronger association with leverage in countries that have land tradability and secured transactions laws, because absent such legal protection, even loans "secured" by tangible assets may have very high liquidation risks and costs.

with full tradability[11] of land, whereas columns 2 and 4 contain observations from countries without full land tradability. We find support for our hypothesis as the coefficient for asset tangibility is almost eight times as large in the unrestricted countries for the leverage models and almost six times as large for the debt maturity models. In fact, the coefficient for asset tangibility is significantly different between specifications 1 and 2 and between specifications 3 and 4 (z-statistics of 20.73 and 19.64, respectively, both with p-values of 0.000). This confirms our expectation that in countries with specific legal provisions related to land tradability, asset tangibility matters more for leverage and debt maturity.

Columns 5 through 8 of Table III present GLS estimations, but with the data set split according to whether each firm-year observation is from a country with a secured transactions law on the books. Again consistent with expectations, we find that the coefficients for asset tangibility are higher for countries with such legislation compared to countries without such legal provisions (z-statistics of 6.62 and 4.90 respectively, both with p-values of 0.000).

V. EXTENSION: "COLLAT" VARIABLE

We now turn to a different characterization of collateral based on the perspectives of legal scholars that examined the various countries of Central and Eastern Europe. Pistor, et al characterized in detail the environment

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[11] We consider "full tradability" encompass either domestic-only or foreign creditors; we do not draw a distinction between these types of creditors due to the likely relatively high importance of domestic sources of debt for small, privately-held firms in our sample.

A. Collateral and Remedy: Levels

MORE

B. Changes in Collateral Laws

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VI. CONCLUSION

Our examination of thousands of firm-year observations from a number of

different countries show that the magnitude of the relationship between asset

tangibility and leverage varies, depending on the existence of laws relating to

collateral (transferability of land ownership and secured transactions); this is also

true for debt maturity. This indicates that the ability of creditors to obtain

physical assets has an important (and hitherto little-examined) relationship with a

firm's ability to raise debt finance, and its maturity.

The implications of our work are clear for policy-makers who wish to help

small- and medium-sized firms obtain access to external finance: they should

enact legal reforms in order to allow collateral to function effectively, which will

in turn encourage the provision of credit to firms with tangible assets.

Appendix: Variable Definitions

Panel A: Dependent Variables

Variable:	Definition	Source
LTD/TA	Long-Term Debt/Total Assets	Amadeus data base
LTD/TD	Long-Term Debt/Total Debt	

Panel B: Independent Variables

Variable:	Definition	Source
EFFTAX	Effective Tax Rate: Taxes/(EBIT-Interest)	Amadeus data base
TANG	Tangible Assets: Net Fixed Assets/Total Assets	
ROA	Return on Assets	
LNTA	Natural Log of Total Assets	
LNPCGDP	Log of per capita output	World Bank
GROWTH	Annual GDP growth rate	
M3/GDP	Broad money as a portion of GDP	
TERMSPREAD	Difference between long-term (lending) and short-term (deposit) rates of interest	
ASSETSPEC	Dummy variable receiving value of 1 for industries with high asset specificity (mining, transportation, and manufacturing)	Amadeus data base and author calculations
RULELAW	Expert rating from a survey of regional experts in *Central and Eastern Europe Economic Review,* 1998; scores range from 1.4 to 8.7	Pistor, Raiser, and Gelfer, 2000
TIMETREND	Takes value of 1 for 1997, 2 for 1998, 3 for 1999, 4 for 2000, and 5 for 2001	Author calculations

Panel C: Secured Transactions Law and Tradability of Land

Country	Secured Transactions Law	Tradability of Land
Bosnia-Herzegovina	No	Limited De Jure
Bulgaria	Yes	Full Except Foreigners
Croatia	Yes	Full Except Foreigners
Czech Republic	Yes	Full Except Foreigners
Estonia	Yes	Full
Hungary	Yes	Full Except Foreigners
Latvia	Restricted	Full Except Foreigners
Lithuania	Yes	Full
Macedonia	Yes	Limited De Jure
Poland	Yes	Full Except Foreigners
Romania	Yes	Limited De Facto
Russian Federation	Yes	Limited De Jure
Slovak Republic	Yes	Full Except Foreigners
Slovenia	Restricted	Full Except Foreigners
Ukraine	Restricted	Limited De Facto

