European Companies' Financing Decisions and the Financial Crisis of 2007/2008

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ABSTRACT

Capital structure decisions are taken on the basis of firm specific characteristics but are also dependent on the environment in which the firm operates. The 2007/2008 financial crisis had major implications for both of those inputs considered in corporates' financing behaviour. Using a sample of European companies listed in the *Eurostoxx 600* index, this research tries to assess the impact of this particular event on firms' capital structure in order to identify the existence of a theoretical pattern underlying those decisions. Capital structure components are analysed comparing three time ranges representing the pre, during and after crisis periods. The analysis is performed for the overall sample but also considering sector, industry and country classifications expected to determine how the impact of the crisis is felt differently among companies. The main findings suggest that the assumed decrease in bank loan supply did not reflect into a decrease in *leverage* with a clear preference for debt over equity from the prior to the crisis period. A rebalancing seems to happen afterwards, in line with the observable importance of time invariant variables. Overall, *pecking-order* seems to explain better the results, mainly in *bank-based* countries while *market timing* is also considered, particularly by *market-based* ones.

Na escolha da estrutura de capitais são tomados em consideração quer fatores específicos à empresa como também relativos ao ambiente envolvente, os quais se assumem ter sido afetados pela crise financeira de 2007/2008. Utilizando uma amostra de empresas europeias listadas no índice Eurostoxx 600, este estudo pretende analisar o impacto deste evento específico na estrutura de capitais das empresas de forma a identificar a existência de padrões teóricos subjacentes. As componentes da estrutura de capitais são analisadas através da comparação de três períodos de tempo distintos que pretendem representar respetivamente o período anterior, durante e posterior à crise financeira. A análise é executada para a amostra completa assim como considerando a classificação de sector, industria e país, os quais se esperam relevantes na determinação do impacto sentido pelas diferentes empresas. Os resultados principais sugerem que o decréscimo da oferta de crédito bancários não se refletiu numa diminuição da alavancagem financeira das empresas. É evidente uma preferência por dívida em detrimento de capitais próprios. Ainda, o período pós crise parece ser caracterizado por um regresso ao valor de partida. Em geral, a teoria *pecking-order* tende a explicar melhor os comportamentos observados, especialmente no caso de países designados *"bank-based"* sendo que *market timing* se revela importante essencialmente para os países restantes, "market-based".

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CONTENTS

EXHIBIT LIST

ACRONYMS LIST

CPX	Capital Expenditures
FE	Fixed Effects
GDP	Gross Domestic Product
GICS	Global Industry Classification Standard
MB	Market to Book Ratio
NDTS	Non-Debt Tax Shields
PRF	Profitability
RAT	Credit Rating
SIZE	Size
TNG	Tangibility
UNIQ	Uniqueness

1. INTRODUCTION

1.1. Financial Crisis and Capital Structure

Capital structure issues are among the central topics concerning the management of a company. In particular, capital structure decisions describe the way a company structures its financing in terms of sources, which can be either internal or external, amount and timing.

There has been a substantial amount of research in the corporate financing field but no consensus was attained so far regarding the mechanics underlying those decisions which, as Meyers (1984) claimed, one should not expect to see given their non-definite nature. Nevertheless, there remain no doubts about both their importance for companies' value and their dependence upon numerous factors, either firm, industry, institutional or macroeconomic related.

For instance, Graham, Leary, and Roberts (2014) found that the commonly used firm specific features, if considered alone, do not fully explain the amount of *leverage* carried by firms. Instead, they assume macroeconomic factors such as government borrowing, financial markets development, economic uncertainty, taxes, financial distress and asymmetric information costs to be a relevant consideration for corporate *leverage*. From those, the first two, representing funding sources alternative to debt, were found by the authors to be statistically significant. As for the former, its impact relies on a substitute effect between government and corporate debt while the second arises from reduced asymmetry information from the improved knowledge and scale of market players as development occurs (Diamond, 1984; Leland & Pyle, 1977, cited in Graham et al., 2014, p. 27).

The influence of the previously mentioned factors, generally correlated with the broad macroeconomic environment, depends on the specific moment at which *leverage* decisions are taken. In this setting, the financial crisis of 2007/2008 is a good opportunity to examine how capital structure adapts according to several constraints on firms' ability to finance, invest and ultimately to survive. As Campello, Giambona, Graham and Harvey (2012, p.331) state, times of "*credit squeeze*" are the best to test liquidity sources' decisions.

Indeed, Bhamra, Kuehn and Strebulaev (2010) observed that, during periods of financial distress, firms are differently impacted by macroeconomic factors according to how financially constrained they are. The likelihood of suffering from economic recessions is higher for those facing credit raising constraints, lower profitability and unfavourable credit

ratings (Campello et al., 2012). Thus, firm specific factors related to macroeconomic conditions are included in this research adopted methodology, mainly to account for the increased impact of adverse selection and bankruptcy costs on the leverage adjustments during worsen macroeconomic conditions (Korajczyk & Levy, 2003).

This financial crisis can see its roots on the fragility and connections within the banking system. The resulting contagion between financial institutions suffering losses in their assets' value, as mortgage borrowers started to default and housing prices declining, limited their ability to provide capital to the corporate side of the economy and forcing them to tighten their credit supply conditions (Spiegel, 2011).

Although starting in the United States, quickly saw its effects spread all over the world with Europe being extremely penalized. Considering European companies to be traditionally "*bank-based*" (Demirguc-Kunt & Levine, 2001, cited in Campello et al., 2012, p.334), as relying hugely on bank financing rather than open market transactions, one could expect to see a stronger impact from the reduced bank credit availability on their ability to raise capital, among other things, at the same time they most required it (Campello, et al., 2012). Leary (2009) points for an increasingly important negative impact of banking shocks for firms that face more restrictions in switching bank loans by public debt, for which size might play an important role. Indeed, it finds a more negative impact for small and riskier companies and more liquidity constrained from reduced bank loan supply.

Other sources of liquidity rather than bank loans were also impacted by the crisis with investors demanding higher returns to compensate for the increased risk. Particularly during downturns, internal stakeholders have superior information than outside investors which reflects in higher costs of raising external capital (Myers & Majluf, 1984). Thus, a natural preference for internally generated funds avoids investors to react negatively to managers' tendency to raise debt or to issue securities when they are overpriced. Indeed, as from Korajczyk and Levy (2003), *pecking-order* behaviour, as introduced below, tends to be observed when macroeconomic conditions are included as determinants of *leverage* leading firms to depart from the target amount. Although the opposite could also be expected, this is, lower profits, decreased shielded income and more bankruptcy risk making debt negatively associated with declining economic circumstances, a *pecking-order* pattern leading to the highest leverage level happening during financial crisis periods still remains plausible.

Two mechanisms can help to reconcile the apparently contradictory increased capital raising difficulties with the higher debt ratios observed during financial crisis. First, although information asymmetries exist, they have a much lower impact for debt than equity securities issues (Chaplynskin & Hensen 1993, cited in Korajczyk & Levy, 2003, p.80). Additionally, Levy (2001, cited in Korajczyk and Levy, p.78) claim that during periods of economic downturns, a higher amount of debt is required to avoid conflicts of interests between management and shareholders since the first are more affected than the seconds in their wealth from the decisions they make.

Another reason for studying European companies within this specific period arises from data on European companies funding which shows this period as a changing point by switching from the traditional bank loan source to market financing, mainly for large companies which can more easily bear the high issuing costs (EC, 2010).

Combining all those ideas together, the knowledge around capital structure decisions in periods of market disruption and corporate funding distress provides a basis for firms' liquidity management when cash reserves are not enough and external capital is required. It is crucial to avoid passing positive net present value projects and thus maximize firm value. Also, for regulators it is important to know how their interference on financial markets and on how banking institutions are allowed to provide capital can impact corporate financial structure while avoiding deeper consequences of distressed times.

1.2. Objective of research

In line with the previous section, this thesis perceives the 2007/2008 financial crisis as an opportunity to assess the impact of such a macro event on the corporate sector financing, a link putted forward by Korajkzyc and Levy (2003) as to be further explored. Indeed, by focusing on the debt side of capital structure, it attempts to understand whether a significant effect on firms' financing decisions is empirically observed, which might be also differently reflected among countries.

This is particularly interesting to investigate in the case of European companies, which have traditionally based their financing needs on the bank sector, which might be the result of the strong fragmentation within European markets limiting the potential for higher development.

Using an European sample, this thesis starts by examining the evolution of capital structure components and other related firm specific variables in three distinct moments in time which try to mirror different circumstances delimited by the financial crisis event. Additionally, econometric procedures are applied to withdrawal more consistent results regarding the observed pattern. In case the impact shows up to be significant, this study aims to identify which of the capital structure theories provides a basis for explaining the evolution of debt along with several variables or, instead, to propose possible arguments in case none is verified. The analysis also accounts for industry and country related factors.

The remainder of this work goes as follows. Chapter 2 present a broad overview of the relevant literature as well as the main research questions and respective hypothesis. Chapter 3 describes the sample data and outlines the methodology employed. In Chapter 4 the main findings are presented alongside with further discussion. Chapter 5 recognizes the main limitations of the methodology used and the results obtained. Chapter 6 Concludes.

2. LITERATURE REVIEW

Around the 1950's, a new setting in the way of thinking corporate finance topics replaced the commonly used "normative" approach to a more positive type of questioning whose main goal is to understand the impact of specific decisions instead of merely creating an hypothetical setting about the optimal decisions (Jensen & Smith, 1984, p.2). Given the recognised interest surrounding capital structure decisions, an extensive theoretical and empirical research, which is now briefly introduced, has been developed since an early stage of the corporate finance study extending until the very recent moment. This sets the basis for results interpretation.

2.1. Irrelevance Theory

In the late 1950's, Modigliani and Miller (1958) developed a model stating that, under several restrictive assumptions representative of a perfect capital market setting in which two perfect substitutes trade at the same price, the financing decisions of a company do not impact its value as long as cash flows probability is not affected. According to their assumptions, *Proposition I* states that any asset from a given homogeneous class should be worth the same in proportion to its expected return. Equivalently, it can be said that the cost of capital is not affected, because none of the sources of funds would result in relative benefits or costs to the company and the overall value would be the same even though allocated differently among stakeholders.

2.2. Trade-Off Theory

However, against what was suggested by the above mentioned authors, in practice there is significant concern regarding capital structure issues suggesting for the relevance of the financing mix for firm value purposes. Indeed, in a study concerning tax shield effect from capital structure changes, Masulis (1980, cited in DeAngelo & Masulis, 1980 p. 23) found that a given change in debt market value would result in a 10% to 20% change, of that amount, on the firm value.

Departing from the Modigliani and Miller irrelevance ground, several other capital structure theories can be seen as the result of dropping some of their assumptions in line with more realistic hypothesis. To start with taxes, on a subsequent work, Modigliani and Miller (1963) considered that the existence of corporate income taxes would change the probability distribution of after-tax cash flows and thus firm value. If on one hand the tax advantage of

debt may suggest for an highly levered capital structure in order to fully exploit interest tax deductibility, one must also consider the presence of other items offsetting its tax advantage (Brenan & Schwartz, 1978). Within this framework, the *trade-off* theory was born by equating both the benefits and potential disadvantages of *leverage*.

One of those items relates to the presence of personal taxes. As Miller (1977) claimed, although the corporate tax advantage of debt increases the overall value available for stakeholders, the pre-tax return from bonds must be significantly high to offset the personal taxability of income from bonds when it is fixed above the tax rate on income from equity. Nevertheless, the author does not deny his previous irrelevancy hypothesis by considering that the interaction between demand and supply sides of corporate debt will lead to an equilibrium in which the value of the firm is independent on tax deductibility of debt interest.

DeAngelo and Masulis (1980) counter argue this statement through a model which, by considering personal taxation, non-debt tax shields (including depreciations and investment tax credits on after-tax earnings) and default costs, shows that the presence of corporate tax shields affects firm value. They find that the optimum level of debt indeed exists and is inversely related to those non-debt tax shields due to limits imposed by taxation laws on the way and amount a firm can shield its taxes. Nevertheless, the author recognises that in a setting allowing for "*carrybacks and carryforwards*" (DeAngelo & Masulis, 1980, p.18) the effect would be smaller and delayed in time.

Another objection to the irrelevancy theory can be seen in Kraus and Litzenberger (1973) by considering the bankruptcy risk arising from contrasting the pre-established nature of debt service claim compared to the uncertain capability of being solvent according to the availability of funds. In case the firm is not able to comply with its debt service commitments it will be in financial distress which, because of non-perfect capital markets, imposes costs destroying the value available to debt holders and thus the total value of the firm. Already Miller (1977) accounted for those costs but cautiously denying their significance compared to the tax advantage of leverage. Evidence for the significance of bankruptcy costs can be seen in Warner (1977) which, in a study regarding bankrupt U.S. railroad firms, found that security prices significantly account for both the bankruptcy possibility and deviations from the bankruptcy legal procedure.

Finally, what is usually called agency problem represents another reason for capital structure's significance. As Jensen and Meckling (1976) pointed out, although being profit-

maximization oriented, firms' ownership structure creates a complex dynamic of conflicting interests. Those arise from the several layers of decision making power and property rights determining how costs and benefits are distributed. Because managers have to consider debt service payments, debt can help avoiding value destroying decisions, such as bad projects, excessive perquisites and overpaying for acquisitions.

Nevertheless, it does not fully eliminate the associated agency costs for which the owners' loss of welfare is just a part. From Jensen and Meckling (1976) there are still costs associated with bankruptcy and with measures needed to create incentives within management, align conflicting interests and monitor behaviours not only through salary and compensation means but also by providing the appropriate working conditions. Accounting for those costs, firms will chose the financing mix with the lowest agency cost, something which varies widely between industries. For those reasons, industries highly constrained in their capital budgeting decisions, either by regulation or the nature of their business (such as public utilities and financial firms) and thus less likely to engage in risk shifting activities tend to be more levered than other similarly risky but nonregulated firms.

The balancing of all those benefits and costs of debt relative to equity constitutes the mainstream of *trade-off* theory.

2.3. Pecking-Order Theory

Financing behaviour is also driven by adverse selection costs. Myers and Majluf (1984) suggested that in a world of information asymmetries and transaction costs, the signalling effect of a company's decisions leads to a hierarchy among the possible sources of funding. Considering that managers want to maximize the value available for existing shareholders, investors believe they would not be willing to share the expected profits if the investment is valuable. Assuming investors to be aware of information asymmetries, a discounted price is demanded to account for bad news perceived from stock issues.

According to the authors, this problem of information asymmetries mainly arises because providing information to the market may destroy the competitive advantage of the firm relative to competitors. Because firms can simply ask for a bank loan without sharing information with external stakeholders, this becomes less relevant for debt raising. Hence, equity signalling costs inflated by issuance costs make it a worse financing alternative compared to debt, even when stock is overvalued.

However, raising debt does not come without costs, as it has been explained before, making this source a second-best choice when there are internal funds available. Furthermore, the use of retained earnings has a positively signalling effect since those that have better information are willing to put money in the company. Hovakimian, Opler and Titman (2001) state that firms usually go for equity issue when information asymmetries are lower and investors recognize the additional value from a given investment and for debt otherwise.

Frank and Goyal (2003) found that, although it would be expectable that small firms with high costs and in high-growth industries carry more debt relative to equity because of their particularly high asymmetric information, in practice larger firms follow this *pecking-order* behaviour. Moreover, maturity seems to be relevant and the theory also predicts that short term debt has less information asymmetries and should be used prior to long term. However, those are not straightforward results and evidence against was found by others (Barclay & Smith, 1995, cited in Frank & Goyal, 2003, p. 220).

Finally, the complex version of *pecking-order*, slightly different from the original, assumes that firms are not only concerned with the costs they currently face to raise external capital but also they consider how their present decisions will influence their ability to finance in the future (Fama & French, 2002). Thus, similarly to a *trade-off* framework, firms with higher investment opportunities will tend to have lower debt.

2.4. Market Timing Theory

More recently a new theory of capital structure has been replacing those two traditionally accepted in the past century. As in Huang and Ritter (2009), *market timing* theory, which is based on the comparison between debt and equity cost, can be seen as similar to *pecking-order* in the sense that both perceive capital structure decisions as the outcome of historical external financing decisions rather than a primary goal itself, as in the *trade-off*. Indeed, they find that "firms only slowly rebalance away the undesired effects of leverage shocks" and "it takes about 3.7 and 2.6 years for a firm to remove half of the effect of a shock on its book and market leverage, respectively" (Huang & Ritter, 2009, p.240).

2.5. Balancing the Several Theories and Empirical Evidence

The several theories before mentioned imply different financing patterns. According to Huang and Ritter (2009) the observed high volatility in the amounts of both debt and capital raised, for instance during the 2000's, cannot be explained on the basis of static *trade-off*

mechanisms, in line with Shyam-Sunder and Meyers (1999 cited in Hovakimian, et al., 2001, p.2) claim that reality is better explained by *pecking-order*. Nevertheless, this seems to be true mainly in the short term while long run financing decisions are driven by the target debt ratio (Hovakimian, et al., 2001). Frank and Goyal (2003) find a much lower coefficient for this determinant which Huang and Ritter (2009) explain on the basis of changes in financing behaviour due to market conditions which seem to have a lasting effect.

In sum, the importance of carefully designing the financing structure derives from its implications not only for the value of the company but also for its long term sustainability. If on one hand it is a crucial topic, its definition is a complex process. Nevertheless, Huang and Ritter (2009), acknowledge for the fact that one cannot expect to find reality, both in time series as across individuals, to be a true representation of one of those theories. Therefore, although evidence exists for each of the theories, the analysis is expected to present distinctive results.

2.6. Research Questions and Hypothesis

The theories outlined in the previous sections might help to understand the results obtained and the coefficients predicted for the variables. Before moving to the empirical analysis, the next paragraphs present the main broad research questions allowing answering this work main question: *How does a financial crisis event impact financial decisions of European companies?* For each of those, different hypothesis, by applying the previous general theories to the crisis context, might be observed throughout the next chapters.

Research Question 1: How does the financial crisis impacted the amount of debt, equity and leverage ratio?

Hypothesis 1: Debt ratio may increase because in distressed times *pecking-order* behaviour is more likely, mainly in the short run. In the face of decreasing internal funds and increasing constrains on bank side financing, companies turn to short term debt and bond market financing instead of equity capital due to equity higher information asymmetry costs. Also, the incentives to raise equity capital were reduced by the increased volatility and stock price decline during financing crisis.

Hypothesis 2: Debt ratio decreases because of the increased yields demanded by investors. This can be true for larger companies since they can more easily bear the issuing costs associated with equity issues. Nevertheless, those are also less dependent on bank loans, thus

not so affected in their leverage ratios as smaller companies (Leary 2009). Yet, it might also be the case of smaller firms either because they cannot switch for public sources of debt or suffered from banks reduced lending to smaller and riskier companies. This negative impact is more reasonable if the negative supply shock is stronger on the private sources of financing side compared to public markets.

Research Question 2: What are the relevant determinants of capital structure decisions and how did their impact on debt changed with crisis?

Hypothesis 1: Different results can be obtained for each of the variables. Those will be outlined in the following chapter in line with the theoretical ground.

Research Question 3: Does country matters for capital structure decisions? What factors might explain the different impact of crisis among different countries?

Hypothesis: It can be expected that different countries reveal specific patterns not only because of their specific macroeconomic environment but mainly due to their relationship with the financial markets. "*Bank-based*" countries are *a priori* foreseen to be more negatively impacted by the financial crisis.

3. DATA AND METHODOLOGY

Recall that the present study intends to understand how corporate financing decisions were affected by the financial crisis and which of the main theories previously stated, if any, helps to explain empirically observed capital structures, focusing on the debt side. In the following section, the sample, methodology and variables considered in the investigation of the research question are described.

3.1. Sample

Companies currently listed in the *Eurostoxx 600* Index are used in this study which represents an initial sample of 600 companies from 17 countries, 8 economic sectors and 44 industry categories, as defined by GICS -Global Industry Classification Standard[1]- code. All data, except for GDP growth rate taken from *Eurostat*, was collected from *Thomson Reuters* database for the time frame considered appropriate to absorb the impact of the financial crisis. For the dependent variable the period from 2003 until 2013, the most recently available for most of the sample, is used. Nevertheless, because the model specifies explanatory variables to be one-year lag correlated with *leverage* additional data from 2002 is required.

