Cross-country evidence on capital structure variability

JOB MARKET PAPER

Balbinder Singh Gill[1]

Vrije Universiteit van Brussel

Email: Balbindersgill@gmail.com

Webpage: www.sites.google.com/site/researchbalbindersinghgill

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Abstract

This paper examines the variability of capital structure in 647,055 unlisted firms from 20 European countries. This paper finds that debt ratio is unstable over time and across 20 European countries. A deeper and more extensive analysis of the instability of leverage suggests that firm-characteristics identified by previous studies important in determining the cross-section of capital structure such as profitability, future growth opportunities and the age of the firm are important in explaining and resolving the puzzle why debt ratio is not stable. Country-specific determinants are not important in explaining the debt instability over time. Only a small part of the instability in capital structure remains unexplained.

JEL classification: G31 and G32
Key words: Capital structure – unlisted firms – international evidence

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1. Introduction

The modern theory of corporate capital structure began with the seminal paper of Modigliani and Miller (1958), which pointed the direction that such theories must take by showing under what conditions capital structure is irrelevant. Since then, many economists have devoted much effort to understanding firm's financing policies. The predominantly theories of capital structure are the trade-off, pecking order, and market timing theories. Other studies have examined the relative merits of static trade-off and pecking order theories. We have accumulated many helpful insights into capital structure choice. However, these theories do not fully explain the observed time series and the cross-sectional dynamics of corporate capital structures documented in the literature. Recent research finds that capital structure remains almost unchanged during its life and significantly stable over time. The stability of leverage ratios is mainly generated by an unobserved time-invariant effect that is liable for the majority of the variation in capital structure (Lemmon, Roberts, and Zender (2008)). This new theory is called the inertia or capital structure stability theory.

A significant fraction of the effort of researchers over the past five decades has been devoted to models in which capital structure choice is determined by the predominantly theories on capital structure. Many papers have been published that are important or representative of a given stream of capital structure research. By contrast, we know very little about capital structure stability. There has been little if any research explaining the origins of the stability of capital structure. As Meyer's (1984) stated "*our capital structure theories do not seem to explain actual financing behavior, and it seems presumptuous to advice firms on optimal capital structure when we are so far from explaining actual decisions*" (page 575). The capital structure stability puzzle is tough to explain. We do not know why corporate capital structures remain stable over periods

of time. In general, we have inadequate understanding of corporate capital structure stability, and of how that behavior affects corporate financing policies. I contribute to the literature by analyzing empirically which factors explain the degree of capital structure stability of unlisted firms in twenty European countries during the period 2004 to 2010.

My primary objective is to establish whether capital structure of unlisted firms is stable in European countries. In doing so, I do not restrict myself to attempting to reproduce regularities found in the United States (see Lemmon, Roberts and Zender (2008)), but I try to go deeper to understand the forces behind them. The use of a comprehensive database of firms in twenty European countries provides a unique opportunity for this analysis. To the extent that other countries are similar to the United States, they provide an independent sample to test the received wisdom.

In my opinion, Europe offers a fertile and interesting ground for investigating empirically which factors explain the degree of capital structure stability of unlisted firms. *First*, relatively little is known about the financing behavior of unlisted firms. Brav (2009) states that the differences between the financial policies of unlisted and listed firms are striking in the United Kingdom. Unlisted firms have on average higher debt ratios, use more short-term debt and raise significantly less equity than their listed counterparts,. Unlisted firm's financial policies are more passive than those of listed firms. Unlisted firms are less likely to visit the external capital markets and it is more costly for these firms to rebalance their debt ratios. However, as unlisted firms increase their leverage the likelihood and the expected costs of bankruptcy increase. According to the traditional trade-off theory, firms will continue to increase their leverage until the marginal costs of their equity is equal to the marginal cost of their debt. As a result, unlisted firms will have a stronger preference for internal financing because raising capital (debt or

equity) in the external capital markets becomes costly at their optimal debt ratio. Moreover, debt becomes more risky and more information-sensitive as well. As a result, unlisted firms will have a preference for internal capital over external capital (debt or equity). *Second*, privately held firms represent a significant share of economic activity and are widely regarded to be important contributors to innovation and economic growth. Equally important, European countries are characterized with a very small number of listed companies compared to the size of their economy. *Third*, the existing empirical evidence on the capital structure stability of firms across European countries is very thin. For example, Hanousek and Shamshur (2011) demonstrate that even substantial changes in the economic environment do not affect the stability of firms' leverage due to the presence of credit constraints in emerging European countries. However, the paper does not document clearly whether the capital structure remains stable over time in these countries. The authors acknowledge that unobserved firm heterogeneity might explain capital structure decisions by including firm fixed effects into their regression models. Brav (2009) documents that the debt ratio of unlisted firms exhibits greater persistence relative to listed firms in the United Kingdom from 1994 until 2003. Moreover the existing research on capital structure stability is focused mainly on US listed firms (Lemmon, Roberts and Zender (2008)). *Fourth*, studies comparing differences in the degree of stability of capital structure between European countries might highlight that common firm-specific factors might significantly influence the level of capital structure stability across European countries, while several country-specific factors also can play an important role. For instance, several recent studies documents that financing policies and managers' behavior can be influenced by the institutional and macro-economic environment and international operations even among developed economies like the U.S. and European countries (see Graham and Harvey (2001); Bancel and Mittoo (2004);

Brounen, De Jong and Koedijk (2006); De Jong, Kabir, and Nguyen (2008)). *Fifth*, a constraint on studying empirically the factors that explain the degree of capital structure stability of privately held firms is the relative scarcity of firm-level data. While publicly held firms are legally required in most countries to publish their financial statements, privately held firms are often not generally required to publicly disclose their financial statements (Zarutskie (2006)). I use Amadeus (Analyse Major Database from European Sources) database by Bureau van Dijk. This database is a comprehensive pan-European database containing financial information on public and private firms in 38 European countries combining data from 35 information provides (Bartholdy and Mateus (2008)). *Finally*, a constraint on studying empirically the factors that explain the degree of capital structure stability of privately held firms is the relative scarcity of firm-level data. While publicly held firms are legally required in most countries to publish their financial statements, privately held firms are often not generally required to publicly disclose their financial statements (Zarutskie (2006)). I use Amadeus (Analyse Major Database from European Sources) database by Bureau van Dijk. This database is a comprehensive pan-European database containing financial information on public and private firms in 38 European countries combining data from 35 information provides (Bartholdy and Mateus (2008)).

To further understand my motivation to whether financial leverage of unlisted firms is stable over time, it is useful to illustrate graphically the decomposition of the variation of financial leverage into a within and between variation component for unlisted firms separately on a country-by-country basis. Financial leverage is defined as the ratio of debt (short-term loans or short-term bank loans and long term debt) to book value of total assets (Rajan and Zingales (1995)). If financial leverage does not vary over time, its within variation should be zero. As illustrated in Figure 1, financial leverage varies significantly more across firms, as opposed to

within firms over the sample period for all the countries under investigation. The results of this figure indicate that the degree of instability in financial leverage varies significantly across countries, but financial leverage ratios are remarkably stable over time within a country.

In this article, I begin by providing empirical evidence on the economic importance of capital structure instability. I construct a unique measure of capital structure instability. The uniqueness of this measure of capital structure instability is that it fully captures how much the actual leverage deviates from the initial leverage or leverage in year t=0. Higher values of this measure indicates that leverage is unstable. I examine the role that my measure of capital structure instability plays in determining future leverage ratios. We quantify whether or not existing determinants of leverage are of little value in explaining variation in leverage. If much of the explanatory power of existing determinants comes from my measure of capital structure instability then the importance of these determinants will fall. However, this study goes beyond simply testing whether capital structure is stable for unlisted firms in twenty European countries by explaining empirically the mystery of leverage stability.

I use an unique two-step approach to explain the mystery of leverage stability. First, I interact the measure of leverage instability with all the firm- and country-specific determinants separately. Including these interaction terms in the baseline model greatly expands our understanding of the possible associations between the traditional determinants of capital structure (firm-specific and country-specific determinants) and degree of past leverage instability. Lastly, I quantify the importance of firm- and country-specific determinants in explaining empirically capital structure instability by carrying out an analysis of covariance (ANCOVA). A traditional multivariate regression model does not account for the covariance

between a particular variable with other independent variables even when variables are standardized.

This paper also quantifies the importance of time-varying effects for identifying target leverage by examining empirically the impact that they have on the estimated speed of adjustment (SOA) in a partial adjustment model. If capital structure is stable then I expect that time-varying traditional determinants are not an important component of firm's target leverage (Lemmon, Roberts and Zender (2008)). I address this issue by using Hahn, Hausman, and Kuersteiner (2007) long differencing estimator for highly persistent data series. This long differencing estimate is less biased than the firm fixed effect mean differencing estimator and the traditional system GMM when the true speed of adjustment is slow or the leverage ratio is highly persistent.

This paper finds that leverage is not stable across twenty European countries between 2004 and 2010. Previously identified determinants of capital structure account for relatively little of the variation in leverage. The majority of the cross-country variation in leverage is mainly explained by my unique measure of leverage instability.

I also provide empirical evidence that would help to explain why this inertia in leverage does not exist. This paper documents that capital structure becomes less stable in European countries and periods where and when (1) the inflation rate of the countries increases; (2) countries with decreasing corporate tax revenues, (3) in countries with a civil law (French, Scandinavian and German) or mixed law system; (4) in countries with strong investor protection rights; (5) in countries with a less sound banking system; (6) in countries with a strong bond market; (7) in more perceived corrupt countries, and in (8) countries where the main religion is not Protestant.

The results also suggest that leverage becomes less stable when firms are less profitable, firms become more mature, or firms have less investment opportunities.

Are all of these significant associations between the measure of leverage instability and a country or firm-characteristic equally important in explaining why leverage becomes less stable? I quantify the importance of these associations by using a parametric framework, analysis of covariance (ANCOVA),which enables me to decompose the variation in leverage attributable to different factors. At least three important results emerge from the analysis of covariance (ANCOVA). *First*, only 0.73% of the heterogeneity in future capital structure instability cannot be explained by existing firm-specific and country-specific determinants. *Second*, firm managers are able to actively manage to a large extent the degree of instability of their capital structure. An important part of the future capital structure instability is explained by firm profitability (9.57%); age of the firm (9.29%), and future investment opportunities (8.17%). *Finally*, existing country-specific determinants (such as GDP growth rate, inflation rate, etc.) are not important in explaining the degree of instability of future leverage. These results have important implications for empirical analysis attempting to understand capital structure stability.

This paper contributes to the literature on capital structure of unlisted firms by showing that the degree of leverage instability varies significantly across 20 European countries. This paper moves close to ultimately providing a more complete and clear understanding which determinants are liable for the instability in capital structure of unlisted firms across 20 European countries. Traditional determinants such as profitability, future investment opportunities and credit worthiness explain a significant part of the leverage instability. Country-specific determinants are not important in explaining the instability in leverage across 20 European

countries. Only a small part of the leverage instability cannot be explained by the existing firm and country-specific determinants across 20 European countries.

This paper is organized as follows. Section II discusses the data, sample and variable selection. Section III presents the results of the economic importance of the degree of instability in capital structure across twenty European countries. This section uses two set of analysis. First, I examine the role that firm's past leverage instability plays in determining future leverage ratios. Finally, I perform a variance decomposition of leverage to quantify the explanatory power of existing determinants and my measure of leverage instability. Section IV explains the mystery of leverage instability across twenty European countries. Section V investigates whether or not firms are adjusting their debt ratio towards a moving target. Section VI concludes.

II. Data, sample and variables selection

A. Data and Sample Selection

This paper examines the degree of instability in leverage for unlisted non-financial firms in 20 European countries during the period 2004 to 2010. The data for this paper comes from four different data sources. Firm-level data comes from the Amadeus database, while data on country specific factors comes from either the databank of the World Bank, Transparency International and Doing Business Project.

Balance sheet, income statement and ownership information come from Amadeus database (version 2012). Amadeus database is constructed by Bureau van Dijk. This database is the most comprehensive source containing financial information on public and private firms in Europe. This database provides balance sheet and income statement information for 10 cross-sections. I drop the first two cross-sections (2012 and 2011) because of poor data coverage. Particular

variables of interests such as ownership, industry and country characteristics (i.e., sector, number of shareholders, legal form, unlisted/listed and country initial) are static and require the disposition of the Amadeus database version per cross-section (i.e., 2004, 2005, 2005, 2006, 2007, 2008, 2009 and 2010). In contrast, balance sheet and income statement data is reported for each accounting year end data in Amadeus (version 2012). The sample covers the period 2004 and 2010. I require that the firms in the sample have at least 3 years of nonmissing data for the primary analysis. This paper only use end of year data. There is no large potential survivorship bias because sufficient death firms that have survived at least three years are included in the sample. Financial sector and government sector firms are excluded from the sample. I do not exclude firms in regulated sectors because of lack of available information of which sectors are regulated separately in the different European countries under investigation.

This paper only focuses on firms reporting unconsolidated accounts because consolidated accounts may understate the extent of level of debt to the extent that a parent barrows from a subsidiary and incorrectly attribute all the leverage to one single firm (i.e. parent firm). This will automatically diminish the differences between firm's leverage across European countries. Moreover, by focusing only on unconsolidated accounts allows me to include all the firms irrespective their firm size (small, medium-sized, large and very firms). However, firms with unconsolidated accounts may (incorrectly) have lower debt levels than their identical firms with consolidated accounts because firms with unconsolidated accounts reports the net assets of an affiliate as a long term investment on their balance sheets. Moreover unconsolidated firms may place the debt they take on in less visible affiliated companies and then borrow it back via interfirm trade credit (Rajan and Zingales (1995)).