Source: *Transition Report 2000*, European Bank for Reconstruction and Development.
Note: In our empirical estimations, we group land tradability into full and restricted categories.
The former includes "Full" as well as "Full Except Foreigners" on the chart above; the remaining
categories constitute the other category (including "Limited De Jure" and "Limited De Facto"). In
terms of secured transactions law, we split observations based on whether the answer was "Yes";
the remaining observations ("No" and "Restricted") are simply grouped as "No".

R E F E R E N C E S

Acharya, V., Rangarajan, S., Kose J., 2004. On the Capital-Structure Implications of Bankruptcy Codes. AFA 2005 Philadelphia Meetings; Tuck Contemporary Corporate Finance Issues III Conference Paper.

Aggarwal, R., and Jamdee, S., 2003. Determinants of Capital Structure: Evidence from the G-7 Countries. Kent State University working paper.

Bancel, F., Mittoo, U., 2004. Cross-Country Determinants of Capital Structure Choice: A Survey of European Firms. Financial Management 33, 103—132.

Barth, J., Caprio, G., Levine, R., 2003. Bank Supervision and Regulation: What works best?. Journal of Financial Intermediation 13, 205—248.

Beck, T., Levine R., 2002. Industry growth and capital allocation: does having a market- or bank-based system matter ?. Journal of Financial Economics 64 (2), 147—80.

Beck, T., Demirgüç-Kunt, A. and Maksimovic, V. 2004. Bank competition and access to finance: International Evidence. Journal of Money, Credit and Banking 36 (6) 627—648.

Beck, T., Demirgüç-Kunt, A. and Maksimovic, V. 2005. Financial and Legal Constraints to Firm Growth: Does Size Matter ?. The Journal of Finance 60 (1) 137—177.

Beck, T., Demirgüç-Kunt, A. and Levine, R. 2003. Law and Finance: Why Does Legal Origin Matter ?. Journal of Comparative Economics 31 (4) 653—75.

Berglöf, E., Bolton, P., 2002. The 'Great Divide': Financial Architecture in Transition. Journal of Economic Perspectives 16 (1) 77—100.

Bogdan, M., 1994 . Comparative law. Norstedts Juridik, Stockholm.

Bonin, J., Wachtel, P., 2002 . Financial Sector Development in Transition Economies: Lessons from the First Decade. Bank of Finland. Institute for Economies in Transition. Bofit Discussion Papers No. 9, 1—57.

Booth, L., Aivazian, V., Demirgüç-Kunt, A., Maksimovic, V., 2001. Capital Structures in Developing Countries. Journal of Finance 56, 87—130.

Deloitte and Touche. 2000. *IAS Plus Accounting Standards* available at
http://www.iasplus.com/dttpubs/ce2000.pdf

Demirgüç-Kunt, A., Maksimovic V. 1998. Law, Finance, and Firm Growth.
Journal of Finance 53, 2107—37.

Demirgüç-Kunt, A. and V. Maksimovic. 1999. Institutions, Financial markets,
and Firm debt Maturity." Journal of Financial Economics 54(3): 295—336.

Demirgüç-Kunt, A., Maksimovic, V. 2002. Funding Growth in Bank-based
and Market-based Financial Systems: Evidence from Firm level Data. Journal
of Financial Economics 65 (3), 337—363.

Dittmar, A. 2004. Capital Structure in Corporate Spinoffs. Journal of Business
77, 9—43.

European Bank for Reconstruction and Development. 2000. *Transition Report*.
EBRD. London.

Fan, J., Titman, S., Twite., G. 2003. International Comparison of Capital
Structure and Debt Maturity Choices. AFA 2005 Philadelphia Meetings, EFA
2003 Annual Conference Paper No. 769.

Gerschenkron, A. 1962. Economic Backwardness in Historical Perspective.
Belknap Press, Cambridge, Massachusetts.