Yet, in line with previous works, Fama and French (2002), Rajan and Zingales (1995) among others, firms from financial and utility sectors are excluded from the analysis since their capital structure decisions may be merely the result of industry regulation. Also financial firms' capital structure is substantially different from other industries (Hovakimian, et al., 2001). Not only the amount of debt allowed is strongly influenced by regulatory requirements, as to protect investors, but also it is not comparable to that of non-financial companies (Rajan & Zingales, 1995). Thus, the sample is reduced to 418 firms.

Following the common procedure of previous works related to the topic (Titman & Wessels, 1988) the sample also excludes companies for which at least one year of data, within the chosen window, is not available for most of the variables of interest. Without those companies, the final sample has strongly balanced panel data with 249[2] companies considered for the entire time span and a total of 2988 observations along the 12 years. Nevertheless, because one must consider the selection bias associated with this criterion, a robustness analysis, where all 418 firms are included, is performed afterwards to assess how the results change.

[1] Appendix A
[2] Appendix B

Data is additionally inspected for repetitions and further treatment is carried to deal with missing values for *R&D* by attributing a value of zero in case not provided by *Reuters*. Yet, some restrictions are imposed in order to avoid outliers which would bias the results. Instead of incurring the problem of dropping observations from the sample, all *leverage* measures are truncated between zero and one and the *market to book* ratio capped at 10.

3.2. Methodology

The methodology and the variables considered, attempt to assess capital structure under theories in the context of the financial crisis by splitting the sample into 3 sub-periods, before (2003-2006) during (2007-2009) and after (2010-2013) financial crisis. Although the delimitation of the sub-periods is mostly arbitrary, it tries to reflect the differing conditions arising in and out of the crisis event. The year of 2007 is commonly considered as the beginning of the crisis whose largest consequences are assumed, from Kahle and Stulz (2013), to last until 2009 with decreasing credit spreads and stock market slight recovery.

Throughout the analysis, although Hovakimian, et al. (2001) found similar results by using the two different approaches, both book and market measures of *leverage* are considered. This attempts to avoid artificial results from the fact that managers may base their financing decisions on either book or market ratios (Titman & Wessels, 1988). Also, it examines different maturities of debt as well as lagged and non-lagged variables.

Furthermore, following Ferri and Jones (1979), cross-industry analysis is performed due to common factors within firms of the same industry, such as similar volatility in demand and production costs. Those are reflected in the business risk considered by the market and thus accounting for a significant part of financing decisions. Additionally, not only regulation but also other industry related factors, such as tax codes and bankruptcy costs were found by Bradley, Jarrel and Kim (1984), to be responsible for the observed higher volatility between industries than by comparing companies belonging to the same.

Finally, there are institutional factors specific to each country, hereafter represented by country of headquarters, which might end up influencing the results on how *leverage* correlates with the assumed determinants, thus explaining the differences across countries (Rajan & Zingales, 1995). As they argue, those factors, which can be related either to the power and corporations' dependence on the banking system versus capital markets, taxation issues or broader regulation (such as bankruptcy code), may be the reason for the observed

lower aggregate *leverage* in *Germany* and *United Kingdom* compared to a similar amount for the remaining within a sample of homogeneous countries in terms of development, G7 countries. Therefore, this study, by considering Antoniou, Guney and Paudyal (2008, p.63) classification of "*bank-based"*, *France* and *Germany,* and "*market-based"* countries, *UK,* also attempts to assess whether differences between countries influence capital structure.

3.2.1. Model

Concerning the regression analysis, the methodology applied consists in regressing a given measure of *leverage* on several variables assumed to explain capital structure decisions. The data under analysis is panel data, with observations for each company along several years. The analysis of this type of data requires special care to avoid biased estimates from both cross and time correlation of residuals (Petersen, 2004).

On the one hand, cross-sectional differences in *leverage* can come from random features. However, it ignores time invariant features for each firm which, because not observable, will be correlated with explanatory variables. This eliminates the independency requirement for OLS estimation therefore displaying standard errors below their true value (Petersen, 2004). Thus, because the variables usually assumed to determine *leverage* are time-varying firm-specific figures, a *fixed effects* model (*FE)* allows to understand their impact adjusted and net of unobservable firm characteristics which do not change throughout time. Those *fixed effects* are found by Lemmon, Roberts and Zender (2008) to explain the most part of *leverage.* The use of *FE* is justified by the unexpected event, the financial crisis, which avoids one of the problems related to this method as it requires variation of explanatory variables within cluster.

Therefore, several specifications were attempted and two regression methods applied: *fixed* and *random effects*. The general model, which serves as basis can be stated as follows:

$$\boldsymbol{Leverage_{i,t} = \alpha + \sum_{k=1}^{m} \beta_k X_{i,t-1} + \beta_{m+1} BC_{i,t-1} + \beta_{m+2} AC_{i,t-1} + \varepsilon_{i,t}}, \quad \textbf{(1)}$$

where *X* vector stands for the *k* explanatory variables, as detailed below, and *BC* and *AC,* representing before crisis and after crisis period respectively. Those two dummy variables attempt to illustrate the 3 sub-periods before mentioned whereas the omitted dummy, *DC*, corresponds to the period defined as crisis. Note that the above formulation implies regressing *leverage* in a given year on one-year lagged values of the explanatory variables, which according to (Frank & Goyal, 2009; Rajan & Zingales, 1995) avoids endogeneity problems.

From this general formulation, several model specifications, further explained throughout the results analysis, are attempted both for deeper understanding as well as robustness, allowing for:

i. Different measures of *leverage* (book and market values)
ii. Different explanatory variables
iii. Lagged and non-lagged variables model
iv. Other *leverage* proxies

3.2.2. Variables

The variables[3] included in the general *leverage* regression are among the most commonly used in previous works for which no universal behaviour is observed. In what follows, those are introduced as well as the proxy and the theoretical mechanism underlying their impact on *leverage* in line with the before mentioned capital structure theories. It starts by defining the dependent variable followed by the main explanatory variables *profitability* and *investment opportunities,* whose coefficients allow testing for the different theories, as well as the crisis dummies. Afterwards, several others assumed as underlying financing choices are presented.

A. Dependent Variable

As Rajan and Zingales (1995) present, different *leverage* measures have been used by several authors, each leading to a different ranking of firms according to this ratio. Two different measures of total *leverage* are used. A book measure, *BTLEV,* defined as total debt over the sum of total *debt* and book equity, and a "quasi-market" measure as Rajan and Zingales (1995, p.1429) designate, *MTLEV* for simplicity referred as *market leverage*, which is the ratio between total debt and the sum of total debt with equity market value.

Total debt excludes non-debt liabilities, such as tax credits, which, according to Rajan and Zingales (1995), offset some assets and thus underestimate the true amount of financial *leverage*. Also, because of availability issues, book debt is used. Although those may be seen a second-best choice compared to market values, it is not perceived as a major problem since Bowman (1980, cited in Titman & Wessels, 1988, p.7) claim those to be strongly correlated. Therefore, their difference is not expected to be correlated with the explanatory variables.

Additionally two maturities of debt are considered, short term debt *(STDEBT)* and long term debt *(LTDEBT)*. This last one includes capital leases since those share with debt the

[3] Appendix C

features of tax savings, periodic interest payments and consequent risk of bankruptcy which determine the financing decision.

B. Explanatory Variables

The following two variables comprise the mainstream difference between *trade-off* and *pecking-order* predictions and also the effect of the financial crisis.

Profitability

Profitability, PRF, is computed from EBIT to total book assets ratio and refers to the amount of operating income before any interest and tax deductions, as a proportion of assets, which is considered for corporate taxes purpose. The relevance of this performance measure for *leverage* explanation can be incorporated in the context of two contradicting theories.

On the one hand, under *trade-off*, it represents the value which a company would consider for interest tax benefits from additional debt raising, thus creating an incentive for more profitable companies to exploit debt tax advantage. *Pecking-order* theory predicts the opposite effect, both in the short and long run, since firms can internally generate the needed funds and avoid the higher costs of external equity, (Myers & Majluf, 1984). Also because increased *profitability* means less bankruptcy risk and less scope for managers' harmful decisions, debt fixed payments are not as important as a control mechanism to avoid agency problems (Rajan & Zingales, 1995).

Investment Opportunities

Two variables are assumed as proxies for *investment opportunities*. First, as from both Titman and Wessels (1988) and Fama and French (2002), capital expenditures over total book assets*, CPX*, is used which implies the strong assumption that future investment will keep at the current pace.

Turning to the theory predictions, both the *trade-off* and a complex version of the *pecking-order* predict that *investment opportunities* relate negatively with *leverage*. The former lies on the agency problem argument that the costs resulting from conflicting situation between stakeholders are higher for high growth companies and on the fact that investment capital needs limit the willingness to deviate from valuable decisions and thus less debt is required for that purpose (Fama & French, 2002). The second is based on the fact that firms should not increase the cost of debt which might have to be raised for future investments. Evidence for this negative impact can be found in Titman and Wessels (1988). A positive

relation is proposed by the simple *pecking-order* once internal funds may not be enough to fulfil investment needs and companies go for debt as the second-best choice.

Additionally, market to book value, *MB*, the ratio between the sum of market capitalization with total debt and book assets, gives an idea of the expected additional value from exploiting *investment opportunities*. Since those are currently not considered an asset or a source of tax shields, it reduces incentive for debt (Titman & Wessels, 1988).

However, MB ratio, as in Baker and Wurgler (2002), also partially accounts for *market timing* since it relates to the recent performance of stock outstanding influencing the decision of issuing equity versus debt, mainly leading to short term deviations from target. It is expectable that the higher *MB* ratio, the higher is the incentive for firms to raise equity rather than debt capital because of the premium asked by investors from increased information asymmetries and adverse selection problems (Korajckzyk & Levy, 2003). Thus, a negative coefficient is possible.

MB also accounts for agency issues, explaining how decision makers feel pressure in their financing decisions, namely for adjusting the leverage ratio to its target, which tends to happen when the market price understates the book value and the owners of the firm exert closer control over management (Hovakimian et al., 2001).

Time Variables

Finally, additional variables account for the three sub-periods of relevance for the understanding of the crisis impact. *BC* is a dummy with value 1 if *leverage* data is of the period 2003-2006, inclusive, and 0 otherwise. *AC* assumes value 1 for the period after-crisis, from 2010 until 2013, inclusive, and 0 otherwise. *DC* represents the crisis period starting in 2007 until the end of 2009.

C. Controls

The use of additional variables intends to fill in the gap in the explanation of *leverage* due to firm, industry specific and macroeconomic factors. Controlling for those relevant elements, the estimated coefficients of the above stated variables can more reliably be considered. The following section starts with firm specific and then moves to those related with macroeconomic environment.

a. Firm Specific

Size and Volatility

An additional factor, *SIZE*, expected to affect the amount of *leverage* carried by firms is depicted by the natural logarithm of firm assets.

This variable inversely accounts for earnings and cash flows volatility which determines firms' ability to comply with the required debt payments and thus avoid bankruptcy. This happens because, as in Hovakimian, et al, (2001) and Titman & Wessels (1988), one can expected larger, and *a priori* more diversified firms, to face less cash flows uncertainty which reflects in a lower cost of debt due to less bankruptcy risk. Hence, it implies a negative relationship between volatility and debt which is the same as a positive effect of *SIZE*. Apart from that, Leary (2009) states that *SIZE* also accounts for the degree of access to public debt market given the higher transaction costs and information asymmetries of smaller companies that make it costly to switch from bank loans to other debt sources.

Nevertheless, it is possible to observe a negative effect of *SIZE* on *leverage* not only because of the lower cost of debt relative to equity financing for smaller firms but also according to the maturity of the *leverage* variable under examination. Indeed, as evidence from Titman and Wessels (1988) suggests, it may happen that smaller firms become more levered than larger ones if one considers short-term debt because of its lower risk and transaction costs, which in turn might make those more exposed to economic fluctuations.

In other cases, no linear positive relation between *leverage* and *SIZE* exists, with Ferri and Jones (1979) finding small firms both in the top and lower end of *leverage* levels and larger firms presenting intermediary amounts. Yet, some caution must be taken when using this variable since it may also be a proxy for other firm characteristics such as age and access to financial markets.

Tangible Assets

The asset structure of a company, in this study represented by *tangibility*, *TNG* as the ratio between property plant and equipment and book assets, also plays an important role for financing decision. As from Titman and Wessels (1988), the implications of those assets can arise in two opposite directions.

On the one hand, a positive relation, because tangible assets can be collateralized and used as securities in debt contract. Therefore, the more of those owned by a firm, the lower

cost of raising debt due to their downward effect on financial distress and information asymmetries costs. Contrarily, it may be the case that firms with few tangible assets become more willing to increase debt in order to create a control mechanism over management perquisites' consumption.

Non-Debt Tax Shields

As from DeAngelo and Masulis (1980), firms obtain *non-debt tax savings,* perceived as substitutes for debt interest tax shields, from depreciation in assets. In this research those are represented by the depreciation over book assets ratio, *NDTS.* Under the *trade-off* setting, this means a decreased advantage from debt financing and thus a negative coefficient. Differently, Bradley et al. (1984) found a positive coefficient suggesting that assets' collateral value is a predominant factor over the non-debt tax deductions associated with tangible assets.

Uniqueness

The degree of uniqueness, *UNIQ*, can be assessed by the amount of research and development expenses over assets. Titman and Wessels (1988) found a negative association between the specialization of a firm's output and the amount of *leverage*. The reasoning lies on the costs resulting under bankruptcy, increasing with specialization both for employees and suppliers for their firm specific skills. This is also true for customers loosing availability of firm servicing. Moreover, it would be more difficult to liquidate those unique assets.

Yet, as the authors argue, one must consider that some of this variable effect might be the result of *UNIQ* correlation with both *non-debt tax shields* and collateral value, positive and negative respectively.

b. Macroeconomic Variables

Further variables are included as representative of macroeconomic conditions effect on the deviation from the target *leverage* due to higher financing costs from the increased potential for adverse selection during financial crisis (Korajczyk & Levy, 2003).

Credit rating

To start with, *credit rating* reflects the risk perceived by the market concerning the ability of a firm to comply with its credit commitments and thus the degree of financial constrain, which in turn is expected to determine how it is impacted by macroeconomic conditions. By including this variable in the regression, one is assuming that changes in the amount of *leverage* are dependent on the terms a firm can get when raising capital which is dependent

not only on the overall state of the economy but also on firm characteristics translated in the rating (Korajczyk and Levy, 2003).

In line with Kisgen (2006), this work includes a dummy variable, *RAT*, with value 1 if the firm is close to a rating change and 0 otherwise, to account for his finding that rating is increasingly relevant for financing decisions as a firm approaches a change from a given rating group. In principle, such circumstances would lead to *leverage* decreases, in order to avoid the costs associated with such a downward change, such as an increased coupon or loss of potential investors, and get the benefits from rating improvements.

GDP

As from Huang and Ritter (2009), the *real GDP growth rate,* obtained from Eurostat (EC, 2015), is included in the model and attempts to account for the overall state of the economy and the availability of investment opportunities for which funding is required.

The model of Leary (2001, cited in Korajczyk & Levy, 2003) also finds the state of the economy to be related with the incentives for managers' decisions, expecting a negative relation of *leverage* with macroeconomic conditions to evidence for *pecking-order*. It is foreseen that during recession times, *leverage* increases for unconstrained firms in order to control their behaviour. On the other hand, by *trade-off* the relation between *GDP* and *leverage* would be a positive one due to the higher income available for tax shields.

4. EMPIRICAL ANALYSIS

This chapter begins with statistical analysis of the several variables mentioned above, in order to understand their behaviour and identify any pattern, and then continues with the application of regression methods in line with the methodology outlined.

4.1. Descriptive Statistics

4.1.1. Capital Structure Components

By comparing the three subsample periods one can see, from Exhibit I, an increase in total *book leverage,* from 39.03% to 41.16% in the crisis period and a subsequent decrease to 39.13%, which is lower than the 39.65% average for the total sample period. A similar pattern is observed in terms of market values, with an increase from 22.42% to 27.36% and further drop to 22.62% in the post-crisis.

Exhibit I
Book and Market Leverage

range	variable	N	mean	max	min	sd
-1	BTLEV	996	.3903095	1	0	.2040372
0	BTLEV	747	.4115655	1	0	.208115
1	BTLEV	994	.3913311	1	0	.2166385
Total	BTLEV	2737	.3964819	1	0	.2099252
-1	MTLEV	996	.2241457	.9365752	0	.1592758
0	MTLEV	747	.2735552	.9155716	0	.1889218
1	MTLEV	995	.226167	1	0	.1927226
Total	MTLEV	2738	.2383605	1	0	.1813977

Reported are the descriptive statistics, including the number of observations, mean, maximum, minimum and standard deviation, of the two *leverage* measures considered. *BTLEV* refers to *book leverage* and in computed as the ratio between book debt and the sum of book debt and book equity, whereas *MTLEV* accounts for *market leverage,* the ratio of book debt with the sum of book debt and market equity. The values are provided for the entire time span (2003-2013) as well as for each sub-period, where *range -1* consists of the pre-crisis period (2003-2006), *range 0* represents the crisis period (2007-2009) and *range 1* stands for the remaining period lasting until 2013.

To further understand these figures, one should look closer at the components of *leverage* ratio in Exhibit II. As of total debt, the average amount for the entire sample has increased 4.00% from the years preceding the financial crisis to the crisis period though suffering a decrease of 47.46% in the post-crisis span to values below the initial average. On contrary, the average amount of book equity carried in firms' capital structure saw a decrease along the three time ranges, 1.80% and then 42.47% respectively.

Exhibit II
Debt and Equity

```
. tabstat TDEBT , by(range) statistics(n mean max min sd) long format
. tabstat STDEBT , by(range) statistics(n mean max min sd) long format
. tabstat LTDEBT , by(range) statistics(n mean max min sd) long format
```

range	variable	N	mean	max	min	sd
-1	TDEBT	996	3690.1491	64032	0	7740.4925
0	TDEBT	747	3837.8273	70883	0	8294.4988
1	TDEBT	996	2016.5535	51071.955	0	4241.6464
Total	TDEBT	2739	3121.8374	70883	0	6910.7461
-1	STDEBT	996	1121.9857	30992	0	3304.7112
0	STDEBT	747	1289.9296	32707	0	3295.1862
1	STDEBT	996	678.98975	15022	0	1610.4865
Total	STDEBT	2739	1007.4186	32707	0	2819.054
-1	LTDEBT	996	2535.5106	50676	0	5231.8868
0	LTDEBT	747	2501.7387	54543	0	5643.2208
1	LTDEBT	996	1297.5207	44552.451	0	3100.1205
Total	LTDEBT	2739	2076.1219	54543	0	4739.5593
-1	BEQUITY	996	4975.14	167763.09	-1123.6103	11582.524
0	BEQUITY	747	4885.5409	233955.96	-9951	15308.384
1	BEQUITY	996	2810.7442	234466.88	-951.95452	8616.48
Total	BEQUITY	2739	4163.6509	234466.88	-9951	11858.79
-1	MEQUITY	996	12421.32	185868.1	71.59969	22852.69
0	MEQUITY	747	11884.88	251565.7	15.5232	26194.96
1	MEQUITY	996	8822.459	194802.7	0	19161.18
Total	MEQUITY	2739	10966.34	251565.7	0	22645.95

Reported are the descriptive statistics, including the number of observations, mean, maximum, minimum and standard deviation, of total debt, its short and long term components, book equity and market equity, all measured in million euros. The values are provided for the entire time span (2003-2013) as well as for each sub-period, where *range -1* consists of the pre-crisis period (2003-2006), *range 0* represents the crisis period (2007-2009) and *range 1* stands for the remaining period lasting until 2013.

In order to understand whether different maturities follow distinct patterns, total debt should be separated into its short and long term components. Although the maximum value of the two debt maturities follows that same pattern identified for total debt, only the average short term component increased during crisis while the long term part decreased over time.

