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Corporate Financing in the New Member States: Firm-Level Evidence for Convergence and Divergence Trends[1]

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Abstract

The paper presents results of an ongoing research project on corporate financing patterns in Central and Eastern Europe (CEE) since 1999. It addresses three broad issues. Which are the specifics of corporate financing in CEE compared to countries in Western Europe? Which country institutional and company factors may explain the similarities and differences of capital structures in the EU-15 and New Member States (NMS)? Which are the major convergence and divergence trends in corporate financing patterns in an enlarged Europe? The study analyzes the interactions between country institutional differences, firm ownership structures, other firm-specific characteristics and corporate financial patterns in both the EU-15 and NMS. It summarizes the firm-level evidence and outlines several unresolved questions and major dimensions for further research.

1. Introduction

Emerging capital markets in Central and Eastern Europe (CEE) have experienced fast changes over the last decade and since 1999 become gradually integrated into

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the EU financial market. However, despite the potential importance of financial sector for the corporate growth in an enlarged Europe, the research on the corporate financial patterns in CEE region is still scarce. First, studies on capital structures traditionally investigate the listed companies in the developed countries. A few studies examine developing and transition countries.[2] Second, studies on capital structures in transition economies focus mostly on the early transition period in the 1990s.[3] Third, the research of the impact of country institutional and company ownership structures on leverage decisions in transition economies is also scarce.[4]

This paper presents firm-level evidence about the emerging corporate financing patterns in Central and Eastern Europe since 1999. It addresses three broad issues. Which are the specifics of corporate financing in CEE compared to countries in Western Europe? Which country institutional and company factors may explain the similarities and differences of capital structures in the EU-15 and NMS? Which are the major convergence and divergence trends in corporate financing patterns in an enlarged Europe?

One contribution of the paper is that it extends the traditional analysis of institutional factors including company ownership structures and their association with leverage in CEE. The second contribution is that it focuses on control theories of capital structures to explain corporate financing choices among firms in CEE region. The goals of the paper are: (i) to present stylized facts about the evolution of corporate financing patterns in Central and Eastern Europe, (ii) to analyze the interactions between country institutional differences, firm ownership structures, other firm-specific characteristics and corporate financial patterns in both the EU-15 and NMS, and (iii) to outline the convergence and divergence trends of corporate financial developments in the NMS.

Section 2 presents stylized facts about corporate finance patterns in transition countries. Section 3 discusses institutional factors for country differences in capital structures in both the EU-15 and NMS. Section 4 analyses the association between firm ownership structures and leverage. Section 5 focuses on other firm-specific factors correlated with leverage. Section 6 discusses the link between ownership, firm-specific factors and leverage. Section 7 concludes with main results and unresolved questions for further research.

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[2] For a survey on developed countries, see Rajan and Zingales (1995); for a survey on developing countries, see Booth *et al.* (2001).

[3] But see Haas and Peeters (2006).

[4] The previous research examines only state-owned, domestic and foreign firms.

2. Corporate Financing Patterns in Transition Economies

2.1 Early Transition

Most studies on capital structures in CEE examine the early transition period in the 1990s.[5] There are few studies that extend the data coverage including more recent years.[6] Some studies examine the effects of ownership structures on leverage. However, all these studies focus on only three ownership categories, namely: state, domestic and foreign.

The previous research reveals several major features of the emerging financial patterns in the early post-communist transition. (1) A number of papers find lower leverage rate for companies in CEE countries compared to their counterparts in G7 countries (see e.g. Hussain and Nivorozhkin (1997) for Poland; Nivorozhkin (2002) for Hungary). This low leverage rate was also observed in the second half of the 1990s during the period 1997–2001. (2) Studies also reveal negligible long-term debt rates and the practical absence of bond markets in CEE region. (3) Several studies focus on the importance of the supply side effects on the capital structure decisions, mainly the failure of the emerging financial sector to allocate efficiently external finance. Banks were reluctant to provide loans to both newly established private firms that have not developed reputation and to state-owned firms accumulated bad loans from the communist times. Banks were also possibly not efficient in screening and monitoring under the new market conditions. Thus, the low debt levels are partly explained by the supply side of the market (Cornelli, Porter and Schaffer (1996); Revoltella (2001); Nivorozhkin, 2002). (4) Studies reveal the importance of soft loans to both state-owned and private firms due to the soft budget constraint. The environment of soft budget constraint distorted banks-firms credit relations in the early transition years. Open remains the question how fast was the process of hardening the budget constraint by countries over transition years. In some countries, the introduction of special institutional arrangements (e.g. currency board) led to a change from a regime of excessive lending rates to a severe credit decline.[7]

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[5] E.g. Revoltella (2001) uses data on 665 listed firms in the Czech Republic for the period 1993-95; Hussain and Nivorozhkin (1997) study 27 listed firms in Poland over the years 1991-94; Nivorozhkin (2002) examines 25 listed companies in Hungary over the period 1992-1995; Cornelli, Porter and Schaffer (1996) focus on Hungarian and Polish firms from the early 1990s; Colombo (2001) studies 1100 Hungarian firms for the period 1992-96.

[6] Haas and Peeters (2006) focus on ten transition economies for 1994-2001. Nivorozhkin (2004) examines data on five transition economies over the period 1997-2001. Nenovsly, Peev and Yalamov (2003) investigate banks-firms relations in Bulgaria for the period 1998-2003.

[7] See e.g. for the case of Bulgaria, Nenovsly, Peev and Yalamov (2003).

2.2 Late Transition

We use data on CEE, EU-15 and other developed economies, and developing countries over the period 2000–2004. Our principal data source for country specific macroeconomic variables such as the lending rate, consumer price index, GDP growth rate, and bank deposits is the International Financial Statistics database provided by the IMF.

The literature on corporate financing usually explores the difference between bank-based and market-based financial systems classified by the size or the power of the banking sector in any country. The prevailing "conventional wisdom" in the early transition years in Central and Eastern Europe stressed on the development of securities markets and moving to Anglo-Saxon (market-based) financial system. The view that the development of the financial system is closely related to its financial funding performance was challenged by Mayer (1988, 1990).[8] He reveals that while the British financing sector has produced a myriad of new financial instruments and services for savers, its role for channeling funds from savers to non-financial companies is rather moderate. Mayer (1990) presents ten stylized facts about corporate finance in developed countries, among them observing that retentions are the dominant source of finance and banks are dominant source of external finance in all countries and in no country do companies raise a substantial amount of finance from securities markets. He suggests that in the early stages of development of both economies and firms an efficient banking system may be an essential requirement for expansion, but securities markets are unlikely to be effective substitutes. The author's policy conclusion sharply contradicts the "conventional wisdom" in the early transition years in CEE for the priority development of securities markets.

Table 1 presents data about the importance of the banking sector, stock market, and bond market in financing firms in both CEE and EU-15 countries. At the bottom part of the table, data on developing countries, the United States and Japan are also used for comparative purposes. All ratios are calculated for 2003. In CEE region, the size of the banking sector (measured by the ratio of bank deposits to the GDP) is about three times larger than the size of the stock market. The bond market is less important for all CEE countries, especially the bond market for the private sector. Estonia is the only country with a larger stock market than its banking sector. In fact, despite the tremendous efforts of policy-makers and contrary to the "conventional wisdom" how to develop local stock exchanges, the securities markets have remained fragile in CEE.

In the EU-15 region, on average, we observe a similar type of financial system. The size of the banking sector (66% of GDP) is higher than the stock market (58% of GDP), but the bond market is much more developed than in CEE countries.

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[8] For a critical view, see Mankiw (1988).

Among EU-15, Anglo-Saxon countries (UK, Ireland), the Netherlands, Finland, and Sweden have bigger stock market than banking sector. When comparing CEE and EU-15 countries, the difference is striking. The CEE region, on average, has about twice less developed banking sector (32% of GDP) and more than four time lower total stock market capitalization (12% of GDP).

Table 2 provides data on capital structure ratios in both CEE and EU-15 countries. Recently, the received wisdom that companies in Continental Europe (bank-based financial system) are more highly leveraged than companies in Anglo-American economies (market-based financial system) was questioned by Rajan and Zingales (1995). They apply an innovative approach studying in detail institutional structures of the G-7 countries and suggest that the leverage differences are very sensitive to the way leverage is defined. The authors find out that at an aggregate level, firm leverage is fairly similar across the G-7 countries. Table 2 confirms these findings. We use three measures of leverage, namely: the long term-debt (defined as the ratio of the long-term debt to total assets), short-term debt (measured as the ratio of the short-term debt to total assets), and total debt (the ratio of the sum of the long-term and short-term debt to total assets).[9] The leverage rates are similar among developed countries in Continental Europe, the UK, Ireland, Japan, and the United States. However, in CEE countries the rates of total debt and long-term debt are still much lower than in the EU-15. The long-term debt in CEE (10.2%) is about twice lower than in both the EU-15 (26.5%) and developing countries (22.2%). Among CEE countries, only Poland (58%) has total debt ration comparable with some EU-15 countries like Austria (57.8%), Greece (58.6%), Spain (60.2%) and the Netherlands (60.7%). In the CEE region, the total debt ratio varies from a low of 32.9% in Slovenia to a high of 58% in Poland.

Table 3 shows the developments of the debt ratio by regions over the period 2000–2004. In the CEE region, we observe slightly increasing long-term debt ratio from 9% in 2000 to about 11% in 2004. For the same period, the short-term debt decreases and the overall change of the total debt is negligible. On average, both the EU-15 and developing countries show no practical change of their total debt ratios.

In the next three sections, we explain the observed corporate financing patterns examining the effects of country institutional factors, firm ownership and other firm characteristics in both the NMS and EU-15.

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[9] We use averages based on firm-level data. See section 4 for the source of our data.

3. Country Institutional Differences

3.1 Country Institutional Variables

Rajan and Zingales (1995) find out that the factors identified to be related to leverage in the United States may also explain leverage in other G7. They suggest, however, that the theoretical underpinnings of the observed correlations are still largely unresolved. The authors focus on several country institutional factors correlated with leverage, namely the size of the banking sector, tax code, bankruptcy laws, the state of development of bond market, and patterns of ownership. Booth *et al.* (2001) examine developing countries and include macroeconomic factors like inflation and real GDP growth rates as important determinants of capital structure choices. In a seminal study on developing countries, Singh (1995) examines also the cost of debt and cost of equity as country capital market conditions influencing leverage. Finally, two recent papers focus on the protection of creditor rights, enforcement and development of the financial sector (Giannetti, 2002) and the legal system and corruption, tax system, and the size of the banking and life insurance sectors (Fan *et al.,* 2005) as institutional determinants of capital structure.

