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MASTER'S THESIS

LEVERAGE DETERMINANTS OF LISTED NON-FINANCIAL COMPANIES IN THE MAJOR EUROPEAN MONETARY UNION ECONOMIES - THE IMPACT OF THE GLOBAL FINANCIAL CRISIS

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AUTHORSHIP STATEMENT

The undersigned Moritz Benjamin Dufner, a student at the University of Ljubljana, Faculty of Economics, (hereafter: FELU), declare that I am the author of the master's thesis entitled: Leverage determinants of listed non-financial companies in the major European Monetary Union economies – the impact of the global financial crisis, written under supervision of doc. dr. Igor Lončarski.

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INTRODUCTION

Since Modigliani and Miller's work on capital structure in 1958 this subject has attracted many researchers to develop theories and conducting empirical studies to be able to explain which factors determine the debt-equity relation. Areas of research are, for example which firm specific, industry and macroeconomic characteristics influence leverage ratios to which extent and in which direction. Are theories universally valid or do leverage determinants differ across countries? Which role does the economic environment play? Does an economic crisis have an effect on factors that explain leverage? These are, now more then ever, important issues that need to be addressed. This is not only to understand company behavior better but it also puts central banks actions to fight credit crunches into a different light. Looking at the Euro Area, an economic area characterized by a single currency, a single market for goods and services and free movement of people, one might expect that the same firm and macroeconomic impacts influence companies' leverage ratios. On the other hand, one could stress country typical cultural and economic differences that contradict this assumption.

The 2007 financial crisis and the subsequent European sovereign debt crisis have still an impact on the current economic environment. This is visible in the slow recovery of most European countries, connected with large government deficits and a high unemployment rate, especially amongst young people. One reason for the sluggish recovery is the financial constraints that were and still are present in some of the Euro Area's countries. Especially in the European periphery, which is in most cases used as a synonym for the economies of Italy, Spain, Portugal and Greece, there are indications for the presence of a credit crunch. Under these circumstances it is of high interest to investigate, which factors are in such times able to reliably explain the debt to capital ratio. Now, as there are first indications of a recovery in the European Monetary Union (hereinafter: EMU), it will be investigated whether a company's location matters when determining its capital structure. I use period average cross sectional data to test which determinants significantly explain the leverage ratios of non-financial companies in selected core (Germany, France and the Netherlands) and periphery (Italy, Spain and Portugal) European countries. The multivariate regressions are estimated using the ordinary linear square method (hereinafter: OLS). The study focuses on non-financial companies listed on the major share index of their respective country. Dividing the full sample into pre-crisis, crisis and post-crisis sub samples allows me to capture the impact the 2007 financial crisis had on the cross sectional determinants of capital structure. It is investigated whether this impact is stronger in certain countries than in others.

The key purpose of this thesis is to:

i) Add more empirical evidence to the existing research on capital structure by testing which determinants influence a firm's leverage ratio with a new data set and relate the findings to the major capital structure theories,

ii) Analyse whether there are country specific differences in leverage itself as well as in its determinants, especially with regards to the fact that the impact of the crisis was much stronger in the European periphery then in core Europe,

iii) Analyse if the significance of determinants alters over the different states of the economy between 2004 and 2012, covering the 2007 financial crisis and

iv) Test the hypothesis, that in the crisis and post-crisis period interest rate, tangibility, profitability and country dummy variables became statistically more significant compared to the pre-crisis situation in the same countries. It is expected to be of importance for a company whether it is based in core or periphery Europe. This difference should be more significant in the crisis and post-crisis period.

Existing research on the influence of the financial crisis on leverage determinants is limited. Campello, Graham and Harvey (2010 assess capital structure decisions during the crisis through a CEO/CFO questionnaire. Dang, Kim and Shin (2014) tests how fast firm's leverage adjusted to its target leverage ratio after the crisis. And Duchin, Ozbas and Sensoy (2010) analyze how leverage levels changed during the crisis. The author is not aware of a study about the impact of the 2007 financial crisis on leverage determinants for non-financial European listed companies.