Concerning the variables of interest, this paper applies a series of filters to clean the data. Observations of firms with data errors are dropped. This is the case when the book value of total assets are negative and zero; when the book value of the ratio fixed assets to total assets are negative or greater than 1; the ratio of cash to total assets are negative; debt variables (short-term debt, long-term debt, current liabilities and long-term liabilities) are negative. Furthermore, I remove observations when their values are unreasonable. This is the case for variables leverage, tax rate, profitability and growth options. I trim these variables tax rate, profitability and growth options at the 1st and 99th percentile. Leverage is trimmed at the 99th percentile because when I trim this variable at the 1st percentile then all the zero leveraged firms are lost. These criteria leave me with 647,055 firms in 20 European countries: Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Estonia, France, Germany, Italy, Iceland, Luxemburg, The Netherlands, Norway, Poland, Portugal, Serbia, Spain, Slovak Republic, Switzerland, The United Kingdom and Ukraine. This unbalanced panel dataset includes 647,055 firms. I provide an overview of the number of firms per European country in Appendix A. Taken all together, the dataset for these 20 countries are quite representative of the European continent.

B. Variable Descriptions

B.1. Measure of capital structure

The empirical literature on capital structure proposes a number of interesting proxies for leverage depending on the aim of study[2]. The broadest definition of leverage is the ratio of total liabilities to total assets. This variable is viewed as a proxy for what is exactly left for shareholders in case of liquidation. However, since total liabilities also include items like accounts payable, which may be used for transactions purposes rather than for financing, it may

[2] For a good discussion of the use of existing proxies of leverage, see Rajan and Zingales (1999).

overstate the amount of leverage (Rajan and Zingales (1995)). Moreover, firms in countries such as Ukraine may use only trade credit as a means of financing because the banking system is underdeveloped. As a result, a more appropriate definition of financial leverage is provided by the ratio of debt (short-term loans or short-term bank loans and long term debt) to book value of total assets.

B.2. Measure of instability of capital structure

I construct a proxy that captures the effect of instability in capital structure on the future use of leverage for unquoted firms. The definition of my proxy slightly differs from the proxy suggested by Lemmon, Roberts and Zender (2008)). The authors use the leverage in year t_0 as their proxy for stability of future capital structure. Their measure only shows how important the initial level of leverage is in explaining future leverage. I expand their proxy by subtracting the initial level of leverage in year t_0 (e.g. year 2004) from the actual level of leverage of the firm. The reasoning is as follows. If capital structure is stable over time, than the difference between the actual leverage and the leverage in year t_0 (2004) should be zero. Figure 2 presents the time series of the differences between the actual levels of debt and the levels of debt for year t_0 (2004) for median and mean firms for the full sample of firms and separately for each European country. When the firm's capital structure is perfect persistent over time, than the difference between the actual levels of debt and the base level of leverage coincides with the X-axis and is zero. The mean difference between the actual levels of leverage and the base level of leverage in year t_0 is small, and, hence might suggest that firm's debt levels are persistent over the sample period. The median difference between the actual levels of debt and the base levels of debt display a stronger convergence pattern and coincides with the X-axis for unquoted firms in a number of European countries such as Bosnia, Croatia, France, Iceland, Luxemburg, The

Netherlands, Poland, Norway, Slovak Republic, and Ukraine. This is particular true for zero leveraged firms[3]. These firms do not finance their projects with interest-bearing bank debt over the sample period. There is consensus among scholars that the percentage of zero leveraged firms tends to be higher in countries with a capital-market oriented financial system than a bank-based financial system. This paper includes also firms with zero level of interest-bearing bank debt financing in all the analyses[4]. For example, Strebulaev and Yang (2013) emphasize that excluding firms with lower than 5 % of book leverage increases the average book leverage ratio by 7 percent point.

This paper also observes from the same Figure that Belgian firms tend to use significantly less debt due to the introduction of the notional interest reduction after 2005. The aim of this measure is to solve the tax discrimination between equity and debt financing by allowing Belgian firms to deduct a fictional interest cost on equity from their tax base. For example, Kestens, Van Cauwenberge and Christiaens (2012) find that the relative tax discrimination between debt versus equity financing significantly declined by 26.79 percentage points since the notional interest deduction was incorporated in 2005. The effect of the start of the financial crisis in 2007 on the persistence in leverage is clearly observable for a couple countries such as Croatia, The Netherlands, Switzerland, Slovak Republic, The United Kingdom and Ukraine. The amount of debt used by firms in these countries sharply declines in respect to the level of debt in 2004 since the financial crisis has begun.

[3] I provide a more detailed analysis of these zero leveraged firms in the supplemental Internet Appendix. In addition, based on the broadest definition of leverage, the study does not document that the increasing number of zero-leveraged firms is a European phenomenon.

[4] For an empirical analysis of the mystery of zero-leveraged firm, see Strebulaev and Yang (2013) and Dang (2009)).

B.3. Firm-Level Characteristics and Capital Structure Choice

Consistent with the existing literature (Titman and Wessels (1988), Guedes and Opler (1996), Rajan and Zingales (1995), Frank and Goyal (2004), De Jong, Kabir, and Nguyen (2008) Fan, Titman and Twite (2012)), I include a set of firm-level variables that are known to affect leverage. These variables include firm size (natural logarithm of total assets, where assets are deflated by GDP deflator), firm age (natural logarithm of firm years), profitability (EBIT over total assets), tax rate (corporate taxation to profit/loss after tax), asset tangibility (fixed assets over total assets), and growth opportunities (annual growth rate of total labor costs over total assets)[5], and sector indicator variables based on 2-digit NACE2008 Classification codes. Due to data limitations in some of the countries included in my study, I do not include variables that measure the effective tax rate, operating risk, research and development expenditure, and capital expenditure. I provide more detailed definitions and data sources for the firm-level characteristics in the leverage regression in Appendix B. I discuss the motivation for each of the right-hand-side variables in the supplemental Internet Appendix.

B.4. Country Characteristics and Capital Structure Choice

I choose the country-specific determinants based on previous leverage literature (see Booth, Aivazian, Demirgüc-Kunt, and Maksimovic (2001); La Porte, Lopez-De-Silanes, Schleifer, and Vishny (1997), etc.). Earlier studies analyze the relation between leverage and legal system

[5] The definition of this proxy slightly differs from the definition of employment growth suggested by Lang, Ofek and Stulz (1996) due to better data coverage of labor costs than the number of employees in all the countries under investigation. The authors define their proxy as the ratio of the number of employees in year t + 1 to the number of employees in year 0, minus one. The intuition behind the choice for this proxy is twofold. First, the sample of this study consists of unlisted firms. As a result, the traditional proxy market-to-book ratio cannot be used. Finally, previous capital structure studies also use the ratio research and development expenditures to sales. This proxy is only a good measure to capture the effect of the severity of potential underinvestment problems when firms by nature invest in research and development. Firms that do not innovate would by origin have no future growth opportunities (Rajan and Zingales (1995) and Johnson (2003)).

origin (Legal origin variable), shareholder rights (strength of investor protection index), creditor right protection (cost of enforcing index and debt recovery rate), financial sector development (the degree of concentration in the banking industry, Z-score, development of private credit), stock market development (bank vs. market based financial system, stock market size and bond market size), macro-economic indicators (GDP per capital annual growth rate, annual GDP growth rate, inflation rate, subsidies of a government to the corporate sector, and total tax rate), country governance indicators (corruption perception index and government effectiveness index); and culture differences (religious). I also provide motivations for each of right-hand-side country-specific determinant in a supplemental Internet Appendix.

B.5. Summary Statistics

Table 1, which presents the summary statistics, shows cross-sectional variation in the country-level variables. The country-specific determinants are defined in Table A1 of Appendix B, along with their data sources. All the variables exhibit time-series variation. To gain a basic understanding of how leverage is influenced by these variables, I compute Pearson correlation coefficients for pairs of leverage and independent variables. The results, reported in the final column of Table 1, suggest that leverage is highly negatively correlated with market based or bank based indictor, almost all the macro-economic indicators, country governance indicators, religion as well with taxes. To investigate whether these variables are likely to be subject to collinearity problems in my later regression analysis, I examine the correlation between the country specific determinants that are used in my analysis. The results of this correlation analysis, reported in the supplemental Internet Appendix, show that most variables are not highly correlated with each other, with one notable exception. In particular, the correlation between government effectiveness indicator and corruption index is 87%. I also report the country-by-

country summary statistics of the country-level explanatory variables in the supplemental Internet Appendix.

III. The economic importance of capital structure instability

In this section, I study the importance of past degree of leverage instability in determining future leverage, controlling for country-level variables, firm-level characteristics, sector- and year-, and country-fixed effects. Existing research has shown that financing policies of unlisted firms might be passive. Firm rely more on debt financing and will only use equity financing as a last resort when all other means of financing are exhausted. Preliminary results from Figure 2 suggest that leverage appears to be less stable over the sample period.

A. The role of past degree of leverage instability?

I investigate the economic importance of past degree of leverage instability in determining future leverage in determining future leverage by estimating the following pooled OLS regression:

$$\text{Leverage}_{it} = \alpha_0 + \alpha X_{it-1} + \alpha_2 \text{ degree of leverage instability}_{it-1} + \alpha Z_{it-1} + \nu_t + \eta_{jt} + \delta_c + \varepsilon_{jtc}. \quad (1)$$

where i indexes firms, t indexes years; X is a set of 1-year lagged firm control variables; Z is a set of 1-year lagged country-specific determinants, ν is a year fixed effect; η is a sector fixed effect; δ country fixed effect; and ε random error term assumed to be possibly heteroskedastic. The first observation of each firm is dropped from the regression because the difference between the actual levels of debt of a firm in 2004 and the initial debt levels of a firm in 2004 is zero. To mitigate endogeneity problems, degree of leverage instability and the firm control variables are lagged one period. Furthermore, Demirgüç-Kunt and Maksimovic (1999) emphasize that problems can arise in explaining differences in financial structures across countries because

institutional determinants can themselves be influenced by firm's debt levels or by the development of other institutions. For example, characteristics of the legal system of a particular country that facilitates enforceable contracts between firms and debtors also facilitate contracting between banks and the borrowing firms. I address these potential endogeneity problems by including one lagged country specific variables in all the regression models. Sector-, year- and country-fixed effects are not lagged one period. Standard errors are robust for heteroskedasticity and clustered within country over time.

De Jong, Kabir and Nguyen (2008) state that when all the country specific determinants are included in one regression model then there may a problem of multi-collinearity arising from high correlation between several country-specific determinants. To mitigate multi-collinearity concerns, the country-specific variables are sorted in nine different groups. Each regression model only includes one group of country specific variables (see Columns 1 to 9 of Table 2). The final two Columns of Table 2 present estimation results of pooled OLS regression model in which all the country-specific variables are included. The main variable of interest is the degree of past leverage stability.

The results in Table 2 show that the relation between the past degree of leverage instability and future leverage is positive and highly significant at 1 % in all the different model specifications. I evaluate the economic significance of the key finding. For example for Column 1, I calculate the importance of changes in past degree of leverage instability from the 50^{th} to the 75^{th} percentile on the mean future leverage. A change in the past degree of leverage instability from the 50^{th} (0.000) to the 75^{th} percentile (0.057) increases future leverage by 2.64 %. I can conclude that there is an economically significant relation between past degree of leverage instability and future leverage.

The top half of Table 2 reports the coefficient estimates of my firm-specific variables. These coefficient estimates indicate that future leverage is positively significantly related to asset tangibility and negatively significantly related to profitability in all the different model specifications. These results are consistent with more recent international evidence (Rajan and Zingales (1995), De Jong, Kabir and Nguyen (2008), and Fan, Titman, and Twite (2012)). These results are also generally consistent with individual country regressions that I report in the supplemental Internet Appendix. Asset tangibility is positively significantly related to future leverage in 15 out of 20 European countries, respectively. Finally, profitability is negatively significantly related to future leverage in 16 out of 20 countries.

The lower half of Table 2 reports coefficient estimates for country variables. These coefficient estimates indicate that future leverage is negatively related to inflation rate, government subsidies and positively related with economic development (GDP growth rate), but unrelated to tax rate (Column (1)). I find support for the idea that country legal origins influence firm debt ratio choices. In particular, I find that firms in countries with French law as legal origin variable have lower debt ratios, providing evidence in support of the hypothesis that countries with worst protection of creditors are less willing to provide more debt financing to firms (Column (3)). Firms in French civil law countries will use 14.40 % less debt in the near future than firms in other legal origins countries. With respect to the common law variable (the reference category), firms in countries with a common-law tradition will use 33 % more debt in the future than firms in countries with a civil-law tradition.

Inconsistent with higher level of banking system soundness leading of a country to higher debt ratios, I find that bank soundness is negatively significantly related to debt ratio (Column 6). The effect of the soundness of a banking sector of a country is statistically significant but

economically not important at all. If the bank Z-score increases by one standard deviation (10.15) then the firm's use of debt decreases by only with 1.02 %. This result is consistent to Beck, De Jonghe, and Schepens (2013) finding that banks in countries with stable banking systems have better profit opportunities, fewer incentives to take aggressive risk, to screen intensively or to extract more economic rent from their borrowers, which would result into lower charged interest rates on bank loans for borrowers (Beck, De Jonghe, and Schepens (2013)).