Overall, these figures go in line with what several authors said regarding the verification of *pecking-order* behaviour in periods of financial constraint. In those circumstances firms seem to switch equity for less risky sources of financing, with a preference for internally

generated funds or, in a second-best case, debt, choosing mainly shorter maturities over riskier long term commitments.

4.1.2. Explanatory Variables

To further assess this theoretical hypothesis, one can see[4] that, in average terms, the observed increase in *leverage* is followed by a decrease in *profitability* which in turn is negatively correlated[5] with both book and market measures of *leverage*. This remains true when analysing each of the ranges separately but with a decreasing correlation degree[6].

Turning to the *investment opportunities'* proxies, the amount invested in *capital expenditures* has been increasing along the three periods. Its correlation with *leverage*, although being considerably low, depends on whether one is using *book* or *market leverage* and thus nothing can be concluded. As per *MB* ratio, which decreases from pre to the crisis-period and then increases in the following, it correlates negatively and moderately (correlation coefficient of -0.5135)[7] with *market leverage.* It seems that a *market timing* consideration is also important and firms tend to choose more debt instead of equity when their shares saw a price decline, which is true from the pre to the crisis-period. The correlation of the remaining explanatory variables with each measure of *leverage* always appears to be of the same sign although generally more correlated with *MTLEV* than *BTLEV*.

In sum, one can infer from the crisis' downward impact on *profitability* and *MB* ratio along with a positive movement of total debt and the opposite for equity, that during financially distressed situations companies tend to follow *pecking-order* behaviour with market *timing concerns*. In the need for external funding from the unavailability of internal funds to undertake the desired investments, firms raise debt rather than equity leading to an increase in *leverage.*

Nevertheless, although the financial crisis period appears to have strongly impacted firms' financial structure, with an overall increase in debt relative to equity instruments, afterwards they seem to use the increased earnings to return towards a target *leverage* ratio, which can indicate for *trade-off* behaviour when they leave those financially constrained circumstances. This apparent mean-reverting feature of *leverage* may be the result of

[4] Appendix D
[5] Appendix D
[6] Appendix E
[7] Appendix D

persistent firm specific factors. Those were found by Lemmon, et al. (2008) to be accountable, at a larger extent than the usual firm specific time varying characteristics, for a large share of *leverage* explanation and for its stability along time.

These results go in line with evidence from Hovakimian, et al. (2001) that the company performance plays an important role in the definition of the capital structure with the best performers tending to move toward a lower *leverage* ratio, either through stock issues after price increases and debt retirement in profitable periods.

4.1.3. Economic Sector and Industry

The business activity of a firm might also play an important role in the financing decision because of the connection between business risk, non-debt tax shields and bankruptcy costs (Bradley, et al., 1984).

Exhibit III
Book and Market Leverage per Industry

```
. tabstat BTLEV MTLEV, by(sec)

Summary statistics: mean
  by categories of: sec (Sector)
```

sec	BTLEV	MTLEV
Consumer Discret	.3954958	.239505
Consumer Staples	.4498078	.2536383
Energy	.3354675	.2202136
Health Care	.3324202	.1621495
Industrials	.4015789	.2358506
Information Tech	.3269115	.1584003
Materials	.3882005	.2901026
Telecommunicatio	.4847384	.2876507
Total	.396084	.2358579

The exhibit presents the total sample average value of l*everage,* measured both in book, *BTLEV,* and market terms, *MTLEV,* for each of the industry classes under GICS classification. The values are reported for the entire time span from 2003 until 2013.

Looking at Exhibit III, the sectors using an amount of debt measured in book values, above the overall sample mean, 39.65% are those whose business requires owning more tangible assets to be used in the operating activities or inventories to be sold, namely *Consumer Staples (44.98%)* and *Industrials (40.16%)* but also *Telecommunication Services (48.47%)*. The other end includes sectors owning mainly intangible assets, such as *Information Technology (32.69%)* and *Healthcare (33.24%)*. Although *market leverage* provides lower figures, the industry ranking remains almost unchanged with *Materials* adding up to the most levered sectors. Those scenarios remain true when comparing the mean values in the three ranges[8].

[8] Appendix F

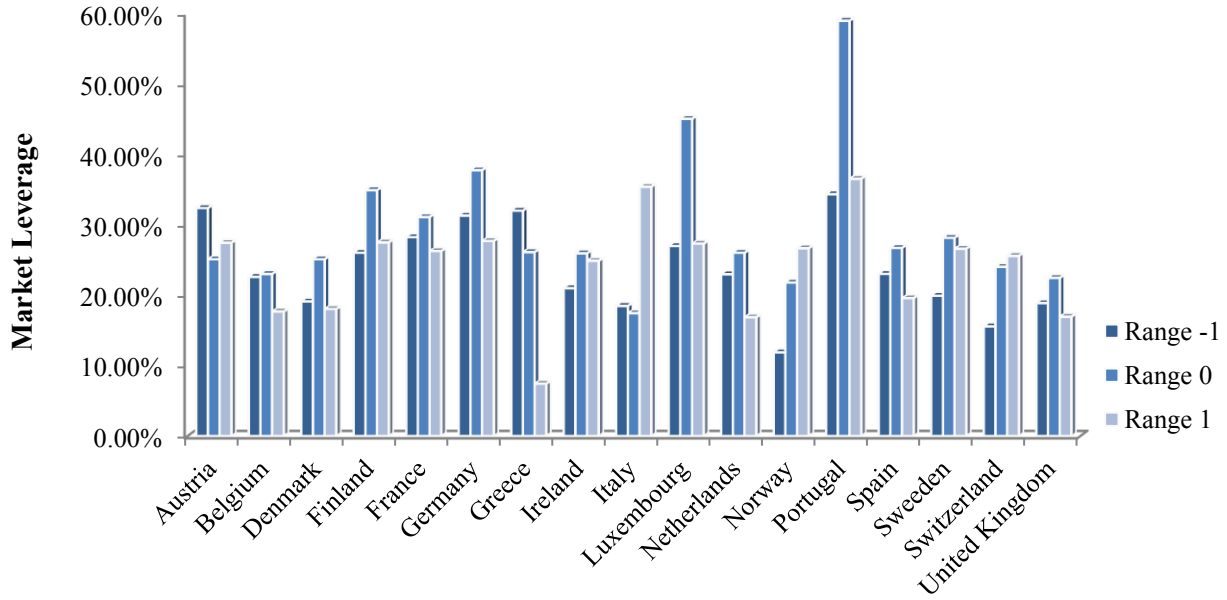
Considering a more detailed industry classification[9], one can see a larger distribution in the mean *book leverage* ranging from 10.60% in *Technology Hardware* (one company which belongs to the *Information Technology* sector) to around 73.71% for *Rail & Road* (two companies belonging to *Industrials*). However, by analysing the standard deviation of within industry observations, although dispersion is lower for a considerable amount of industries compared to dispersion between industries, the difference is not much significant.

Regarding the impact of the financial crisis[10], there seems to exist some convergence of *leverage* between sectors with the two less levered classes, *Healthcare* and *Information Technology*, increasing *leverage* over the three time ranges and the most levered sector, *Telecommunication*, seeing the opposite pattern. For the remaining, the pattern previously observed for the overall sample is also true when comparing the three sub-sample periods.

4.1.4. Countries

Turning now to country related implications, one can say that European countries have been differently impacted by the crisis. Therefore, the distribution of the aggregate amount of *leverage* among countries matters as well as the effects of this particular event on each.

Exhibit IV
Market Leverage per Country and Time Range



The Exhibit presents the *market leverage, MTLEV,* of each country for each of the time ranges considered. *Range -1* stands for the before crisis period (2003-2006), *Range 0* represents the crisis period (2007-2009) and *Range 1* corresponds to the after crisis period (2010-2013).

[9] Appendix G
[10] Appendix F

Among those countries, Portugal presents, as from Exhibit IV, the highest average *leverage* ratio amounting to 76.51% in book values, almost as twice as the overall sample average value 39.65% and much higher than the second most levered country *Republic of Ireland* with 45.16%, while *Austria* appears as the least levered with a 32.88% figure close to *Norway's* ratio of 33.40%. When analysing per time range[11], *Portugal* is, again, consistently the most levered country.

Regarding country specific institutional factors and following Antoniou, et al. (2008) distinction between "*bank-based"* and "*market-based"* countries, the former represented by *France* and *Germany* present *leverage* ratios of 41.96% and 40.23% respectively, above the *United Kingdom* 38.15% ratio, as representative of the last. This goes in line with their hypothesis that firms from "*bank-based*" systems would carry more debt but at the same time confirming their results that the difference in *leverage* between those two groups of countries is not much significant. Indeed, they would be close if one ranks them in terms of *leverage*.

Exhibit V
Capital Structure per Country

country	stats	TDEBT	BEQUITY	BTLEV	MTLEV
Austria	mean	1326.43	2938.0595	.3288105	.2869323
Belgium	mean	1563.2506	2089.8655	.3521281	.2102597
Denmark	mean	964.46779	1443.1392	.3876442	.2045917
Finland	mean	1033.0059	1566.6087	.379395	.2908273
France	mean	5146.8195	4768.548	.4196179	.2839804
Germany	mean	6743.8474	6737.3152	.4022763	.3183916
Greece	mean	2305.0022	3269.5002	.3739605	.2153828
Ireland; Republi	mean	1120.3556	1635.5192	.4515913	.2386161
Italy	mean	4307.2009	7519.6483	.4446093	.2443946
Luxembourg	mean	2208.7373	3645.6193	.4064097	.3212474
Netherlands	mean	2564.4923	2828.615	.4476211	.2168583
Norway	mean	1436.0365	2916.5717	.3339732	.2005357
Portugal	mean	912.45299	270.93965	.7650551	.4193641
Spain	mean	6444.139	4794.0583	.3733642	.2288118
Sweden	mean	1364.6738	2174.6246	.3809898	.2469041
Switzerland	mean	2251.9137	3706.7475	.3706504	.2160971
United Kingdom	mean	2168.6479	4739.7283	.3814588	.1925068
Total	mean	3121.8374	4163.6509	.3964819	.2383605

Reported are the average value of total debt (*TDEBT)* and book equity (*BEQUITY)*, both in million euros, and also *book leverage (BTLEV)* and *market leverage (MTLEV).* The values are computed for each of the countries during the total sample period ranging from 2003-2013.

[11] Appendix H

As from Exhibit VI, and against Leary (2009) findings that debt carried by bank dependent firms would be more negatively impacted in such a circumstance, both *France* and *Germany* saw *book leverage* increasing with the financial crisis and decreasing afterwards, while book equity consistently decreased over the three periods. Moreover, *Germany* presents a downward trend in both debt, while it increased in *France*, and equity suggesting that they relied more on internal funds. On the other side, the *UK* saw its *book leverage* slightly decreasing over time while increasing book equity from the period before to the years of crisis.

Exhibit VI
Capital Structure of France, Germany and United Kingdom

-> country = France

range	stats	TDEBT	BEQUITY	BTLEV	MTLEV
-1	mean	5965.7819	6190.2563	.4219329	.2834304
0	mean	6580.8095	5238.2324	.4265317	.3118365
1	mean	3252.3645	2994.5764	.4121176	.2636384
Total	mean	5146.8195	4768.548	.4196179	.2839804

-> country = Germany

range	stats	TDEBT	BEQUITY	BTLEV	MTLEV
-1	mean	9178.8269	8183.1439	.4090431	.3138556
0	mean	7477.5924	7486.7607	.441558	.3783054
1	mean	3758.5591	4729.4024	.3660482	.2779922
Total	mean	6743.8474	6737.3152	.4022763	.3183916

-> country = United Kingdom

range	stats	TDEBT	BEQUITY	BTLEV	MTLEV
-1	mean	2384.3602	5175.0497	.3882462	.1897733
0	mean	2856.361	6265.3671	.3830281	.2255856
1	mean	1437.1509	3160.1777	.3734411	.1703573
Total	mean	2168.6479	4739.7283	.3814588	.1925068

The table presents the mean value of total debt *(TDEBT),* book equity *(BEQUITY), book leverage (BTLEV) and market leverage (MTLEV)* computed separately for *France, Germany* and *United Kingdom* in each of the time ranges, where *range -1* consists of the pre-crisis period (2003-2006), *range 0* represents the crisis period (2007-2009) and *range 1* stands for the remaining period lasting until 2013. Also, averages are reported for the entire time span (2003-2013). *TDEBT* and *BEQUITY* are reported in million euros.

It may seem surprising for a country strongly dependent on bank financing, like *France*, to have the leverage ratio further increased when banks were restricting credit providing. However, it might be that the increase in debt comes from the issuance of bonds, instead of bank loans, thus avoiding the increased costs from equity markets' instability (EC, 2010). Because the financial crisis was reflected not only on debt markets, its also negative effect on equity markets seems to offset Leary's argument that switching to public debt would be harder for "*bank-based*" companies. .

In sum, it seems that *pecking-order,* giving preference for internal funds and debt over equity*,* is stronger for "*bank-based*" countries. The common trend for all the countries is the downward movement for all those capital structure figures in the after period which aligns with the increased *profitability*.

The analysis performed so far not only provided some understanding regarding the impact of the financial crisis on European firms' capital structure but also indicated new directions for approaching the question. In order to bring solidity to those results and to better understand the mechanics behind, the next sections apply the model before mentioned adjusted to the intuitions raised.

4.2. Regression Results and Discussion

In what follows, several model specifications are attempted, regarding the regression methodology as well as the number, measure and timing of variables considered, in order to approach the data from different perspectives and better understand the problem.

4.2.1. Random versus Fixed Effects

To start with the regression model, the analysis tries to assess if *leverage* carried by firms is explained by a *random effect* model or instead is dependent on firm *fixed effects* (*FE*) and how it depends on the assumed determinants. Exhibit VII summarizes the results[12] from the several specifications.

In a first stage, some firm specific variables are considered and the following model is applied:

[12] Appendix I for regressions output from Stata

$$Leverage_{it} = \alpha + \beta_1 PRF_{i,t-1} + \beta_2 MB_{i,t-1} + \beta_3 SIZE_{i,t-1} + \beta_4 NDTSE_{i,t-1} + \beta_5 TNG_{i,t-1} + \beta_6 UNIQ_{i,t-1} + \beta_7 BC_{i,t-1} + \beta_8 AC_{i,t-1} + u_{i,t-1}, \quad (2)$$

where *total leverage* is measured both in book (*BTLEV*) and market values (*MTLEV*)[13], as explained before. The explanatory variables are expressed one year lagged in time.

Looking only at the output of model (2) only, one can see that among the explanatory variables, only *PRF*, *TNG*, *BC* and *AC* appear to be consistently, in all of the alternative specifications, significantly different from zero at the 5% significance level with *t-statistic* above the critical value 1.96. From now onwards, by omission of the level of significance assume a 95% bilateral confidence interval.

PRF and the time dummies *BC* and *AC*, accounting for the pre and post-crisis period respectively, are always negatively related with *leverage*. The dummies' coefficients mean that, on average and after controlling for other relevant variables, *leverage* is expected to be higher during a crisis period (omitted dummy) compared to its average value during the remaining time span, everything else constant. Also, the null hypothesis that those coefficients are higher or equal to zero is rejected at the 5% significance level since the *t-statistic*[14] is higher, more negative, than the -1.65 critical value, thus not rejecting the alternative hypothesis of a negative effect.

TNG, on the other hand, suggests that the collateral value of assets significantly and positively impacts the *leverage* ratio, *ceteris paribus,* rejecting the null hypothesis that its effect is equal or less than zero (*t-statistic* is above the 1.65 critical value*)*. As for *NDTS* and *UNIQ*, they do not significantly explain the level of *leverage.*

MB and *SIZE* in some regressions appear to be significant, the former when using *market leverage* and the second when ignoring firm *fixed effects* and using *book leverage.* This last seems to indicate for *fixed effects* which are correlated and absorbed by *SIZE*. In those cases of significance, *MB* impacts negatively and *SIZE* positively the *leverage* ratio.

In order to further access this result, the variable *LARGE* is included*,* a dummy equal to 1 if book assets are above the sample median value and zero otherwise, as well as an interaction with the crisis dummy *DC*[15]. Although larger firms appear to have significantly more debt than smaller ones, 0.048% everything else constant, there is not enough evidence that those

[13] See appendix J
[14] Appendix I.1
[15] Appendix J

were the companies choosing more debt during the crisis period. This may mean either that they go for other non-debt sources of capital or, contrarily, that they are equally impacted by the financial crisis independently whether they are larger or smaller.

Because there are other variables of relevance for the present study, which attempt to depict conditions of the specific event under analysis, another model is specified as follows:

$$TLEV_{it}=\alpha + \beta_1 PRF_{i,t-1} + \beta_2 MB_{i,t-1} + \beta_3 CPX_{I,t-1} + \beta_4 SIZE_{i,t-1} + \beta_5 NDTSE_{i,t-1} + \beta_6 TNG_{i,t-1} + \beta_7 UNIQ_{i,t-1} + \beta_8 RAT_{i,t-1} + \beta_9 GDP_{i,t-1} + \beta_{10} BC_{i,t-1} + \beta_{11} AC_{i,t-1} + u_{i,t-1}, \quad (3),$$

where an additional firm specific variable, *CPX*, is added in order to account for *investment opportunities* since *MB* may be a better proxy for *market timing* issues, as well as two other variables attempting to represent and control for the effect of macroeconomic conditions.

One can see that the results do not significantly change from adding those variables. From model (3), the same sign for the coefficients is observed for the previously significant variables, remaining significant most of the times, with their coefficients not changing by much. However, *MB* and *CPX* become significant in all the alternative model specifications, with a negative coefficient for both which is expectable from their relation. As for the remaining added variables, *RAT* and *GDP*, a positive impact on *BTLEV* cannot be rejected at the 10% significance, only when applying random effects level. The problem with the *RAT* variable is that it does not distinguish from positive and negative changes in rating, two circumstances which might imply different financing decisions.

Moreover, the relatively low level of model (2) fit to the data does not improve substantially in the second specification. Indeed, in some cases it decreases because of fewer observations from including the variable *RAT* for which some data is missing. Nevertheless, the *F-test*[16] (4.31 and 19.03 for *BTLEV* and *MTLEV* regression, respectively) shows joint significance for the variables included in the model, at the 1% level of significance in all *fixed effects* regressions.

When ignoring *fixed effects*, the statistically significant variables become increasingly significant. This indicates again for time persistent factors whose effect is absorbed by the regressors if the model does not account for them. From the *Hausman*[17]*test* (Brooks, 2008) provided by *Stata,* the null hypothesis of no systematic difference in the coefficients, i.e.

[16] Appendix I.2-Panel B
[17] Appendix K

random effects, is rejected at the 99% confidence level. Thus, showing data to be better explained by a *fixed effects* model and inconsistent under *random*. Also, one can see that, 52.87% of the variance of *MTLEV* is due to time-invariant factors responsible for cross-sectional differences. Following this evidence, already suggested by the industry analysis performed, *FE* will be used in the following analysis.

4.2.2. Book versus Market Leverage

For robustness reasons, the previous analysis contemplated both book and market measures of *leverage*. However, *MTLEV* seems to improve the model fit to the data, as from the increased R^2 measure.

In sum, the following analysis compares to the results of regressing *MTLEV* through model (3), because there is theoretical ground for including macroeconomic variables, and *FE* approach. In favour of this, a correlation of 0.65 is found in the present work in line with the already mentioned high correlation expected between those two measures, which means little implication expected for the results from using one of them.

4.2.3. Lagged versus Non-Lagged variables

A third model specification attempts to assess whether there is a time delay in the reaction of *leverage* to changes in the explanatory variables. Thus, contrary to the above models, regressors are contemporaneous to leverage, as follows:

$$TLEV_{it}=\alpha + \beta_1 PRF_{i,t} + \beta_2 MB_{i,t} + \beta_3 CPX_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 NDTSE_{i,t} + \beta_6 TNG_{i,t} + \beta_7 UNIQ_{i,t} + \beta_8 RAT_{i,t} + \beta_9 GDP_{i,t} + \beta_{10} BC_{i,t} + \beta_{11} AC_{i,t} + u_{i,t}, \quad (4).$$ [18]

One can immediately see, form Exhibit VIII, that additional variables become relevant for *leverage* explanation, almost all being significantly different from zero at the 1% level of significance, except for *CPX* and *RAT*. *PRF* as well as *MB* ratio coefficients remain significantly lower than zero (even at a higher degree) and even more negatively correlated with *MTLEV*. As before, suggesting for a complex version of *pecking-order* theory, where highly profitable companies and with more expected investments choose less external financing, *ceteris paribus*. Regarding *MB*, it evidences for *market timing* patterns, with estimated impact being almost twice as negative as before. Also, *leverage* is consistently positively impacted in the crisis period comparing to the pre and post time range.