We follow the previous literature and identify six broad groups of country factors possibly important for affecting leverage in CEE, namely (1) the development of post-communist external capital markets, especially the banking sector, (2) the tax code and macroeconomic factors (inflation, GDP growth and the like), (3) capital markets conditions (lending rate, cost of equity), (4) the quality of country governance institutions, (5) legal system, law enforcement and especially bankruptcy laws[10], and (6) patterns of ownership structures.[11]

The supply side effects on capital structures were documented in several studies on transition economies. The development of the banking sector is related to the availability of external finance for non-financial firms and is assumed to be a major factor explaining cross-country differences in capital structures. We measure the size of the banking sector by the ratio of bank deposits to GDP calculated using the IMF IFS database.

The tax code is other important factor that influences the company capital structure (Graham, 2003). However, for an empirical study of the effects of taxation on capital structures one needs also data on both personal and corporate tax rates, and assumptions about the marginal investor's tax rate. This kind of precise tax rates calculation requires additional data collection, a task usually beyond many studies on leverage. In our research, we use the tax rates compiled by

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[10] In this research, we have no data on legal indicators in CEE region and do not discuss legal factors.

[11] Ownership structures and leverage are discussed in the Section 4.

the KPMG's annual survey of corporate tax rates (KPMG, 2003). The survey, which started in 1993, currently covers 68 countries, including the 30 member countries of the OECD, and many others in the Asia Pacific and Latin America regions. Data on tax rates collected by the local KPMG tax offices are used for this survey.

Main macroeconomic factors that influence capital structure choices are the real economic growth and inflation. Booth *et al.* (2001) find out that higher economic growth tends to cause capital structure to increase and higher inflation causes it to decrease.

Several studies show the importance of the cost of debt and equity for capital structure decisions in both developed and developing countries. For developed countries, Baker and Wurgler (2002) reveal that capital structure is the cumulative outcome of past attempts to time the equity markets. For developing countries, in seminal contributions Singh and Hamid (1992) and Singh (1995) examine largest listed companies in developing countries and observe puzzling facts that contradict the traditional pecking order theory.[12] According to this theory, companies finance new investment rising funds first internally, then with low-risk debt, and finally with equity only as a last resort (Myers and Majluf, 1984). The authors find out that the developing country corporations rely very heavily on external funds and on new issues of shares to finance their growth of net assets. They suggest that these results are historically specific for the 1980s and stress on the institutional and conjuncture differences, e.g. the rise of share prices and the increase of the cost of debt.[13] We control for the market conditions in CEE countries measuring the cost of debt by average country annual lending rate and the cost of equity proxied by the change of the composite share price index in local currency terms of the individual country. Both measures are calculated using the IMF IFS database.

Recent studies examine the importance of the legal system, law enforcement and corruption on the corporate financing decisions (Fan *et al.,* 2005; Giannetti, 2002). We measure the quality of country institutions calculating a general index which is measured as the sum of six indexes: (1) Voice and Accountability, (2) Political Stability, (3) Government Effectiveness, (4) Regulatory, (4) Quality, (5) Rule of Law, and (6) Control of Corruption. The indicators are constructed using an unobserved components methodology described in detail in Kaufmann, Kraay and Mastruzzi (2005). The six governance indicators are measured in units ranging from about −2.5 to 2.5, with higher values corresponding to better governance outcomes.

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[12] Gugler, Mueller and Yurtoglu (hereafter GMY) (2003) offer an alternative explanation for Singh's findings.

[13] The authors also point out the role of the country governments for development of security markets and the more active involvement of international institutional investors.

3.2 Differences between the EU-15 and NMS

Table 4 presents correlation coefficients among all the country institutional variables and leverage (long-term debt) for both the EU-15 and CEE. This exercise shows a high degree of collinearity between the lending rate and inflation (positive), the tax rate and economic growth (negative), and the share price index, on the one hand, and both institutional variables, the index of institutional quality and the size of banking sector, on the other. Inflation has the predicted negative association with leverage. The real economic growth rate has the expected positive link with leverage only for the NMS sub-sample, but a negative one with the EU-15. The change of the share price index (proxy for the cost of equity) is correlated significantly negatively with debt finance for the whole sample of firms, but the coefficient is not significant for both the sub-samples of the EU-15 and NMS.

Table 5 shows the results of cross-section regressions with long-term debt ratio dependent variable, and independent variables the two institutional variables. For controlling variables we use also lending and tax rates, but exclude the other variables described above due to collinearity problems. The number of observations for the whole sample is 20 and for the sub-sample of CEE countries it shrinks to 9. For this small number of observations, the standard errors of the coefficients are too large for the coefficients to be estimated precisely at usual levels. Despite the obvious caveat, the specifications reveal important differences between the EU-15 and NMS. In Table 4, the correlation between debt ratio and the index of institutional quality is significantly positive for the EU region, but significantly negative for the sub-sample of the NMS. Specifications 1–3 in Table 5 confirm this unexpected significantly negative coefficient for the NMS.

To control for country variations, chart 1 presents the association between leverage and the quality of country institutions by countries. The differences are striking. In the NMS sub-sample, all the advanced CEE countries are clustered in a group with a low debt (5–15%) and average institutional quality (coefficient 0.5 – 1.0). The obvious outliers are Romania (low debt-low institutional quality) and Bulgaria and Croatia, both with average debt (15–20%) and low institutional quality (coefficient less 0.5). In the EU-15 sub-sample, we separate also three groups of countries. The bulk of countries are clustered in a group with high debt (20–40%) and a very high institutional quality (coefficient 1.5 –2). Greece (debt ratio about 20%) and Italy (about 31%) form the group with a high debt and an average institutional quality (coefficient 0.5–1). The third group (Portugal, France and Spain) are in between with high debt and an average institutional quality (coefficient 1–1.5).

In specifications 4–6 in Table 5, we use the development of the banking sector as a proxy for the country institutional effects on debt financing. The results confirm the expectations about the importance of the banking sector. The debt ratios vary positively with the size of the banking sector in both EU-15 and NMS,

but are significant only for the total EU sample. Finally, the coefficient on lending rate has the expected negative sign for all the specifications. The tax rate has the predicted positive association with the debt ratio and is significant for the EU-15 sub-sample. For the NMS, however, the effect of the tax rate on leverage is significantly negative. As other studies also stated, additional data collection and calculations are needed for more decisive conclusions about the effects of taxes on leverage dcisions (Rajan and Zingales, 1995).

4. Ownership Categories and Leverage

Recent research shows that ownership identity and ownership concentration have important implications for company performance. However, there is less research and correspondingly a much fewer number of stylized facts on the impact of ownership structure on the capital structure choices that companies make. On the one hand, following the Modigliani-Miller approach to corporate financing choices, one can argue that ownership structure is irrelevant to their analysis.[14] In a recent empirical study, Mayer (1990) finds out similar patterns of investment finance (overwhelming reliance on retentions and a tiny use of new equity), despite the obvious institutional differences between Anglo-Saxon countries (companies with dispersed ownership and active takeover market) and the Continental Europe (concentrated ownership and negligible hostile acquisitions).

On the other hand, many studies focus on the agency conflicts within firms as an important determinant of leverage.[15] In these free-cash flow views, debt is a corporate governance mechanism restricting the availability of free cash flow at a manager's disposal and constraining the manager from pursuing personal utility maximization strategies. Debt like other governance mechanisms (e.g. CEO compensations) has to be designed to alleviate the agency problems in publicly traded companies. However, as recent research on CEO compensation stated this kind of governance instruments seem to reflect managerial rent-seeking rather than the provision of efficient incentives.[16] Zwiebel (1996) presents a model of dynamically consistent capital structure which is a result of the trade-off between managerial empire-building ambitions and the need to ensure efficiency to prevent takeover. In a similar vein, Mueller (2003) suggests an investment model where the

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[14] As Merton Miller wrote about the Modigliani-Miller approach to the firm: " We opted for a Fisherian rather than the standard Marshallian representation of the firm. Irving Fisher's view of the firm – now the standard one in finance, but then just becoming known – impounds the details of technology, production, and sales in a black box and focuses on the underlying net cash flows. The firm for Fisher was just an abstract engine transforming current consumable resources, obtained by issuing securities, into future consumable resources payable to the owners of securities" (Miller, 1988, pp. 103).

[15] See for a survey e.g. Harris and Raviv (1990).

[16] Bebchuk and Fried (2003).

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investment decision presents a trading off between the managerial utility from growth and disutility from the rise of probability of takeover caused by this investment. According to the managerial discretion theory of investment, in firms with cash flows and insufficient investment opportunities cash flow is favored by a growth-oriented management, because its implicit cost is lower than that of external finance. In these and other similar models, takeover market plays a crucial rile for constraining the managerial opportunism. A strong pressure from the market for corporate control forces managers to increase leverage (Rajan and Zingales, 1995). However, for the emerging markets in Central and Eastern Europe we may expect the disciplining role of the takeover market to be less important. Thus, *ceteris paribis*, we predict lower leverage rates for the companies with dispersed ownership in NMS than in their counterparts in the EU-15.

Empirical evidence on the effects of managerial control on capital structure is scarce. Friend and Lang (1988) find out that the debt ratio is negatively related to management' shareholding in public companies with dispersed ownership. The authors show that unless there is a non-managerial principal shareholder, no substantial increase of debt can be realized. Unfortunately, there is no data about the managerial shareholdings in both the EU-15 and NMS countries. We use the dispersed ownership as a proxy for the lack of non-managerial principal shareholder and predict lower leverage rates for the companies with dispersed ownership than the other companies in both the EU-15 and NMS.

In this section, we analyze whether ownership identity and managerial control based on dispersed ownership have an impact on the observed leverage ratios in our sample of EU-15 and NMS.