I find some support for the idea that creditor protection rights, measured by cost of claim index, influence firm debt ratio choices (Column (5)). The analysis reveals that cost of claim index is associated with lower debt ratios. This evidence supports Diamond (2004) results, who find that firms in countries with legal systems with expensive or ineffective contract enforcement will use less debt. Banks in countries with a more efficient court system which is seen as the most important institution to enforce the legal system, as proxied by the costs of enforcing contracts, are more willing to grant financing to firms when the costs of enforcing contracts decreases then countries with inefficient court systems. I also evaluate the economic significance of this finding. For example, an increase in the costs of the enforcement of a contract by one standard deviation is associated with a decrease of 3.36 % in firm leverage, a magnitude that is economically significant. In addition, I do not find a significant relation between leverage and shareholder protection rights, and debt recovery index,

Large differences in financial systems across countries may influence the firm's use of debt. I find that firms in countries with a market based financial system are 9.5 % less likely to use debt than firms in countries with a bank based financial system (Column (7)). However, the level of stock market development, proxied by the stock market capitalization, does not influence the firm's debt ratio choice. This finding suggests that firms in countries in which the stock market

does not provide enough liquidity then the value of control and degree of information transparency between shareholders and potential investors is lower. As a result, unlisted firms are more willing to use more bank debt. Moreover when the stock market does not provide enough liquidity then the financial policy of listed firms will be similar as the financial policy of unlisted firm (Brav (2009)). In addition, I find no support for the idea that firms do not consider different available alternative financing means provided by the bond market when considering using more bank debt financing[6].

B. Variance decomposition of leverage

This paper has remained largely silent on the importance of the magnitude of the coefficient estimates of one independent variable relative to other independent variables in explaining future leverage. One way to examine the importance of the magnitude of the coefficient of these variables is by putting all the variables on the same scale by standardizing these variables. Larger coefficient of a particular variable relative to other variable implies that the former has more effect on future leverage than the latter. However, by just standardizing the variables does not account for the covariance between a particular standardized variable with other independent variables in the multiple regression model. A multiple regression model does not enable me to decompose the heterogeneity in the future debt ratio relative to the different factors. As a result, I quantity the importance of degree of past leverage instability, country-specific, firm-specific determinants, sector- and year-, and country-fixed effects in capturing the variability in future leverage by carrying out an analysis of covariance (ANCOVA). This parametric framework accounts for the correlations between the right-hand side variables. I do so by estimating the following model of leverage:

[6] I also present results on the role of past leverage instability and variance decomposition of leverage on a country-by-country basis in the supplemental Internet Appendix.

$$\text{Leverage}_{it} = \alpha_0 + \alpha X_{it-1} + \alpha_2 \text{ degree of leverage instability}_{it-1} + \alpha Z_{it-1} + \nu_t + \eta_{jt} + \delta_c + \varepsilon_{jtc}. \quad (2)$$

where i indexes firms, t indexes years; X is a set of 1-year lagged firm-specific variables; Z is a set of 1-year lagged country-specific determinants, ν is a year fixed effect; η is a sector fixed effect; δ country fixed effect; and ε random error term assumed to be possibly heteroskedastic. Consistent with Lemmon, Roberts and Zender (2009), I compute the Type III sum of squares for each effect in the model and then normalize each estimate by the sum across all the effects. As a result, the sum of all the effects should sum to one. Table 3 presents the results of the variance decomposition for several specifications. Each column in the table corresponds to the same model specification in the previous Table (e.g. Table 2).

The majority of the variation in future leverage is captured by the past degree of leverage instability variable. The importance of the past degree of leverage instability in explaining the variation in future leverage ranges from 67.43 % (Column (3)) to 92.06 % (Column (10)). The results of this analysis also suggest that the variability captured by unobserved country institutional determinants ranges from 0.53 % (column 10) to 27.61 % (column 9), while the time and sector affects share in capturing the variation in future leverage is negligible.

Consistent with Brav (2009), I examine whether the capital structure of unlisted firms is strongly influenced by the firm's profitability and less influenced by other traditional variables such as firm age, firm size, asset tangibility, growth opportunities and tax rate. The most important time-varying determinant that captures the majority of the variation in leverage is asset tangibility. The results of the covariance decomposition imply that firm's capital structure is more sensitive to firm's collateral (i.e. asset tangibility), profitability and firm size, but less sensitive to the firm's growth options, firm age, and tax rate.

The different groups of country-specific determinants are not important in explaining the heterogeneity in future leverage in the first nine columns of Table 3. For example in column 1, the economic indicators such as inflation rate, GDP per capital annual growth rate, government subsidies and tax rate only explain a total of 0.16 % of the variability in future leverage. In contrast to these economic indicators, the firm-specific variables (asset tangibility, firm size, firm age, growth options, tax rate, and profitability) explain a combined 5 % of the heterogeneity in future leverage.

I think it is worth clarifying precisely what the results of the analysis of covariance (ANCOVA) imply. First, I document that the cross-country variation in leverage is mainly explained by the degree of past leverage instability. Leverage do not tend to remain stable over time. Second, the variance decomposition analysis does not necessarily imply, however, that existing firm- and country-specific determinants are of little value in explaining variation in future leverage ratios. This finding contradicts to the Jõeveer (2013) findings that country determinants matter a lot in explaining future leverage heterogeneity because unlisted firms rely mainly on finance from the domestic market.

IV. Explaining the mystery of leverage instability

Previous section provides significant evidence that the degree of past leverage instability is the most important variable in explaining the variability in leverage across twenty European countries. The importance of firm and country-specific factors identified by previous capital structure studies as correlated in the cross-section with leverage is negligible in capturing the variability in the leverage. However, the actual firm's leverage seems to be very sensitive to asset tangibility, firm size and profitability. Given the evidence presented so far, it is obviously

to ask whether the existing traditional capital structure theories may play an important role in explaining why leverage tends to be less stable over time[7].

A. Do firm- and country-specific determinants explain the importance of the degree of past leverage instability in determining future leverage?

The results from the previous section imply that the degree of past leverage instability is highly correlated with its leverage in the following years up to 2010, even after controlling for other variables that traditionally have been used to explain firm's leverage. In this section, I tend to provide more evidence that would help to explain why this inertia in leverage might not exist. More, specifically I interact the degree of past leverage instability with all the firm- and country-specific determinants separately. Including these interaction terms in the regression model (1) will greatly expand our understanding of the possible associations between the traditional determinants of capital structure (firm-specific and country-specific determinants) and the degree of past leverage stability. The following pooled OLS regression model is been estimated to measure the economic importance of the interaction of the d degree of past leverage instability with a set of traditional capital structure determinants:

$$\text{Leverage}_{it} = \alpha_0 + \alpha_1 \text{Firm\_size}_{it-1} + \alpha_2 \text{degree of leverage instability}_{it-1} + \alpha_3 \text{Tang}_{it-1} + \alpha_4 \text{Tax}_{it-1} + \alpha_5 \text{Profit}_{it-1} + \alpha_6 \text{Growth}_{it-1} + \alpha_7 \text{Firm\_age}_{it-1} + \alpha_8 \text{interaction\_term}_{it-1} + \nu_t + \eta_{jt} + \varepsilon_{jtc}. \quad (3)$$

where i indexes firms, t indexes years; X is a set of 1-year lagged firm control variables; Z is a set of 1-year lagged country-specific determinants, ν is a year fixed effect; η is a sector fixed effect; δ country fixed effect; and ε random error term assumed to be possibly heteroskedastic. The first observation of each firm is dropped from the regression because the difference between

[7] I also present results on the mystery of instability of leverage on a country-by-country basis in the supplemental Internet Appendix.

the actual levels of debt of a firm in 2004 and the initial debt levels of a firm in 2004 is zero. To mitigate endogeneity problems, degree of leverage instability, the firm-specific and country-specific variables are lagged one period. Sector-, year- and country-fixed effects are not lagged one period. Standard errors are robust for heteroskedasticity and clustered within country over time. Table 4 presents the result of the pooled OLS regressions for several specifications.

The results indicate that the main effect of the degree of past leverage instability on future leverage is, on average, positive but statistically insignificant (Columns (1) to (9)). Furthermore, the relation between the degree of past leverage instability and country-specific determinant is largely statistically insignificant. However, I find a statistically significant and positive (negative) interaction term between the degree of past leverage instability and French Commercial legal code, debt recovery rate, and private fund (bank concentration). Thus, capital structure becomes less stable in countries where country's legal origin is French Commercial Legal Code; countries with a higher debt recovery rate; countries with more available domestic financial resources to the private sector; and in countries with a less concentrated banking sector. The final two columns of Table 4 present the results of the pooled OLS regression model with the simultaneously inclusion of all the interaction term the degree of past leverage instability with country and firm-specific variables. The degree of future leverage instability increases in European countries and periods where and when (1) the inflation rate of the countries increases; (2) countries with decreasing corporate tax revenues, (3) in countries with a civil law (French, Scandinavian and German) or mixed law system; (4) in countries with strong investor protection rights; (5) in countries with a less sound banking system; (6) in countries with a strong bond market; (7) in more perceived corrupt countries, and in (8) countries where the main religion is not Protestant (Column (11)). The results also suggest that the degree of instability on future

leverage becomes stronger when firms are less profitable, firms become more mature, and firms have less investment opportunities.

B. The importance of firm- and country-specific determinants in explaining the importance of the degree of past leverage instability in determining future leverage

The previous sub-section provides significant evidence that a number of firm-specific and country-specific determinants can positively influence the degree of future leverage instability. In this sub-section, I investigate more in detail the relative importance of the interaction terms between the degree of leverage instability and firm- or country-specific determinants in capturing the heterogeneity in future leverage. I carry out an analysis of the covariance (ANCOVA) by estimating the following regression model:

$$\text{Leverage}_{it} = \alpha_0 + \alpha X_{it-1} + \alpha_2 \text{ degree of leverage instability}_{it-1} + \alpha Z_{it-1} + \alpha \text{ degree of leverage instability}_{it-1} \text{ x } X_{it-1} + \alpha \text{ degree of leverage instability}_{it-1} \text{ x } Z_{it-1} + \nu_t + \eta_{jt} + \delta_c + \varepsilon_{jtc}. \quad (4)$$

where i indexes firms, t indexes years; X is a set of 1-year lagged firm-specific determinants; Z is a set of 1-year lagged country-specific determinants, degree of past leverage instability x X_{it-1} is an interaction term between 1-year lagged degree of leverage instability and a set of firm-specific determinants; degree of past leverage instability x Z_{it-1} is an interaction term between 1-year lagged degree of leverage instability and a set of country-specific determinants; ν is a year fixed effect; η is a sector fixed effect; δ country fixed effect; and ε random error term assumed to be possibly heteroskedastic. Consistent with Lemmon, Roberts and Zender (2009), I compute the Type III sum of squares for each effect in the model and then normalize each estimate by the sum across all the effects. As a result, the sum of all the effects should sum to one.

Table 5 reports the results of the covariance decomposition analysis. In the first nine columns of Table 5, I analyze the relative importance of the interactions between degree of past leverage instability and one group of country-specific determinants in capturing the variability in future leverage at a time. In the final two columns of Table 5, I simultaneously investigate the relative importance of the interactions between degree of past leverage instability and all the country-specific determinants in capturing the variability in future leverage. The interactions between degree of past leverage instability and firm-specific variables are included in all the eleven models of Table 5.

Four main results emerge from an examination of Table 5. First, the importance of the variable degree of past leverage instability in explaining the variability in future leverage diminishes when interaction terms between degree of past leverage instability and the traditional firm- and country-specific variables are included in the regression models. For example, degree of past leverage instability variable explains only 0.73 % of the variability of the future leverage when all interaction terms between my proxy for capital structure instability and firm-specific and country-specific determinants are included (Column (10)). Only a small part of the instability in future leverage cannot be explained by the existing firm-specific and country-specific determinants. Second, firm managers are able to actively manage to a large extent the degree of future leverage instability. As shown in column (10) of Table 4, the degree of future leverage instability increases when (1) firms become less profitable, have more growth opportunities or become more mature. These variables explains total of 27.03 % of the instability of future leverage (profitability x degree of past leverage instability (9.57 %); firm age x degree of past leverage (9.29 %); growth options x degree of past leverage instability (8.17%)) in Column (10). Third, existing country-specific determinants are not important in explaining the

degree of instability of future leverage. Finally, the results of the covariance analysis suggest that sector fixed-effects capture 10.26 % of the heterogeneity in future leverage in Column (10)). It is still unclear how and which sector determinants may affect the firm's capital structure, or why financial structure of the firm vary so widely across unlisted firms within their sector. However, Mackay and Philips (2005) show that the firm's capital structure can be influenced by sector-related factors other than sector fixed effects. This is especially the case in competitive sectors. For instance, they find that firms with capital-labor ratios close to the sector median (high natural hedging behavior) use less financial leverage than firms that depart from the industry median capital ratio (low natural hedging behavior). This paper did not include sector-related factor such as the traditional sector median leverage in the regressions because of almost all the annual median leverage values per sector for particular countries such as Ukraine are zero.

V. Are firms adjusting their debt ratio towards a moving target?

This sub-section quantifies the importance of time-varying effects for identifying target leverage by examining the impact that they have on the speed of adjustment (SOA) in a partial adjustment model. I test whether time-varying effects are important in determining firm's target leverage.