In chapter two I discuss the theoretical background of capital structure theories. Chapter three provides a literature review on these theories with special regards to the determinants of leverage ratios. In chapter four I explain the hypothesis and define the variables to test the hypothesis. Chapter five lays out the methodology used. The data is described in chapter six via a univariate analysis. The empirical results of the multivariate regressions and their importance in the light of previous research can be found in chapter seven. Chapter eight provides an interpretation of the findings and their implications for European policies. The last chapter concludes.

2 DISCUSSION OF CAPITAL STRUCTURE THEORIES

The question of what influences capital structure and financing behavior of companies has been of high interest within the academic community at least since the work conducted by Modigliani and Miller (1958). There have been discussions whether Modigliani and Miller really were the first ones describing this phenomenon, a summary can be found in Rubinstein (2003). Nevertheless, the controversially discussed Modigliani and Miller model (hereinafter: MM), even today, is the reference point for most studies on capital structure. It shows that under the assumption of frictionless, perfect capital markets and a non-tax environment, the value of a company does not depend on its financing mix (Modigliani & Miller, 1958; Myers, 2001). The main idea is that companies have a certain amount of expected cash flows they can divide between their debt and equity holders. Capital market access is assumed to be the

same for investors and firms. This makes self-made leverage possible. Based on this assumption, investors can then create any level of leverage that is wanted but not offered by the company and can get rid off any leverage the company took but that is not wanted by the investor (Frank & Goyal, 2005; Ryen, 1997).

Hence, the capital structure is irrelevant and has no effect on the enterprise value. Furthermore, Modigliani and Miller (1958) argue that replacing equity with debt makes no sense as this increases only the cost of equity and leaves the weighted average cost of capital unchanged. There are two types of capital structure irrelevances. First, it can be argued that arbitrage by investors makes the enterprise value independent of its leverage (Frank & Goyal, 2005; Modigliani & Miller, 1958). An extension of these arguments can be found in Hirshleifer (1966) and Stiglitz (1969). Second, the irrelevance of the financing mix can be explained via a multiple equilibrium argument. There, the aggregate amount of debt and equity is pinned down through certain equilibrium conditions (Frank & Goyal, 2005; Miller, 1977).

Even though the MM theory seems intuitive, it is also obvious, that the assumptions are not very close to reality. A more detailed summary of the complex framework on which the MM model is based on can be found in Fama (1978). Miller (1988) argues that the financing mix does matter in reality. One straightforward argument is that if only the fundamental value of assets, cash flows and growth opportunities matter, there would be no incentive for financial innovation (Myers, 2001). When the strong MM assumptions are relaxed, it has been shown that the enterprise value is not independent of the capital mix anymore (Kjellmann & Hansén, 1995). On the other side, the MM model is empirically hard to test, as debt and enterprise value are endogenous and influenced by other factors. Hence, regressing value on debt would not be meaningful (Frank & Goyal, 2005).

Most and especially the early research on that topic focused on U.S. companies. They, at least in the past, had the best capital market access and the largest financing choice. This framework came closest to the MM assumptions (Myers, 2001). Since two decades or so, research has been increasingly internationalized. This is shown in chapter three.

Capital structure theories mostly focused on two topics, taxes and information. Even though there are many specified sub-theories, there are two major directions in which most approaches can be categorized into: the trade-off theory that focuses on taxes and the pecking order theory with an emphasis on information. Other theories such as the signaling and the market timing theory will also be explained in short.

2.1 The trade-off Theory

In “The Capital Structure Puzzle” Myers (1984) categorized the research on capital structure into two kind of theories, trade-off and pecking order theories. These theories grew out of the

MM framework when relaxing the strict assumptions and e.g. including the effects of taxes on leverage.