4.1 Firm-Level Data

Our data source is the OSIRIS data bank provided by Bureau van Dijk. The industrial company financial data on OSIRIS is provided by World'Vest Base (WVB) and some regionally specialized providers such as Multex and Edgar Online for the USA. This company dataset contains standardized and as reported financials, including restated accounts on approximately 24,700 listed and 900 unlisted companies, the data base also includes 2,600 delisted companies.

OSIRIS contains basic balance sheet and income statement data for most of the listed companies and the names, country of origin, type and%age of direct owners.While for some European and USA companies the financial data goes back for up to 20 years, there is generally much less information on NMS countries. As a result we restrict our attention to the period 2000–2004, where most of the necessary data on both financial and ownership indicators are available for the EU-15 and NMS samples. We are interested in the financing choices made by the largest companies, hence we focus our attention to the largest 100 companies in the

EU-15 and NMS. We also employ data from USA, Japan and developing countries for comparative purposes in some of our tables.

We classify firms using six ownership categories, namely: state, financial firm, family, mutual fund[17], non-financial firm, dispersed. In doing that, we follow the existing literature and employ two ownership criteria for categorizing companies – the largest shareholder owns 10% or more of the company's shares, and a 20% cut off.[18] The differences in results between the two definitions were modest, and thus in Table 6 we report only those for the 20% criterion. Under each heading there are two entries. The first entry for each ownership category represents the mean leverage ratio for that category. Thus, state controlled firms in EU-15 have a mean leverage ratio of 34.1%. The second entry is the mean leverage ratio for the remaining companies in that country group. Thus, the mean leverage ratio for all EU-15-origin companies that were not state controlled is 27.7%. The > (<) separating these two numbers indicates that the first entry is greater (less) than the second entry at a 5% level significance test or better (two-tailed test). If there is no statistically significant difference between the entries, we use ≈ to show it.

Table 6 shows that all leverage ratios for the six ownership categories in the EU-15 are greater than their NMS counterparts. Only five out of 12 possible comparisons are statistically different.

4.2 State

Studies on developed countries reveal that leverage of government firms exceeds that of private firms (Dewenter and Malatesta, 2001). Most studies on the early transition also document that state-owned firms have leverage increases due to soft-budget constraint (Kornai *et al.*, 2003).

Our results show that the state controlled companies in both EU-15 countries and NMS have higher leverage ratios than other types of companies in their respective samples. The differences are both economically and statistically significant; state controlled companies in the EU-15 have a mean leverage ratio of 34.1% whereas other firms have only a 27.7% leverage ratio, which amounts to an almost 25% difference. A much dramatic difference is found for companies from the NMS. Namely state controlled companies have a mean leverage ratio of 23.7%, which is almost 70% higher compared to the leverage ratio of other types of

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[17] This category has been included to highlight its special importance as an owner category in the NM sample.

[18] There exists an important caveat measuring ownership concentration in both EU-15 and NMS countries. The usual estimates are based on the share of the *direct* largest shareholder, but the major unresolved problem is rather who are the actual *ultimate* owners. For discussion on transition economies, see e.g. Mueller, Dietl and Peev (2003) for the case of Bulgaria.

firms (14.1%). Indeed, state owned firms in NMS countries have the largest leverage ratio in six possible ownership categories. These differences are consistent with a number of existing results from the previous research.

4.3 Financial Firm

Our second set of comparisons is between companies owned by a financial company (bank, insurance company or other financial companies except mutual funds). In the CEE region, the role of these owners has gradually increased.[19] We expect that companies controlled by financial firms should have higher leverage ratios, because having a financial firm as the largest shareholder would weaken the asymmetric information problems and reduce the transaction costs of using debt. While EU-15 firms under financial control exhibit a slightly higher leverage ratio than other firms, the difference is modest in magnitude and also statistically insignificant (29.2 vs. 27.7%). On the other hand, when we restrict our attention to companies from the NMS sample, we see that finance controlled companies have even lower leverage ratios than other types of firms, while this difference is also insignificant.

4.4 Family

It is often argued that family controlled firms are subject to more severe asymmetric information problems than other firms (GMY, 2006). Consistent with this argument, we expect to find lower levels of leverage for these types of firms in both the EU-15 and NMS samples. This prediction is confirmed in the EU-15 sample; family controlled firms' leverage ratio is 23.5% compared to a leverage ratio of 28.5% by all other types of firms. On the other hand, we find no statistically significant difference in the NMS sample.

4.5 Non-Financial Firm and Mutual Fund

In contrast to the latter three ownership categories, we believe that it is hard to make any predictions about the leverage ratios of firms controlled by other companies and mutual funds due to the conflicting goals of these owners concerning the performance and financial structure of the companies they control. We do, however, present tests of whether these ownership categories are associated with systematic differences in leverage ratios. Companies under corporate control in both the EU-15 and NMS do not have different leverage ratios from other

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[19] For a recent study on the investment performance of companies with financial owners in CEE countries, see e.g. Mueller and Peev (2006).

companies in their respective samples. The differences are both economically and statistically insignificant. We estimate similar results for firms controlled by mutual funds in the NMS sample, where the difference of 1% is statistically insignificant (15.2 vs. 14.2%). On the other hand, firms controlled by mutual funds in the EU-15 sample, have higher leverage ratios. While the difference of 2.5% points is not dramatic, it is statistically significant at the five% level.

4.6 Dispersed Ownership

The final comparison is between firms that have a dispersed ownership structure (defined at the 20% level) and firms which have a direct shareholder with at least 20% of the outstanding shares. Table 6 shows a striking difference between the two sub-samples. In the NMS, firms with dispersed ownership have statistically significant leverage ratio of 9.7%, which is almost 50% lower than the leverage ratio of other types of firms (15%). Firms with dispersed ownership in NMS countries have the lowest leverage ratio among the six ownership categories that corroborate our predictions about the negative effects of managerial discretion on leverage. This leverage rate is also lower than in firms with dispersed ownership in the sub-sample of the EU-15 countries. The result confirms the expectations about the inefficient disciplining role of the takeover market for managers in the CEE region. However, the expectations about the lower leverage for companies with dispersed ownership in the EU-15 were not corroborated. There is no significant difference between these companies and the rest of the firms in the EU-15 sub-sample. Are markets for corporate control in the EU-15 countries so efficient to constrain managerial discretion in firms with dispersed ownership? Are there country differences between Anglo-Saxon and the Continental European countries? These questions need to be addressed by further research.

We have examined six ownership categories identified by *direct* ownership and reveal that three of them, the state, family and dispersed ownership have association with leverage rates. The state and family are also *ultimate* owners of the companies. An important path for further research is to identify the ultimate owners of all the public companies in the NMS and their influence on the corporate financing choices.

5. Firm-Specific Factors Correlated with Leverage

Myers (2001) argues that there is no universal theory of the debt-equity choice and no reason to expect one. While some papers concentrate on a specific story of the financing choices, in general there are three useful conditional theories (1) the static trade-off theory, (2) the pecking-order theory, and (3) the agency theory.

The static trade-off theory suggests that leverage ratios reflect a trade-off between the marginal value of interest tax shields on additional debt and the

potential cost of financial distress that the additional debt will cause. The nature of the firm's assets, its risk profile and profitability will also affect leverage ratios.

In the pecking-order theory, firms issue debt before issuing equity to minimize the cost of asymmetric information. This theory implies that both the firm's investment opportunities and its profitability are important determinants of leverage. While highly profitable firms will prefer internal funds, firms with lower profitability will choose debt financing. In our empirical work, we use the return on assets (ROA) as the measure of profitability, which is defined to be the earnings before tax divided by total assets.

The agency problems between shareholders and managers are likely to have a material impact on leverage ratios. The use of debt can have two opposite effects under this theory depending on the height of the investment opportunities. As Jensen (1986) argues debt can be an important disciplinary device for firms that generate large cash flows and have no good investment opportunities (see also Stulz, 1990 and Berger, Ofek and Yermack, 1997). The managers under Jensen's free cash flow hypothesis are assumed to be growth maximizers, which are not subject to control due to the dispersed ownership structures of their companies.[20]

On the other hand it is well known that debt can generate its own agency costs in that a highly levered firm forgoes positive NPV projects due to the debt overhang problem (Jensen and Meckling, 1976; Myers, 1977). In this case, the agency costs of debt are the foregone NPV and the costs of enforcing contractual provisions, which are likely to be a function of the institutional environment such as the bankruptcy code and the strength of law enforcement. In the agency framework, better investment opportunities lead to higher agency costs of debt suggesting a negative relationship running from investment opportunities to leverage. Since we lack market-to book ratios for most of the NMS sample and our data sources do not report R&D expenditures, we hope that our measure, the%age growth of sales, serves as a good proxy for growth opportunities. The tangibility of the firm's assets serves as a proxy for agency costs in the agency model. We define tangibility as the ratio of total fixed assets to the total assets of the firm. We also use the firm size as further right hand side variable by defining it as the (natural) logarithm of total assets of the firm. Firm size is likely to be an inverse proxy for the bankruptcy risk and it is also related to the agency costs of debt and equity.

Table 7 reports the means and standard deviations of these four variables that we employ to explain leverage ratios. In the final two columns, we also report the concentration of the shareholdings by the largest direct shareholder irrespective of his/her identity. The table suggests important differences between the samples of

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[20] On the other hand, Jung, Kim and Stulz (1996) show that equity finance is the preferred choice of growth maximizing managers and their shareholders, when firms have valuable investment opportunities.

EU-15 and NMS companies. The profitability in the EU-15 sample is higher than in the NMS sample by about 1.2%. As one might expect EU-15 companies are much larger than the NMS companies as indicated by the logarithm of the total assets. Important differences also emerge in comparing the tangibility of the firms' assets in both samples. The NMS sample has a much larger ratio of fixed assets to total assets than the EU-15 companies. In terms of sales growth, on average, both samples are similar, while there are countries which exhibit high average growth rates such as Spain (41.1%) and Greece (29.6%) in the EU-15 and Lithuania (42.8%) in the NMS sample. We also note that the NMS companies exhibit a much more concentrated ownership structure measured by direct ownership with a mean largest shareholding of about 53% than the EU-15 sample (34.3%). The next step is to analyze whether these differences also have different impact on the leverage choices of companies.

In all reported regression equations the ratio of long-term debt to total assets is used as the dependent variable. We control for industry and time specific effects by including a full set of time and industry dummies defined at the level of two-digit NACE codes.