Goyal, V.K. Lehn, K. Racic, S. 2002. Growth Opportunities and Corporate Debt
Policy: The Case of the U.S. Defense Industry. Journal of Financial
Economics 55, 1901—1941.

de Haas, R., Peeters, M. 2006. Firms' Dynamic Adjustment to Target Capital
Structures in Central and Eastern Europe, Economic Transition 14 (1) ,
133—169.

Hyytinen, A., Kuosa, I., Takalo, T. 2003. Law or Finance: Evidence from
Finland. European Journal of Law and Economics 16, 59—89.

Jörgensen, Fredrik. 2004. Legal Legacies and Recent Reforms in Central and
Eastern Europe. Södertörns Högskola (South Stockholm University College)
working paper.

Johnson, S., McMillan, J., Woodruff, C., 2002. Property Rights, and Finance.
American Economic Review 92 (5), 1335—1357.

Ju, N., Parrino, R., Poteshman, A..M., Weisbach, M.S. 2005. Horses and Rabbits? Trade-Off Theory and Optimal Capital Structure. Journal of Financial and Quantitative Analysis, 40(2), 259—281.

Klapper, L., Sarria-Allende, V. and Sulla, V. (2002) Small and Medium-Sized Enterprise Financing, in Eastern Europe. World Bank Working Paper, 2002.

Köke, J., Schröder, M. 2003. The Prospect of Capital Markets in Central and Eastern Europe. East European Economics, 41 (4), 5—38.

Krkoska, L. 2001. Foreign Direct Investment Financing of Capital Formation in Central and Eastern Europe. EBRD Working Paper #67.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R. 1997. Legal Determinants of External Finance. The Journal of Finance 52 (3), 1131—1151.

La Porta, R., Lopez-de-Silanes, F.; Shleifer, A.; and Vishny, R. (1998) "Law and Finance." Journal of Political Economy 106(6), 1113—55.

La Porta, R. Lopez-de-Silanes, F. and Shleifer, A.2006. What Works in Securities Laws? Journal of Finance 61 (1), 1—32.

Levine, R. 1998. The Legal Environment, Banks, and Long-Run Economic Growth. Journal of Money, Credit, and Banking 30(3), 596—613.

Mehrotra, V., Mikkelson, W., Partch, M. 2003. The Design of Financial Policies in Corporate Spinoffs. Review of Financial Studies 16, 1359—1388.

Murrell, P. 2001. Assessing the Value of Law inTransition Economies. University of Michigan Press, Ann Arbor.

Myers, S.C. 1977. Determinants of Corporate Borrowing. Journal of Financial Economics 5, 147—175.

Nivorozhkin, E. 2005. Financing Choices of Firms in EU Accession Countries. Emerging Markets Review 6 (2), 138—169.

Pistor, K.,. Raiser, M., Gelfer, G., 2000. Law and Finance in Transition Economies. Economics of Transition / European Bank for Reconstruction and Development 8 (2), 325—68.

Pistor, K. 2004. Patterns of Legal Change: Shareholder and Creditor Rights in Transition Economies. European Business Organization Law Review 1 (1), 59—110.

Rajan, R. G., Zingales, L. 2003 . The Great Reversals: the Politics of Financial Development in the Twentieth Century. Journal of Financial Economics 69(1), 5—50.

Schmuckler, S., Vesperoni, E. 2000. Firms' Financing Choices in Bank-based and Market-based Economies. World Bank working paper.

Slavova, S. 1999. Law and Finance in Transition Economies. London School of Economics and Political Science. LSE Financial Markets Group. Special Paper Series No. 121, 1—48.

Wald, J., 1999. How Firm Characteristics Affect Capital Structure: An International Comparison. The Journal of Financial Research. 22 (2), 161—188.

Welch, I. 2004. Capital Structure and Stock Returns. Journal of Political Economy 112, 106—31.

Wooldridge, J. 2002. Econometric Analysis of Cross Section and Panel Data. Massachusetts Institute of Technology Press, Cambridge.