According to Myers' static trade-off idea companies set themselves a target debt-to-value ratio and adjust their existing debt-equity mix towards this target over time. This behavior is similar to the process in which companies adjust their dividends to move towards a target payout ratio (Myers, 1984). As firms are not obliged to pay taxes on interest payments of debt there is an incentive to increase debt. On the other side is the possibility of bankruptcy increasing with higher interest payments. Hence, companies face a trade-off between tax savings from debt and their expected bankruptcy costs (Kraus & Litzenberger, 1973; Frank & Goyal, 2005). Common points of critique of this theory are that the target leverage ratio is not directly observable and that the complexity of the tax system is not considered strong enough in the models. An overview of the tax effects on leverage can be found in Graham (2000). Furthermore, it is not explained in detail what these bankruptcy costs companies face exactly are. Frank and Goyal (2005) argue that the nature of costs, so fixed against variable, is important. Also whether they increase with bankruptcy size and if they are one time costs. A discussion concerning bankruptcy costs can be found in Haugen and Senbet (1978). The trade-off theory leads to several implications (Miglo, 2010). First, large firms have a higher degree of diversification and face therefore a lower probability of default and lower expected bankruptcy costs. Hence, their debt relative to equity is higher compared to small firms. Second, tangible assets lose less of their value when firms go into distress. Hence, tangibility and leverage should be positively related. Third, the value decline for growth firms is higher than for value firms when facing bankruptcy. So, growth companies should have less leverage than value companies. According to the static trade-off theory, taxes and debt should have a positive relation. On the other side, firms with non-debt tax shields (hereinafter: NDTS) should use less debt compared to companies without the NDTS (de Miguel & Pindado, 2001; Deesomsak, Paudyal & Pescetto, 2004). The reasoning is such that firms cannot reduce tax payments through debt only but also through depreciation, tax credit and pension funds. Firms with higher NDTS use less debt (Wiwattanakantang, 1999) or one could say NDTS can replace debt with regards to the tax reducing ability. Therefore, a negative relation between the NDTS and leverage is predicted (de Miguel & Pindado, 2001). Evidence provided amongst others by Titman and Wessels (1988) and Barton, Hill and Sundaram (1989) confirmed the static trade-off theory. Companies with high positive earnings and consequently high free cash flows to firm have a higher ability to repay high debt. Hence, profitability and leverage is, according to the static trade-off theory positively related (Miglo, 2010). The contrary has been proved by Titman and Wessels (1988), Rajan and Zingales (1995), Fama and French (2002) and Frank and Goyal (2005)).

2.2 Extension: the dynamic trade-off theory

In the MM model and also in the early work on trade-off theories researchers mostly assumed a one-period world. As scholars extended this framework, much more complex theories were

built, the dynamic trade-off theories. In this world, the financing decision depends also on the financing needs a company expects in the next period(s). Firms always have the choice between distributing their funds to shareholders or to keep them within the company. The decision is often related to tax rates and to the difference between the return the funds generate when they are kept within the company relative to when they are allocated to the shareholders; which is to say internal versus external expected returns (Miglo, 2010). As a highly profitable firm is likely to deliver higher returns than the investor would be able to achieve when he receives the funds, funds are kept within the company. This leads to a negative relationship between debt and profitability (Frank & Goyal, 2005). If taxes are high, companies are more reluctant to pay out funds to their shareholders. Consider the scenario that a company has no investment needs in the following period but might do so three periods later. In a tax free world it could simply pay out the funds as dividends and issue new equity or debt three periods later when it needs capital. In a world with taxes, companies are reluctant to do so as investors are taxed on the dividends and consequently have less money in the future to invest in newly issued equity (Frank & Goyal, 2005). This means that profitable companies prefer to build internal funds as this reduces their need for external finance in form of debt. This causes a negative relation between debt and profitability. This is in contrast to the prediction of the static trade-off theory.

2.3 The pecking order theory

The second theory Myers (1984) describes in his paper "The Capital Structure Puzzle" is the pecking order theory. One of the earliest proponents was Donaldson (1961) when he observed the financing behavior of large companies. He argues that management favors the internal generation of new funds to external capital rising, except for unavoidable situations where external funds can be used as a last option. Myers (1984) summarizes the key attributes of the pecking order theory. First, firms prefer internal to external finance. Second, investment opportunities determine the target payout ratios even though the adjustment process is slow, as payout ratios tend to be sticky. Third, dividend policies are unlikely to change but profitability and investment opportunities fluctuate unpredictably. Hence, internally generated cash flows can be above or below investment needs. If internally generated cash flows are below investment needs, companies use cash and marketable securities. Fourth, should external financing be unavoidable, companies first issue the safest security, which is debt. They then continue with hybrid securities, e.g. mezzanine and convertible bonds and issue equity only as last option. According to Myers (1984) there is no defined target leverage ratio in the pure pecking order model. He explains this with the fact that there are two kinds of equity, internal, retained earnings and external, new equity. Therefore, a target ratio cannot be determined. In the pecking order theory the debt ratio represents cumulative requirements for external finance.