To the extent that each of these theories applies to different types of firms, choosing variables in empirical work suggested by any or all of them will guide us little in identifying which theory really explains leverage. Leaving this theoretical warning of Myers (2001) aside, in table 8 we first present the coefficient estimates from a pooled OLS regression for the full sample of companies in the EU-15 and NMS.[21] The estimated coefficient of ROA is negative and significant suggesting that profitable firms use less debt. The size and the tangibility of the firms' assets both have a positive and highly significant effect on leverage ratios. Sales growth has a negative albeit small negative effect in the pooled sample. The equation, which includes a full set of country, industry and time dummies explains about 43% of the variation in 2998 firm-year observations on the leverage ratios from both the EU-15 and NMS companies.

The second column in Table 8 shows the results for the sample of companies from the EU-15. ROA and sales growth have the same negative and significant effect, while size and tangibility have a significantly positive effect on leverage. One important difference of the EU-15 results is the substantially higher coefficient on tangibility for the EU-15 sample. On the other hand, the coefficient estimates for the NMS sample suggest three important differences to the EU-15. First we observe that size has a much smaller impact on leverage (0.009 vs. 0.039) and it is much less significant. Second, we note that tangibility of the firms' assets is now insignificantly related to leverage (note also the much smaller coefficient on this variable). The third difference is observed in the much more negative albeit

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[21] The Appendix contains the ownership structures and regression results by individual countries.

insignificant role of sales growth of the NMS sample companies. While one might expect smaller t-statistics due to the smaller sample size for the NMS companies, we nevertheless have a total of 1124 observations. The lower fit of the model to the data suggests that the NMS sample is much more heterogeneous than the EU-15 sample.

6. Discussion

6.1 Ownership and Firms Specific Factors in the EU-15 and NMS

Following the previous literature on capital structure, we use various firm-specific factors correlated with leverage, namely tangibility of assets, sales growth (a proxy for investment opportunities), company size and profitability. However, in their excellent survey Rajan and Zingales (1995) conclude that from the theoretical standpoint, empirical evidence is still puzzling for the correlations of tangibility and market-to-book ratio (investment opportunities) with leverage and explicitly state that they do not really understand why size is correlated with leverage. The effects of profitability on leverage are also ambiguous due to the dual role of profitability as a proxy for both the amount of internally generated funds and the quality of investment opportunities.

We discuss a possible missing link suggesting additional institutional variables (e.g. ownership categories) to clarify the effects of the firm-specific factors in both the EU-15 and NMS region. Table 9 presents preliminary results about the effects of both ownership categories and firm-specific factors on leverage. The table outlines several major differences. First, for the sub-sample of the NMS, only profitability and tangibility of assets seem important explaining leverage. However, in the EU-15 sub-sample all the four factors are important in most of ownership categories, except the state-owned firms.

Another striking result is the statistical and economic significance of the tangibility of assets in the NMS by *some* ownership categories. The coefficients on tangibility are statistical and economic significant only for family-controlled firms (0.318), firms controlled by mutual funds (0.356) and firms with dispersed ownership (0.151). A possible reason could be that these firms suffer from potentially severe asymmetric information problems with the external providers of finance. The cost of debt is also higher for these ownership categories. In contrast, we find that in the NMS tangibility seems to be no major factor for financial choices in state-owned firms, companies under financial control, and firms controlled by other non-financial firms. The results corroborate the expectations that these firms have easier access to external finance and less cost of debt.

Third, the results show that profitability has different effects *conditional* on ownership structures. For firms controlled by other non-financial firms, the coefficient on profitability is negative and significant in both the EU-15 (–0.420)

and NMS (–0.353). This negative sign is reported in many studies on developed countries. Open remains the question why the same ownership category in the NMS shows similar pattern of performance.

Fourth, for family-controlled firms, the coefficient on profitability is significant and with opposite signs – negative for the EU-15 (–0.283), and highly positive (0.435) – for the NMS. These opposite effects of leverage could be explained by the importance of different institutional factors. In the NMS sub-sample, we suggest that the supply side effects play a major role. The family-bank relations are less developed in the CEE region that in the Western Europe. Banks prefer lending to firms with current cash flows. While in the EU-15 sub-sample, the negative link between profitability and cash flow could be due to other reasons. The first is the possible asymmetric information problems with the external capital markets. Thus, the pecking order theory can partly explain this negative relationship. The second and, perhaps, more plausible explanation for the Western Europe is that old family firms with a good reputational capital and a long-truck record with banks have a high discretion of the controlling shareholder on internally generated cash flows. The firms prefer internal cash flows at a low cost to issuing debt. We need additional variables in order to separate and test these two different effects.

6.2 Ownership Concentration and Non-Linear Relationship with Capital Structures

After the analysis of the differential impact of the firm specific factors under these five different owner identities and dispersed ownership, we now move to the question whether ownership concentration has a material impact on the leverage ratios.

There is a long and well-known literature on the impact of ownership concentration on the performance of companies (for surveys see Shleifer and Vishny, 1997; GMY, 2004). Most of these papers point to the fact that the impact of ownership concentration on performance will be nonlinear due to different net effects of the incentive alignment and entrenchment effects of corporate ownership. A similar argument has been put forward and supported by a few empirical studies on the relationship between ownership concentration and financing choices (Brailsford, Olive and Pua, 1999; Du and Dai, 2005). There are also few studies on the effects of ownership concentration on leverage in transition economies. Hussain and Nivorozhkin (1997) find out negative and insignificant effects for listed firms in Poland. Nivorozhkin (2004) reports that in Estonia and Bulgaria, the presence of a shareholder with the ownership stake over 49.9% lead to a lower debt ratio, but the effect of ownership concentration is insignificant in Poland, the Czech Republic, and Romania.

To analyze potential nonlinearities in our data, we augment our basic regression equation by including the linear and squared terms of the shareholdings by the

direct largest shareholder (SH1). While we estimate this equation for all ownership categories, we report in Table 10 only the results for family-owned and corporate controlled companies both in the EU-15 and NMS samples. We start with an OLS estimation and then instrument SH1 using industry and country dummies along with other regressors in the equation to account for the potential endogeneity of the size of the largest shareholding and other variables (profitability and size in the first place).

In the EU-15 sample, we find an inverted-U pattern for family-owned firms, suggesting that leverage starts increasing at lower levels of family ownership and then declines, reaching its maximum at about 50% of family ownership in the OLS estimation. While less significant, instrumental variables (IV) estimation suggests a similar turning point at 55% ownership by families. On the other hand, family ownership in the NMS sample does not exhibit any impact on leverage using both the OLS and IV methods.

Turning now to the impact of ownership concentration by corporations, we observe that the linear SH1 has a negative and significant impact in both the OLS and IV estimation (albeit marginally in the IV estimation) for the EU-15 sample. The squared term is positive in both equations, hence implying a U-pattern. The OLS coefficients imply that as ownership concentration by corporate shareholders increases, leverage decreases up to a shareholding of 47.3% and starts increasing after that point. The IV coefficients imply a somewhat higher turning point at about 52.2%. For corporate shareholders in the NMS, we observe exactly the *opposite* pattern, namely leverage increases as ownership by corporate shareholders increases and declines after an ownership level of 45.3% (62.7% in the IV estimation).

We depict these relationships in the graphs 2–4 after controlling for the fact that ownership concentration is a declining function of the firm size. We first compute the averages of all the right-hand side variables for deciles of ownership concentration and then multiply the interval means with the estimated coefficients obtained from the IV estimation. In this way, we obtain nine observations in the predicted leverage−SH1 space, and then use a quadratic form to fit SH1 in the predicted leverage series. The graphs 2–4 are connected scatter plots of this relationship.

It is worth to mention that in all three cases, ownership concentration has a substantial impact on leverage ratios. As family ownership in the EU-15 increases, the relationship depicted in chart 2 suggests that leverage starts increasing from about 27% to almost 34%, reaching its maximum at about 50% ownership. Leverage starts to decline gradually after that point reaching a level of 20% at very high levels of family ownership.

The charts 3 and 4 depict the relationship between ownership concentration and leverage for the sample of companies with a corporate shareholder. Again ownership concentration has a dramatic influence on debt ratios. For the NMS

sample leverage starts increasing from 10% when ownership is in the range of 20–30%, reaching its maximum of almost 19% at about 50% ownership and from that point on declines to a level of 12%. The opposite pattern is found for firms under corporate ownership in the EU-15 sample. While these companies exhibit dramatically higher debt ratios starting at about 30% when ownership is low, leverage declines when ownership increases having a minimum of about 23% in the range of 55–60% ownership and from that point on increases till it reaches 28% at very high levels of corporate ownership.

While these patterns are interesting in there own right, it is hard to reconcile then with existing theories of capital structure without making further assumptions concerning the investment opportunities and the nature of agency relationships observed in these countries. We leave a finer analysis of this issue to future work.

7. Summary: Convergence and Divergence Trends

We summarize our major findings focusing on the observed convergence and divergence trends in the evolution of the corporate financing patterns between the EU-15 and the NMS.

Emerging Bank-Based Financial System in the NMS

In Central and Eastern Europe (CEE), the size of the banking sector (measured by the ratio of bank deposits to the GDP) is about three times larger than the size of the stock market. The bond market is less important for all CEE countries, especially the bond market for the private sector. Thus, despite the tremendous efforts of policy-makers and contrary to the "conventional wisdom" how to develop local stock exchanges, the securities markets had remained fragile in CEE.

In the EU-15 region, on average, we observe a similar type of financial system. The size of the banking sector (66% of GDP) is higher than the stock market (58% of GDP), but the bond market is much more developed than in CEE countries.

When comparing CEE and EU-15 countries, the difference is striking. The CEE region, on average, has about twice less developed banking sector (32% of GDP) and more than four time lower total stock market capitalization (12% of GDP).

Corporate Financing Patterns

In the CEE region, the total debt ratio varies from a low of 32.9% in Slovenia to a high of 58% in Poland. In CEE countries, the rates of total debt and long-term debt are still much lower than in the EU-15. The long-term debt in CEE (10.2%) is about twice lower than in both the EU-15 (26.5%) and developing countries (22.2%). Among CEE countries, only Poland (58%) has total debt ration comparable with some EU-15 countries like Austria (57.8%), Greece (58.6%), Spain (60.2%) and the Netherlands (60.7%).