Huang and Ritter (2009) show that the estimated speed of adjustment coefficient is biased downwards without fixed effects since the estimated autoregressive parameter is biased upwards, and that the estimated SOA using a mean differencing estimator is biased upwards with the bias being especially large for slow true speeds. The system GMM estimator is biased when the dependent variable debt ratio is highly persistent. As a result, the authors recommend estimating SOA by using Hahn, Hausman, and Keursteiner (2007) long differencing estimator for a dynamic panel when the dependent variable is highly persistent and with a short time dimension

of the panel. In this estimator, a multiyear difference of the model is taken rather than a one-year difference. I present results from the long-differencing estimator with differencing lengths of k=2, 3 and 4 years to reinforce my conclusion that the debt ratio tends to be stable over time in Table 6,

$$L_{it} - L_{it-k} = (1-\lambda)\, L_{it-1} - L_{it-k-1}) + \delta(X_{it-1} - X_{it-k-1}) + \tilde{\varepsilon}_{it} - \tilde{\varepsilon}_{it-k} \quad (5)$$

$$\text{or } \Delta L_{it,it-k} = \lambda\Delta\, L_{it-1,t-k-1} + \delta\Delta X_{it-1,t-k-1} \; \tilde{u}_{it,t-k} \quad (6)$$

The dependent variable is the change of debt ratio between the end of year t and the end of year t-k of firm i (k=2, 3, 4). The parameter λ, the SOA, measures the fraction of the gap between k-period's debt ratio and this period's target that firms close each period. I drop some year dummies to avoid multicollinearity. Variables that are constant over time (sector fixed effects, country fixed effects, culture, legal origin, and market vs. bank based system) are dropped. For brevity, the coefficient on year dummies are not reported. The t-statistics are heteroskedastic consistent standard errors, further adjusted for correlation across observations of a given firm (White (1980), Rogers (1993)).

Depending on the differencing length (k), the estimated SOA toward target debt ratio varies from 69.10 to 84.0 % per year . The sensitivity of the estimates to the differencing length is partly because different firms are examined. All the models include the proxy for leverage instability as a determinant of target leverage. These results show that, even in the presence of lagged leverage, firms degree of leverage instability are statistically significant determinants of future leverage ratios or alternatively, of firms' leverage targets. The degree of leverage instability is also an economically significant determinant of future leverage, more important than most other determinants of leverage. This can be seen more clearly by multiplying the coefficient of each

regressor by its standard deviation found in Table 1. Thus, again, I see that the debt ratio do tend to remain less stable as such even after controlling for the current level of debt ratio as well as changes in the determinants of debt ratio.

VI. Conclusion

Using a large database of unlisted firms in twenty European countries, this paper examines whether the stylized fact that the leverage tend to be stable over time is true**.**

I start with investigating the importance of the degree of instability in leverage of unlisted firms in determining their future leverage across twenty European countries. The economic importance of the degree of instability in leverage is substantial. The degree of instability in past leverage is the most important variable in explaining future leverage. The importance of factors identified by previous capital structure studies as correlated in the cross-section with future leverage are negligible in capturing the variability in future leverage.

I also shed light whether existing firm and country-specific determinants may explain the degree of instability in financial leverage of unlisted firms across all European countries. I find that the instability effects of financial leverage becomes stronger in European countries and periods where and when (1) the inflation rate of the countries increases; (2) countries with decreasing corporate tax revenues, (3) in countries with a civil law (French, Scandinavian and German) or mixed law system; (4) in countries with strong investor protection rights; (5) in countries with a less sound banking system; (6) in countries with a strong bond market; (7) in more perceived corrupt countries, in (8) countries where the main religion is not Protestant (9) when firms become less profitable, (10) firms become more mature and (11) firms have more growth opportunities. In addition, this paper provides strong evidence that mainly existing firm-

specific determinants such as growth opportunities, profitability and firm age explain capital structure instability over time.

The study's implications for future capital structure studies are very clear. The main result of this paper is that the degree of instability in leverage tends to vary across countries. Corporate managers are aware that a large degree of future leverage is unstable over time and adapt their corporate policies based on the degree of instability in leverage.

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Appendix A: Overview of the number of firms per European Country

This Appendix provides an overview of the number of firms per European country.

European Country	Number of firms
Belgium	26,627
Bosnia-Herzegovina	1,007
Bulgaria	2,841
Croatia	16,820
Estonia	8,753
France	205,062
Germany	3,786
Iceland	554
Italy	159,955
Luxemburg	155
Norway	41,350
Poland	3,682
Portugal	11,999
Serbia	14,247
Slovak Republic	2,069
Spain	115,356
Switzerland	135
Netherlands	1,108
United Kingdom	5,028
Ukraine	26,522
Total number of firms	647,055

Appendix B: Variable Definitions and Data Source

Table 1: Definition of Firm-Specific Determinants and Data Sources

Firm size	The natural logarithm of book value of total assets, where assets are deflated by GDP deflator. Data source: Amadeus Database. GDP deflator . Data source: World Bank Institute
Firm age	The natural logarithm of firm years. Data source: Amadeus Database.
Growth	The annual growth rate of the ratio costs of employees to book value of total assets. Data source: Amadeus Database.
Profit	The ratio of earnings before interest and tax (EBIT) to book value of total assets. Data source: Amadeus Database.
Tang	The ratio of book value of fixed assets to book value of total assets. Data source: Amadeus Database.
Tax rate	The ratio of corporate taxation to P/L after tax. Data source: Amadeus Database.
Number of subsidiaries	Number of subsidiaries. Data source: Amadeus Database.
Number of shareholders	Number of shareholders. Data source: Amadeus Database.
Public	Dummy variable equal to one if the firm is public unlisted firm and zero if private unlisted firm
Leverage	The ratio of the sum of loans and long-term debt to book value of total assets. Data source: Amadeus Database.
Leverage in the broadest sense	The ratio of total liabilities to book value of total assets. Data source: Amadeus Database.
Degree of leverage instability	The difference between leverage in year t and leverage in year t_0. Leverage is defined as ratio of the sum of loans and long-term debt to book value of total assets. Data source: Amadeus Database.

Table 2: Definition of Country-Specific Determinants and Data Sources

Country-Specific Determinants	**Definition and Data Source**
Legal system origin variable	Equals one if the origin is English common law, two if the origin is French commercial legal code, three if the origin is German commercial legal code; four if the origin is Scandinavian civil law and five if the origin is from mixed law which includes characteristics of different existing legal law systems. Data source: La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998); Demirgüc-Kunt and Maksimovic (1998); La Porta, Lopez-De-Silanes, and Schleifer (1997)
Investor protection index	The average of the extent of disclosure index, the extent of director liability index and the ease of shareholder suits index. Consistent with De Jong, Kabir and Nguyen (2008), I take the average of the available data in case of missing values. Data source: Doing Business project database.
Enforcing contract indicator	Is defined as the total costs to enforce a contract through the Commercial courts as a percentage of the present value of a claim. Consistent with De Jong, Kabir and Nguyen (2008), I take the average of the available data in case of missing values. Data source: Doing Business project database.
Debt recovery rate	Share of how much of the debt is recovered by creditors through reorganization, liquidation or debt enforcement proceedings to present value of a claim. Consistent with De Jong, Kabir and Nguyen (2008), I take the average of the available data in case of missing values. Data source: Doing Business project database.
The degree of concentration in the banking industry	the fraction of assets held by the three largest commercial banks in each observed country. Consistent with De Jong, Kabir and Nguyen (2008), I take the average of the available data in case of missing values. Data source: World Bank database.
Z-score	calculated as a weighted average of the z-scores of a country's individual banks (the weights are based on the individual banks' total assets). Z-score compares a bank's buffers (capitalization and returns) with the volatility of those returns. It is estimated as

	(ROA+(equity/assets))/σ(ROA). Data source: World Bank database.
Private credit	Is the ratio of domestic credit to the private sector scaled by GDP. Consistent with De Jong, Kabir and Nguyen (2008), I take the average of the available data in case of missing values. Data source: World Bank database.
Market- and bank-based financial system dummy	Dummy variable that equal 1 if the country's financial system is market-based and 0 if it is a bank-based financial system. Data source to the gross domestic products (GDP). Data source: World Bank database; Demirgüc-Kunt and Levine (2001); Thimann (2002)); Berglof and Bolton (2002); Mykhnenko (2007); Day and Taylor (2004); Backé and Walko (2006); Holzmann, Bebczuk, and Musalem (2007).
Size of the stock market	Is the ratio of listed shares to the gross domestic products (GDP). Data source: World Bank database.
Development of bond markets	Is the ratio of the sum of private and public bonds to the gross domestic products (GDP). Consistent with De Jong, Kabir and Nguyen (2008), I take the average of the available data in case of missing values. Data source: World Bank database.
GDP per capita growth	Is the annual percentage growth rate of GDP per capita based on constant local currency. Data source: World Bank database
GDP growth rate	Is the annual percentage growth rate of GDP at market prices based on constant local currency. Data source: World Bank database.
Inflation rate	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used. Consistent with De Jong, Kabir and Nguyen (2008), I take the average of the available data in case of missing values. Data source: World Bank database.
Subsidies and other transfers	Ratio of subsidies, grants, and other social benefits include all unrequited, nonrepayable transfers on current account to private and public enterprises; grants to foreign governments, international organizations, and other government units; and social security, social assistance benefits, and employer social benefits in cash and in kind to total government expenses. Consistent with De Jong, Kabir and Nguyen (2008), I take the average of the available data in case of missing values. Data source: World Bank database.
Total tax rate	Tax revenue refers to compulsory transfers to the central government for public purposes. Certain compulsory transfers such as fines, penalties, and most social security contributions are excluded. Refunds and corrections of erroneously collected tax revenue are treated as negative revenue. Consistent with De Jong, Kabir and Nguyen (2008), I take the average of the available data in case of missing values. Data source: World Bank database.
Corruption perception index	Corruption is defined as the abuse of public office for private gain, which ranges from 0 to 10, with smaller values indicating more higher perceived corruption. Data source: Transparency International
Government effectiveness measure	is the average of government effectiveness; regulatory quality; the voice and accountability; the political stability and absence of violence/terrorism indices. Data source: World Bank database.
Religion dummy variable	A dummy variable that equal 1 if the country's main religion is Protestant, else 0. Data source: Center Intelligence Agency The World Factbook (2004, 2005, 2006, 2007, 2008, 2009, and 2010)

Table 1: Summary Statistics

Table 1 provides the mean, standard deviation, median, minimum, and maximum values of each variable. In addition, I also reports the Pearson sample correlation coefficient between the dependent variable leverage and all the independent variables. I use a, b, and c to denote significance at the 1% level, 5% level and 10% level, respectively. The sample consists of all nonfinancial unlisted European firms in the Amadeus database from 2004 to 2010. All variables are defined in Appendix A.

Variables	N	Mean	Standard deviation	Median	Minimum	Maximum	Correlation with leverage
Leverage ratio	4,262,269	0.207	0.481	0.061	0.000	6.946	1.00
Degree of leverage instability	4,262,269	0.041	0.384	0.000	-6.941	6.946	0.53[a]
Firm size (thousand euros)	4,416,761	6.434	1.647	6.315	-0.251	17.15	-0.03[a]
Tangibility	4,416,623	0.306	0.263	0.231	0.000	1.000	0.12[a]
Tax	4,244,575	0.262	0.389	0.235	-1.800	2.999	-0.01[a]
Profitability	4,386,956	0.063	0.141	0.054	-0.815	0.679	0.09[a]
Growth opportunities	3,675,773	0.027	0.325	0.001	-0.998	1.883	0.00[a]
Firm age	4,416,761	2.537	0.683	2.565	0.000	5.737	-0.00[a]
Legal origin of a country	140	2.95	1.12	3	1	5	-0.06[a]
Strength of investor protection index	140	5.32	1.13	5	3	8	-0.15[a]
Cost of enforcing contracts (%)	140	20.54	8.40	19.00	7.7	41.5	0.02[a]
Debt recovery rate (%)	140	54.39	24.71	46.80	8.1	94.4	0.14[a]
Market vs. bank based system	140	0.15	0.36	0	0	1	-0.02[a]
Bank concentration (%)	140	67.60	21.50	68.23	26.16	100	0.03[a]
Bank Z-score	140	13.83	10.15	12.25	-5.50	46.74	0.11[a]
Private or domestic funds (%)	140	106.95	59.70	94.45	22.96	319.46	0.10[a]
Stock market capitalization (%)	133	63.41	80.57	27.00	0.02	394.60	0.11[a]
Bond market development (%)	103	74.74	53.22	70.40	0.01	314.05	-0.01[a]
GDP per capita growth rate (%)	140	1.96	4.24	1.93	-14.42	12.95	-0.04[a]
GDP growth rate (%)	140	2.34	4.12	2.66	-14.80	12.10	-0.01[a]
Inflation rate annual growth rate (%)	140	3.77	3.84	2.46	-0.84	25.23	-0.08[a]
Government subsidies (%)	140	62.98	13.37	64.86	22.62	82.62	0.12[a]
Corruption perception index	140	6.19	2.22	6.60	2.20	9.70	0.01[a]
Governance country effectiveness indicator	140	76.15	18.39	81.47	32.88	97.57	-0.05[a]
Religious	140	0.35	0.48	0	0	1	-0.06[a]
Taxes (%)	140	19.98	5.33	21.31	8.61	29.40	-0.22[a]

Figure 1: Decomposition of the variation of leverage

This figure presents the decomposition of the variation of leverage into between and within component for unlisted firms from 2004 to 2010 for all the European countries under investigation. Leverage is defined as the ratio of debt (short-term plus long-term debt) to book value of total assets. The interpretation is as follows: for instance for firms in The United Kingdom. Leverage varies more across firms than within firms over time in the United Kingdom. Note that the panel data is unbalanced. The between and within variance is calculated using the mean of the panel means. This may be different from the overall mean (Statacorp (2012)).