[18] Appendix L

Exhibit VII

Leverage Regressions

	Fixed Effects				Random Effects			
	(2)	(3)	(2)	(3)	(2)	(3)	(2)	(3)
VARIABLES	BTLEV	BTLEV	MTLEV	MTLEV	BTLEV	BTLEV	MTLEV	MTLEV
l1PRF	-0.126**	-0.059	-0.392***	-0.325***	-0.174***	-0.116*	-0.437***	-0.388***
	(0.061)	(0.063)	(0.053)	(0.056)	(0.060)	(0.062)	(0.051)	(0.054)
l1MB	-0.004	-0.008*	-0.020***	-0.019***	-0.004	-0.007*	-0.023***	-0.023***
	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)
l1CPX		-0.347***		-0.450***		-0.292***		-0.403***
		(0.099)		(0.088)		(0.096)		(0.084)
l1SIZE	-0.001	-0.002	-0.008	-0.008	0.011**	0.012**	0.004	0.004
	(0.008)	(0.009)	(0.007)	(0.008)	(0.005)	(0.005)	(0.004)	(0.004)
l1NDTS	0.072	0.052	-0.002	0.012	0.057	0.053	0.008	0.037
	(0.049)	(0.053)	(0.042)	(0.047)	(0.045)	(0.048)	(0.038)	(0.041)
l1TNG	0.095**	0.074*	0.066**	0.074**	0.093***	0.091***	0.083***	0.109***
	(0.038)	(0.040)	(0.033)	(0.036)	(0.032)	(0.034)	(0.026)	(0.028)
l1UNIQ	0.189	0.489***	0.083	0.175	0.049	0.269*	-0.018	0.021
	(0.165)	(0.186)	(0.142)	(0.165)	(0.148)	(0.162)	(0.122)	(0.136)
l1RAT		0.009		0.004		0.019*		0.014
		(0.010)		(0.009)		(0.010)		(0.009)
l1GDP		0.194		0.078		0.225*		0.104
		(0.130)		(0.115)		(0.129)		(0.115)
BC	-0.015**	-0.015*	-0.031***	-0.027***	-0.016**	-0.016**	-0.032***	-0.027***
	(0.007)	(0.007)	(0.006)	(0.007)	(0.007)	(0.007)	(0.006)	(0.006)
AC	-0.020***	-0.014*	-0.038***	-0.032***	-0.015**	-0.009	-0.032***	-0.026***
	(0.007)	(0.008)	(0.006)	(0.007)	(0.007)	(0.008)	(0.006)	(0.007)
Constant	0.398***	0.425***	0.373***	0.383***	0.302***	0.303***	0.275***	0.278***
	(0.073)	(0.082)	(0.063)	(0.073)	(0.048)	(0.051)	(0.036)	(0.039)
Observations	2,737	2,433	2,738	2,434	2,737	2,433	2,738	2,434
Number of id	249	244	249	244	249	244	249	244
R-squared	0.0110	0.0213	0.0898	0.0876	0.0094	0.0183	0.0875	0.0840

The table presents the results from regressing both *book leverage, BTLEV,* and *market leverage, MTLEV,* on the several explanatory variables lagged one year in time using both a *fixed effects* and a *random* model. *l1PRF* stands for *profitability* and *investment* opportunities are represented both from *l1MB, market to book* ratio, and *l1CPX, capital expenditures. l1SIZE* proxies for *volatility, l1NDTS* represents *non-debt tax shields, l1TNG* stands for *tangibility,* and *l1UNIQ* represents *uniqueness.* Two macroeconomic variables are illustrated by *l1RAT, credit rating,* and *l1GDP, GDP growth rate. BC* and *AC* are dummy variables accounting for before crisis period (2003-2006) and after crisis (2010-2013) where the crisis dummy *DC* is the omitted one. More detailed information on the variables is presented on chapter 3 of the present work. Standard errors are reporter in parentheses and the following code applies for p-values: *** p<0.01, ** p<0.05, * p<0.1.

The remaining included variables, namely *SIZE, NDTS, TNG, UNIQ* and *GDP*, all have a positive and significant, at the 1% level, impact on *leverage*. Only *CPX* and *RAT* are not statistically significant although the first one appeared significant when lagged in time. This may indicate for a delay impact of *CPX* on leverage or a downward adjustment of *leverage* in the following year towards a target value in order to avoid future higher raising costs.

Exhibit VIII

Leverage Regression with Contemporaneous Variables

VARIABLES	(4) MTLEV
PRF	-0.430***
	(0.048)
MB	-0.041***
	(0.003)
CPX	-0.096
	(0.075)
SIZE	0.023***
	(0.006)
NDTS	0.124***
	(0.040)
TNG	0.092***
	(0.029)
UNIQ	0.420***
	(0.140)
RAT	0.009
	(0.008)
GDP	0.297***
	(0.108)
BC	-0.053***
	(0.006)
AC	-0.024***
	(0.007)
Constant	0.176***
	(0.058)
Observations	2,676
Number of id	244
R-squared	0.200

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The table presents the results from regressing *market leverage, MTLEV,* on the several contemporaneous explanatory variables using a *fixed effects* model. *PRF* stands for *profitability* and *investment opportunities* are represented both from *MB*, *market to book* ratio, and *CPX*, *capital expenditures*. *SIZE* proxies for *volatility*, *NDTS* represents *non-debt tax shields, TNG* stands for *tangible assets,* and *UNIQ* represents *uniqueness*. Two macroeconomic variables are illustrated by *RAT, credit rating,* and *GDP*, *GDP growth rate*. *BC* and *AC* are dummy variables accounting for before crisis period (2003-2006) and after crisis (2010-2013) where the crisis dummy *DC* is the omitted one. More detailed information on the variables is presented on chapter 3 of the present work.

The intercept, which accumulates the firm specific effect, is also significant and positive meaning that, again, there are firm specific factors persistent over time which help to explain the differences in *leverage* between different firms. Finally, the model fits better the data with the R^2 increasing significantly. Around 20% of *leverage* variation within each firm, i.e. net of

fixed effects, is explained by the model compared to only 8.76% in the lagged model. However, the problem that remains with this analysis arises from endogeneity in the data.

The increased significance of the considered variables may derive from the crisis period considered, where firms closely watch their financials and try to react quick to the environment.

From the previous specification it is possible to withdrawal several insights concerning the adequacy of *fixed effects* and the impact of the control variables, while accounting simultaneously for time periods. From that, one can go deeper on the main research question related to the time dummies.

4.2.4. PRF, CPX, MB and the Crisis Period

So far, evidence seems to exist for crisis positive impact on *leverage*. In order to understand whether any of the capital structure theories underlie behind this pattern, three variables responsible for the main differences on their theoretical arguments, namely *PRF*, *MB and CPX*, are interacted with a dummy variable equal to 1 if data is of the crisis period and 0 otherwise[19]. A lagged model is again considered to avoid endogeneity problems.

From Exhibit IX one can see that *l1PRF*, *l1MB* and *l1CPX* are significant at the 99% confidence level and, in line with previous results, negatively correlated with *MTLEV*. Although the impact of l1*PRF* and *l1CPX* during crisis is not significantly more negative, per *PRFDC* and *CPXDC* coefficients, the same is not true for *l1MB*. On average, and by keeping everything else unchanged, for each 1 unit change in *MB* ratio, leverage changes an additional -0.017% over the -0.018% average effect.

These results seem to suggest again for complex *pecking-order* behaviour and for the increased importance of *market timing* during a financial crisis period.

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[19] Appendix M

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Exhibit IX
Leverage Regression with Variables Interacted with Crisis Dummy

VARIABLES	(5) MTLEV
l1PRF	-0.309***
	(0.063)
l1MB	-0.018***
	(0.004)
l1CPX	-0.452***
	(0.091)
l1SIZE	-0.008
	(0.008)
l1NDTS	0.009
	(0.047)
l1TNG	0.071**
	(0.036)
l1UNIQ	0.178
	(0.164)
l1RAT	0.004
	(0.009)
l1GDP	0.063
	(0.115)
BC	-0.056***
	(0.012)
AC	-0.062***
	(0.013)
PRFDC	-0.023
	(0.089)
MBDC	-0.017***
	(0.006)
CPXDC	0.047
	(0.132)
Constant	0.406***
	(0.073)
Observations	2,434
Number of id	244
R-squared	0.094

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The table presents the results from regressing *market leverage, MTLEV,* on the several explanatory variables lagged one year in time using a *fixed effects* model. *l1PRF* stands for *profitability* and *investment* opportunities are represented both from *l1MB*, *market to book* ratio, and *l1CPX*, *capital expenditures*. *l1SIZE* measures proxies for *volatility*, *l1NDTS* represents *non-debt tax shields*, *l1TNG* stands for *tangible assets,* and *l1UNIQ* represents *uniqueness.* Two macroeconomic variables are illustrated by *l1RAT, credit rating,* and *l1GDP*, *GDP growth rate.* *BC* and *AC* are dummy variables accounting for before crisis period (2003-2006) and after crisis (2010-2013) where the crisis dummy *DC* is the omitted one. Additionally, *l1PRF*, *l1MB* and *l1CPX* are interacted with *DC*. More detailed information on the variables is presented on chapter 3 of the present work.

4.2.5. Country Analysis

So far, the results ignored country considerations. Indeed, there are reasons to believe that, due to different market structures and country specific macroeconomic environment, the financial crisis may lead to different capital structure patterns observed in different countries. Three regressions[20] are performed by applying model (3) to each of 3 countries chosen by their representativeness of corporates' market dependency.

By regressing for each country, one can see that only *l1PRF* and *AC* dummy present significant coefficients, at different degrees, for *leverage* explanation in every country. The first thing to note is that *l1PRF* negative impact on *MTLEV,* everything else constant, is the highest in *France* and the lowest in the *UK*. Contrarily, *l1MB* coefficient is only significant and negative for the *UK*. The increased impact of *profitability* for *"bank-based"* countries follows the hypothesis of those countries higher dependence on debt sources of capital when profits decrease, with less profitable companies raising more debt than more profitable ones, again indicating for *pecking-order,* while not considering so relevant the market price of equity against *UK*'s tradition of equity financing and the indicated importance given to *market timing,* not seen for the other two.

Also, it seems that in *Germany*, the only country were *l1GDP* reveals significant*, leverage* behaves in a counter cyclical way with 0.01% change in *GDP* leading to an estimated -0.986% variation in *MTLEV*. Surprisingly, *l1SIZE* does not seem to be significant except for *Germany*, whose significantly negative coefficient goes against the positive one found in the previous regressions. This may evidence for, as expected, the increased easiness of larger German firms to switch for equity capital or to produce enough resources for internal financing, everything else constant and for smaller companies' preference for debt given the higher costs they face in equity raising. This might be the reason for the previously observed drop in aggregate debt and equity for German companies after crisis since, assuming those companies to be larger, they did not suffer so much from capital markets constraints.

[20] Appendix N

Exhibit X

Leverage Regression per Country

VAR.	(UK) MTLEV	(GERMANY) MTLEV	(FRANCE) MTLEV
l1PRF	-0.198***	-0.529*	-0.765***
	(0.075)	(0.288)	(0.199)
l1MB	-0.022***	0.001	-0.003
	(0.007)	(0.017)	(0.009)
l1CPX	-0.409**	-0.397	-0.643***
	(0.169)	(0.442)	(0.206)
l1SIZE	-0.010	-0.086*	-0.018
	(0.014)	(0.044)	(0.019)
l1NDTS	-0.132	0.177	-0.005
	(0.115)	(0.247)	(0.162)
l1TNG	0.073	0.073	0.055
	(0.073)	(0.178)	(0.103)
l1UNIQ	0.393	-0.144	-0.064
	(0.388)	(0.892)	(0.278)
l1RAT	0.003	0.020	0.012
	(0.022)	(0.025)	(0.018)
l1GDP	-0.276	-0.986**	0.455
	(0.237)	(0.430)	(0.373)
BC	-0.013	-0.061**	-0.009
	(0.012)	(0.029)	(0.014)
AC	-0.044***	-0.138***	-0.038**
	(0.012)	(0.030)	(0.016)
Constant	0.316**	1.280***	0.527***
	(0.126)	(0.453)	(0.182)
Observations	724	240	420
Number of id	73	24	42
R-squared	0.116	0.129	0.131

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The table presents the results from regressing *market leverage, MTLEV,* on the several explanatory variables lagged one year in time using a *fixed effects* model for each of the three countries: *United Kingdom, Germany* and *France*. *l1PRF* stands for *profitability* and *investment* opportunities are represented both from *l1MB, market to book* ratio, and *l1CPX, capital expenditures*. *l1SIZE* measures proxies for *volatility*, *l1NDTS* represents *non-debt tax shields, l1TNG* stands for *tangible assets,* and *l1UNIQ* represents *uniqueness*. Two macroeconomic variables are illustrated by *l1RAT, credit rating,* and *l1GDP, GDP growth rate*. *BC* and *AC* are dummy variables accounting for before crisis period (2003-2006) and after crisis (2010-2013) where the crisis dummy *DC* is the omitted one. More detailed information on the variables is presented on chapter 3 of the present work.

Turning to the crisis effect on *leverage*, it is only for *Germany* that both the before and the after crisis period significantly help to explain *leverage,* with the highest estimated after-crisis negative impact on *leverage.* In the other two countries, the differences in *leverage* ratio between the prior and the crisis period are not explained by the time itself.

Moreover, looking at the intercept term, one can see that, during crisis and remaining true for the following period, average *leverage,* everything else equal to zero, is higher in *Germany* followed by *France* and only then *UK*. This should, in principle, not come as a surprise since in the *UK* companies relate closely and have a long standing tradition of market financing as well as an existing preference for equity, therefore not seeing their financing

decisions so affected by the crisis. They can turn more easily to equity markets while not facing the same information asymmetry costs in situations of financing constraints. This is compatible with the observed increase in equity and decrease in debt throughout time, meaning that they did not switch to bond markets following private debt depletion.

Nevertheless, the significant *leverage* decrease in the after period is common to all three countries, in line with earnings recovery and less need for external finance, but also with less market uncertainty enabling them to reach less costly equity. Also, it might be the result of a move towards a target by using inflows to become less levered.

4.3. Robustness

Although acceptable reasoning was provided for the use of debt over equity as a measure of *leverage*, a new proxy is assessed for a matter of robustness check of the main results, from model (3) with *FE,* whereas *MFinLev,* computed as debt over total book assets minus book equity plus market capitalization, is used instead as dependent variable. The results[21] do not change much with the estimated coefficients remaining of the same sign and significance. The same applies when using non-lagged variables.

Another robustness check consists in using the entire sample[22], after removing non-eligible sectors but including those firms previously excluded for data absence reasons. Observations for which data was not available were given a value of zero, and panel data is unbalanced. The overall results change a bit, with l1*SIZE* and *l1GDP* becoming significant while *l1PRF*, *l1TNG* and AC lose their explanatory power. MB, CPX and BC still significantly help to explain *leverage* with a negative coefficient which again points for complex *pecking-order* behaviour and *market timing* relevance as well as a positive impact of the crisis on *leverage*. In any case, the interpretation of these results should be cautious given the few number of observations for a panel data sample.

[21] Appendix O
[22] Appendix P

5. LIMITATIONS

Although solid reasoning underlies the several aspects of the analysis performed, and limitations were attempted to be minimized, some cannot be ignored when using the previous results to explain corporates' behaviour.

A primary source of limitations arises from obtaining measures for the variables from the available data. Although financial indicators are proposed for each variable, one should be aware of their non-perfect nature given the impossibility of finding a measure for the isolated effect of the factor they directly attempt to appraise. Indeed, as Titman and Wessels (1988) claim, each indicator may be representing different factors which, in turn, may have their effect spread over a set of separate indicators. Yet, for some variables, such as *R&D*, *selling expenses* and *credit rating,* large amounts of data were missing and special treatment was applied. The outcome may be the introduction of estimation errors.

Also, the analysis is based on accounting data whose accuracy not only may be subject to manipulation but also is dependent on reporting rules specific to each regulatory framework, thus influencing recognition and valuation of items within financial statements (Rajan and Zingales, 1995). However, international comparisons are foreseen as plausible under the assumption of growing normalization of those rules within the considered European sample.

Another problem relates to the representativeness of the selected sample. Because companies from a major European Index are considered, one must be aware of the results' bias towards larger companies and those which can more easily access market financing, thus not illustrative of the average firm. When doing the analysis per country, additional concerns arise from the reduced number of observations for each, as well as the different average size of each country's corporations. Furthermore, country clustering refers to headquarters which means that, presuming those firms to operate in several countries, they might be influenced at a large extent by all of them, reducing the ability for binding the conclusions to each single country.

Regarding the regressive methodology applied, none is ever free of error. For instance, the focus on *fixed effects* models could be problematic in case the explanatory variables have a persistent effect which creates stability throughout time. Finally, the exclusion of financial and utility industries because of their dependence on regulation followed the *GICS* code whose classification might not encompass all the companies belonging to those sectors.

6. CONCLUSION

Capital structure decisions of European companies are assessed looking at the evolution of *financial leverage* during the specific period of the 2007/2008 financial crisis. Not only distressed times are perceived as a unique opportunity to understand companies' decisions regarding liquidity sources, but also this specific one had visible impacts on the European corporate sector.

Therefore, the results could let one conclude for theoretical patterns of any of the three theories considered. From *trade-off* it would be expectable to see *profitability* and *investment opportunities* positively and negatively correlated with *leverage*, respectively. P*ecking-order*, on the other hand, predicts a preference for internal funds followed by debt, with firms going for equity mainly in case the value of new investments is reflected in their market price. As per *market timing*, equity is preferable when the market valuation overstates the book value of the company.

If on the one hand the crisis period is described by a decrease in *profitability,* on the other the observed increasing *capital expenditures* required firms to go for external financing in order to satisfy their financing needs. In such a circumstance, at the same time that bank credit is assumed to deteriorate, a preference for debt over equity is deduced from the increasing *leverage* ratio. Indeed, on average, while equity capital is found to decrease along the entire sample period, debt increases from the before crisis period to the crisis one, declining afterwards as profits recover after this event. Nevertheless, only short-term debt seems to follow this pattern whilst the long-term component continuously decreases. These results are further confirmed by regression analysis, both when considering only firm characteristics as well as after including macroeconomic factors, where *profitability, investment opportunities* and the before and after-crisis dummies appear negatively related with *leverage* in a significant way.

Altogether, this suggests for *pecking-order* behaviour, in its complex version, in line with previous evidence on firms preference for less risky sources of capital, going for debt, when both internal and bank funding is lacking, not only due to its lower asymmetry costs compared to equity but also from the associated control mechanism over decision makers. This proves mainly true during financially distressed times. Although neither *profitability* nor *capital expenditures* impact shows up significantly more negative during crisis, it does happen with the remaining *investment opportunities* proxy, *market to book* ratio. This can also

be the result of *market timing* considerations from the disincentive for equity following the observed stock price decline and increased volatility.

The remaining firm specific variables were not found to significantly explain *leverage*, except for the positive impact of *tangibility* as one would expect collateral to represent higher capacity for firms to raise debt from financial institutions. This is also evidenced in the distribution of *leverage* across industries, from which *Telecommunication Services, Consumer Staples* and *Industrials* appear to have the highest levels of *leverage* against the less levered *Information Technology* and *Healthcare* sectors. This collateral value of assets seems to be more relevant than the *non-debt tax shields* which do not show as significant.