In the CEE region, we observe a slight increase of the long-term debt ratio from 9% to about 11% for the period 2000–2004. For the same period, the short-term debt decreases and the overall change of the total debt is negligible. On average, both the EU-15 and developing countries show no practical change of their total debt ratios for the same period.

Country Institutional Factors

The correlation between debt ratio and the index of institutional quality is significantly positive for the EU region, but significantly negative for the NMS. There is a high degree of heterogeneity by countries. In both sub-samples, most countries are clustered in a main group and outliers. In the NMS sub-sample, all the advanced CEE countries are clustered in a group with a low debt (5-15%) and average institutional quality (coefficient 0.5–1.0). Outliers are Romania (low debt-low institutional quality) and Bulgaria and Croatia, both with average debt (15–20%) and low institutional quality (coefficient less 0.5).

In the EU-15 sub-sample, the bulk of countries are clustered in a group with high debt (20–40%) and a very high institutional quality (coefficient 1.5–2). Greece (debt ratio about 20%) and Italy (about 31%) form a group with a high debt and average institutional quality (coefficient 0.5–1). The third group (Portugal, France and Spain) is in between with high debt and an average institutional quality (coefficient 1–1.5). Definitely, further research is needed to identify the convergence models (1) among some countries in the MNS, and (1) among countries in the two sub-samples of the EU-15 and NMS.

The results confirm the expectations about the importance of the banking sector. The debt ratios vary positively with the size of banking sector in both EU-15 and NMS, but are significant only for the total EU sample.

Ownership Categories and Leverage

The state controlled companies in both EU-15 countries and NMS have higher leverage ratios than other types of companies. State controlled companies in the EU-15 have a mean leverage ratio of 34.1% whereas other firms have only a 27.7% leverage ratio, which amounts to an almost 25% difference.

A much dramatic difference is found for companies from the NMS. Namely state controlled companies have a mean leverage ratio of 23.7%, which is almost 70% higher compared to the leverage ratio of other types of firms (14.1%). Indeed, state owned firms in NMS countries have the largest leverage ratio among the six studied ownership categories. These findings are consistent with a number of existing results from both developed and developing countries (see e.g., Dewenter and Malatesta, 2001).

The expectations that family controlled firms have lower levels of leverage were confirmed in the EU-15 sample. Family controlled firms' leverage ratio is 23.5% compared to a leverage ratio of 28.5% by all other types of firms. However,

we find no statistically significant difference in the NMS sample. Only further research on the differences between family firms in the EU-15 and NMS (size, reputational capital, long-term relations with the banks, and the like) will tell us more.

The study reveals a striking difference for the dispersed ownership between the two sub-samples. In the NMS, firms with dispersed ownership have statistically significant leverage ratio of 9.7%, which is almost 50% lower than the leverage ratio of other types of firms (15%). These firms have the lowest leverage ratio among the six ownership categories that corroborate our expectations about the negative effects of managerial discretion on leverage. This leverage rate is also lower than in firms with dispersed ownership in the sub-sample of the EU-15 countries. The result confirms the expectations about the inefficient disciplining role of the takeover market for managers in the CEE region.

However, the expectations about the lower leverage for companies with dispersed ownership in the EU-15 were not corroborated. Are markets for corporate control in the EU-15 countries so efficient to constrain managerial discretion in firms with dispersed ownership? Are there country differences between Anglo-Saxon and the Continental Europe countries? These questions need to be addressed by further research.

We examine six ownership categories identified by *direct* ownership and reveal that three of them, the state, family and dispersed ownership have potential association with leverage rates. The state and family are also *ultimate* owners of the companies. An important path for further research is to identify the ultimate owners of all the public companies in the NMS and their influence on the corporate financing choices.

Firm-specific factors correlated with leverage

For the sample of companies from the EU-15, profitability (ROA) and sales growth have a negative and significant effect, while size and tangibility have a significantly positive effect on leverage. One important difference of the EU-15 results is the substantially higher coefficient on tangibility for the EU-15 sample.

On the other hand, the coefficient estimates for the NMS sample suggest three important differences to the EU-15. First we observe that size has a much smaller impact on leverage and it is much less significant. Second, tangibility of the firms' assets is now insignificantly related to leverage. The third difference is observed in the much more negative albeit insignificant role of sales growth of the NMS sample companies. The lower fit of the model to the data suggests that the NMS sample is much more heterogeneous than the EU-15 sample. Again, further research is needed to focus on these country differences within the NMS.

Other Unresolved Questions

We finish with the most preliminary part of our research, the joint effects of ownership and other firm characteristics on leverage and the possible non-linear relationship between ownership concentration and leverage.

We discuss a possible missing link suggesting additional institutional variables (e.g. ownership categories) to clarify the effects of the firm-specific factors in both the EU-15 and NMS region. The preliminary results show a statistical and economic significance of the tangibility of assets in the NMS for *only* family-controlled, firms controlled by mutual funds and firms with dispersed ownership. In contrast, we found that tangibility seems to be no important determinant of leverage for state-owned, firms under financial control, and firms controlled by other non-financial firms. One may suggest that asymmetric information plays important role explaining these differences.

The results also show that profitability has different effects on leverage conditional on ownership structures. The coefficient on profitability is negative and significant for firms controlled by other non-financial firms in both the EU-15 (– 0.42) and NMS (–0.35).

For family-controlled firms, the coefficient on profitability is significant and with opposite sign – negative for the EU-15, and positive – for NMS. These opposite effects of leverage could be explained by the importance of different institutional factors. In the NMS sub-sample, we suggest that the supply side effects play a major role. While in the EU-15 sub-sample, the negative link between profitability and cash flow could be due to other reasons. The first is the possible asymmetric information problems with the external capital markets. The second – the high managerial discretion of the controlling shareholder on internally generated cash flows. Both lead to a negative link between profitability and leverage, but we need additional variables in order to separate and test these two different effects.

Finally, we find a non-linear relationship between ownership concentration and leverage. It is interesting that this non-linearity is observed for companies under the control of corporations in both the EU-15 and NMS samples. Regression results indicate that the EU-15 companies exhibit a U-pattern, while the pattern is an inverted-U in the NMS sample. While this result may be obscured by the fact that corporations are not the ultimate owners, it is hard to reconcile the inverted-U pattern that we find for the family-owned firms in the EU-15 sample. These findings also suggest that the impact of ownership concentration can be quite substantial. On the other hand, we do not find any (either linear or non-linear) relationship between ownership concentration by families and leverage in the NMS sample. In the absence of potentially helpful proxies for agency costs and investment opportunities, we leave further extensions and interpretations of these results to further research.

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Chart 1: The Relationship between Leverage and Institutional Quality across Countries

This chart presents the relationship between leverage (measured as the mean of the long-term debt to total assets ratio of all firms in our sample) and institutional quality (av_wb_index), which is measured as the sum of six measures: (1) Voice and Accountability, (2) Political Stability, (3) Government Effectiveness, (4) Regulatory, (4) Quality, (5) Rule of Law, and (6) Control of Corruption. The indicators are constructed using an unobserved components methodology described in detail in Kaufmann, Kraay and Mastruzzi (2005). The six governance indicators are measured in units ranging from about –2.5 to 2.5, with higher values corresponding to better governance outcomes.
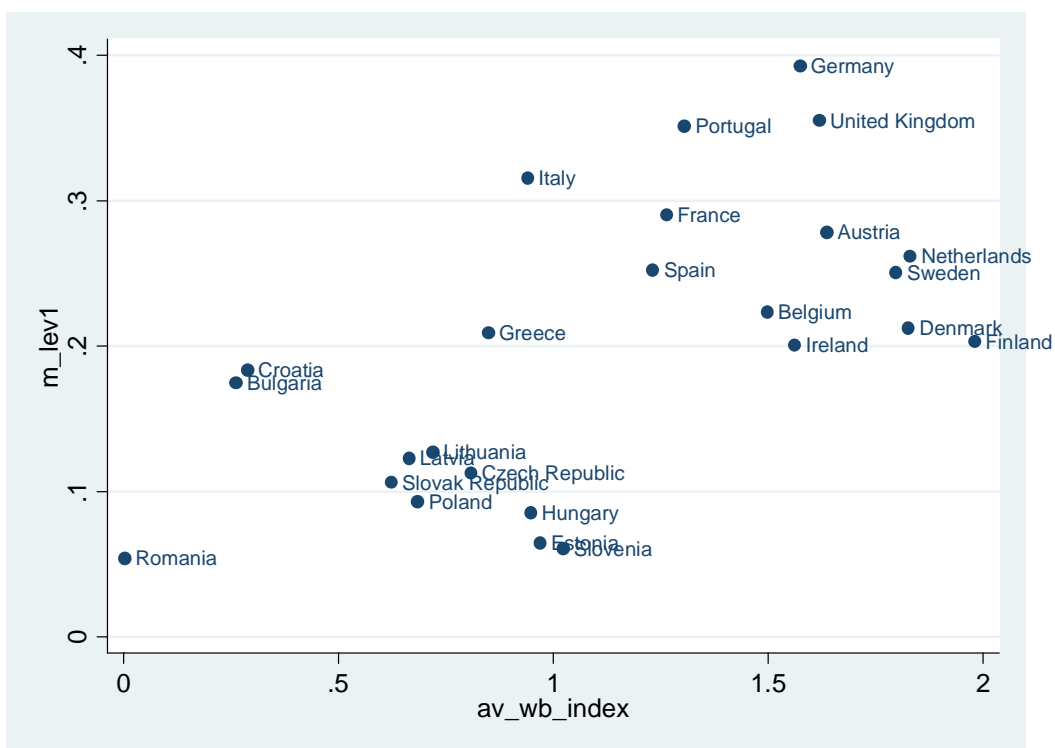
Source: Authors' calculations.