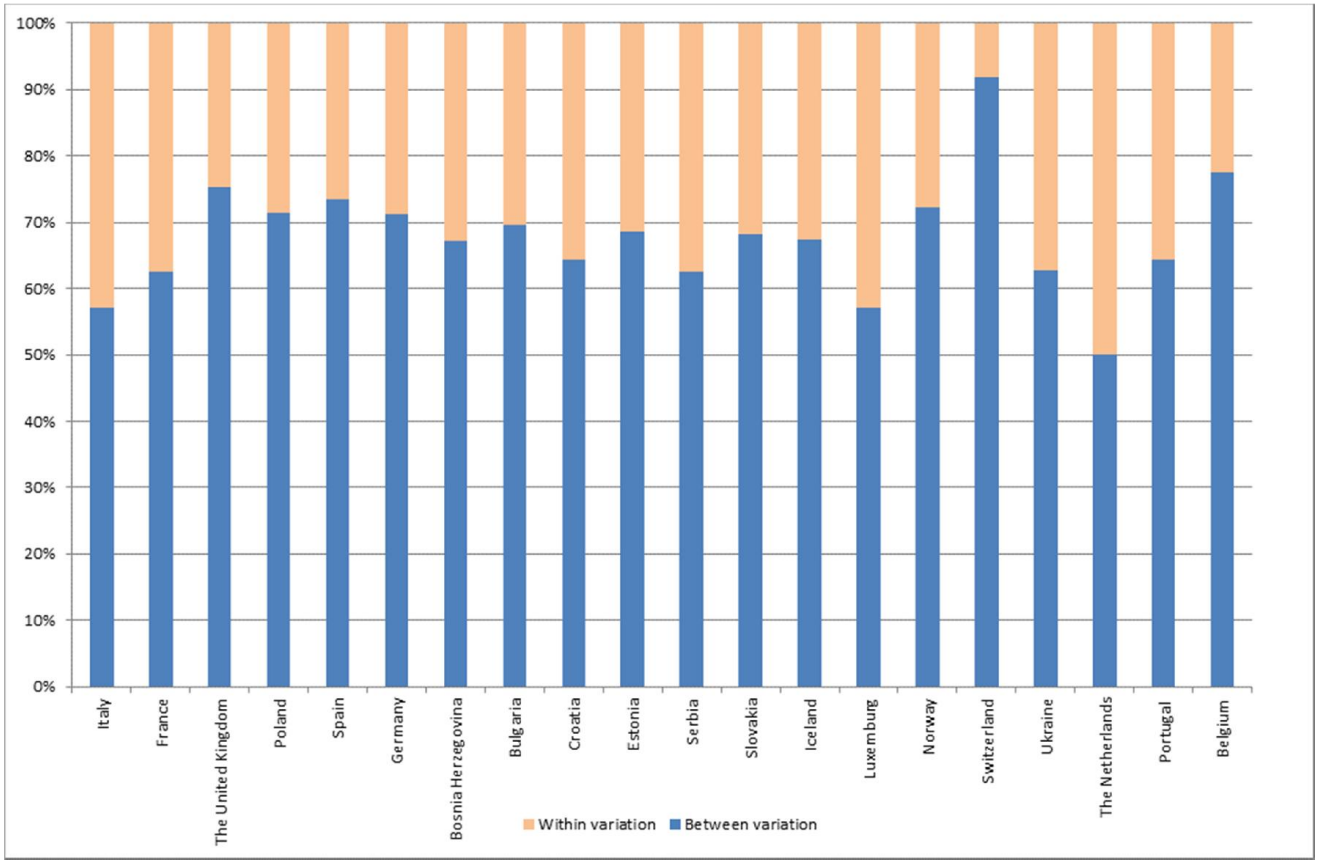
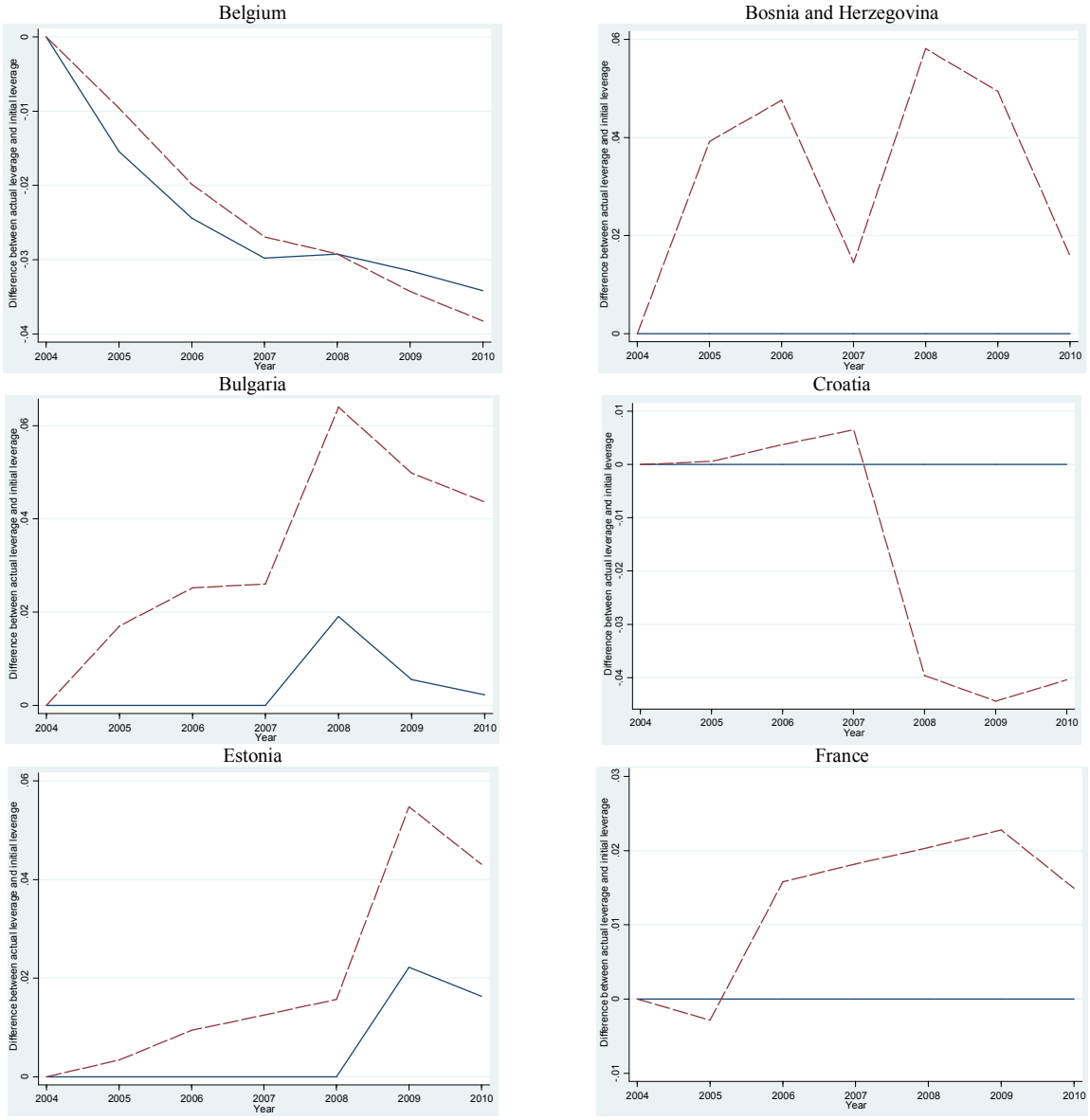
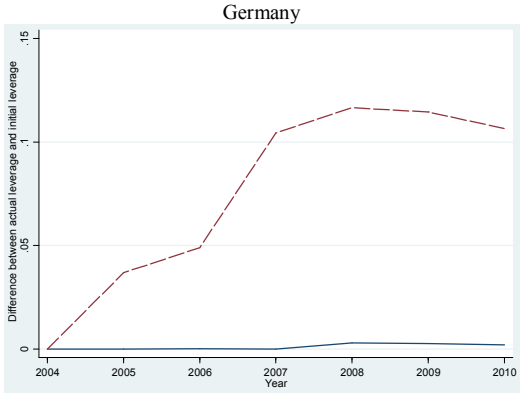


Figure 2: Evolution of the degree of leverage instability

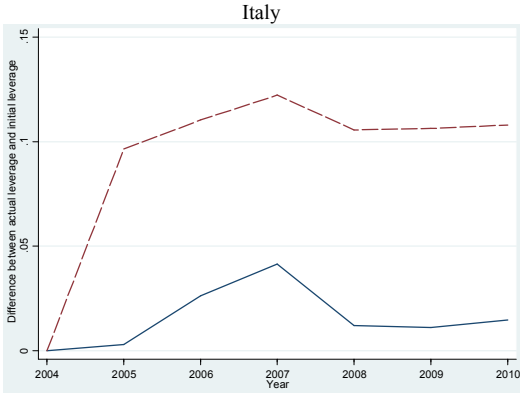
The figures present the evolution of the difference between actual leverage and initial leverage of firms in all European countries and separately for each European country over a period of 2004 to 2010. The dashed lines are the evolution of the mean of the difference between actual leverage and initial leverage (e.g. degree of instability in leverage). The solid lines are the evolution of the median of the difference between actual leverage and initial leverage. Initial leverage is the leverage for firm i in year t equals to zero.



Germany



Italy



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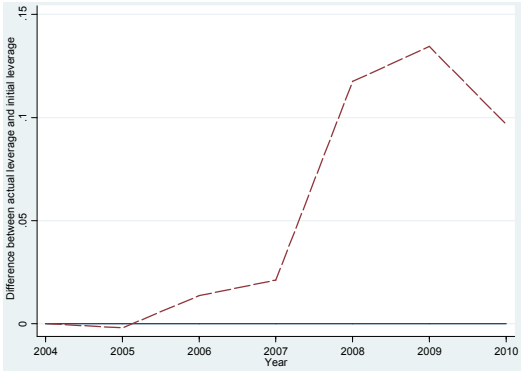
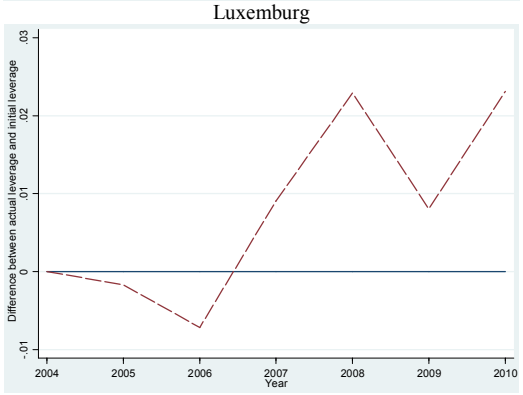
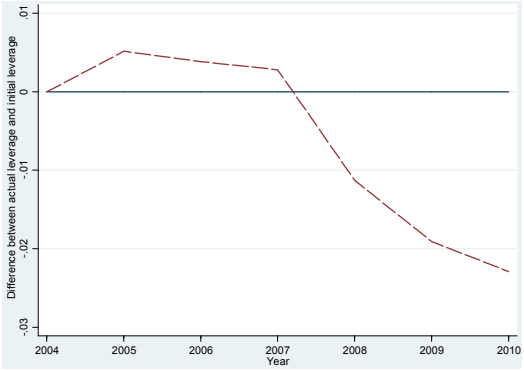