Frank and Goyal (2005) argue that the pecking order theory focuses on the problem of information asymmetries and adverse selection in companies. Naturally, insiders have more

information than outside investor. For companies of high quality it might be hard to convince outsiders of their high quality company, especially with regards to future performance. If a company is willing to issue equity or debt, investors will ask why a company does so. An undervalued firm is reluctant in issuing equity (Frank & Goyal, 2005). It knows the true value but can hardly convince outside investors of its high quality and will get unfavorable conditions. An overvalued company is happy to issue equity and get better conditions than it should based on its fundamental value (Bharath, Pasquariello & Wu, 2009). Due to the adverse selection process, the price for equity and debt is too high for high-quality firms. Miglo (2010) argues that it can be shown that debt suffers less from misevaluation and adverse selection than equity and that this is the reason why debt is preferred over equity. Especially high quality companies prefer to use internally generated funds first as they suffer more from a misevaluation of debt and equity (Frank & Goyal, 2005).

Frank and Goyal (2005) criticize that such a simple model as the pecking order theory can hardly catch the complexity of firms' capital structure. Following Myers (1984) argument, retained earnings are preferred to debt and debt is preferred to equity. This is based on an adverse selection model of Myers and Majluf (1984). Frank and Goyal (2005) argue that the hierarchical order is influenced by other sources as well, e.g. agency conflicts and taxes. Evidence for the pecking order theory is mixed. Chirinko and Singha (2000) and Leary and Roberts (2010) do not find support whilst Shyam-Sunder and Myers (1999) and Kamath (1997) do so. Frank and Goyal (2004) show that greatest support for a pecking order is found amongst large firms. As companies prefer internal to external financing, profitable companies use their internally generated funds first. This means that according to the pecking order theory, profitability and leverage should be negatively related. In the pecking order world, asymmetric information are negatively related with equity issuance, since more asymmetric information increases company's cost on debt and equity (Miglo, 2010). Empirical findings on this matter are mixed. Positive evidence has been found by Bharath et al. (2009) and D'Mello and Ferris (2000).

2.4 Others

Agency theory

Another capital structure theory is the agency approach. When companies increase external finance, management monitoring from outside investors increase. Managers dislike this process, they favor internal over external fund raising. Traditionally, there is no distinction made whether debt or equity is preferred in the agency framework (Frank & Goyal, 2005). Myers (2003) showed that higher agency costs of equity compared to debt result in the specific hierarchy of the pecking order.

Market timing

The basic idea of the market timing theory is that companies time their financing decision based on market conditions. According to Baker and Wurgler (2002), firms are more likely to

issue equity when their market-to-book (hereinafter: MTB) value is high and that they prefer repurchasing equity when their market-to-book value is low. This market timing theory was first described by Lucas and McDonald (1990) and has been extended by Korajczyk, Lucas and McDonald (1991). Baker and Wurgler (2002) describe four empirical findings supporting the market timing theory. First, firms are likely to issue equity instead of debt if they have a high MTB ratio and if their market value is historically high. On the other side, equity repurchases are conducted when MTB values are low. Second, long-term studies show that equity market timing is successful on average. Third, firms manage to issue equity in times of great investor enthusiasm about earning expectations. Fourth, Graham and Harvey (2001) found in an anonymous survey that managers use market timing in their financing decisions. In their study, Baker and Wurgler (2002) show that firms with low leverage are firms that raise funds when their MTB ratio is high. Companies with high leverage raise funds when the MTB ratio is low. Empirical evidence for a positive relation between the business cycle and equity issuance can be found in the work of Choe, Masulis and Nanda (1993) and Bayless and Chaplinsky (1996). Furthermore, Baker and Wurgler (2002) and Graham and Harvey (2001) prove the importance of share price performance for the decision to issue equity.