Chart 2: The Predicted Relationship between Leverage and Shareholder Concentration of Families in the EU-15
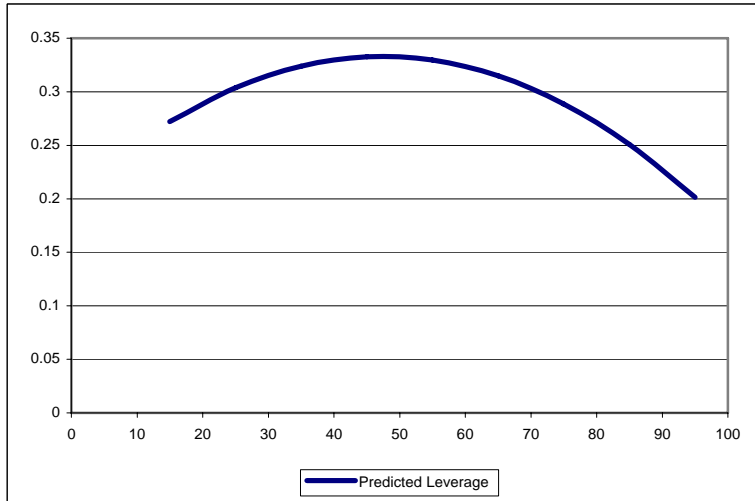
Source: Authors calculations.

Chart 3: The Predicted Relationship between Leverage and Shareholder Concentration of Corporations in the NMS
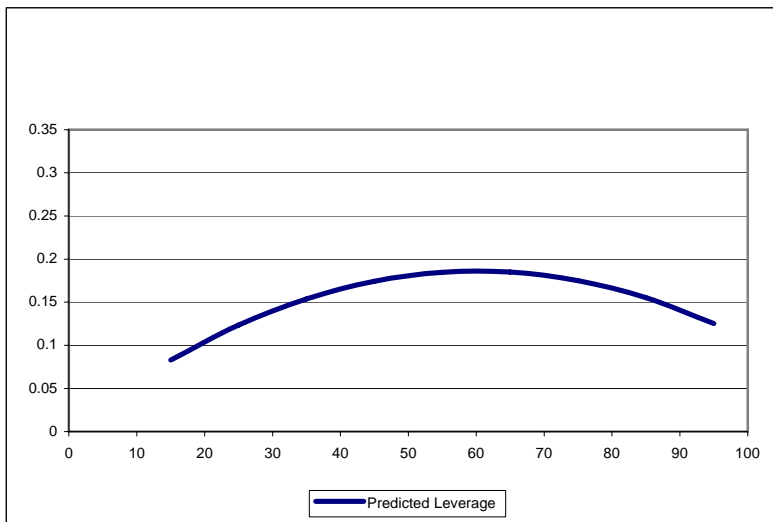
Source: Authors' calculations.

Chart 4: The Predicted Relationship between Leverage and Shareholder Concentration of Corporations in the EU-15
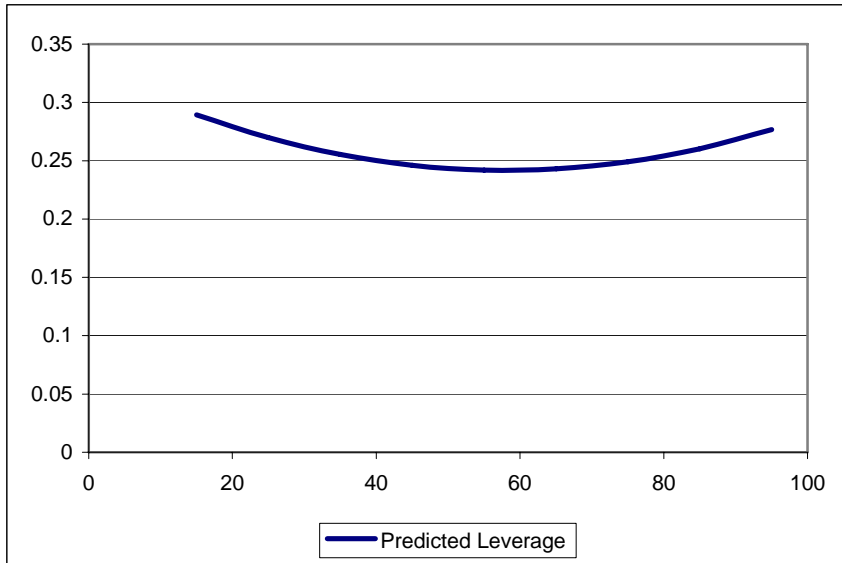
Source: Authors' calculations.

Table 1: Size of Capital Markets

Country	Bank deposits to GDP	Stock market capitalization to GDP	Private bond market cap. to GDP	Public bond market cap. to GDP
Austria	0.8086	0.1441	0.3137	0.3173
Belgium	0.7339	0.575	0.485	10.096
Denmark	0.5246	0.4437	10.459	0.5536
Finland	0.5039	0.8681	0.2964	0.2822
France	0.6056	0.5583	0.46	0.3829
Germany	0.736	0.3682	0.4937	0.2769
Greece	0.6097	0.4531	0.0204	0.7118
Ireland	0.606	0.6072	0.0709	0.3304
Italy	0.535	0.3179	0.336	0.9027
Netherlands	0.8336	0.9596	0.369	0.453
Portugal	0.8763	0.3009	0.1729	0.402
Spain	0.6748	0.5026	0.1696	0.419
Sweden	0.4006	0.8313	0.4844	0.4384
United Kingdom	0.8631	12.997	0.156	0.2993
EU-15	**0.6612**	**0.5873**	**0.3481**	**0.4842**
Bulgaria	0.3702	0.0445		
Croatia	0.3819	0.1493		
Czech Republic	0.5785	0.2114	0.0412	0.2234
Estonia	0.2304	0.2937		
Hungary	0.375	0.1657	0.0149	0.2651
Latvia	0.1829	0.0627		
Lithuania	0.158	0.124		
Poland	0.2876	0.0999	0	0.2819
Romania	0.1907	0.0384		
Slovak Republic	0.5359	0.062	0	0.1198
Slovenia	0.3634	0.1217		
CEE-Total	**0.3293**	**0.122**	**0.014**	**0.2225**
Developing - Total	0.4854	0.6461	0.074	0.1888
Japan	10.598	0.7305	0.4409	0.6913
United States	0.5602	10.791	0.9049	0.5135

Source: IMF, IFS. Data are for 2003.

Table 2: Debt Ratios

Country	Long-term debt ratio	Short-term debt ratio	Total debt ratio
Austria	0.2632	0.3139	0.5771
Belgium	0.2227	0.3283	0.551
Denmark	0.2012	0.3238	0.525
Finland	0.2087	0.3112	0.5199
France	0.3015	0.3904	0.692
Germany	0.3813	0.3031	0.6844
Greece	0.203	0.3834	0.5863
Ireland	0.1412	0.3204	0.4616
Italy	0.2841	0.3686	0.6526
Netherlands	0.2577	0.3495	0.6072
Portugal	0.3373	0.3978	0.7351
Spain	0.2536	0.3479	0.6016
Sweden	0.2619	0.2982	0.5601
United Kingdom	0.3407	0.3358	0.6765
EU-15	**0.2646**	**0.3427**	**0.6073**
Bulgaria	0.1574	0.3407	0.4981
Croatia	0.1697	0.2656	0.4353
Czech Republic	0.0941	0.2934	0.3875
Estonia	0.0645	0.3029	0.3674
Hungary	0.0603	0.3152	0.3756
Latvia	0.0888	0.1847	0.2735
Lithuania	0.1655	0.2373	0.4019
Poland	0.0957	0.4821	0.5805
Romania	0.0512	0.3393	0.3905
Slovak Republic	0.0958	0.3489	0.4447
Slovenia	0.0536	0.2755	0.329
CEE-Total	**0.1029**	**0.3043**	**0.4074**
Developing-Total	0.2221	0.2968	0.5191
Japan	0.2975	0.3908	0.6883
United States	0.4209	0.2079	0.6288

Source: OSIRIS database. Data are for 2003. The long term-debt is defined as the ratio of the long-term debt to total assets. The short-term debt is measured as the ratio of the short-term debt to total assets. Total debt is the ratio of the sum of the long-term and short-term debt divided by total assets.

Table 3: Debt Ratios by Years

Region	2001	2002	2003	2004	Total
EU-15					
Long-term debt	0.2638	0.2677	0.2767		0.2646
Short-term debt	0.3472	0.3353	0.3353		0.3427
Total debt	0.611	0.603	0.612		0.6073
CEE					
Long-term debt	0.0908	0.0983	0.113	0.1104	0.1029
Short-term debt	0.3207	0.2989	0.2982	0.3011	0.3043
Total debt	0.4112	0.3978	0.4112	0.4116	0.4074
Developing					
Long-term debt	0.2191	0.239	0.211		0.2221
Short-term debt	0.291	0.2952	0.3026		0.2968
Total debt	0.5111	0.5341	0.5135		0.5191
United States					
Long-term debt	0.4549	0.4979	0.4741		0.4209
Short-term debt	0.2191	0.203	0.1897		0.2079
Total debt	0.674	0.7009	0.6638		0.6288
Japan					
Long-term debt	0.2977	0.3052	0.2897		0.2975
Short-term debt	0.395	0.3962	0.381		0.3908
Total debt	0.6927	0.7013	0.6707		0.6883

Source: OSIRIS database.