TABLE 1: Descriptive Statistics

Panel A: Descriptive Statistics of LTD/TA for All Firms, All Years

Country	Number of Firms	Firm-Year Observations	Mean	Standard Deviation	Minimum	Maximum
Bosnia-Herzegovina	389	389	0.035	0.095	0.000	0.626
Bulgaria	2,176	8,477	0.030	0.111	0.000	1.422
Czech Republic	4,016	13,002	0.137	0.206	0.000	2.996
Estonia	395	1,678	0.107	0.152	0.000	0.999
Hungary	1,170	3,091	0.040	1.694	0.000	94.135
Latvia	804	3,288	0.155	0.243	0.000	2.439
Lithuania	319	666	0.147	0.165	0.000	1.067
Poland	7,398	11,406	0.105	0.199	0.000	5.628
Republic of Macedonia	311	550	0.048	0.105	0.000	0.991
Romania	4,753	21,180	0.038	0.117	0.000	1.842
Russian Federation	13,450	21,847	0.026	0.232	0.000	25.010
Slovak Republic	1,022	2,543	0.116	0.204	0.000	3.795
Ukraine	12,841	38,172	0.045	0.160	0.000	9.858

Panel B: Descriptive Statistics of LTD/TD for All Firms, All Years

Country	Number of Firms	Firm-Year Observations	Mean	Standard Deviation	Minimum	Maximum
Bosnia-Herzegovina	389	389	0.096	0.185	0.000	0.867
Bulgaria	2,176	8,426	0.050	0.155	0.000	1.000
Czech Republic	4,016	12,922	0.230	0.273	0.000	1.000
Estonia	395	1,676	0.184	0.226	0.000	0.998
Hungary	1,170	3,095	0.016	0.081	0.000	1.000
Latvia	804	3,280	0.227	0.274	0.000	1.000
Lithuania	319	666	0.275	0.239	0.000	0.980
Poland	7,398	11,406	0.155	0.200	0.000	0.998
Republic of Macedonia	311	550	0.093	0.171	0.000	1.000
Romania	4,753	21,109	0.062	0.165	0.000	1.000
Russian Federation	13,450	21,843	0.036	0.121	0.000	0.995
Slovak Republic	1022	2,545	0.199	0.245	0.000	1.000
Ukraine	12,841	38,125	0.110	0.191	0.000	1.000

TABLE 1: Descriptive Statistics, Continued

Panel C: LTD/TD: Number of Firm-Year Observations by Country

LTD/TD	1997	1998	1999	2000	2001
Bulgaria	381	599	713	781	825
Czech Republic	896	1005	1280	1288	684
Estonia	143	168	187	201	181
Hungary	290	360	432	449	292
Latvia	238	301	340	367	374
Lithuania	46	59	66	75	68
Poland	642	1094	1418	1450	1116
Romania	1574	1688	1734	1797	1814
Russian Federation		2102	512	2286	3371
Slovak Republic	161	202	248	274	202
Ukraine	2	1196	2641	2973	2899
Yugoslavia	92	68	607	604	581

Panel D: LTD/TA: Number of Firm-Year Observations by Country

LTD/TA	1997	1998	1999	2000	2001
Bulgaria	386	611	722	786	827
Czech Republic	906	1013	1294	1294	685
Estonia	143	168	188	203	181
Hungary	292	361	432	449	292
Latvia	238	303	340	367	375
Lithuania	46	59	66	75	68
Poland	642	1094	1418	1450	1116
Romania	1582	1700	1742	1801	1816
Russian Federation		2102	512	2287	3371
Slovak Republic	161	203	248	274	202
Ukraine	2	1198	2645	2984	2900
Yugoslavia	92	68	607	604	581

TABLE II: Baseline Regressions: Leverage and Debt Maturity
(GLS with firm-level fixed effects estimations; p-values in parentheses)

Dependent Variable	(1) Leverage (LTD/TA)	(2) Maturity (LTD/TD)	(3) Leverage (LTD/TA)	(4) Maturity (LTD/TD)
Constant				
Tang				
EffTax			--	--
ROA			--	--
LnTA				
AssetSpec				
LnPCgdp				
M3/GDP				
GDP growth				
Timetrend				
Term Spread				
RuleLaw				
Overall R^2				
Obs				
Firms				
Wald Chi^2				