Moreover, against previous works, the expected significant impact of macroeconomic variables, hereby represented by *GDP* and *RAT,* is not observed. These variables as well as *SIZE* only show up to be significant when *fixed effects* are ignored which indicates for the presence of correlated time invariant factors. In the case of *SIZE,* although larger firms are on average more levered, during crisis this difference is not observed as significant which may mean that they can less costly turn to equity capital than smaller ones. Therefore, it does not confirm the hypothesis that smaller companies would have *leverage* more negatively affected by a financial crisis.

The results also suggest that the effect is not so delayed in time and firms tend to react contemporaneously to changes in the relevant variables. Except for *CPX, AC* and intercept term, all the remaining variables become significant when not lagged in time.

Concerning countries, their ranking in terms of *leverage* did not change considerably throughout time with *Portugal* being the one with higher aggregated indebtedness, and most of them saw an increase in *leverage* following the crisis. Although "*bank-based*" countries, represented by *France* and *Germany,* present higher *leverage* than the *UK,* a *"market-based"* one, they fall closely after ranking them.

Although the two groups share the decreasing external finance and downward *leverage* pattern after the crisis period, it also shows some differences both between and within cluster. *"Bank-based"* countries seem to prioritize either internal funds or debt during the crisis period, with an observed decrease in *leverage,* from the lower associated asymmetry costs and increased difficulties of accessing equity markets compared to *"market-based"* long tradition of market financing, for which book equity increased from the prior to the crisis period. This

and the increased negative impact of *profitability* for the former countries indicates for stronger *pecking-order* for them compared to the *market timing* importance given by *"bank-based"* countries, the only for which *MB* ratio appears significant for *leverage* explanation. However, by this country clustering does not allow claiming for the hypothesis that "*bank-based"* debt would be negatively impacted by the financial crisis, indeed its aggregate value increased in *France*, which may mean it was able to switch to private debt.

Overall, no conclusion for one of the theories can be claimed. Indeed, they all seem to contribute partially for the explanation, with complex *pecking-order* dominating the relation between *leverage* and the explanatory variables but at the same time with important market considerations and a target ratio, characteristic of *trade-off*, for which firms seem to return after crisis deviation.

Although there is large amount of research dedicated to capital structure, this research highlights important results, some in line but others contradicting prior observations, for the impact of a financial crisis in a sample of European companies for which research has been lagging behind other regions in this field.

Also, this study benefits from the larger time span of data available for the after period and includes macroeconomic variables which, although considered by managers, have not been given the deserved attention in research (Graham & Harvey, 2001).

Nevertheless, further attention should be given to smaller sized companies which constitute the core of the corporate sector in most of European countries and which tend to be more affected by unexpected events. Additionally, it might be interesting to understand how companies will behave in the following years in the context of increasing funding provided by European Union government bodies in order to foster this segment of the market. This would make those smaller, riskier companies, more attractive to investors improving their access to market funding. This opened door to currently more expensive capital might change the rules of the game regarding capital structure decisions.

7. APPENDICES

APPENDIX A

Exhibit A.1
GICS Sector and Industry Classification

Code	Sector	Subcode	Industry groups
10	Energy	**1010**	Energy
15	Materials	**1510**	Materials
20	Industrials	**2010**	Capital Goods
		2020	Commercial & Professional Services
		2030	Transportation
25	Consumer Discretionary	**2510**	Automobiles & Components
		2520	Consumer Durables & Apparel
		2530	Consumer Services
		2540	Media
		2550	Retailing
30	Consumer Staples	**3010**	Food & Staples Retailing
		3020	Food, Beverage & Tobacco
		3030	Household & Personal Products
35	Health Care	**3510**	Health Care Equipment & Services
		3520	Pharmaceuticals, Biotechnology & Life Sciences
40	Financials	**4010**	Banks
		4020	Diversified Financials
		4030	Insurance
		4040	Real Estate
45	Information Technology	**4510**	Software & Services
		4520	Technology Hardware & Equipment
		4530	Semiconductors & Semiconductor Equipment
50	Telecommunication Services	**5010**	Telecommunication Services
55	Utilities	**5510**	Utilities

The exhibit presents the 10 sectors and 24 industry classes considered under the *GICS-Global Industry Classification Standard* as well as the respective code. Each sector includes companies from different industries. From*: http://www.spindices.com/documents/index-policies/methodology-gics.pdf.*

APPENDIX B

Exhibit B.1
List of Sample Companies

Company	Country	Sector	Industry
AALB.AS	Netherlands	Industrials	Machinery
ABBN.VX	Switzerland	Industrials	Electrical Equipment
ABE.MC	Spain	Industrials	Transportation Infrastructure
ABF.L	United Kingdom	Consumer Staples	Food Products
ABI.BR	Belgium	Consumer Staples	Beverages
ACCP.PA	France	Consumer Discretionary	Hotels, Restaurants & Leisure
ACS.MC	*Spain*	*Industrials*	*Construction & Engineering*
ADEN.VX	Switzerland	Industrials	Professional Services
ADSGn.DE	Germany	Consumer Discretionary	Textiles, Apparel & Luxury Goods
AGGK.L	United Kingdom	Industrials	Commercial Services & Supplies
AHLN.AS	Netherlands	Consumer Staples	Food & Staples Retailing
AHT.L	United Kingdom	Industrials	Trading Companies & Distributors
AIR.PA	France	Industrials	Aerospace & Defense
AIRF.PA	France	Industrials	Airlines
AIRP.PA	France	Materials	Chemicals
AKZO.AS	Netherlands	Materials	Chemicals
ALSO.PA	France	Industrials	Electrical Equipment
ALUA.PA	France	Information Technology	Communications Equipment
AMEAS.HE	Finland	Consumer Discretionary	Leisure Products
AMFW.L	United Kingdom	Energy	Energy Equipment & Services
ANTO.L	United Kingdom	Materials	Metals & Mining
ASMI.AS	Netherlands	Information Technology	Semiconductors & Semiconductor Equipment
ASML.AS	Netherlands	Information Technology	Semiconductors & Semiconductor Equipment
ASSAb.ST	Sweden	Industrials	Building Products
ATCOa.ST	Sweden	Industrials	Machinery
AVMD.PA	France	Industrials	Aerospace & Defense
AZN.L	United Kingdom	Health Care	Pharmaceuticals
BAB.L	United Kingdom	Industrials	Commercial Services & Supplies
BAES.L	United Kingdom	Industrials	Aerospace & Defense
BALF.L	United Kingdom	Industrials	Construction & Engineering
BARN.S	Switzerland	Consumer Staples	Food Products
BASFn.DE	Germany	Materials	Chemicals
BATS.L	United Kingdom	Consumer Staples	Tobacco
BAYGn.DE	Germany	Health Care	Pharmaceuticals
BBA.L	United Kingdom	Industrials	Transportation Infrastructure
BDEV.L	United Kingdom	Consumer Discretionary	Household Durables

BEIG.DE	Germany	Consumer Staples	Personal Products
BG.L	United Kingdom	Energy	Oil, Gas & Consumable Fuels
BICP.PA	France	Industrials	Commercial Services & Supplies
BKGH.L	United Kingdom	Consumer Discretionary	Household Durables
BLT.L	United Kingdom	Materials	Metals & Mining
BMWG.DE	Germany	Consumer Discretionary	Automobiles
BNZL.L	United Kingdom	Industrials	Trading Companies & Distributors
BOL.ST	Sweden	Materials	Metals & Mining
BOLL.PA	France	Industrials	Air Freight & Logistics
BOSN.AS	Netherlands	Industrials	Construction & Engineering
BOSSn.DE	Germany	Consumer Discretionary	Textiles, Apparel & Luxury Goods
BP.L	United Kingdom	Energy	Oil, Gas & Consumable Fuels
BRSN.L	United Kingdom	Industrials	Commercial Services & Supplies
BT.L	United Kingdom	Telecommunication Services	Diversified Telecommunication Services
BVS.L	United Kingdom	Consumer Discretionary	Household Durables
BWY.L	United Kingdom	Consumer Discretionary	Household Durables
CAPP.PA	France	Information Technology	IT Services
CARLb.CO	Denmark	Consumer Staples	Beverages
CARR.PA	France	Consumer Staples	Food & Staples Retailing
CASP.PA	France	Consumer Staples	Food & Staples Retailing
CFR.VX	Switzerland	Consumer Discretionary	Textiles, Apparel & Luxury Goods
CLN.VX	Switzerland	Materials	Chemicals
COB.L	United Kingdom	Industrials	Aerospace & Defense
COLOb.CO	Denmark	Health Care	Health Care Equipment & Supplies
COLR.BR	Belgium	Consumer Staples	Food & Staples Retailing
CPI.L	United Kingdom	Industrials	Professional Services
CRDA.L	United Kingdom	Materials	Chemicals
CRH.I	Ireland; Republic of	Materials	Construction Materials
CWC.L	United Kingdom	Telecommunication Services	Diversified Telecommunication Services
DANO.PA	France	Consumer Staples	Food Products
DAST.PA	France	Information Technology	Software
DCC.L	Ireland; Republic of	Industrials	Industrial Conglomerates
DELB.BR	Belgium	Consumer Staples	Food & Staples Retailing
DGE.L	United Kingdom	Consumer Staples	Beverages
DIOR.PA	France	Consumer Discretionary	Textiles, Apparel & Luxury Goods
DMGOa.L	United Kingdom	Consumer Discretionary	Media

DOKA.S	Switzerland	Industrials	Commercial Services & Supplies
DPWGn.DE	Germany	Industrials	Air Freight & Logistics
DSMN.AS	Netherlands	Materials	Chemicals
DTEGn.DE	Germany	Telecommunication Services	Diversified Telecommunication Services
EKTAb.ST	Sweden	Health Care	Health Care Equipment & Supplies
ELI1V.HE	Finland	Telecommunication Services	Diversified Telecommunication Services
ELM.L	United Kingdom	Materials	Chemicals
ELUXb.ST	Sweden	Consumer Discretionary	Household Durables
EMSN.S	Switzerland	Materials	Chemicals
ENI.MI	Italy	Energy	Oil, Gas & Consumable Fuels
ERICb.ST	Sweden	Information Technology	Communications Equipment
ESSI.PA	France	Health Care	Health Care Equipment & Supplies
EXPN.L	Ireland; Republic of	Industrials	Professional Services
FGP.L	United Kingdom	Industrials	Road & Rail
FIN.S	Switzerland	Industrials	Machinery
FLS.CO	Denmark	Industrials	Construction & Engineering
FMEG.DE	Germany	Health Care	Health Care Providers & Services
FOUG.PA	France	Industrials	Construction & Engineering
FREG.DE	Germany	Health Care	Health Care Providers & Services
GBFG.DE	Germany	Industrials	Commercial Services & Supplies
GETIb.ST	Sweden	Health Care	Health Care Equipment & Supplies
GKN.L	United Kingdom	Consumer Discretionary	Auto Components
GL9.I	Ireland; Republic of	Consumer Staples	Food Products
GN.CO	Denmark	Health Care	Health Care Equipment & Supplies
GNK.L	United Kingdom	Consumer Discretionary	Hotels, Restaurants & Leisure
GRF_u.L	Ireland; Republic of	Industrials	Trading Companies & Distributors
GSK.L	United Kingdom	Health Care	Pharmaceuticals
HEIN.AS	Netherlands	Consumer Staples	Beverages
HEIO.AS	Netherlands	Consumer Staples	Beverages
HEXAb.ST	Sweden	Information Technology	Electronic Equipment, Instruments & Components
HLMA.L	United Kingdom	Information Technology	Electronic Equipment, Instruments & Components
HMb.ST	Sweden	Consumer Discretionary	Specialty Retail
HNKG_p.DE	Germany	Consumer Staples	Household Products

HRMS.PA	France	Consumer Discretionary	Textiles, Apparel & Luxury Goods
HUH1V.HE	Finland	Materials	Containers & Packaging
HWDN.L	United Kingdom	Consumer Discretionary	Specialty Retail
IMI.L	United Kingdom	Industrials	Machinery
IMTP.PA	France	Materials	Construction Materials
INCH.L	United Kingdom	Consumer Discretionary	Distributors
INGC.PA	France	Information Technology	Electronic Equipment, Instruments & Components
ISPA.AS	Luxembourg	Materials	Metals & Mining
ITX.MC	Spain	Consumer Discretionary	Specialty Retail
JCDX.PA	France	Consumer Discretionary	Media
JMAT.L	United Kingdom	Materials	Chemicals
JMT.LS	Portugal	Consumer Staples	Food & Staples Retailing
KESBV.HE	Finland	Consumer Staples	Food & Staples Retailing
KGF.L	United Kingdom	Consumer Discretionary	Specialty Retail
KNIN.VX	Switzerland	Industrials	Marine
KPN.AS	Netherlands	Telecommunication Services	Diversified Telecommunication Services
KYGa.I	Ireland; Republic of	Consumer Staples	Food Products
LAGA.PA	France	Consumer Discretionary	Media
LEOGn.DE	Germany	Consumer Discretionary	Auto Components
LHAG.DE	Germany	Industrials	Airlines
LHN.VX	Switzerland	Materials	Construction Materials
LING.DE	Germany	Materials	Chemicals
LISN.S	Switzerland	Consumer Staples	Food Products
LOGN.S	Switzerland	Information Technology	Technology Hardware, Storage & Peripherals
LONN.VX	Switzerland	Health Care	Life Sciences Tools & Services
LUX.MI	Italy	Consumer Discretionary	Textiles, Apparel & Luxury Goods
MANG.DE	Germany	Industrials	Machinery
MEDAa.ST	Sweden	Health Care	Pharmaceuticals
MEO1V.HE	Finland	Industrials	Machinery
MEOG.DE	Germany	Consumer Staples	Food & Staples Retailing
MGGT.L	United Kingdom	Industrials	Aerospace & Defense
MICP.PA	France	Consumer Discretionary	Auto Components
MKS.L	United Kingdom	Consumer Discretionary	Multiline Retail
MRCG.DE	Germany	Health Care	Pharmaceuticals
MRW.L	United Kingdom	Consumer Staples	Food & Staples Retailing
NESN.VX	Switzerland	Consumer Staples	Food Products
NHY.OL	Norway	Materials	Metals & Mining

NOVN.VX	Switzerland	Health Care	Pharmaceuticals
NOVOb.CO	Denmark	Health Care	Pharmaceuticals
NRE1V.HE	Finland	Consumer Discretionary	Auto Components
NXT.L	United Kingdom	Consumer Discretionary	Multiline Retail
OERL.S	Switzerland	Industrials	Machinery
OMVV.VI	Austria	Energy	Oil, Gas & Consumable Fuels
ORAN.PA	France	Telecommunication Services	Diversified Telecommunication Services
OTEr.AT	Greece	Telecommunication Services	Diversified Telecommunication Services
PERP.PA	France	Consumer Staples	Beverages
PEUP.PA	France	Consumer Discretionary	Automobiles
PHG.AS	Netherlands	Industrials	Industrial Conglomerates
PRTP.PA	France	Consumer Discretionary	Textiles, Apparel & Luxury Goods
PSN.L	United Kingdom	Consumer Discretionary	Household Durables
PSON.L	United Kingdom	Consumer Discretionary	Media
PTNL.AS	Netherlands	Industrials	Air Freight & Logistics
RAND.AS	Netherlands	Industrials	Professional Services
RB.L	United Kingdom	Consumer Staples	Household Products
RCOP.PA	France	Consumer Staples	Beverages
RECI.MI	Italy	Health Care	Pharmaceuticals
RENA.PA	France	Consumer Discretionary	Automobiles
REP.MC	Spain	Energy	Oil, Gas & Consumable Fuels
REX.L	United Kingdom	Materials	Containers & Packaging
RHMG.DE	Germany	Industrials	Industrial Conglomerates
RIO.L	United Kingdom	Materials	Metals & Mining
ROCH.PA	France	Industrials	Professional Services
ROG.VX	Switzerland	Health Care	Pharmaceuticals
ROR.L	United Kingdom	Industrials	Machinery
RPC.L	United Kingdom	Materials	Containers & Packaging
RR.L	United Kingdom	Industrials	Aerospace & Defense
RRTL.DE	Luxembourg	Consumer Discretionary	Media
RTN.L	United Kingdom	Consumer Discretionary	Hotels, Restaurants & Leisure
RTO.L	United Kingdom	Industrials	Commercial Services & Supplies
RYA.I	Ireland; Republic of	Industrials	Airlines
SAB.L	United Kingdom	Consumer Staples	Beverages
SAND.ST	Sweden	Industrials	Machinery
SASY.PA	France	Health Care	Pharmaceuticals
SBMO.AS	Netherlands	Energy	Energy Equipment & Services

SBRY.L	United Kingdom	Consumer Staples	Food & Staples Retailing
SBSTA.OL	Norway	Consumer Discretionary	Media
SCAb.ST	Sweden	Consumer Staples	Household Products
SCHN.PA	France	Industrials	Electrical Equipment
SCHP.VX	Switzerland	Industrials	Machinery
SCMN.VX	Switzerland	Telecommunication Services	Diversified Telecommunication Services
SEBF.PA	France	Consumer Discretionary	Household Durables
SECUb.ST	Sweden	Industrials	Commercial Services & Supplies
SESFd.PA	Luxembourg	Consumer Discretionary	Media
SGC.L	United Kingdom	Industrials	Road & Rail
SGE.L	United Kingdom	Information Technology	Software
SGOB.PA	France	Industrials	Building Products
SGSN.VX	Switzerland	Industrials	Professional Services
SHP.L	Ireland; Republic of	Health Care	Pharmaceuticals
SIEGn.DE	Germany	Industrials	Industrial Conglomerates
SIFI.MI	Italy	Industrials	Aerospace & Defense
SIK.VX	Switzerland	Materials	Chemicals
SKAb.ST	Sweden	Industrials	Construction & Engineering
SKFb.ST	Sweden	Industrials	Machinery
SKYB.L	United Kingdom	Consumer Discretionary	Media
SMDS.L	United Kingdom	Materials	Containers & Packaging
SMIN.L	United Kingdom	Industrials	Industrial Conglomerates
SMWH.L	United Kingdom	Consumer Discretionary	Specialty Retail
SOON.VX	Switzerland	Health Care	Health Care Equipment & Supplies
SPX.L	United Kingdom	Industrials	Machinery
SRP.L	United Kingdom	Industrials	Commercial Services & Supplies
STMN.S	Switzerland	Health Care	Health Care Equipment & Supplies
SUBC.OL	United Kingdom	Energy	Energy Equipment & Services
SUN.S	Switzerland	Industrials	Machinery
SWMA.ST	Sweden	Consumer Staples	Tobacco
SXS.L	United Kingdom	Information Technology	Electronic Equipment, Instruments & Components
TATE.L	United Kingdom	Consumer Staples	Food Products
TCH.PA	France	Consumer Discretionary	Media
TDC.CO	Denmark	Telecommunication Services	Diversified Telecommunication Services
TECF.PA	France	Energy	Energy Equipment & Services
TEF.MC	Spain	Telecommunication	Diversified Telecommunication Services

		Services	
TEL2b.ST	Sweden	Telecommunication Services	Wireless Telecommunication Services
TFFP.PA	France	Consumer Discretionary	Media
TGS.OL	Norway	Energy	Energy Equipment & Services
TKAG.DE	Germany	Materials	Metals & Mining
TOTF.PA	France	Energy	Oil, Gas & Consumable Fuels
TPK.L	United Kingdom	Industrials	Trading Companies & Distributors
TRELb.ST	Sweden	Industrials	Machinery
TSCO.L	United Kingdom	Consumer Staples	Food & Staples Retailing
TUIT.L	Germany	Consumer Discretionary	Hotels, Restaurants & Leisure
UBIP.PA	France	Information Technology	Software
UBM.L	United Kingdom	Consumer Discretionary	Media
UCB.BR	Belgium	Health Care	Pharmaceuticals
UHR.VX	Switzerland	Consumer Discretionary	Textiles, Apparel & Luxury Goods
ULE.L	United Kingdom	Industrials	Aerospace & Defense
ULVR.L	United Kingdom	Consumer Staples	Personal Products
UMI.BR	Belgium	Materials	Chemicals
UPM1V.HE	Finland	Materials	Paper & Forest Products
UTDI.DE	Germany	Information Technology	Internet Software & Services
VCTX.L	United Kingdom	Materials	Chemicals
VIS.MC	Spain	Consumer Staples	Food Products
VIV.PA	France	Consumer Discretionary	Media
VLLP.PA	France	Industrials	Machinery
VLOF.PA	France	Consumer Discretionary	Auto Components
VOD.L	United Kingdom	Telecommunication Services	Wireless Telecommunication Services
VOLVb.ST	Sweden	Industrials	Machinery
VOWG_p.DE	Germany	Consumer Discretionary	Automobiles
WDH.CO	Denmark	Health Care	Health Care Equipment & Supplies
WEIR.L	United Kingdom	Industrials	Machinery
WLSNc.AS	Netherlands	Consumer Discretionary	Media
WOS.L	Switzerland	Industrials	Trading Companies & Distributors
WPP.L	United Kingdom	Consumer Discretionary	Media
WTB.L	United Kingdom	Consumer Discretionary	Hotels, Restaurants & Leisure
ZODC.PA	France	Industrials	Aerospace & Defense
ZOT.MC	Spain	Industrials	Machinery

Above are indicated the companies included in the final sample, after eliminating, from the composition of *Eurostoxx 600* Index, *Financial* and *Utility* sector firms and excluding companies for which data was not available. The full list of companies presents the code which represents each company on *Thomson Reuters* database, the country of headquarters and the respective sector and industry class at which they belong.