Table 4: Correlation Matrix

	Long-term debt	Lending rate	Tax_rate	Bank deposits/GDP	CPI	Real GDP growth	Index of institutional quality
EU region							
Long-term debt	1						
Lending rate	-0.5212	1					
	0						
Tax rate	0.6309	-0.3993	1				
	0.0022	0.0656					
Bank deposits/GDP	0.699	-0.3015	0.6356	1			
	0	0	0.0008				
Inflation rate	-0.3639	0.5734	-0.0882	-0.1214	1		
	0.0013	0	0.682	0.0743			
Real GDP growth	-0.4479	0.2481	-0.8419	-0.4792	0.1064	1	
	0.0001	0.0184	0	0	0.2919		
Index of institutional quality	0.5744	-0.4243	0.4685	0.5608	-0.1897	-0.4116	1
	0	0	0.021	0	0.0043	0	
Share price change	-0.3121	0.3354	-0.463	-0.3593	0.2097	0.4324	-0.4081
	0.009	0	0.03	0	0.0024	0	0

Table 4 continued: Correlation Matrix

	Long-term debt	Lending rate	Tax_rate	Bank deposits/GDP	CPI	Real GDP growth	Index of institutional quality
EU-15							
Long-term debt	1						
Lending rate	-0.0511	1					
	0.781						
Tax rate	0.5454	0.2757	1				
	0.0666	0.362					
Bank deposits/GDP	0.4746	-0.2162	0.2167	1			
	0.003	0.0246	0.4568				
Inflation rate	0.0319	0.3796	-0.3448	0.2054	1		
	0.8511	0	0.2273	0.0256			
Real GDP growth	-0.3128	0.1416	-0.8063	-0.0815	0.5991	1	
	0.0595	0.3268	0.0005	0.5506	0		
Index of institutional quality	-0.1929	-0.3911	-0.2835	-0.0451	-0.4229	-0.1098	1
	0.2527	0	0.3261	0.5262	0	0.4206	
Share price change	0.1094	0.3586	0.1876	-0.075	0.1267	0.1082	-0.3495
	0.5192	0.0001	0.5206	0.2909	0.1574	0.4273	0

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Table 4 continued: Correlation Matrix

	Long-term debt	Lending rate	Tax_rate	Bank deposits/GDP	CPI	Real GDP growth	Index of institutional quality
CEE							
Long-term debt	1						
Lending rate	-0.0362	1					
	0.8341						
Tax rate	-0.4744	-0.05	1				
	0.197	0.8983					
Bank deposits/GDP	-0.0305	-0.0222	0.5155	1			
	0.856	0.8355	0.1273				
Inflation rate	-0.3858	0.592	0.1587	-0.0635	1		
	0.0167	0	0.6615	0.5324			
Real GDP growth	0.2768	-0.3363	-0.6733	-0.4654	-0.2517	1	
	0.0925	0.0338	0.0328	0.0015	0.0993		
Index of institutional quality	-0.4173	-0.2397	0.1708	0.1569	-0.1983	0.0571	1
	0.0091	0.0229	0.637	0.0671	0.0491	0.7127	
Share price change	0.2217	0.1788	-0.5985	-0.1925	0.1702	0.469	-0.061
	0.2226	0.1329	0.117	0.0411	0.1288	0.0039	0.4824

Note: For data sources and definitions of the variables, see Section 3.

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Table 5: Institutional Influences on Leverage

The table presents the coefficients of a regression equation estimated for the full sample of EU-15 and new member state companies, and for separate samples of EU-15 and new member state companies. The dependent variable is the long-term debt to total assets ratio. The independent variables are as follows. Institutional quality is measured as the sum of six measures: (1) Voice and Accountability, (2) Political Stability, (3) Government Effectiveness, (4) Regulatory, (4) Quality, (5) Rule of Law, and (6) Control of Corruption. The indicators are constructed using an unobserved components methodology described in detail in Kaufmann, Kraay and Mastruzzi (2005). Bank deposits/GDP is the ratio of bank deposits to GDP. Lending rate is the average country annual lending rate. Tax rate is measured by the tax rates compiled by the KPMG's annual survey of corporate tax rates (KPMG, 2003). The absolute values of the t-statistics are under the coefficients.

	Full Sample	EU-15	NMS	Full Sample	EU-15	NMS
Institutional quality	0.006	-0.039	-0.146			
	0.12	-0.64	-6.48			
Bank deposits/GDP				0.176	0.089	0.299
				2.34	1.08	1.50
Lending rate	-0.015	-0.022	0.000	-0.011	-0.013	-0.006
	-1.59	-1.39	-0.07	-1.76	-0.97	-0.68
Tax rate	0.006	0.006	-0.001	0.003	0.005	-0.009
	2.39	2.19	-0.64	1.14	2.03	-2.06
Observations	20	11	9	20	11	9
Adj-R-Sq.	0.46	0.22	0.87	0.59	0.30	0.19

Source: Authors' calculations.

Table 6: Ownership Categories and Leverage

This table presents comparisons of long-term debt levels as a fraction of total assets across direct ownership categories. We define a company as state-owned, if the largest direct shareholdings are held by the state and are at least 20%. Other types of ownership are defined similarly. Dispersed companies are those with no shareholder holding 20% of the outstanding shares. The comparisons are based on the means of the long-term debt ratio. For example, the state owned firms in the old member states (EU-15) have a 34.1% long-term debt ratio, whereas the same ratio is 27.7% for all other types of firms in the EU-15. The signs between the two means indicate the statistical significance of the debt levels (>: significantly greater at the 5% or better, <: significantly smaller at the 5% or better, and ≈: insignificantly different at the 5% significance level or better).

	EU 15				**NMS**		
State	0.341	>	0.277		0.237	>	0.141
Financial	0.292	≈	0.277		0.105	≈	0.144
Family	0.235	<	0.284		0.164	≈	0.147
Corporations	0.279	≈	0.276		0.145	≈	0.140
Mutual Funds	0.302	>	0.277		0.152	≈	0.142
Dispersed	0.283	≈	0.275		0.097	<	0.150

Source: Authors' calculations.

Table 7: Summary Statistics by Country in the EU-15 and NMS Samples

Country	ROA		Size		Tangibility		Sales growth		SH1	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Austria	0.046	0.095	12.869	1.716	0.348	0.212	0.203	0.243	50.01	17.38
Belgium	0.048	0.075	12.552	1.499	0.327	0.262	0.226	0.302	45.19	22.86
Denmark	0.034	0.117	12.251	1.458	0.326	0.181	0.168	0.419	26.91	16.63
Finland	0.036	0.113	12.355	1.813	0.309	0.208	0.276	0.381	30.00	21.24
France	0.062	0.042	15.319	1.091	0.225	0.163	0.193	0.157	44.77	21.96
Germany	0.063	0.059	14.874	1.111	0.294	0.167	0.223	0.526	46.11	30.32
Greece	0.073	0.062	12.218	1.244	0.313	0.180	0.296	0.427	42.54	19.69
Ireland	0.126	1.368	11.897	1.972	0.285	0.252	0.289	0.647	19.51	14.20
Italy	0.047	0.056	14.085	1.126	0.275	0.195	0.278	0.305	40.52	19.91
Netherlands	0.047	0.083	13.838	1.437	0.236	0.186	0.159	0.244	27.81	25.78
Portugal	0.010	0.097	12.756	1.723	0.321	0.178	0.173	0.176	39.72	23.85
Spain	0.064	0.051	13.577	1.563	0.356	0.204	0.411	1.402	29.33	19.73
Sweden	0.032	0.116	13.171	1.558	0.255	0.200	0.207	0.231	27.30	16.00
United Kingdom	0.073	0.067	15.472	0.456	0.346	0.275	0.161	0.246	11.51	10.45
EU-15	0.052	0.282	13.520	1.812	0.296	0.209	0.207	0.271	34.36	23.41

Table 7contintued: Summary Statistics by Country in the EU-15 and NMS Samples

Country	ROA		Size		Tangibility		Sales growth		SH1	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Bulgaria	0.026	0.072	9.682	0.904	0.509	0.190	0.207	0.501	63.620	23.525
Croatia	0.027	0.063	11.061	0.913	0.563	0.255	0.203	0.360	54.842	27.626
Czech Republic	0.044	0.095	12.159	1.202	0.562	0.211	0.149	0.348	58.263	32.305
Estonia	0.080	0.088	10.301	0.505	0.301	0.218	0.263	0.244	54.199	23.558
Hungary	0.052	0.073	11.768	1.720	0.431	0.185	0.264	0.893	34.261	26.760
Latvia	0.042	0.126	9.929	1.414	0.547	0.172	0.189	0.535	51.347	18.566
Lithuania	0.054	0.063	10.877	1.274	0.598	0.183	0.428	0.885	59.973	24.631
Poland	0.053	0.062	11.218	0.898	0.368	0.194	0.138	0.417	37.118	20.425
Romania	0.071	0.094	9.985	1.122	0.505	0.142	0.250	0.444	60.265	24.774
Slovak Republic	0.024	0.059	9.085	1.275	0.523	0.179	0.229	0.273	54.017	23.941
Slovenia	0.048	0.041	10.784	1.189	0.473	0.136	0.241	0.224	36.963	32.434
NMS	0.040	0.073	10.484	1.428	0.499	0.207	0.214	0.455	52.795	26.954
EU-15 & NMS	0.048	0.228	12.386	2.230	0.371	0.230	0.208	0.366	39.47	25.80

Source: Authors' calculations.

Table 8: The Determinants of Leverage in the EU-15 and the New Member States

The table presents the coefficients of a regression equation estimated for the full sample of EU-15 and new member state companies, and for separate samples of EU-15 and new member state companies. The dependent variable is the long-term debt to total assets ratio. The independent variables are defined as follows: ROA is the return on assets, defined as the ratio of earnings before interest and taxes to total assets. Size is the (natural) logarithm of total assets. Tangibility is the ratio of total fixed assets to total assets. Sales growth is the percentage change in sales. All equations include a full set of time, industry and country dummies. The absolute values of the t-statistics are under the coefficients.

	Full Sample	**EU-15**	**NMS**
ROA	-0.135	-0.167	-0.152
	(4.55)	(4.59)	(2.89)
Size	0.034	0.039	0.009
	(17.24)	(17.16)	(2.32)
Tangibility	0.132	0.181	0.028
	(9.68)	(10.55)	(1.19)
Sales Growth	-0.0002	-0.0002	-0.0035
	(2.08)	(2.18)	(1.00)
Country dummies	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Observations	2998	1874	1124
Adj- R-Sq	0.43	0.38	0.18

Source: Authors' calculations.

Table 9: The Impact of Ownership Identity

Table 9 presents the coefficient estimates of our basic model to explain the variation in the long-term debt to asset ratios for companies under State ownership, Financial company ownership, Family ownership, Non-financial corporate ownership, Mutual Fund ownership and with dispersed ownership structures. For each ownership category, we report the results for the full sample (All), for the sample of companies in the EU-15 countries (EU-15), and for the NMS. All equations include a full set of time and industry dummies, with the exception of state owned companies in the NMS sample, where we drop the industry dummies due to the number of degrees of freedom in such a small sample. The (absolute values) of the t-statistics are reported under the coefficients. The cut-off point for defining ownership identity is 20%.