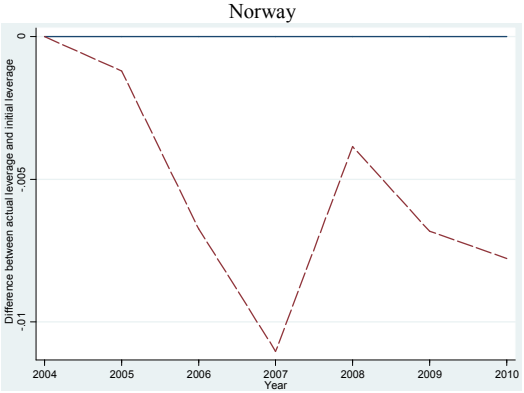
Luxemburg



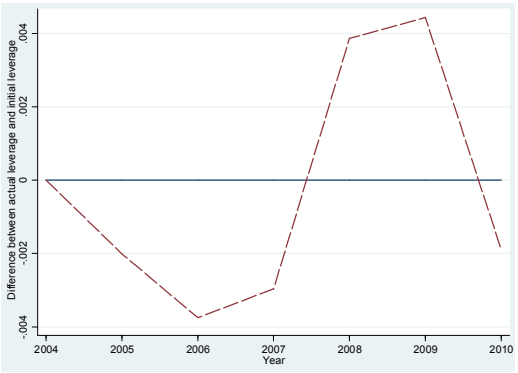
The Netherlands



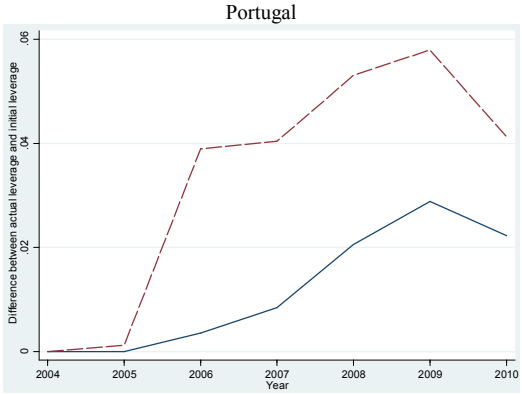
Norway



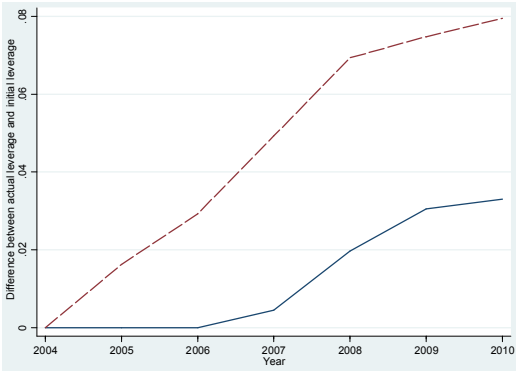
Poland



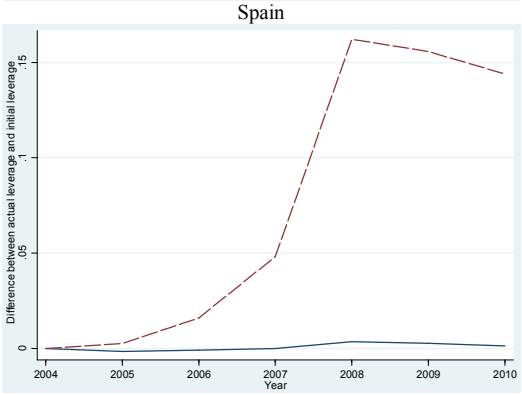
Portugal



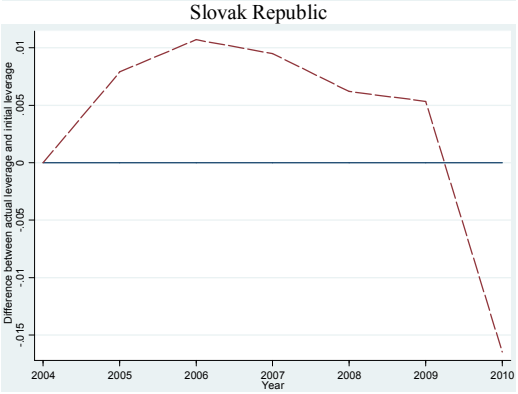
Serbia



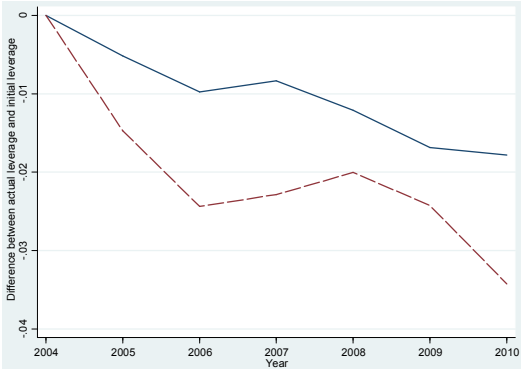
Spain



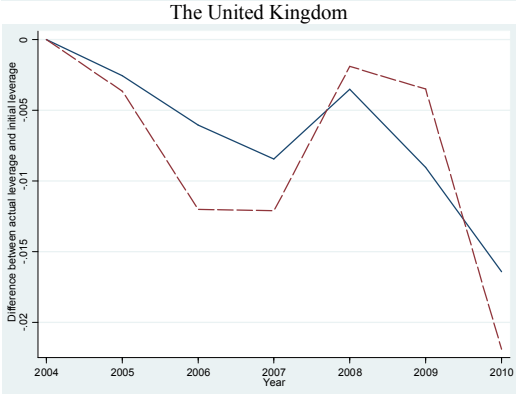
Slovak Republic



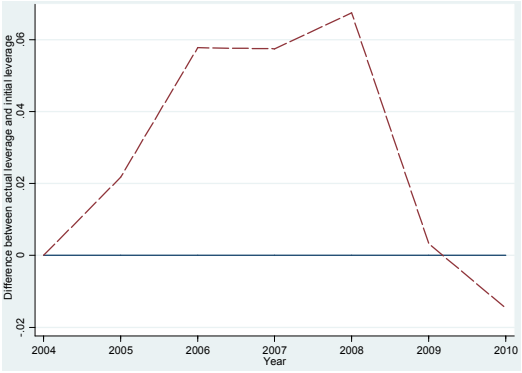
Switzerland



The United Kingdom



Ukraine



All European Countries

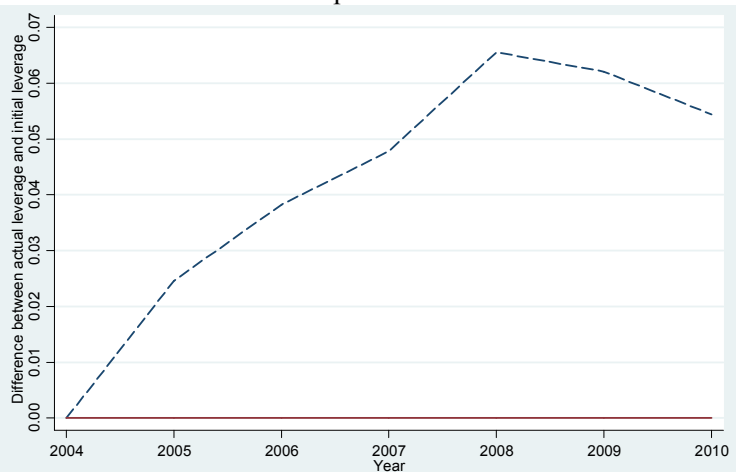


Table 2: Country-specific determinants and the degree of instability in financial leverage of unlisted firms across European countries

The sample consists of unlisted European firms in twenty European countries in the Amadeus database from 2004 to 2010. This Table presents pooled OLS estimates results for the sample of all European countries. The model presents the parameter estimates from pooled OLS regression of book leverage on the degree of leverage instability, country-specific determinants, firm controls, country, sector and year fixed effects for the full sample of European firms. Year FE are year fixed effects. Country FE are country fixed effects. All variables are lagged one period, except for year, country and sector fixed-effects. The adjusted R-squares are in the bottom row of this Table. The z-statistics, reported in parentheses, are computed using standard errors robust to both clustering at country level and heteroskedasticity. The superscripts a, b, and c indicate statistical significance at 1%, 5% and 10% level, respectively. Country-specific determinants and firm-specific determinants are lagged one period. Variables are defined in Appendix A.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
The degree of leverage instability	0.463[a]	0.463[a]	0.463[a]	0.463[a]	0.463[a]	0.463[a]	0.483[a]	0.463[a]	0.463[a]	0.484[a]	0.484[a]
	(16.42)	(16.42)	(16.54)	(16.54)	(16.52)	(16.67)	(29.87)	(16.63)	(16.54)	(29.58)	(29.58)
Firm size	-0.013	-0.013	-0.013	-0.013	-0.013	-0.013	-0.012	-0.013	-0.013	-0.012	-0.012
	(-0.64)	(-0.64)	(-0.64)	(-0.64)	(-0.64)	(-0.64)	(-0.52)	(-0.64)	(-0.64)	(-0.52)	(-0.52)
Asset tangibility	0.136[a]	0.136[a]	0.137[a]	0.137[a]	0.137[a]	0.137[a]	0.141[a]	0.137[a]	0.137[a]	0.141[a]	0.141[a]
	(3.87)	(3.87)	(3.89)	(3.89)	(3.89)	(3.89)	(3.56)	(3.88)	(3.89)	(3.57)	(3.57)
Tax rate	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.007	-0.008	-0.008	-0.008
	(-0.73)	(-0.73)	(-0.72)	(-0.72)	(-0.72)	(-0.74)	(-0.72)	(-0.72)	(-0.72)	(-0.73)	(-0.73)
Firm age	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.002	0.002	0.001	0.001
	(0.25)	(0.25)	(0.24)	(0.24)	(0.24)	(0.23)	(0.15)	(0.23)	(0.24)	(0.13)	(0.13)
Growth opportunities	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.011	-0.010	-0.010	-0.011	-0.011
	(-1.61)	(-1.60)	(-1.58)	(-1.58)	(-1.57)	(-1.57)	(-1.33)	(-1.56)	(-1.58)	(-1.29)	(-1.29)
Profitability	-0.112[a]	-0.112[a]	-0.112[a]	-0.112[a]	-0.112[a]	-0.112[a]	-0.125[a]	-0.112[a]	-0.112[a]	-0.125[a]	-0.126[a]
	(-3.87)	(-3.87)	(-3.85)	(-3.85)	(-3.85)	(-3.85)	(-3.57)	(-3.85)	(-3.85)	(-3.57)	(-3.57)
Economic indicators											
GDP per capital annual growth rate	0.001[b]									0.002	
	(2.85)									(0.84)	
GDP growth rate		0.002[a]									-0.000
		(3.23)									(-0.05)
Inflation rate	-0.005[a]	-0.005[a]								0.000	0.001
	(-3.20)	(-3.25)								(0.09)	(0.44)
Government subsidies	-0.002[b]	-0.002[b]								0.001	0.002
	(-2.36)	(-2.36)								(0.51)	(1.04)
Tax rate	0.003	0.003								0.010	0.010
	(1.07)	(1.07)								(1.67)	(1.70)
Legal system (reference category: common law)											
French Commercial Legal Code			-0.144[a]							-0.404[c]	-0.397
			(-3.58)							(-1.78)	(-1.74)
German Commercial Legal Code			0.030							0.278	0.275
			(1.54)							(0.74)	(0.74)
Scandinavian Civil Law			-0.058							-0.103	-0.105
			(-1.43)							(-0.28)	(-0.29)
Mixed Origin Law			-0.117							0.151	0.141

			(-1.52)							(0.49)	(0.47)
Shareholder protection											
Strength of investor protection				-0.010 (-0.69)						0.023 (0.74)	0.021 (0.68)
Creditor rights protection											
Cost of claim (%)					-0.004[b] (-2.64)					0.014 (1.32)	0.014 (1.28)
Debt recovery rate					0.000 (0.12)					0.005[c] (2.00)	0.005[c] (2.06)
Financial sector development											
Private fund						-0.000 (-0.40)				0.000 (0.04)	0.000 (0.16)
Bank concentration						-0.000 (-0.56)				-0.001 (-1.13)	-0.001 (-1.13)
Bank Z-score						-0.001[a] (-3.00)				-0.001[a] (-3.01)	-0.001[b] (-2.88)
Stock-market development											
Market-based financial system							-0.095[b] (-2.79)			0.037 (0.22)	0.032 (0.19)
Stock-market capitalization							0.000 (1.33)			-0.000 (-0.57)	-0.000 (-0.52)
Bond-market development							0.000 (1.22)			-0.000 (-0.57)	-0.000 (-0.67)
Country governance indicator											
Corruption perception index								-0.010 (-0.95)		-0.008 (-1.19)	-0.009 (-1.25)
Government effectiveness measures								-0.000 (-0.12)		-0.005 (-1.71)	-0.005 (-1.73)
Culture											
Religion									0.027 (0.71)	-0.320 (-1.73)	-0.316 (-1.71)
Constant	0.290[b] (2.34)	0.291[b] (2.32)	0.330[c] (1.90)	0.248[a] (2.87)	0.312[c] (1.89)	0.222[c] (1.88)	0.179 (1.35)	0.250 (1.13)	0.186 (1.37)	-0.023 (-0.04)	0.011 (0.02)
Year FE	X	X	X	X	X	X	X	X	X	X	X
Sector FE	X	X	X	X	X	X	X	X	X	X	X
Country FE	X	X	X	X	X	X	X	X	X	X	X
Firm-year observations	2,734,384	2,734,384	2,734,384	2,734,384	2,734,384	2,734,384	2,511,214	2,734,384	2,734,384	2,511,214	2,511,214
Adj. R^2	0.236	0.236	0.220	0.220	0.219	0.219	0.219	0.220	0.236	0.220	0.219

Table 3: Variance Decomposition analysis of Leverage

The sample consists of unlisted European firms in twenty European countries in the Amadeus database from 2004 to 2010. This Table presents variance decomposition results for the sample of all European countries. The model presents the parameter estimates from the variance decomposition of book leverage on degree of leverage instability, country-specific determinants, firm controls (firm age, firm size, tax rate, profitability, asset tangibility, and growth options), country, sector and year fixed effects on future leverage for the full sample of European firms. Year FE are year fixed effects. Country FE are country fixed effects. All variables are lagged one period, except for year, country and sector fixed-effects. The adjusted R-squares are in the bottom row of this Table. Country-specific determinants and firm-specific determinants are lagged one period. I compute the Type III partial sum of squares for each effect of the independent variable in the model and normalize each estimate by the sum across all the effects. This force each row to be one. This Table is interpreted as follows. For example, past degree of leverage instability explains 84.10 % of the variation in future financial leverage in column 1. Variables are defined in section A.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
The degree of leverage instability	84,10%	84,17%	67,30%	72,13%	69,96%	81,29%	74,08%	70,01%	67,43%	92.06%	92.06%
Firm size	0.98%	0.98%	0.77%	0.83%	0.80%	0.93%	0.72%	0.80%	0.77%	0.91%	0.91%
Asset tangibility	3,20%	3,20%	2,56%	2,75%	2,67%	3,11%	3,09%	2,67%	2,57%	3.85%	3.85%
Tax rate	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.03%	0.02%	0.02%	0.03%	0.03%
Firm age	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Growth opportunities	0.04%	0.04%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.04%	0.04%
Profitability	0.76%	0.76%	0.60%	0.65%	0.63%	0.73%	0.82%	0.63%	0.61%	1.02%	1.02%
Economic indicators											
GDP per capital annual growth rate	0,01%									0.00%	
GDP growth rate		0,01%									0.00%
Inflation rate	0,12%	0,12%								0.00%	0.00%
Government subsidies	0,02%	0,03%								0.00%	0.00%
Tax rate	0,01%	0,01%								0.07%	0.07%
Legal system											
Legal system			0,56%							0.12%	0.12%
Shareholder protection rights											
Strength of investor protection				0,00%						0,00%	0,00%
Creditor protection rights											
Cost of claim (%)					0,01%					0,00%	0,00%
Debt recovery rate					0,00%					0,04%	0,04%
Financial sector development											
Private fund						0,00%				0,00%	0,00%
Bank concentration						0,00%				0,01%	0,01%
Bank Z-score						0,03%				0,01%	0,01%
Stock-market development											
Market-based financial system							0,05%			0,00%	0,00%
Stock-market capitalization							0,00%			0,00%	0,00%
Bond-market development							0,00%			0,00%	0,00%
Country governance indicator											
Corruption perception index								0,01%		0.01%	0.01%
Government effectiveness measures								0,00%		0.07%	0.07%
Culture											
Religion									0,06%	0.00%	0.00%
Sector FE	0,99%	0,99%	0.79%	0.85%	0,83%	0,96%	0,96%	0,83%	0,80%	1.20%	1.20%

Year FE	0,03%	0,03%	0.10%	0.11%	0,07%	0,07%	0,03%	0,10%	0,10%	0.01%	0.01%
Country FE	9,70%	9,63%	27.25%	22.63%	24,99%	12,83%	20,17%	24,91%	27,61%	0.53%	0.53%
Firm-year observations	2,734,384	2,734,384	2,734,384	2,734,384	2,734,384	2,734,384	2,511,214	2,734,384	2,734,384	2,511,214	2,511,214
Adj. R^2	0.236	0.236	0.220	0.220	0.219	0.219	0.219	0.220	0.236	0.220	0.220

Table 4: What explains the degree of instability in leverage?