APPENDIX C

Exhibit C.1
Variables Description

Variable	Description
MTLEV	This variable is the proxy for *market leverage* which is the ratio between total debt and the sum of total debt with equity market value (market capitalization, of common shares outstanding, by year end).
BTLEV	This variable is the proxy for *book leverage* which is the ratio between total debt and the sum of total debt with equity book value.
MFinLev	This variable is another proxy of *leverage* and corresponds to the ratio between total debt and book assets minus book equity plus market equity.
PRF	This variable represents *profitability* ratio as EBIT over total *book assets*.
MB	This variable is the proxy not only for *investment opportunities* as for *market timing*. It represents the *market to book* ratio computed as the sum of market capitalization with total debt over book assets.
CPX	This variables proxy for *investment opportunities* and is computed as the ratio between *capital expenditures* and book assets.
SIZE	This variable proxy for *volatility* and is represented by the natural logarithm of book assets.
TNG	This variable proxy for *tangibility* and is computes from property plant and equipment over book assets ratio.
NDTS	This variable proxy for *non-debt tax shields* and is the ration between depreciations and book assets.
UNIQ	This variable proxy for *uniqueness* and results from the ratio between research and development expenses and book assets.
RAT	This variable proxy for *credit rating*. It is a dummy variable equal to one if the firm is close to a change in rating class and zero otherwise.
GDP	This variable proxy for *GDP growth rate* of the country of headquarters.
BC	This variable proxy for the period before financial crisis, from 2003 until 2006 inclusive.
DC	This variable proxy for the during crisis period, from 2007 until 2009 inclusive.
AC	This variable proxy for the period after financial crisis, from 2010 until 2013 inclusive.
PRFDC	This dummy variable results from interaction between *PRF* and *DC*.
MBDC	This dummy variable results from interaction between *MB* and *DC*.
CPXDC	This dummy variable results from interaction between *CPX* and *DC*.
LARGE	This dummy variable takes the value one if book assets are above the sample median and zero otherwise.
LARGEDC	This variables represents the interaction term between *LARGE* and *DC* variables.

This exhibit presents the several variables considered throughout the empirical analysis as well as the respective description and computation.

APPENDIX D

Exhibit D.1
Descriptive Statistics of the Explanatory Variables

range	variable	N	mean	max	min	sd
-1	PRF	996	.1036797	.5530777	-.2627648	.0743316
0	PRF	747	.0888817	.5476084	-.2314185	.0761573
1	PRF	994	.1030039	.6187668	-.2440782	.0773995
Total	PRF	2737	.0993955	.6187668	-.2627648	.0762011
-1	MB	996	1.872461	10	.7148084	1.115614
0	MB	747	1.802923	10	.6463166	1.331911
1	MB	994	2.119275	10	.3875242	1.628342
Total	MB	2737	1.943118	10	.3875242	1.384596
-1	CPX	996	.0516333	.2818212	-.0023577	.0367508
0	CPX	747	.0598544	.2870997	0	.0441398
1	CPX	994	.0700414	.547732	-.1019375	.0568637
Total	CPX	2737	.0605624	.547732	-.1019375	.0475116
-1	SIZE	996	8.542023	12.3038	4.614264	1.484204
0	SIZE	747	8.399588	12.53587	3.778562	1.568175
1	SIZE	994	7.876014	12.45034	3.380988	1.650009
Total	SIZE	2737	8.261273	12.53587	3.380988	1.596116
-1	NDTS	996	-.2814069	1.656655	-1.550345	.2213541
0	NDTS	747	-.2693483	-.0022009	-1.292312	.1898968
1	NDTS	994	-.2877387	0	-1.233762	.2113771
Total	NDTS	2737	-.2804153	1.656655	-1.550345	.2095729
-1	TNG	996	.544459	1.884331	0	.3530703
0	TNG	747	.5561159	1.778809	-.3007832	.3414042
1	TNG	994	.6077199	2.00106	0	.3667255
Total	TNG	2737	.5706115	2.00106	-.3007832	.3559949
-1	UNIQ	996	.0173212	.2835523	0	.0323623
0	UNIQ	747	.0158701	.2516577	0	.0322131
1	UNIQ	994	.017	.4367651	0	.039961
Total	UNIQ	2737	.0168085	.4367651	0	.0352666

range	variable	N	mean	max	min	sd
-1	RAT	976	.1864754	1	0	.3896895
0	RAT	730	.1082192	1	0	.31087
1	RAT	972	.0864198	1	0	.2811275
Total	RAT	2678	.1288275	1	0	.3350715
-1	GDP	996	.0254749	.063	-.009	.0128921
0	GDP	747	-.0022718	.084	-.083	.0318875
1	GDP	996	.0142791	.06	-.091	.0150177
Total	GDP	2739	.0138364	.084	-.091	.023228

The Exhibit presents the summary statistics (number of observations, average, maximum, minimum, standard deviation) of the variables included in the regression analysis. The statistics are reported for each time range, where *range-1* stands for the 2003-2006 period, *range 0* represents the crisis period 2007-2009 and *range 1* corresponds to the period from 2010 until 2013. The variables are: *PRF (profitability), MB (market to book ratio), CPX (capital expenditures), SIZE (volatility), NTDS (non-debt-tax-shields), TNG (tangibility), UNIQ (uniqueness), RAT (credit rating) and GDP (GDP growth rate).*

Exhibit D.2
Variables Correlation

Panel A

	BTLEV	MTLEV	l1PRF	l1MB	l1CPX	l1SIZE	l1NDTS	l1TNG	l1UNIQ	l1RAT	l1GDP
BTLEV	1.0000										
MTLEV	0.6445	1.0000									
l1PRF	-0.2137	-0.4047	1.0000								
l1MB	-0.1805	-0.4532	0.5842	1.0000							
l1CPX	-0.0024	-0.0545	0.1657	0.1047	1.0000						
l1SIZE	0.2006	0.2166	-0.2906	-0.2818	-0.0879	1.0000					
l1NDTS	-0.0828	-0.1431	0.0157	0.1477	-0.3331	-0.1216	1.0000				
l1TNG	0.0898	0.1571	0.0322	-0.1413	0.4856	0.1066	-0.8771	1.0000			
l1UNIQ	-0.1061	-0.1760	0.1525	0.3334	-0.0832	-0.0415	0.1034	-0.1703	1.0000		
l1RAT	0.1797	0.1642	-0.1189	-0.0897	-0.0006	0.3425	-0.0628	0.0523	-0.0007	1.0000	
l1GDP	0.0252	0.0376	-0.0054	-0.0406	-0.0746	-0.0007	-0.0339	0.0014	0.0060	0.0145	1.0000

Panel B

	BTLEV	MTLEV	PRF	MB	CPX	SIZE	NDTS	TNG	UNIQ	RAT	GDP
BTLEV	1.0000										
MTLEV	0.6520	1.0000									
PRF	-0.2456	-0.4488	1.0000								
MB	-0.1651	-0.5135	0.5766	1.0000							
CPX	0.0160	-0.0207	0.1533	0.0915	1.0000						
SIZE	0.2082	0.2452	-0.2922	-0.2843	-0.0913	1.0000					
NDTS	-0.0743	-0.1131	0.0129	0.1425	-0.3281	-0.1233	1.0000				
TNG	0.0946	0.1406	0.0388	-0.1364	0.4764	0.1048	-0.8739	1.0000			
UNIQ	-0.1186	-0.1850	0.1628	0.3283	-0.0816	-0.0445	0.1015	-0.1660	1.0000		
RAT	0.1670	0.1679	-0.1164	-0.0863	0.0043	0.3383	-0.0669	0.0558	-0.0032	1.0000	
GDP	-0.0107	-0.0134	0.0040	-0.0310	-0.0765	0.0001	-0.0223	-0.0050	0.0053	0.0113	1.0000

The exhibit presents the correlation between the several dependent and independent variables considered in the different model specifications. Panel A reports the correlation values for one-year lagged explanatory variables and Panel B the same coefficient for contemporaneous variables.

APPENDIX E

Exhibit E.1
Variables Correlation per Time Range

Panel A

-> range = -1
(obs=732)

	BTLEV	MTLEV	l1PRF	l1MB	l1CPX	l1SIZE	l1NDTS	l1UNIQ	l1RAT	l1GDP
BTLEV	1.0000									
MTLEV	0.7301	1.0000								
l1PRF	-0.2554	-0.4686	1.0000							
l1MB	-0.2846	-0.5225	0.7506	1.0000						
l1CPX	0.0381	-0.0068	0.2536	0.1699	1.0000					
l1SIZE	0.2184	0.3082	-0.2694	-0.3704	-0.0980	1.0000				
l1NDTS	-0.1424	-0.1871	0.0250	0.1269	-0.3916	-0.0637	1.0000			
l1UNIQ	-0.1252	-0.1890	0.1224	0.2344	-0.1098	-0.0612	0.1219	1.0000		
l1RAT	0.2112	0.2369	-0.1087	-0.1507	0.0257	0.4222	-0.1338	0.0056	1.0000	
l1GDP	-0.0023	-0.1035	0.0783	0.0358	0.0272	-0.1987	0.0416	-0.0998	-0.1910	1.0000

-> range = 0
(obs=731)

	BTLEV	MTLEV	l1PRF	l1MB	l1CPX	l1SIZE	l1NDTS	l1UNIQ	l1RAT	l1GDP
BTLEV	1.0000									
MTLEV	0.6903	1.0000								
l1PRF	-0.1777	-0.4153	1.0000							
l1MB	-0.1689	-0.4896	0.5789	1.0000						
l1CPX	-0.0121	-0.0686	0.1376	0.1142	1.0000					
l1SIZE	0.2226	0.2179	-0.2709	-0.2385	-0.0728	1.0000				
l1NDTS	-0.1025	-0.1783	0.0496	0.1485	-0.3353	-0.1088	1.0000			
l1UNIQ	-0.1485	-0.2057	0.0636	0.3066	-0.0570	-0.0024	0.1188	1.0000		
l1RAT	0.2373	0.2417	-0.1210	-0.0858	-0.0528	0.3042	0.0248	-0.0048	1.0000	
l1GDP	0.0236	0.0955	-0.0318	-0.0755	-0.0813	0.0012	-0.1057	-0.0039	0.0751	1.0000

-> range = 1
(obs=970)

	BTLEV	MTLEV	l1PRF	l1MB	l1CPX	l1SIZE	l1NDTS	l1UNIQ	l1RAT	l1GDP
BTLEV	1.0000									
MTLEV	0.5610	1.0000								
l1PRF	-0.2051	-0.3447	1.0000							
l1MB	-0.1312	-0.4015	0.5218	1.0000						
l1CPX	-0.0071	-0.0527	0.1495	0.0563	1.0000					
l1SIZE	0.1716	0.1578	-0.3358	-0.2539	-0.0488	1.0000				
l1NDTS	-0.0211	-0.0887	-0.0211	0.1686	-0.3229	-0.1812	1.0000			
l1UNIQ	-0.0678	-0.1513	0.2331	0.3962	-0.0872	-0.0560	0.0818	1.0000		
l1RAT	0.1081	0.0478	-0.1527	-0.0474	0.0618	0.2816	-0.0632	-0.0047	1.0000	
l1GDP	0.0106	0.0010	-0.0015	0.0241	0.0094	-0.0644	-0.0430	0.0417	-0.0255	1.0000

Panel B

-> range = -1
(obs=976)

	BTLEV	MTLEV	PRF	MB	CPX	SIZE	NDTS	UNIQ	RAT	GDP
BTLEV	1.0000									
MTLEV	0.7362	1.0000								
PRF	-0.2905	-0.5062	1.0000							
MB	-0.2780	-0.5366	0.7290	1.0000						
CPX	0.0269	-0.0193	0.2188	0.1437	1.0000					
SIZE	0.2340	0.3338	-0.2547	-0.3406	-0.1006	1.0000				
NDTS	-0.1291	-0.1611	0.0474	0.1358	-0.3713	-0.0706	1.0000			
UNIQ	-0.1592	-0.2074	0.1150	0.2572	-0.1073	-0.0533	0.1259	1.0000		
RAT	0.2181	0.2387	-0.1124	-0.1337	0.0057	0.4011	-0.1005	-0.0028	1.0000	
GDP	0.0034	-0.0256	0.0063	0.0015	0.0166	-0.1778	0.0154	-0.0723	-0.1688	1.0000

-> range = 0
(obs=730)

	BTLEV	MTLEV	PRF	MB	CPX	SIZE	NDTS	UNIQ	RAT	GDP
BTLEV	1.0000									
MTLEV	0.6903	1.0000								
PRF	-0.2701	-0.4624	1.0000							
MB	-0.1822	-0.5289	0.5418	1.0000						
CPX	0.0269	-0.0209	0.1267	0.1075	1.0000					
SIZE	0.2391	0.2414	-0.2797	-0.2313	-0.0175	1.0000				
NDTS	-0.0933	-0.1543	0.0144	0.1599	-0.3542	-0.1079	1.0000			
UNIQ	-0.1549	-0.2103	0.1148	0.3414	-0.0571	0.0174	0.1072	1.0000		
RAT	0.1983	0.2207	-0.1160	-0.0714	-0.0286	0.2938	0.0231	0.0169	1.0000	
GDP	0.0171	0.0947	-0.0669	-0.1255	-0.0985	0.0263	-0.0807	0.0136	0.0403	1.0000

-> range = 1
(obs=970)

	BTLEV	MTLEV	PRF	MB	CPX	SIZE	NDTS	UNIQ	RAT	GDP
BTLEV	1.0000									
MTLEV	0.5610	1.0000								
PRF	-0.1798	-0.3839	1.0000							
MB	-0.0784	-0.4938	0.5091	1.0000						
CPX	0.0055	-0.0244	0.1378	0.0396	1.0000					
SIZE	0.1671	0.1867	-0.3429	-0.2630	-0.0716	1.0000				
NDTS	-0.0125	-0.0586	-0.0165	0.1509	-0.3017	-0.1994	1.0000			
UNIQ	-0.0656	-0.1550	0.2285	0.3650	-0.0811	-0.0749	0.0807	1.0000		
RAT	0.0914	0.0824	-0.1440	-0.0457	0.0812	0.2757	-0.0896	-0.0206	1.0000	
GDP	0.0106	0.0249	-0.0285	0.0145	-0.0502	0.0346	0.0540	0.0246	-0.0253	1.0000

The exhibit presents the correlation between the several variables, dependent and independent, considered in the different model specifications for each of the three time periods considered. *Range -1* refers to the pre-crisis period (2003-2006), *range 0* stands for the crisis years (2007-2009) and *range 1* represents the after crisis period (2010-2013). Panel A reports the correlation values for one-year lagged explanatory variables and Panel B the same coefficient for contemporaneous variables.

APPENDIX F

Exhibit F.1
Book and Market Leverage per Sector and Time Range

-> range = -1

sec	stats	BTLEV	MTLEV
Consumer Discret	mean	.39128	.2378656
Consumer Staples	mean	.4425369	.2471206
Energy	mean	.3381582	.2035516
Health Care	mean	.3085546	.1418614
Industrials	mean	.4017742	.220738
Information Tech	mean	.3033207	.1477783
Materials	mean	.3773091	.2583236
Telecommunicatio	mean	.4993995	.3046323
Total	mean	.3903095	.2241457

-> range = 0

sec	stats	BTLEV	MTLEV
Consumer Discret	mean	.4011157	.2718395
Consumer Staples	mean	.4670508	.27693
Energy	mean	.3471172	.2509016
Health Care	mean	.3328828	.1666326
Industrials	mean	.4197605	.2763766
Information Tech	mean	.3142255	.202252
Materials	mean	.445464	.3655775
Telecommunicatio	mean	.4888331	.3479169
Total	mean	.4115655	.2735552

-> range = 1

sec	stats	BTLEV	MTLEV
Consumer Discret	mean	.3916495	.2159302
Consumer Staples	mean	.4523972	.2570071
Energy	mean	.3418031	.2383319
Health Care	mean	.3466564	.1799559
Industrials	mean	.3869434	.2261165
Information Tech	mean	.3739542	.1458441
Materials	mean	.3656708	.2810442
Telecommunicatio	mean	.449448	.2239709
Total	mean	.3913311	.226167

The exhibit presents the average values of *book leverage, BTLEV,* and *market leverage, MTLEV,* for each of the sectors, according to *GICS* classification, considered in the sample. Those values are reported for each of the time ranges, where *range -1* refers to the pre-crisis period (2003-2006), *range 0* stands for the crisis years (2007-2009) and *range 1* represents the after crisis period (2010-2013).