	State			Financial			Family			Non-financial firm			Mutual fund			Dispersed		
	All	EU-15	NMS	All	EU-15	NMS	All	EU-15	NMS	All	EU-15	NMS	All	EU-15	NMS	All	EU-15	NMS
ROA	0.386	0.341	0.555	0.149	-0.234	0.473	-0.078	-0.283	0.435	-0.367	-0.420	-0.353	-0.621	-0.607	-0.267	-0.164	-0.147	0.149
	(0.60)	(0.29)	(0.61)	(0.56)	(0.65)	(0.83)	(0.76)	(2.46)	(1.96)	(6.41)	(5.63)	(4.27)	(3.49)	(2.75)	(0.96)	(2.63)	(2.23)	(0.89)
Size	0.057	0.095	-1.17	0.046	0.041	0.104	0.044	0.049	-0.010	0.044	0.043	-0.005	0.029	0.027	0.016	0.042	0.035	-0.004
	(2.85)	(2.85)	(-2.40)	(5.64)	(4.45)	(0.89)	(8.96)	(7.42)	(0.59)	(18.23)	(12.37)	(0.78)	(4.00)	(3.19)	(0.74)	(16.00)	(11.91)	(0.36)
Tangibility	0.502	0.004	0.968	0.150	0.233	-0.056	0.220	0.243	0.318	0.083	0.221	-0.055	0.005	0.058	0.356	0.100	0.133	0.151
	(2.23)	(0.01)	(0.53)	(2.34)	(3.10)	(0.16)	(4.41)	(3.34)	(3.65)	(3.54)	(7.49)	(1.40)	(0.007)	(0.48)	(2.92)	(3.93)	(5.02)	(1.74)
Sales Growth	-0.100	-0.204	-0.093	0.001	0.0007	-0.099	-0.007	-0.008	-0.011	0.004	0.012	-0.004	0.051	0.169	0.009	-0.0003	-0.0002	-0.033
	(0.88)	(1.33)	(-0.74)	(0.19)	(0.08)	(0.67)	(0.75)	(0.72)	(0.64)	(0.94)	(1.96)	(0.62)	(1.53)	(2.05)	(0.29)	(3.29)	(3.04)	(-1.31)
Observations	53	39	14	130	108	22	319	205	114	1140	639	501	131	89	42	800	705	95
Adj- R-Sq	0.57	0.28	0.43	0.56	0.54	0.47	0.31	0.35	0.32	0.31	0.39	0.15	0.54	0.52	0.67	0.39	0.37	0.66

Table 10: Non-Linear Impact of Shareholder Concentration

	Family				Corporate			
	EU-15		NM		EU-15		NM	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
SH1	0.005	0.0044	0.0013	-0.001	-0.0016	-0.0027	-0.0012	0.006
	(2.88)	(1.73)	(0.63)	(0.65)	(1.84)	(1.67)	(0.89)	(2.04)
SH1_2	-0.000054	-0.00004	-0.00001	0.00001	0.00001	0.00002	0.00001	-0.00005
	(2.81)	(1.50)	(0.79)	(0.43)	(1.99)	(1.67)	(1.16)	(2.02)
ROA	-0.267	-0.230	0.256	0.056	-0.340	-0.253	-0.328	-0.328
	(2.61)	(2.41)	(1.26)	(0.21)	(5.07)	(3.14)	(3-98)	(3.07)
Size	0.048	0.046	-0.003	-0.0008	0.038	0.042	-0.0005	-0.0028
	(8.88)	(11.54)	(0.23)	(0.06)	(11.76)	(14.84)	(0.07)	(0.55)
Tangibility	0.210	0.152	0.283	0.213	0.244	0.287	-0.049	0.098
	(3.30)	(2.95)	(3.64)	(3.79)	(8.88)	(11.07)	(1.28)	(3.12)
Sales Growth	-0.009	-0.016	-0.008	0.014	-0.0002	-0.0003	-0.008	-0.0018
	(0.84)	(2.67)	(0.54)	(0.85)	(2.77)	(11.54)	(1.27)	(0.50)
Obs.	239	239	136	136	748	748	523	523
Adj. R-Sqd	0.41	0.372	0.30	0.10	0.38	0.34	0.13	0.03

Source: Authors' calculations.

Appendix

Table 1A: Ownership Structure by Country and Region
(the Fraction of Companies under the Six Ownership Categories in Each Country)

Country	State	Financial	Families	Corporate	Mutuals	Dispersed
Austria	7.55%	3.77%	17.12%	50.00%	0.00%	20.75%
Belgium	0.00%	17.28%	4.48%	40.23%	5.95%	32.01%
Denmark	1.51%	2.26%	8.68%	34.34%	13.96%	38.49%
Finland	6.11%	1.93%	14.24%	31.19%	3.54%	42.44%
France	0.58%	4.09%	7.02%	38.30%	5.85%	44.15%
Germany	1.24%	4.95%	15.10%	40.87%	2.48%	34.06%
Greece	0.00%	2.13%	37.56%	34.57%	4.26%	19.68%
Ireland	0.00%	0.00%	11.84%	19.67%	6.56%	59.02%
Italy	11.18%	15.59%	7.54%	45.29%	0.88%	19.12%
Netherlands	2.45%	7.36%	3.75%	25.15%	1.53%	59.20%
Portugal	0.00%	8.79%	9.89%	53.85%	5.49%	21.98%
Spain	0.00%	3.85%	6.59%	49.18%	1.10%	39.29%
Sweden	0.28%	3.35%	18.31%	28.77%	13.41%	35.47%
United Kingdom	0.00%	3.14%	1.69%	7.06%	2.75%	85.10%
Total	**2.19%**	**6.21%**	**10.59%**	**35.70%**	**4.95%**	**39.74%**
Bulgaria	0.00%	2.27%	9.92%	84.42%	0.00%	3.40%
Croatia	3.67%	1.33%	18.90%	49.00%	12.00%	13.33%
Czech Republic	0.00%	11.54%	0.00%	57.69%	11.54%	19.23%
Estonia	0.00%	0.00%	33.33%	66.67%	0.00%	0.00%
Hungary	0.00%	0.00%	0.00%	42.86%	14.29%	42.86%
Latvia	0.00%	0.00%	26.67%	63.64%	0.00%	0.00%
Lithuania	0.00%	6.45%	9.38%	74.19%	3.23%	6.45%
Poland	4.70%	1.88%	20.49%	42.01%	3.76%	24.14%
Romania	2.33%	4.65%	5.00%	63.95%	12.79%	4.65%
Slovak Republic	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%
Slovenia	0.00%	0.00%	0.00%	46.88%	0.00%	53.13%
Total	**1.90%**	**2.85%**	**9.92%**	**60.80%**	**5.64%**	**13.72%**

Table 2A: Regression Results by Individual Countries in the EU-15 Sample

	AT	BE	DK	FI	FR	DE	GR	IE	IT	NL	PT	ES	SE	UK
ROA	0.146	-0.304	-0.094	-0.071	-0.801	-0.636	-0.423	0.350	-0.307	0.119	-0.432	-0.468	-0.135	-0.326
	0.62	-2.01	-0.86	-0.83	-2.64	-3.66	-1.39	2.67	-1.44	1.05	-2.34	-2.23	-0.94	-1.90
Size	0.038	0.032	0.012	0.012	0.060	0.006	0.066	0.038	0.044	0.064	0.083	0.048	0.025	0.010
	1.59	3.95	1.39	2.24	5.38	0.81	4.82	2.72	4.92	9.26	5.78	5.55	2.83	0.32
Tangibility	0.233	0.196	0.245	0.247	0.276	0.300	-0.068	-0.146	0.304	0.079	-0.200	0.235	0.163	0.177
	0.88	3.90	3.18	4.41	3.71	4.17	-0.48	-1.00	4.96	1.26	-1.79	3.84	2.01	2.15
Sales Growth	-0.076	-0.001	0.025	0.027	0.015	-0.013	-0.013	0.006	-0.004	-0.071	-0.111	0.017	0.000	-0.114
	-0.76	-1.34	1.13	1.30	0.21	-0.90	-1.25	0.17	-0.54	-1.88	-1.16	2.53	-1.69	-1.89
Intercept	-0.293	-0.248	-0.024	-0.012	-0.660	0.256	-0.555	-0.235	-0.408	-0.642	-0.625	-0.458	-0.120	0.166
	-1.08	-2.39	-0.20	-0.17	-3.57	2.18	-3.30	-1.34	-3.13	-6.51	-3.31	-3.95	-0.98	0.33
N	52	155	134	155	154	167	92	66	158	180	90	169	169	133
Adj. R-Sqd	0.62	0.38	0.4	0.59	0.44	0.55	0.53	0.6	0.5	0.48	0.52	0.45	0.35	0.54

Table 3A: Regression Results by Individual Countries in the NMS Sample

	BG	HR	CZ	EE	HU	LV	LT	PL	RO	SK	SI
ROA	-0.394	-0.331	-0.371	-0.651	-0.117	0.087	-0.077	0.113	-0.281	-0.325	-0.521
	-2.04	-1.76	-3.43	-1.54	-0.62	0.75	-0.26	0.79	-1.56	-2.24	-2.54
Size	0.004	0.008	-0.006	0.400	0.007	-0.055	0.019	-0.025	0.043	-0.019	0.016
	0.23	0.69	-0.41	2.07	0.4	-1.32	0.69	-2.64	2.91	-2.04	2.31
Tangibility	-0.153	0.061	0.292	0.533	0.412	-0.303	-0.068	0.297	-0.017	-0.134	-0.014
	-2.02	1.07	3.43	1.23	1.9	-1.32	-0.42	6.1	-0.13	-2.19	-0.26
Sales Growth	-0.007	-0.001	-0.004	-0.150	-0.002	0.012	-0.007	0.008	0.016	0.062	-0.006
	-0.71	-0.12	-0.16	-1.81	-0.15	0.37	-0.24	0.66	0.5	1.99	-1.91
Intercept	0.231	0.060	0.032	-4.062	-0.187	0.848	-0.027	0.257	-0.351	0.344	-0.071
	1.42	0.43	0.17	-2.03	-1.07	1.55	-0.08	2.39	-2.01	3.39	-0.84
N	235	182	92	17	22	31	58	169	97	146	75
Adj. R-Sqd	0.07	0.44	0.35	0.79	0.27	0.51	0.09	0.29	0.10	0.15	0.30