The sample consists of unlisted European firms in twenty European countries in the Amadeus database from 2004 to 2010. This Table presents pooled OLS estimates results for the sample of all European countries. The model presents the parameter estimates from pooled OLS regression of book leverage on the degree of leverage instability, country-specific determinants, firm controls (firm age, firm size, tax rate, profitability, asset tangibility, and growth options), interactions between degree of leverage instability and country/firm-specific determinants, country, sector and year fixed effects for the full sample of European firms. Year FE are year fixed effects. Country FE are country fixed effects. All variables are lagged one period, except for year, country and sector fixed-effects. The adjusted R-squares are in the bottom row of this Table. The z-statistics, reported in parentheses, are computed using standard errors robust to both clustering at country level and heteroskedasticity. The superscripts a, b, and c indicate statistical significance at 1%, 5% and 10% level, respectively. Country-specific determinants and firm-specific determinants are lagged one period. All variables are defined in Appendix A.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
The degree of leverage instability	0.270	0.262	0.100	0.089	-0.061	0.131	0.058	0.131	0.185[b]	-1.109	-1.058
	(1.24)	(1.26)	(0.92)	(0.58)	(-0.65)	(1.57)	(0.58)	(1.13)	(2.31)	(-1.40)	(-1.29)
Firm size	-0.012	-0.012	-0.012	-0.013	-0.012	-0.012	-0.011	-0.013	-0.012	-0.010	-0.010
	(-0.64)	(-0.64)	(-0.64)	(-0.65)	(-0.62)	(-0.63)	(-0.49)	(-0.65)	(-0.64)	(-0.45)	(-0.45)
Firm size x the degree of leverage instability	0.009	0.009	0.004	0.009	0.001	0.007	-0.011	0.011	0.005	-0.015	-0.015
	(0.44)	(0.45)	(0.19)	(0.44)	(0.07)	(0.35)	(-0.58)	(0.54)	(0.26)	(-1.09)	(-1.09)
Asset tangibility	0.139[a]	0.139[a]	0.136[a]	0.136[a]	0.137[a]	0.140[a]	0.143[a]	0.137[a]	0.137[a]	0.145[a]	0.145[a]
	(3.95)	(3.95)	(3.94)	(3.86)	(3.91)	(4.07)	(3.54)	(3.90)	(3.95)	(3.57)	(3.57)
Asset tangibility x the degree of leverage instability	0.012	0.012	0.015	0.009	0.018	0.014	-0.005	0.008	0.012	0.007	0.007
	(0.30)	(0.30)	(0.37)	(0.22)	(0.48)	(0.35)	(-0.09)	(0.19)	(0.30)	(0.14)	(0.14)
Tax rate	-0.006	-0.006	-0.007	-0.007	-0.006	-0.006	-0.007	-0.007	-0.007	-0.006	-0.006
	(-0.72)	(-0.72)	(-0.75)	(-0.83)	(-0.65)	(-0.70)	(-0.75)	(-0.84)	(-0.76)	(-0.56)	(-0.56)
Tax rate x the degree of leverage instability	0.003	0.003	0.007	0.013	-0.003	-0.002	0.011	0.014	0.007	-0.008	-0.008
	(0.14)	(0.15)	(0.27)	(0.58)	(-0.23)	(-0.09)	(0.35)	(0.59)	(0.28)	(-0.51)	(-0.51)
Firm age	-0.003	-0.003	-0.002	-0.003	-0.003	-0.002	-0.003	-0.003	-0.002	-0.003	-0.003
	(-0.45)	(-0.44)	(-0.41)	(-0.42)	(-0.43)	(-0.41)	(-0.42)	(-0.47)	(-0.42)	(-0.43)	(-0.43)
Firm age x the degree of leverage instability	0.099[b]	0.098[b]	0.106[b]	0.109[b]	0.109[b]	0.092[b]	0.099[b]	0.108[b]	0.106[b]	0.093[b]	0.093[b]
	(2.36)	(2.35)	(2.29)	(2.37)	(2.40)	(2.28)	(2.15)	(2.39)	(2.31)	(2.17)	(2.17)
Growth options	-0.017[c]	-0.017[c]	-0.016[c]	-0.015[c]	-0.016[c]	-0.017[c]	-0.018[c]	-0.016[c]	-0.016[c]	-0.018[c]	-0.018[c]
	(-2.07)	(-2.07)	(-1.83)	(-1.95)	(-1.86)	(-2.03)	(-1.83)	(-1.87)	(-1.84)	(-1.92)	(-1.92)
Growth options x the degree of leverage instability	0.133[b]	0.133[b]	0.127[b]	0.125[b]	0.125[b]	0.129[b]	0.144[c]	0.126[b]	0.127[b]	0.142[c]	0.142[c]
	(2.45)	(2.46)	(2.47)	(2.48)	(2.45)	(2.53)	(2.13)	(2.47)	(2.46)	(2.14)	(2.14)
Profitability	-0.109[a]	-0.109[a]	-0.101[a]	-0.100[a]	-0.102[a]	-0.110[a]	-0.113[a]	-0.101[a]	-0.101[a]	-0.123[a]	-0.123[a]
	(-4.47)	(-4.46)	(-3.80)	(-4.12)	(-4.22)	(-4.06)	(-3.68)	(-4.12)	(-3.84)	(-4.24)	(-4.24)
Profitability x the degree of leverage instability	-0.341[a]	-0.340[a]	-0.348[a]	-0.357[a]	-0.345[a]	-0.329[a]	-0.408[a]	-0.360[a]	-0.348[a]	-0.390[a]	-0.390[a]
	(-4.59)	(-4.60)	(-4.60)	(-4.71)	(-4.82)	(-4.36)	(-4.00)	(-4.70)	(-4.59)	(-4.24)	(-4.24)
Economic indicators											
GDP per capital annual growth rate	0.002[a]									0.003	
	(3.57)									(1.28)	
GDP per capital annual growth rate x the degree of leverage instability	-0.002									-0.002	
	(-0.53)									(-0.48)	
GDP growth rate		0.002[a]									0.003
		(3.55)									(1.43)
GDP growth rate x the degree of		-0.003									-0.003

leverage instability		(-0.63)									(-0.71)
Inflation rate	-0.005[a] (-2.95)	-0.005[a] (-2.97)								0.001 (0.21)	0.000 (0.04)
Inflation rate x the degree of leverage instability	-0.002 (-1.24)	-0.002 (-1.19)								0.022[a] (8.58)	0.023[a] (8.85)
Government subsidies	-0.003[b] (-2.83)	-0.003[b] (-2.85)								0.001 (0.61)	0.001 (0.52)
Government subsidies x the degree of leverage instability	0.000 (0.11)	0.000 (0.16)								0.001 (0.19)	0.000 (0.15)
Tax rate	0.003 (1.00)	0.003 (0.98)								0.010 (1.74)	0.011[c] (1.77)
Tax rate x the degree of leverage instability	-0.007 (-1.58)	-0.007 (-1.57)								-0.019[b] (-2.49)	-0.019[b] (-2.53)
Legal system (reference category: common law)											
French Commercial Legal Code			-0.146[a] (-3.96)							-0.413[c] (-1.96)	-0.404[c] (-1.88)
French Commercial Legal Code x the degree of leverage instability			0.097[b] (2.23)							0.812[a] (3.39)	0.785[a] (3.26)
German Commercial Legal Code			0.038[c] (1.86)							0.320 (0.84)	0.314 (0.84)
German Commercial Legal Code x the degree of leverage instability			0.128 (1.48)							1.049[a] (5.20)	1.025[a] (4.77)
Scandinavian Civil Law			-0.056 (-1.45)							-0.101 (-0.29)	-0.103 (-0.30)
Scandinavian Civil Law x the degree of leverage instability			-0.004 (-0.11)							0.640[a] (3.60)	0.629[a] (3.38)
Mixed Origin Law			-0.118 (-1.56)							0.172 (0.58)	0.161 (0.55)
Mixed Origin Law x the degree of leverage instability			0.022 (0.26)							0.819[a] (6.66)	0.800[a] (6.29)
Shareholder protection rights											
Strength of investor protection				-0.012 (-0.76)						0.037 (1.17)	0.033 (1.11)
Strength of investor protection x the degree of leverage instability				0.011 (0.40)						0.207[a] (4.33)	0.200[a] (3.99)
Creditor protection rights											
Cost of claim (%)					-0.005[a] (-3.10)					0.014 (1.33)	0.013 (1.29)
Cost of claim (%) x the degree of leverage instability					0.004 (1.66)					-0.002 (-0.73)	-0.002 (-0.67)
Debt recovery rate					0.000 (0.28)					0.006[b] (2.25)	0.006[b] (2.28)
Debt recovery rate x the degree of					0.003[a]					-0.004	-0.004

leverage instability					(2.90)					(-1.69)	(-1.47)
Financial sector development											
Private fund						-0.000 (-0.71)				-0.000 (-0.29)	-0.000 (-0.14)
Private fund x the degree of leverage instability						0.001[a] (3.89)				0.001 (1.08)	0.001 (1.05)
Bank concentration						-0.000 (-0.74)				-0.001 (-0.98)	-0.001 (-1.01)
Bank concentration x the degree of leverage instability						-0.002[c] (-1.81)				-0.004[b] (-2.19)	-0.004[b] (-2.18)
Bank Z-score						-0.002[b] (-2.74)				-0.001[b] (-2.31)	-0.001[b] (-2.24)
Bank Z-score x the degree of leverage instability						-0.002 (-0.82)				0.000 (0.04)	-0.000 (-0.01)
Stock-market development											
Market-based financial system							-0.092[b] (-2.77)			0.060 (0.37)	0.055 (0.34)
Market-based financial system x the degree of leverage instability							-0.006 (-0.07)			0.210 (1.29)	0.192 (1.26)
Stock-market capitalization							0.000 (1.11)			-0.000 (-0.60)	-0.000 (-0.55)
Stock-market capitalization x the degree of leverage instability							0.000 (1.39)			0.000 (1.33)	0.001 (1.38)
Bond-market development							0.000 (1.21)			-0.000 (-0.37)	-0.000 (-0.46)
Bond-market development x the degree of leverage instability							0.002[c] (2.05)			0.002[b] (2.73)	0.001[b] (2.73)
Country governance indicator											
Corruption perception index								-0.010 (-1.00)		-0.011[c] (-1.88)	-0.012[c] (-1.92)
Corruption perception index x the degree of leverage instability								-0.001 (-0.33)		-0.040[b] (-2.70)	-0.037[b] (-2.94)
Government effectiveness measures								-0.000 (-0.05)		-0.005 (-1.62)	-0.005 (-1.63)
Government effectiveness measures x the degree of leverage instability								0.011 (0.52)		0.002 (0.38)	0.002 (0.34)
Culture											
Religion									0.028 (0.70)	-0.374[b] (-2.18)	-0.365[c] (-2.12)
Religion x the degree of leverage instability									-0.059 (-1.37)	0.296[b] (2.51)	-0.037[b] (-2.94)
Constant	0.322[b] (2.75)	0.324[b] (2.73)	0.338[c] (2.00)	0.263[a] (3.48)	0.316[c] (1.96)	0.242[c] (1.99)	0.172 (1.30)	0.254 (1.10)	0.192 (1.43)	-0.161 (-0.26)	-0.117 (-0.19)

Year FE	X	X	X	X	X	X	X	X	X	X	X
Sector FE	X	X	X	X	X	X	X	X	X	X	X
Country FE	X	X	X	X	X	X	X	X	X	X	X
Firm-year observations	2,734,384	2,734,384	2,734,384	2,734,384	2,734,384	2,734,384	2,511,214	2,734,384	2,734,384	2,511,214	2,511,214
Adj. R^2	0.228	0.228	0.227	0.226	0.227	0.228	0.243	0.226	0.226	0.247	0.247