APPENDIX G

Exhibit G.1
Book and Market Leverage per Industry

. tabstat BTLEV MTLEV, by(ind) statistics(mean sd) long format

ind	variable	mean	sd	variable	mean	sd
Aerospace & Defe	BTLEV	.3864568	.158053	MTLEV	.2346782	.1684973
Air Freight & Lo	BTLEV	.4680473	.1937083	MTLEV	.2787744	.1777931
Airlines	BTLEV	.4951887	.1750837	MTLEV	.4011016	.2426461
Auto Components	BTLEV	.4137532	.1278764	MTLEV	.3038383	.167098
Automobiles	BTLEV	.6308418	.1339404	MTLEV	.6450023	.1735234
Beverages	BTLEV	.4881759	.1321191	MTLEV	.2927463	.1633483
Building Product	BTLEV	.4346342	.0780539	MTLEV	.2801489	.1128597
Chemicals	BTLEV	.3255979	.1646841	MTLEV	.2157868	.1551166
Commercial Servi	BTLEV	.4662245	.2752505	MTLEV	.2146845	.1410812
Communications E	BTLEV	.3743877	.1838091	MTLEV	.2307993	.1850394
Construction & E	BTLEV	.4163078	.2405257	MTLEV	.3026799	.2382111
Construction Mat	BTLEV	.4639686	.0951494	MTLEV	.3768385	.1615712
Containers & Pac	BTLEV	.4487923	.1046644	MTLEV	.3474822	.1258784
Distributors	BTLEV	.3129599	.1518636	MTLEV	.2674293	.2045685
Diversified Tele	BTLEV	.5767766	.2003281	MTLEV	.3645927	.1901427
Electrical Equip	BTLEV	.4479557	.2174706	MTLEV	.269813	.1943429
Electronic Equip	BTLEV	.3413366	.2168813	MTLEV	.1608486	.1272883
Energy Equipment	BTLEV	.3120838	.2187484	MTLEV	.2254926	.21864
Food & Staples R	BTLEV	.4273279	.1227907	MTLEV	.2763821	.168352
Food Products	BTLEV	.4183322	.1921124	MTLEV	.2285353	.1438501
Health Care Equi	BTLEV	.3265042	.2205453	MTLEV	.1195749	.1188925
Health Care Prov	BTLEV	.5265534	.0804931	MTLEV	.4381435	.1739622
Hotels, Restaura	BTLEV	.4414741	.1607783	MTLEV	.3273212	.185583
Household Durabl	BTLEV	.2146038	.1754971	MTLEV	.1644945	.1435956
Household Produc	BTLEV	.3553825	.1165609	MTLEV	.2134405	.129758
IT Services	BTLEV	.2237152	.0977192	MTLEV	.162581	.0946557
Industrial Congl	BTLEV	.3955937	.1213206	MTLEV	.242348	.1447462
Internet Softwar	BTLEV	.4413154	.2442687	MTLEV	.1826721	.2751602
Leisure Products	BTLEV	.4035291	.1008258	MTLEV	.320869	.1230236
Life Sciences To	BTLEV	.4595363	.1505777	MTLEV	.2468054	.1301839
Machinery	BTLEV	.3214177	.177829	MTLEV	.2176747	.1736896
Marine	BTLEV	.4795822	.1518309	MTLEV	.1479272	.2349204
Media	BTLEV	.4842967	.2545052	MTLEV	.2300864	.1558045
Metals & Mining	BTLEV	.3643936	.1872721	MTLEV	.293515	.2458395
Multiline Retail	BTLEV	.4558821	.2737076	MTLEV	.1516347	.1110848
Oil, Gas & Consu	BTLEV	.3325651	.0921145	MTLEV	.2432796	.1375755
Paper & Forest P	BTLEV	.3957021	.0598585	MTLEV	.4146059	.1600719
Personal Product	BTLEV	.2281059	.2521155	MTLEV	.1153087	.172241
Pharmaceuticals	BTLEV	.3046168	.119071	MTLEV	.1622886	.1760726
Professional Ser	BTLEV	.3390757	.1888982	MTLEV	.1371751	.0931977
Road & Rail	BTLEV	.7370865	.1495475	MTLEV	.3879491	.1336306
Semiconductors &	BTLEV	.3435766	.2262976	MTLEV	.1908315	.2224296
Software	BTLEV	.2440923	.2233104	MTLEV	.1195005	.1599254
Specialty Retail	BTLEV	.1307975	.1711875	MTLEV	.0624826	.0971619
Technology Hardw	BTLEV	.1059939	.1248601	MTLEV	.0384611	.0492743
Textiles, Appare	BTLEV	.3178861	.2279877	MTLEV	.1970096	.1890672
Tobacco	BTLEV	.6512964	.211044	MTLEV	.2310186	.1461242
Trading Companie	BTLEV	.4183581	.1732446	MTLEV	.2751391	.1900143
Transportation I	BTLEV	.5029834	.201944	MTLEV	.3355261	.1738075
Wireless Telecom	BTLEV	.3159982	.2059574	MTLEV	.2026857	.1600792
Total	BTLEV	.3910102	.2153928	MTLEV	.2431018	.189735

The exhibit displays the average values, throughout the years from 2003 until 2013, of *book leverage, BTLEV,* and *market leverage, MTLEV,* for each of the industry groups, according to *GICS* classification, considered in the sample. Standard deviation of those measures are also reported.

APPENDIX H

Exhibit H.1
Capital Structure per Country and per Range

Panel A

-> range = -1

country	stats	TDEBT	BEQUITY	BTLEV	MTLEV
Austria	mean	2032.7548	4949.4428	.3002133	.3246213
Belgium	mean	2172.4727	3356.31	.338816	.2270138
Denmark	mean	1328.5748	1594.92	.3990378	.192198
Finland	mean	1127.1009	1815.3	.3815901	.2613636
France	mean	5965.7819	6190.2563	.4219329	.2834304
Germany	mean	9178.8269	8183.1439	.4090431	.3138556
Greece	mean	3622.475	3538.7	.5031991	.3209012
Ireland; Republi	mean	1512.6468	2236.8366	.4232096	.2109943
Italy	mean	4513.6309	10184.536	.3752869	.1857556
Luxembourg	mean	3527.0003	6826.2187	.2974037	.270777
Netherlands	mean	2727.1836	3201.3166	.453204	.230888
Norway	mean	1022.6099	3729.4138	.2566206	.1195939
Portugal	mean	738.05125	332.50275	.6996325	.3443213
Spain	mean	8603.5227	5401.8758	.4075708	.2313262
Sweden	mean	1468.7523	2562.3742	.3628413	.2002149
Switzerland	mean	2150.4243	4377.4304	.3212692	.1565618
United Kingdom	mean	2384.3602	5175.0497	.3882462	.1897733
Total	mean	3690.1491	4975.14	.3903095	.2241457

Panel B

-> range = 0

country	stats	TDEBT	BEQUITY	BTLEV	MTLEV
Austria	mean	831.62033	2184.379	.2731077	.2521161
Belgium	mean	1747.324	2067.3303	.3156815	.2311541
Denmark	mean	1078.5642	1621.5707	.4414332	.2520771
Finland	mean	1240.0783	1668.8365	.4133629	.3500589
France	mean	6580.8095	5238.2324	.4265317	.3118365
Germany	mean	7477.5924	7486.7607	.441558	.3783054
Greece	mean	2551.9613	3496.0697	.4208772	.2622059
Ireland; Republi	mean	1105.5021	1847.833	.4305847	.2604806
Italy	mean	4197.8506	7966.7007	.4319382	.1754026
Luxembourg	mean	2086.2843	2912.5933	.5056665	.4512566
Netherlands	mean	3829.8592	3273.9141	.4905666	.2612634
Norway	mean	2074.3574	3172.1682	.3368577	.2190467
Portugal	mean	1257.4634	174.08684	.8893327	.5903184
Spain	mean	7366.0946	5983.3491	.3753079	.2681489
Sweden	mean	1613.9964	2318.5496	.4016019	.2824784
Switzerland	mean	2752.0344	3942.2509	.3981946	.2412772
United Kingdom	mean	2856.361	6265.3671	.3830281	.2255856
Total	mean	3837.8273	4885.5409	.4115655	.2735552

Norway	mean	2074.3574	3172.1682	.3368577	.2190467
Portugal	mean	1257.4634	174.08684	.8893327	.5903184
Spain	mean	7366.0946	5983.3491	.3753079	.2681489
Sweden	mean	1613.9964	2318.5496	.4016019	.2824784
Switzerland	mean	2752.0344	3942.2509	.3981946	.2412772
United Kingdom	mean	2856.361	6265.3671	.3830281	.2255856
Total	mean	3837.8273	4885.5409	.4115655	.2735552

Panel C

-> range = 1

country	stats	TDEBT	BEQUITY	BTLEV	MTLEV
Austria	mean	991.2125	1491.9367	.3991849	.2753555
Belgium	mean	815.97348	840.32252	.3927752	.1778348
Denmark	mean	514.78841	1157.5347	.3359088	.1813714
Finland	mean	783.60655	1241.2465	.351724	.2758672
France	mean	3252.3645	2994.5764	.4121176	.2636384
Germany	mean	3758.5591	4729.4024	.3660482	.2779922
Greece	mean	802.31013	2830.3731	.2095345	.0747469
Ireland; Republi	mean	739.20436	874.96634	.4957279	.2498397
Italy	mean	4182.7835	4519.471	.5234349	.3547775
Luxembourg	mean	982.31394	1014.7894	.4409731	.2742108
Netherlands	mean	1452.7757	2121.9392	.4098291	.1695246
Norway	mean	1370.7223	1912.0322	.4091624	.2675943
Portugal	mean	828.0969	282.01616	.7372695	.3661912
Spain	mean	3593.2886	3294.2727	.3376997	.1967947
Sweden	mean	1073.6034	1678.9313	.3836791	.2669124
Switzerland	mean	1978.3126	2859.437	.3993734	.2567474
United Kingdom	mean	1437.1509	3160.1777	.3734411	.1703573
Total	mean	2016.5333	2810.7442	.3913311	.226167

Reported are the average value of total debt (*TDEBT)* and book equity (*BEQUITY)*, both in million euros, and also *book leverage (BTLEV)* and *market leverage (MTLEV).* The values are computed for each of the countries in each of the three periods. Panel A presents the results for *range -1,* the pre-crisis period (2003-2006), Panel B displays the results for *range 0*, the crisis period (2007-2009), while the values for *range 1 (2010-2013)* is represented in Panel C.

APPENDIX I

Exhibit I.1
Leverage Regression with Model (2)

Panel A

```
Random-effects GLS regression                   Number of obs      =      2737
Group variable: id                              Number of groups   =       249

R-sq:  within  = 0.0094                         Obs per group: min =        10
       between = 0.0950                                        avg =      11.0
       overall = 0.0603                                        max =        11

                                                Wald chi2(8)       =     46.27
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

BTLEV	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
l1PRF	-.1743962	.0595195	-2.93	0.003	-.2910523	-.0577402
l1MB	-.0037721	.0036554	-1.03	0.302	-.0109365	.0033923
l1SIZE	.011117	.0050291	2.21	0.027	.0012602	.0209739
l1NDTS	.0567449	.0450244	1.26	0.208	-.0315013	.1449911
l1TNG	.0930196	.0317963	2.93	0.003	.0307	.1553393
l1UNIQ	.048761	.1477675	0.33	0.741	-.2408579	.3383799
BC	-.0159155	.0069169	-2.30	0.021	-.0294724	-.0023587
AC	-.0148789	.0069259	-2.15	0.032	-.0284533	-.0013045
_cons	.3023489	.0480408	6.29	0.000	.2081906	.3965072
sigma_u	.14886792					
sigma_e	.13559884					
rho	.54654419	(fraction of variance due to u_i)				

```
.
.
Random-effects GLS regression                   Number of obs      =      2738
Group variable: id                              Number of groups   =       249

R-sq:  within  = 0.0875                         Obs per group: min =        10
       between = 0.3853                                        avg =      11.0
       overall = 0.2507                                        max =        11

                                                Wald chi2(8)       =    372.55
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

MTLEV	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
l1PRF	-.4365339	.0507867	-8.60	0.000	-.5360741	-.3369938
l1MB	-.023473	.0030935	-7.59	0.000	-.0295362	-.0174099
l1SIZE	.0038468	.0038286	1.00	0.315	-.0036571	.0113508
l1NDTS	.007512	.0375585	0.20	0.841	-.0661013	.0811253
l1TNG	.0828147	.0258243	3.21	0.001	.0322	.1334293
l1UNIQ	-.0180096	.1220266	-0.15	0.883	-.2571773	.2211582
BC	-.0316171	.0059623	-5.30	0.000	-.043303	-.0199312
AC	-.0320842	.0059617	-5.38	0.000	-.043769	-.0203995
_cons	.27472	.0364717	7.53	0.000	.2032368	.3462033
sigma_u	.10198937					
sigma_e	.11725111					
rho	.43072385	(fraction of variance due to u_i)				

Panel B

```
Fixed-effects (within) regression               Number of obs      =      2737
Group variable: id                              Number of groups   =       249

R-sq:  within  = 0.0110                         Obs per group: min =        10
       between = 0.0391                                        avg =      11.0
       overall = 0.0275                                        max =        11

                                                F(8,2480)          =      3.44
corr(u_i, Xb)  = 0.0562                         Prob > F           =    0.0006
```

BTLEV	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
l1PRF	-.1259349	.0612573	-2.06	0.040	-.2460556	-.0058141
l1MB	-.0042651	.0038574	-1.11	0.269	-.0118291	.003299
l1SIZE	-.0005649	.007777	-0.07	0.942	-.0158149	.0146851
l1NDTS	.0715916	.0490372	1.46	0.144	-.0245665	.1677497
l1TNG	.0948021	.0379844	2.50	0.013	.0203176	.1692866
l1UNIQ	.1888755	.1647492	1.15	0.252	-.1341847	.5119357
BC	-.0145127	.0070493	-2.06	0.040	-.0283358	-.0006896
AC	-.0196223	.0071276	-2.75	0.006	-.033599	-.0056456
_cons	.3980053	.0731349	5.44	0.000	.2545936	.5414171
sigma_u	.16232321					
sigma_e	.13559884					
rho	.58898655	(fraction of variance due to u_i)				

```
F test that all u i=0:     F(248, 2480) =    14.34           Prob > F = 0.0000
```

```
Fixed-effects (within) regression               Number of obs      =      2738
Group variable: id                              Number of groups   =       249

R-sq:  within  = 0.0898                         Obs per group: min =        10
       between = 0.3348                                        avg =      11.0
       overall = 0.2186                                        max =        11

                                                F(8,2481)          =     30.59
corr(u_i, Xb)  = 0.2355                         Prob > F           =    0.0000
```

MTLEV	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
l1PRF	-.3923029	.0529663	-7.41	0.000	-.4961656	-.2884402
l1MB	-.020039	.0033354	-6.01	0.000	-.0265794	-.0134987
l1SIZE	-.0083734	.0067229	-1.25	0.213	-.0215564	.0048097
l1NDTS	-.0021881	.042402	-0.05	0.959	-.0853351	.0809589
l1TNG	.0657037	.0328442	2.00	0.046	.0012989	.1301085
l1UNIQ	.0826586	.1424566	0.58	0.562	-.1966875	.3620047
BC	-.0313852	.0060954	-5.15	0.000	-.0433378	-.0194326
AC	-.0380615	.0061627	-6.18	0.000	-.0501461	-.025977
_cons	.3730746	.0632198	5.90	0.000	.2491056	.4970436
sigma_u	.11865484					
sigma_e	.11725111					
rho	.5059502	(fraction of variance due to u_i)				

```
F test that all u i=0:     F(248, 2481) =     9.55           Prob > F = 0.0000
```

The exhibit presents the results from Stata by running model (2) and applying two different regression methods. Panel A refers to the outcome from regressing *book leverage, BTLEV,* and *market leverage, MTLEV,* separately, on the variables included in model (2) by applying a *random effects* method. Panel B displays the corresponding results from using a *fixed effects* model instead. Reported are the coefficients, *standard errors* and the *t-statistics* referring to the null hypothesis that the estimated coefficient is equal to zero. *P-values* and *confidence intervals* are also presented.

Exhibit I.2
Leverage Regression with Model (3)

Panel A

Random-effects GLS regression — Number of obs = 2433
Group variable: id — Number of groups = 244

R-sq: within = 0.0183 — Obs per group: min = 5
between = 0.0864 — avg = 10.0
overall = 0.0604 — max = 10

Wald chi2(11) = 62.30
corr(u_i, X) = 0 (assumed) — Prob > chi2 = 0.0000

BTLEV	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
l1PRF	-.1156734	.0615578	-1.88	0.060	-.2363245	.0049778
l1MB	-.0070845	.0038136	-1.86	0.063	-.0145589	.0003899
l1CPX	-.2918406	.0958608	-3.04	0.002	-.4797243	-.1039569
l1SIZE	.0117273	.0053395	2.20	0.028	.0012621	.0221925
l1NDTS	.0534622	.0484019	1.10	0.269	-.0414038	.1483283
l1TNG	.0907549	.0338337	2.68	0.007	.024442	.1570677
l1UNIQ	.2691314	.1617284	1.66	0.096	-.0478504	.5861133
l1RAT	.0187369	.0103209	1.82	0.069	-.0014916	.0389655
l1GDP	.2251523	.1289193	1.75	0.081	-.0275249	.4778295
BC	-.0159892	.0073074	-2.19	0.029	-.0303115	-.0016669
AC	-.0092424	.0075591	-1.22	0.221	-.024058	.0055733
_cons	.3032179	.0506855	5.98	0.000	.2038762	.4025596
sigma_u	.14810471					
sigma_e	.13319127					
rho	.55286829	(fraction of variance due to u_i)				

Random-effects GLS regression — Number of obs = 2434
Group variable: id — Number of groups = 244

R-sq: within = 0.0840 — Obs per group: min = 5
between = 0.3886 — avg = 10.0
overall = 0.2544 — max = 10

Wald chi2(11) = 333.19
corr(u_i, X) = 0 (assumed) — Prob > chi2 = 0.0000

MTLEV	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
l1PRF	-.3883225	.0538653	-7.21	0.000	-.4938965	-.2827484
l1MB	-.0231861	.0033068	-7.01	0.000	-.0296674	-.0167049
l1CPX	-.4032667	.0838941	-4.81	0.000	-.5676962	-.2388373
l1SIZE	.0043598	.0041304	1.06	0.291	-.0037356	.0124553
l1NDTS	.037086	.0412007	0.90	0.368	-.0436659	.1178379
l1TNG	.1086938	.028255	3.85	0.000	.053315	.1640726
l1UNIQ	.021087	.1356527	0.16	0.876	-.2447875	.2869614
l1RAT	.0144463	.0090998	1.59	0.112	-.003389	.0322816
l1GDP	.1043444	.1145756	0.91	0.362	-.1202196	.3289084
BC	-.0265818	.0064807	-4.10	0.000	-.0392838	-.0138799
AC	-.025971	.0066682	-3.89	0.000	-.0390403	-.0129016
_cons	.2779089	.0391121	7.11	0.000	.2012506	.3545672
sigma_u	.103278					
sigma_e	.11834099					
rho	.43234461	(fraction of variance due to u_i)				

Panel B

```
Fixed-effects (within) regression               Number of obs      =      2433
Group variable: id                              Number of groups   =       244

R-sq:  within  = 0.0213                         Obs per group: min =         5
       between = 0.0070                                        avg =      10.0
       overall = 0.0119                                        max =        10

                                                F(11,2178)         =      4.31
corr(u_i, Xb)  = -0.0259                        Prob > F           =    0.0000
```

BTLEV	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
l1PRF	-.0588389	.0634918	-0.93	0.354	-.1833497	.0656719
l1MB	-.0079173	.00404	-1.96	0.050	-.0158399	5.36e-06
l1CPX	-.3466568	.0990516	-3.50	0.000	-.5409024	-.1524113
l1SIZE	-.0019762	.0087744	-0.23	0.822	-.0191832	.0152308
l1NDTS	.0516468	.053306	0.97	0.333	-.0528891	.1561828
l1TNG	.0743357	.0402408	1.85	0.065	-.0045786	.15325
l1UNIQ	.4885001	.1856092	2.63	0.009	.1245105	.8524897
l1RAT	.0094281	.0104984	0.90	0.369	-.0111598	.0300159
l1GDP	.1939875	.1296068	1.50	0.135	-.0601784	.4481535
BC	-.0145507	.0074295	-1.96	0.050	-.0291203	.0000189
AC	-.014411	.0079112	-1.82	0.069	-.0299253	.0011033
_cons	.4247266	.0821825	5.17	0.000	.2635623	.5858909
sigma_u	.16694372					
sigma_e	.13319127					
rho	.61105311	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(243, 2178) =    13.70           Prob > F = 0.0000
```

```
Fixed-effects (within) regression               Number of obs      =      2434
Group variable: id                              Number of groups   =       244

R-sq:  within  = 0.0876                         Obs per group: min =         5
       between = 0.3221                                        avg =      10.0
       overall = 0.2087                                        max =        10

                                                F(11,2179)         =     19.03
corr(u_i, Xb)  = 0.2499                         Prob > F           =    0.0000
```

MTLEV	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
l1PRF	-.3254454	.0564106	-5.77	0.000	-.4360697	-.2148212
l1MB	-.018645	.0035894	-5.19	0.000	-.0256841	-.0116059
l1CPX	-.4500696	.0880048	-5.11	0.000	-.6226517	-.2774874
l1SIZE	-.0080218	.0077938	-1.03	0.303	-.023306	.0072623
l1NDTS	.0115586	.0473626	0.24	0.807	-.081322	.1044392
l1TNG	.0737436	.0357529	2.06	0.039	.0036303	.143857
l1UNIQ	.1753506	.1649133	1.06	0.288	-.1480531	.4987543
l1RAT	.0041779	.0093278	0.45	0.654	-.0141144	.0224701
l1GDP	.0780424	.1151534	0.68	0.498	-.1477795	.3038643
BC	-.0270197	.0066011	-4.09	0.000	-.0399648	-.0140746
AC	-.0324707	.0070286	-4.62	0.000	-.0462542	-.0186872
_cons	.3831132	.0729955	5.25	0.000	.2399651	.5262613
sigma_u	.12534606					
sigma_e	.11834099					
rho	.52872245	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(243, 2179) =     9.06           Prob > F = 0.0000
```

The exhibit presents the same results as Exhibit I.1 but by regressing model (3) instead. Panel A refers to the outcome of *random effects* method whereas Panel B displays the corresponding results from using a *fixed effects* approach. Reported are the coefficients, *standard errors* and the *t-statistics* referring to the null hypothesis that the estimated coefficient is equal to zero. *P-values* and *confidence intervals* are also presented.