[†], *, **, and *** indicate significance at the 15%, 10%, 5% and 1% levels, respectively

TABLE III: Land Tradability and Secured Transactions Law
(Generalized least squares with firm-level fixed effects; p-values in parentheses)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable	Leverage (LTD/TA)	Leverage (LTD/TA)	Maturity (LTD/TD)	Maturity (LTD/TD)	Leverage (LTD/TA)	Leverage (LTD/TA)	Maturity (LTD/TD)	Maturity (LTD/TD)
Land Tradability	Full	Restricted	Full	Restricted	--	--	--	--
Secured Transactions Law	--	--	--	--	Yes	No	Yes	No
Constant	-0.080***	-0.020**	-0.103***	0.247***	-0.130***	0.215***	-0.219***	0.493***
	(0.000)	(0.037)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tang	0.119***	0.015***	0.215***	0.037***	0.062***	0.032***	0.140***	0.098***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LnTA	0.011***	0.006***	0.014***	0.010***	0.009***	0.004***	0.012***	0.007***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
AssetSpec	0.009***	0.007***	0.027***	0.016***	0.010***	0.005†	0.026***	0.013***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.127)	(0.000)	(0.007)
LnPCgdp	-0.005**	-0.006***	0.001	-0.037***	0.000	-0.050***	0.010***	-0.063***
	(0.019)	(0.000)	(0.783)	(0.000)	(0.830)	(0.000)	(0.000)	(0.000)
M3/GDP	0.0004***	0.000	0.0005***	0.001***	0.0002***	0.000	0.0005***	-0.001**
	(0.000)	(0.593)	(0.001)	(0.000)	(0.000)	(0.376)	(0.000)	(0.044)
GDP growth	0.001**	0.001***	-0.001	0.001***	0.001***	0.004***	0.001***	0.000
	(0.017)	(0.001)	(0.244)	(0.000)	(0.000)	(0.000)	(0.008)	(0.979)
Timetrend	-0.004***	0.001*	-0.006***	0.009**	-0.002***	-0.005***	-0.005***	-0.005*
	(0.000)	(0.057)	(0.000)	(0.014)	(0.000)	(0.002)	(0.000)	(0.072)
Term Spread	--	--	-0.002***	-0.000	--	--	-0.002***	-0.005
			(0.000)	(0.687)			(0.000)	
RuleLaw	0.006***	0.006***	0.002	-0.022**	0.011***	0.031***	0.010***	0.023***
	(0.000)	(0.000)	(0.377)	(0.028)	(0.000)	(0.000)	(0.000)	(0.000)
Overall R^2	0.0663	0.0217	0.1126	0.0429	0.0986	0.0890	0.1370	0.0876
Obs	19,432	24,854	19,349	16,504	33,313	10,973	24,906	10,947
Firms	6,399	9,218	6,387	7,211	11,897	3,720	9,888	3,710
Wald Chi^2	978.12***	405.85***	1433.52***	581.27***	1954.99***	476.72***	2258.55***	569.85***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

†, *, **, and *** indicate significance at the 15%, 10%, 5% and 1% levels, respectively

TABLE IV: "COLLAT" Variable
(Generalized least squares; p-values in parentheses)

Dependent Variable	(1) Leverage (LTD/TA)	(2) Leverage (LTD/TA)	(3) Maturity (LTD/TD)	(4) Maturity (LTD/TD)	(5) Leverage (LTD/TA)	(6) Leverage (LTD/TA)	(7) Maturity (LTD/TD)	(8) Maturity (LTD/TD)
Constant								
Tang								
LnTA								
AssetSpec								
LnPCgdp								
M3/GDP								
GDP growth								
Timetrend								
Term Spread								
RuleLaw								
COLLAT								
Overall R^2								
Obs								
Firms								
Wald Chi^2								

†, *, **, and *** indicate significance at the 15%, 10%, 5% and 1% levels, respectively