Table 5: The importance of the joint effect of country- and firm-specific determinants and the degree of instability in leverage of in explaining future leverage across European countries

The sample consists of unlisted European firms in twenty European countries in the Amadeus database from 2004 to 2010. This Table presents variance decomposition results for the sample of all European countries. The model presents the parameter estimates from the variance decomposition of book leverage on the degree of leverage instability, country-specific determinants, firm controls (firm age, firm size, tax rate, profitability, asset tangibility, and growth options), interactions between degree of leverage instability and country/firm-specific determinants , country, sector and year fixed effects on future leverage for the full sample of European firms. Year FE are year fixed effects. Country FE are country fixed effects. All variables are lagged one period, except for year, country and sector fixed-effects. The adjusted R-squares are in the bottom row of this Table. Country-specific determinants and firm-specific determinants are lagged one period. I compute the Type III partial sum of squares for each effect of the independent variable in the model and normalize each estimate by the sum across all the effects. This force each row to be one. This Table is interpreted as follows. For example, past degree of leverage instability explains 3.18 % of the variation in future financial leverage in column 1. All variables are defined in Appendix A.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
The degree of leverage instability	3,18%	3,32%	2.05%	0,86%	0,24%	7,88%	0,50%	3,24%	6.33%	0,73%	0,65%
Firm size	4,64%	4,66%	2,06%	2,20%	2,22%	3,50%	2,13%	2,33%	1,99%	5,68%	5,70%
Firm size x the degree of leverage instability	0,28%	0,29%	0,02%	0,14%	0,00%	0,16%	0,23%	0,21%	0,05%	1,06%	1,07%
Asset tangibility	16,87%	16,95%	7,18%	7,54%	8,30%	13,47%	10,82%	7,99%	6,94%	34,97%	35,07%
Asset tangibility x the degree of leverage instability	0,02%	0,02%	0,01%	0,01%	0,02%	0,02%	0,00%	0,00%	0,01%	0,01%	0,01%
Tax rate	0,07%	0,08%	0,04%	0,05%	0,04%	0,06%	0,07%	0,05%	0,04%	0,13%	0,13%
Tax rate x the degree of leverage instability	0,00%	0,00%	0,00%	0,02%	0,00%	0,00%	0,02%	0,02%	0,01%	0,03%	0,03%
Profitability	3,61%	3,63%	1,38%	1,42%	1,62%	2,90%	2,30%	1,54%	1,34%	8,42%	8,45%
Profitability x the degree of leverage instability	5,36%	5,35%	2,47%	2,75%	2,79%	3,95%	3,36%	2,94%	2,40%	9,57%	9,58%
Growth options	0,53%	0,53%	0,19%	0,19%	0,22%	0,40%	0,32%	0,21%	0,19%	1,04%	1,04%
Growth options x the degree of leverage instability	4,82%	4,88%	1,96%	2,01%	2,19%	3,65%	2,71%	2,13%	1,89%	8,17%	8,20%
Firm age	0,05%	0,04%	0,02%	0,02%	0,02%	0,03%	0,03%	0,02%	0,02%	0,09%	0,09%
Firma age x the degree of leverage instability	5,66%	5,61%	2,94%	3,29%	3,54%	3,83%	3,61%	3,41%	2,87%	9,29%	9,31%
Economic indicators											
GDP per capital annual growth rate	0,08%									0,05%	
GDP per capital annual growth rate x the degree of leverage instability	0,18%									0,01%	
GDP growth rate		0,10%									0,08%
GDP growth rate x the degree of leverage instability		0,27%									0,02%
Inflation rate	0,53%	0,54%								0,00%	0,00%
Inflation rate x the degree of leverage instability	0,22%	0,25%								1,24%	1,26%
Government subsidies	0,17%	0,18%								0,02%	0,02%
Government subsidies x the degree of leverage instability	0,00%	0,01%								0,00%	0,00%
Tax rate	0,07%	0,07%								0,76%	0,80%
Tax rate x the degree of leverage instability	0,79%	0,77%								0,42%	0,40%
Legal system											
Legal system			1,67%							0,97%	0,94%

Legal system x the degree of leverage instability			0,73%							0,93%	0,90%
Shareholder protection											
Strength of investor protection				0,00%						0,00%	0,00%
Strength of investor protection x the degree of leverage instability				0,04%						0,79%	0,69%
Creditor rights protection											
Cost of claim (%)					0,02%					0,02%	0,02%
Cost of claim (%) x the degree of leverage instability					0,32%					0,01%	0,00%
Debt recovery rate					0,00%					0,34%	0,35%
Debt recovery rate x the degree of leverage instability					0,84%					0,15%	0,11%
Financial sector development											
Private fund						0,05%				0,00%	0,00%
Private fund x the degree of leverage instability						3,66%				0,11%	0,10%
Bank concentration						0,01%				0,07%	0,08%
Bank concentration x the degree of leverage instability						0,51%				0,26%	0,26%
Bank Z-score						0,12%				0,09%	0,08%
Bank Z-score x the degree of leverage instability						0,07%				0,00%	0,00%
Stock-market development											
Market-based financial system							0,16%			0,00%	0,00%
Market-based financial system x the degree of leverage instability							0,00%			0,01%	0,01%
Stock-market capitalization							0,01%			0,02%	0,02%
Stock-market capitalization x the degree of leverage instability							0,25%			0,11%	0,12%
Bond-market development							0,02%			0,01%	0,01%
Bond-market development x the degree of leverage instability							1,92%			0,12%	0,12%
Country governance indicator											
Corruption perception index								0,03%		0,06%	0,06%
Corruption perception index x the degree of leverage instability								0,03%		0,07%	0,06%
Government effectiveness measure								0,00%		0,53%	0,53%
Government effectiveness measure x the degree of leverage instability								0,02%		0,01%	0,01%
Culture											
Religion									0,17%	0,07%	0,07%
Religion x the degree of leverage instability									0,41%	0,14%	0,13%
Sector FE	5,03%	5,05%	2,22%	2,35%	2,53%	3,94%	3,28%	2,47%	2,14%	10,26%	10,29%

Year FE	0,15%	0,15%	0,31%	0,32%	0,20%	0,28%	0,17%	0,30%	0,30%	0,16%	0,19%
Country FE	47,31%	47,24%	74,74%	76,90%	74,88%	51,51%	68,09%	73,04%	72,91%	2,96%	2,94%
Firm-year observations	2,734,384	2,734,384	2,734,384	2,734,384	2,734,384	2,734,384	2,511,214	2,734,384	2,734,384	2,511,214	2,511,214
Adj. R^2	0.228	0.228	0.227	0.226	0.227	0.228	0.243	0.226	0.226	0.247	0.247

Table 6: Long Differencing Estimation of the Speed of Adjustment towards Target Leverage

The sample consists of unlisted European firms in twenty European countries in the Amadeus database from 2004 to 2010. This Table presents the results of the long differencing estimation of the speed of adjustment towards target leverage with different differencing length of k= 2, 3 and 4. I drop some year dummies to avoid multicollinearity. Variables that are constant over time (sector fixed effects, country fixed effects, culture, legal origin, and market vs. bank based system) are dropped. For brevity, the coefficient on year dummies are not reported. The t-statistics are heteroskedastic consistent stand errors, further adjusted for correlation across observations of a given firm (White (1980), Rogers (1993)). Year FE are year fixed effects. The adjusted R-squares are in the bottom row of this Table. The superscripts a, b, and c indicate statistical significance at 1%, 5% and 10% level, respectively. Variables are defined in Appendix A.

	k = 2		**k = 3**		**k = 4**	
ΔLeverage $_{it-1\ t-k-1}$	0.309[a]	0.310[a]	0.202[a]	0.197[a]	0.160[a]	0.157[a]
	(25.24)	(25.26)	(16.10)	(15.96)	(13.43)	(13.26)
ΔDegree of leverage instability$_{it-1\ t-k-1}$	0.564[a]	0.563[a]	0.672[a]	0.676[a]	0.725[a]	0.728[a]
	(51.92)	(51.70)	(57.78)	(58.94)	(62.99)	(63.62)
ΔFirm size $_{it-1\ t-k-1}$	0.018[a]	0.018[a]	0.010[a]	0.010[a]	0.008[a]	0.008[a]
	(22.30)	(22.25)	(15.96)	(15.99)	(11.82)	(11.87)
ΔAsset tangibility $_{it-1\ t-k-1}$	0.024[a]	0.024[a]	0.013[a]	0.014[a]	0.008[a]	0.008[a]
	(10.84)	(10.85)	(6.88)	(6.97)	(3.86)	(3.89)
ΔTax rate $_{it-1\ t-k-1}$	0.000	0.000	-0.000	-0.000	-0.000	-0.000
	(0.38)	(0.36)	(-1.19)	(-1.23)	(-0.76)	(-0.77)
ΔProfitability $_{it-1\ t-k-1}$	-0.046[a]	-0.046[a]	-0.040[a]	-0.039[a]	-0.038[a]	-0.038[a]
	(-26.56)	(-26.58)	(-22.69)	(-22.62)	(-18.88)	(-18.85)
ΔGrowth opportunities $_{it-1\ t-k-1}$	-0.000	-0.000	-0.002[a]	-0.002[a]	-0.002[a]	-0.002[a]
	(-0.87)	(-0.92)	(-5.00)	(-4.93)	(-3.99)	(-3.93)
ΔFirm age $_{it-1\ t-k-1}$	-0.006[a]	-0.006[a]	0.005[a]	0.005[a]	-0.001	-0.001
	(-2.96)	(-2.96)	(3.54)	(3.62)	(-0.80)	(-0.69)
ΔTaxrate $_{it-1\ t-k-1}$	-0.000	-0.000	-0.003[a]	-0.003[a]	-0.001	-0.001
	(-0.70)	(-0.44)	(-8.06)	(-7.44)	(-1.36)	(-1.17)
ΔGDP per capita $_{it-1\ t-k-1}$	-0.000		-0.003[a]		-0.003[a]	
	(-0.31)		(-12.23)		(-7.69)	
ΔGDP growth rate $_{it-1\ t-k-1}$		0.000[c]		-0.002[a]		-0.003[a]
		(1.79)		(-9.46)		(-7.83)
ΔInflation $_{it-1\ t-k-1}$	-0.000	-0.000	0.005[a]	0.005[a]	-0.000	0.001
	(-1.24)	(-1.41)	(13.63)	(14.10)	(-0.10)	(0.71)
ΔGovernment subsidies $_{it-1\ t-k-1}$	0.002[a]	0.002[a]	0.004[a]	0.004[a]	-0.000	-0.000
	(5.61)	(5.71)	(19.56)	(19.51)	(-1.15)	(-0.84)
ΔStrength of investor protection $_{it-1\ t-k-1}$	-0.000[a]	-0.000[a]	-0.000[a]	-0.000[a]	-0.000	-0.000
	(-10.84)	(-10.78)	(-19.57)	(-19.59)	(-1.30)	(-1.05)
ΔCost of claim $_{it-1\ t-k-1}$	0.016[a]	0.017[a]	0.029[a]	0.029[a]	-0.001	-0.001
	(9.40)	(9.69)	(14.92)	(14.67)	(-0.46)	(-0.44)
ΔDebt recovery rate $_{it-1\ t-k-1}$	0.003[a]	0.003[a]	0.004[a]	0.005[a]	-0.004[a]	-0.003[a]
	(10.41)	(10.57)	(12.86)	(14.11)	(-14.25)	(-12.85)
ΔBank Z-score $_{it-1\ t-k-1}$	0.000[a]	0.000[a]	0.001[a]	0.001[a]	-0.001[a]	-0.001[a]
	(3.82)	(3.78)	(6.10)	(6.44)	(-2.89)	(-3.12)
ΔBank concentration $_{it-1\ t-k-1}$	-0.000[a]	-0.000[a]	-0.000[a]	-0.000[a]	-0.001[a]	-0.000[a]
	(-5.28)	(-5.01)	(-5.08)	(-3.60)	(-9.65)	(-7.87)
ΔPrivate fund $_{it-1\ t-k-1}$	0.000[a]	0.000[a]	-0.000	-0.000	-0.000[a]	-0.000[a]
	(4.05)	(4.28)	(-1.53)	(-1.35)	(-4.76)	(-4.69)
ΔStock-market capitalization $_{it-1\ t-k-1}$	0.000[a]	0.000[a]	-0.000	-0.000	0.000[a]	0.000[a]
	(17.13)	(17.57)	(-0.90)	(-0.69)	(11.06)	(11.22)
ΔBond-market development $_{it-1\ t-k-1}$	0.000[a]	0.000[a]	0.001[a]	0.001[a]	0.000[b]	0.000[b]

	(3.55)	(3.14)	(10.07)	(9.70)	(2.35)	(2.20)
ΔGovernment effectiveness measure $_{it-1\ t-k-1}$	-0.004[a] (-11.19)	-0.004[a] (-11.29)	-0.007[a] (-20.05)	-0.007[a] (-20.02)	-0.001[b] (-2.42)	-0.001[a] (-2.61)
ΔCorruption perception index $_{it-1\ t-k-1}$	-0.032[a] (-35.70)	-0.033[a] (-34.90)	-0.023[a] (-16.92)	-0.024[a] (-17.92)	0.006[a] (2.93)	0.005[a] (2.73)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-year observations	1,768,980	1,768,980	1,256,490	1,256,490	786,240	786,240