APPENDIX J

Exhibit J.1
Leverage Regression with LARGE and LARGEDC Variables

```
Fixed-effects (within) regression               Number of obs      =      2434
Group variable: id                              Number of groups   =       244

R-sq:  within  = 0.0932                         Obs per group: min =         5
       between = 0.3162                                        avg =      10.0
       overall = 0.2218                                        max =        10

                                                F(11,2179)         =     20.37
corr(u_i, Xb)  = 0.1835                         Prob > F           =    0.0000
```

MTLEV	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
l1PRF	-.3174604	.0556086	-5.71	0.000	-.4265118	-.2084091
l1MB	-.0165783	.0034932	-4.75	0.000	-.0234288	-.0097279
l1CPX	-.4414006	.0862283	-5.12	0.000	-.6104988	-.2723023
l1NDTS	.0193447	.046541	0.42	0.678	-.0719246	.1106141
l1TNG	.0889219	.0340806	2.61	0.009	.022088	.1557558
l1UNIQ	.1982142	.1626172	1.22	0.223	-.1206869	.5171153
l1RAT	.0049612	.0092173	0.54	0.590	-.0131144	.0230369
l1GDP	.0792377	.1052585	0.75	0.452	-.1271798	.2856552
DC	.0214519	.0076613	2.80	0.005	.0064278	.0364761
LARGE	.0419028	.013067	3.21	0.001	.0162777	.067528
LARGEDC	.0143794	.0106016	1.36	0.175	-.0064108	.0351696
_cons	.2541734	.0157186	16.17	0.000	.2233483	.2849985
sigma_u	.12191323					
sigma_e	.11797644					
rho	.51640642	(fraction of variance due to u_i)				

```
F test that all u i=0:     F(243, 2179) =     9.12           Prob > F = 0.0000
```

The table presents the results, using Stata, from regressing *MTLEV* on the same variables as in model (3) but excluding the variable *l1SIZE* and adding both the dummy *LARGE* and the interaction term *LARGEDC*. The variable *LARGEDC* is the interaction of a *LARGE,* equal to one if firms have book assets above the sample median value and zero otherwise, with the crisis dummy *DC*, equal to one if data is of the crisis period and zero otherwise. Reported are the coefficients, *standard errors* and the *t-statistics* referring to the null hypothesis that the coefficient is equal to zero. *P-values* and *confidence intervals* are also presented.

APPENDIX K

Exhibit K.1
Hausman Test

Panel A

	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
l1PRF	-.0588389	-.1156734	.0568345	.0155512
l1MB	-.0079173	-.0070845	-.0008328	.0013335
l1CPX	-.3466568	-.2918406	-.0548162	.0249385
l1SIZE	-.0019762	.0117273	-.0137035	.0069627
l1NDTS	.0516468	.0534622	-.0018154	.0223335
l1TNG	.0743357	.0907549	-.0164192	.0217853
l1UNIQ	.4885001	.2691314	.2193687	.0910752
l1RAT	.0094281	.0187369	-.0093089	.0019223
l1GDP	.1939875	.2251523	-.0311648	.0133317
BC	-.0145507	-.0159892	.0014385	.0013411
AC	-.014411	-.0092424	-.0051687	.0023338

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(11) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 44.80
Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)

Panel B

	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
l1PRF	-.3254454	-.3883225	.062877	.0167538
l1MB	-.018645	-.0231861	.0045412	.0013961
l1CPX	-.4500696	-.4032667	-.0468029	.0265825
l1SIZE	-.0080218	.0043598	-.0123817	.0066094
l1NDTS	.0115586	.037086	-.0255274	.0233606
l1TNG	.0737436	.1086938	-.0349501	.0219072
l1UNIQ	.1753506	.021087	.1542636	.0937802
l1RAT	.0041779	.0144463	-.0102684	.0020496
l1GDP	.0780424	.1043444	-.026302	.0115214
BC	-.0270197	-.0265818	-.0004379	.0012549
AC	-.0324707	-.025971	-.0064998	.002222

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(11) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 62.92
Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)

Reported are the results, using Stata, regarding the *Hausman Test* from applying model (3) and a *fixed effects* model. Panel A refers to the regression where *book leverage, BTLEV,* is the dependent variables whereas *market leverage, MTLEV,* is used in Panel B.

APPENDIX L

Exhibit L.1
Leverage Regression with Model (4)

```
Fixed-effects (within) regression               Number of obs      =      2676
Group variable: id                              Number of groups   =       244

R-sq:  within  = 0.1997                         Obs per group: min =         5
       between = 0.3676                                        avg =      11.0
       overall = 0.2980                                        max =        11

                                                F(11,2421)         =     54.92
corr(u_i, Xb)  = 0.0057                         Prob > F           =    0.0000
```

MTLEV	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
PRF	-.4299923	.048407	-8.88	0.000	-.5249157	-.335069
MB	-.0406076	.0030186	-13.45	0.000	-.0465268	-.0346883
CPX	-.0956359	.0751797	-1.27	0.203	-.243059	.0517873
SIZE	.0228756	.0063561	3.60	0.000	.0104117	.0353395
NDTS	.1237256	.0396312	3.12	0.002	.046011	.2014402
TNG	.0919378	.0286829	3.21	0.001	.0356922	.1481833
UNIQ	.4195324	.1395623	3.01	0.003	.1458585	.6932063
RAT	.0090937	.0083978	1.08	0.279	-.0073739	.0255613
GDP	.2972232	.1080497	2.75	0.006	.0853436	.5091027
BC	-.0531226	.0063818	-8.32	0.000	-.0656369	-.0406083
AC	-.0242202	.0065762	-3.68	0.000	-.0371158	-.0113246
_cons	.1757674	.0584938	3.00	0.003	.0610644	.2904704
sigma_u	.11133383					
sigma_e	.11068698					
rho	.50291345	(fraction of variance due to u_i)				

```
F test that all u i=0:     F(243, 2421) =    10.05           Prob > F = 0.0000
```

Reported are the results, using Stata, of applying model (4) and a *fixed effects* approach. The model regresses *market leverage, MTLEV,* on the same variables as model (3) with the difference that now those variables are expressed in contemporaneous terms with the dependent one. Reported are the coefficients, *standard errors* and the *t-statistics* referring to the null hypothesis that the coefficient is equal to zero. *P-values* and *confidence intervals* are also presented.

APPENDIX M

Exhibit M.1
Leverage Regression with model (5)

```
Fixed-effects (within) regression               Number of obs      =      2434
Group variable: id                              Number of groups   =       244

R-sq:  within  = 0.0941                         Obs per group: min =         5
       between = 0.3298                                        avg =      10.0
       overall = 0.2194                                        max =        10

                                                F(14,2176)         =     16.14
corr(u_i, Xb)  = 0.2417                         Prob > F           =    0.0000
```

MTLEV	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
l1PRF	-.3089312	.0630991	-4.90	0.000	-.432672	-.1851905
l1MB	-.0179078	.0036372	-4.92	0.000	-.0250405	-.0107751
l1CPX	-.4524661	.0910345	-4.97	0.000	-.6309898	-.2739425
l1SIZE	-.0075427	.0077732	-0.97	0.332	-.0227864	.007701
l1NDTS	.0085581	.0472711	0.18	0.856	-.0841431	.1012594
l1TNG	.0712231	.0357004	2.00	0.046	.0012126	.1412335
l1UNIQ	.1781343	.1644572	1.08	0.279	-.1443753	.5006439
l1RAT	.0040751	.0093115	0.44	0.662	-.0141853	.0223355
l1GDP	.0625191	.1149507	0.54	0.587	-.1629056	.2879437
BC	-.0564336	.0122671	-4.60	0.000	-.08049	-.0323771
AC	-.0618412	.0127169	-4.86	0.000	-.0867797	-.0369028
PRFDC	-.022673	.0887179	-0.26	0.798	-.1966537	.1513076
MBDC	-.0172062	.0056467	-3.05	0.002	-.0282798	-.0061327
CPXDC	.0465493	.1320168	0.35	0.724	-.2123429	.3054415
_cons	.4061796	.0732089	5.55	0.000	.262613	.5497462
sigma_u	.12389534					
sigma_e	.11800325					
rho	.52434326	(fraction of variance due to u_i)				

```
F test that all u i=0:     F(243, 2176) =     9.07           Prob > F = 0.0000
```

Reported are the results, using Stata, of applying model (5) and a *fixed effects* approach. The model regresses *market leverage, MTLEV,* on the same variables as model (3) and includes other variables interacted with the crisis dummy, *DC*. Those variables are *PRFDC, MBDC* and *CPXDC,* which interact *PRF, MB* and *PCX*, respectively, with the crisis dummy, *DC,* equal to one if data is of the crisis period. Reported are the coefficients, *standard errors* and the *t-statistics* referring to the null hypothesis that the coefficient is equal to zero. *P-values* and *confidence intervals* are also presented.

APPENDIX N

Exhibit N.1
Leverage Regression per Country

Panel A

Fixed-effects (within) regression — Number of obs = 724
Group variable: id — Number of groups = 73

R-sq: within = 0.1159 — Obs per group: min = 5
between = 0.2245 — avg = 9.9
overall = 0.1724 — max = 10

F(11,640) = 7.63
corr(u_i, Xb) = -0.0092 — Prob > F = 0.0000

MTLEV	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
l1PRF	-.1983803	.0747838	-2.65	0.008	-.3452316	-.0515289
l1MB	-.0223268	.0066821	-3.34	0.001	-.0354484	-.0092053
l1CPX	-.4086415	.1692986	-2.41	0.016	-.7410895	-.0761936
l1SIZE	-.0103284	.0139266	-0.74	0.459	-.0376758	.0170189
l1NDTS	-.1323428	.1148795	-1.15	0.250	-.3579292	.0932435
l1TNG	.0733006	.0729606	1.00	0.315	-.0699704	.2165716
l1UNIQ	.3934139	.3876262	1.01	0.311	-.367759	1.154587
l1RAT	.0031858	.0224139	0.14	0.887	-.0408278	.0471994
l1GDP	-.2764215	.236627	-1.17	0.243	-.7410806	.1882375
BC	-.0132759	.011804	-1.12	0.261	-.0364553	.0099034
AC	-.0443064	.0117952	-3.76	0.000	-.0674683	-.0211445
_cons	.3158532	.1255704	2.52	0.012	.0692735	.5624329
sigma_u	.0954531					
sigma_e	.10890451					
rho	.43446108	(fraction of variance due to u_i)				

F test that all u i=0: F(72, 640) = 5.93 — Prob > F = 0.0000

Panel B

Fixed-effects (within) regression — Number of obs = 240
Group variable: id — Number of groups = 24

R-sq: within = 0.1288 — Obs per group: min = 10
between = 0.0051 — avg = 10.0
overall = 0.0035 — max = 10

F(11,205) = 2.75
corr(u_i, Xb) = -0.6181 — Prob > F = 0.0024

MTLEV	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
l1PRF	-.5293785	.2878164	-1.84	0.067	-1.096838	.0380813
l1MB	.0014346	.0172424	0.08	0.934	-.0325607	.0354299
l1CPX	-.3967103	.4422468	-0.90	0.371	-1.268646	.475225
l1SIZE	-.0863932	.0440029	-1.96	0.051	-.1731496	.0003631
l1NDTS	.1767759	.2469639	0.72	0.475	-.310139	.6636908
l1TNG	.0726231	.1782892	0.41	0.684	-.2788925	.4241388
l1UNIQ	-.1437943	.8922839	-0.16	0.872	-1.903024	1.615436
l1RAT	.0200132	.0254774	0.79	0.433	-.0302181	.0702444
l1GDP	-.9862514	.4300659	-2.29	0.023	-1.834171	-.138332
BC	-.0611921	.0285624	-2.14	0.033	-.1175059	-.0048783
AC	-.1383568	.0299024	-4.63	0.000	-.1973126	-.0794011
_cons	1.280216	.4530129	2.83	0.005	.3870539	2.173378
sigma_u	.20542772					
sigma_e	.15551812					
rho	.6356803	(fraction of variance due to u_i)				

F test that all u i=0: F(23, 205) = 7.47 — Prob > F = 0.0000

Panel C

```
Fixed-effects (within) regression               Number of obs      =       420
Group variable: id                              Number of groups   =        42

R-sq:  within  = 0.1312                         Obs per group: min =        10
       between = 0.1673                                        avg =      10.0
       overall = 0.1463                                        max =        10

                                                F(11,367)          =      5.04
corr(u_i, Xb)  = 0.1369                         Prob > F           =    0.0000
```

MTLEV	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
l1PRF	-.7651486	.1992529	-3.84	0.000	-1.156969	-.373328
l1MB	-.0028369	.0094745	-0.30	0.765	-.0214681	.0157943
l1CPX	-.6434067	.2057467	-3.13	0.002	-1.047997	-.2388163
l1SIZE	-.0175856	.0185775	-0.95	0.344	-.0541173	.0189462
l1NDTS	-.0050365	.1619446	-0.03	0.975	-.3234923	.3134193
l1TNG	.0545757	.1032281	0.53	0.597	-.1484171	.2575685
l1UNIQ	-.0641507	.2778398	-0.23	0.818	-.6105086	.4822071
l1RAT	.012473	.0181987	0.69	0.494	-.0233139	.0482598
l1GDP	.4546565	.3725757	1.22	0.223	-.2779947	1.187308
BC	-.0094576	.0142953	-0.66	0.509	-.0375686	.0186534
AC	-.0377095	.015755	-2.39	0.017	-.0686909	-.0067281
_cons	.5266695	.1816975	2.90	0.004	.1693706	.8839685
sigma_u	.16171974					
sigma_e	.1063899					
rho	.6979402	(fraction of variance due to u_i)				

```
F test that all u i=0:     F(41, 367) =    13.70              Prob > F = 0.0000
```

The Exhibit presents the results, using Stata, of applying model (3) and a *fixed effects* approach for each of the three countries considered. Panel A reports the results for the *United Kingdom,* Panel B those of Germany and *France* is considered in Panel C. Reported are the coefficients, *standard errors* and the *t-statistics* referring to the null hypothesis that the coefficient is equal to zero. *P-values* and *confidence intervals* are also presented.

APPENDIX O

Exhibit O.1
Leverage Regression with another Leverage Measure

Panel A

```
. xtreg MFin l1PRF l1MB l1CPX l1SIZE l1NDTS l1TNG l1UNIQ l1RAT l1GDP BC AC, fe

Fixed-effects (within) regression               Number of obs      =      2434
Group variable: id                              Number of groups   =       244

R-sq:  within  = 0.1127                         Obs per group: min =         5
       between = 0.2652                                        avg =      10.0
       overall = 0.1995                                        max =        10

                                                F(11,2179)         =     25.15
corr(u_i, Xb)  = 0.1742                         Prob > F           =    0.0000
```

MFinLev	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
l1PRF	-.2090063	.0336333	-6.21	0.000	-.274963	-.1430495
l1MB	-.0115087	.0021401	-5.38	0.000	-.0157055	-.0073118
l1CPX	-.3117511	.0524705	-5.94	0.000	-.4146486	-.2088535
l1SIZE	.003869	.0046469	0.83	0.405	-.0052438	.0129817
l1NDTS	.0421604	.0282387	1.49	0.136	-.0132172	.097538
l1TNG	.0557295	.0213167	2.61	0.009	.0139263	.0975327
l1UNIQ	.1571489	.0983251	1.60	0.110	-.035672	.3499697
l1RAT	.0040823	.0055614	0.73	0.463	-.0068239	.0149886
l1GDP	.044787	.0686571	0.65	0.514	-.0898533	.1794273
BC	-.017103	.0039357	-4.35	0.000	-.0248211	-.0093848
AC	-.023435	.0041906	-5.59	0.000	-.031653	-.0152169
_cons	.1855883	.0435216	4.26	0.000	.10024	.2709365
sigma_u	.08108706					
sigma_e	.07055766					
rho	.56910154	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(243, 2179) =    11.17           Prob > F = 0.0000
```

Panel B

```
. xtreg MFin PRF MB CPX SIZE NDTS TNG UNIQ RAT GDP BC AC, fe

Fixed-effects (within) regression               Number of obs      =      2676
Group variable: id                              Number of groups   =       244

R-sq:  within  = 0.2175                         Obs per group: min =         5
       between = 0.2216                                        avg =      11.0
       overall = 0.2146                                        max =        11

                                                F(11,2421)         =     61.18
corr(u_i, Xb)  = -0.1916                        Prob > F           =    0.0000
```

MFinLev	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
PRF	-.3161899	.0291101	-10.86	0.000	-.3732732	-.2591066
MB	-.0206069	.0018152	-11.35	0.000	-.0241665	-.0170473
CPX	-.0483915	.0452102	-1.07	0.285	-.1370461	.0402632
SIZE	.0234677	.0038223	6.14	0.000	.0159724	.030963
NDTS	.1160615	.0238327	4.87	0.000	.0693269	.1627961
TNG	.0710161	.0172488	4.12	0.000	.0371922	.1048401
UNIQ	.2766526	.0839274	3.30	0.001	.1120755	.4412296
RAT	.0029712	.0050501	0.59	0.556	-.0069318	.0128742
GDP	.1339461	.064977	2.06	0.039	.0065299	.2613624
BC	-.028982	.0038378	-7.55	0.000	-.0365076	-.0214563
AC	-.0167777	.0039547	-4.24	0.000	-.0245326	-.0090228
_cons	.045988	.0351759	1.31	0.191	-.02299	.114966
sigma_u	.08173379					
sigma_e	.06656293					
rho	.60124117	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(243, 2421) =    12.93           Prob > F = 0.0000

.
end of do-file
```

The Exhibit displays the results of Stata from running model (3) using another measure of *leverage, MFinLev*, different from the ones previously considered. This variable corresponds to the ratio between total debt and book assets minus book equity plus market equity. Panel A refers to the results when using lagged explanatory variables and Panel B when those are contemporaneous to the dependent variable.

APPENDIX P

Exhibit P.1
Leverage Regression for Larger Sample

```
Fixed-effects (within) regression               Number of obs      =       647
Group variable: id                              Number of groups   =       122

R-sq:  within  = 0.1562                         Obs per group: min =         1
       between = 0.0668                                        avg =       5.3
       overall = 0.0520                                        max =        10

                                                F(11,514)          =      8.65
corr(u_i, Xb)  = -0.3573                        Prob > F           =    0.0000
```

MTLEV	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
l1PRF	-.1574068	.1517761	-1.04	0.300	-.4555846	.1407709
l1MB	-.0538307	.0127341	-4.23	0.000	-.0788481	-.0288134
l1CPX	-.9419883	.2184852	-4.31	0.000	-1.371222	-.5127544
l1SIZE	-.1004561	.0230894	-4.35	0.000	-.1458173	-.0550948
l1NDTS	.1225413	.1473632	0.83	0.406	-.166967	.4120496
l1TNG	.0980324	.0875643	1.12	0.263	-.0739956	.2700605
l1UNIQ	.4740035	.6865363	0.69	0.490	-.8747588	1.822766
l1RAT	-.023855	.0149747	-1.59	0.112	-.0532742	.0055642
l1GDP	.7697489	.3134153	2.46	0.014	.1540164	1.385481
BC	-.0457989	.017104	-2.68	0.008	-.0794012	-.0121965
AC	.0076601	.0216181	0.35	0.723	-.0348106	.0501309
_cons	1.485807	.2345992	6.33	0.000	1.024916	1.946698
sigma_u	.23785076					
sigma_e	.16239237					
rho	.68206022	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(121, 514) =     6.45            Prob > F = 0.0000
```

The Exhibit presents the results of Stata from running model (3) and regressing *market leverage, MTLEV,* on lagged explanatory variables using the initial sample of 418 companies, after eliminating financial and utility sectors. This sample includes companies for which data was not available in some years of the sample period, which were attributed a value of zero and treated automatically by the software.

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