Signaling theory

With the pecking order, high quality firms face the problem of being unable to distinguish the quality of their company to investors. Therefore, firms prefer internal over external funds. In Ross' (1977) framework, capital structure is used as a signal of private information. To eliminate information asymmetries, companies send signals in form of their capital structure to investors. Ross concludes that the companies' value is positively related to leverage. A rise in leverage increases the value perception of the market (Miglo, 2010).

3 LITERATURE REVIEW

There is an immense amount of research on capital structure and empirical work related to it. The scope of this thesis is not capital structure theories in general but empirical evidence on its firm and country specific determinants. So, in the subsequent section, the most important empirical evidence related to the determinants of the leverage ratios and to this research will be highlighted. The work of Rajan and Zingales (1995) marked a change in capital structure theory research as it widened the perspective from U.S. companies towards a more international analysis. Research conducted until 1995 will be summarized and more detail will be given to the important findings after 1995.

3.1 Prior Research

The groundbreaking work on determinants of capital structure of Titman and Wessels (1988) extended the existing research in three ways. First, they analyzed more different capital structure theories than anyone before. Second, they investigated a debt break down instead of

aggregate debt only. So they analyzed short, long and convertible debt. Third, they used linear structural modeling to remove the measurement problems when working with proxy variables. Their results implied that there is a negative relation between debt levels and the "uniqueness" of a business line which is defined as the firm's expenditure on research and development (hereinafter: R&D), selling expenses and a voluntary job leave rate. Titman and Wessels (1988) also found a significant relation between transaction costs and debt implicating that the MM model with its strict assumptions is far away from reality. Furthermore, the authors show a significant negative relation between past profitability and current debt levels scaled on equity's market value. Even though the authors did not find significance for a relation between leverage and NDTS, volatility, collateral value and future growth, they acknowledged that their way of measuring and that their structural equation model might have lead to biased results.

Harris and Raviv (1991) give a good overview on empirical evidence of capital structure theories until the 1990's. Studies until 1991 mostly show a positive relation between leverage ratios and fixed assets, NDTS, growth opportunities and firm size. Whereas leverage and volatility, advertising expenditures, R&D expenditures, bankruptcy probability, profitability and the uniqueness of the product are negatively related (Harris & Raviv, 1991). Early scholars already observed industry specific factors. As shown in Bowen, Daley and Huber (1982), Bradley, Jarrell and Kim (1984), and Kester (1986) there are certain industries which are generally characterized by low leverage levels such as the food industry, electronics and pharmaceuticals. On the other hand, the airline industry, steel and construction materials have high leverage ratios. Looking at the influence of ownership on leverage, Harris and Raviv (1991) found several studies, which show a positive relation between managerial equity ownership and leverage, e.g. Kim and Sorensen (1986), Agrawal and Mandelker (1987) and Amihud, Lev and Travlos (1990). Friend and Lang (1988) detected a positive link between a well distributed outside ownership and leverage.

Besides the empirical evidence, Harris and Raviv (1991) highlight the importance of variable definition to the outcome. Leverage for example can be measured in various ways, be it short term, long-term or overall debt; to include accounts payable and receivables; net debt; or to take a leverage ratio as book value to debt to either market or book value of equity. The independent variables can only be proxies for e.g. profitability, size, etc. Hence, interpretations should be conducted in a careful and conservative way and results should be robust over different leverage definitions. A good example for a range of possible interpretations is the market-to-book ratio. Companies with good growth opportunities should have a high ratio. Companies where assets appreciated strongly due to current earnings improvement which are not distributed have a high MTB ratio as well. Such companies are not necessarily characterized by significant future growth opportunities. Besides variable definition issues, interpreting statistical results should always be done in a cautiously way as a statistical relationship is not necessarily a causal connection. Harris and Raviv (1991) found general trends in capital structure empirics until 1991. First, firms use both, internal and

external financing. Second, internal funds make up a large but over time declining fraction of total financing. This is somehow contradictory to the pecking order theory, which assumes that companies would independent of time always favor internal financing. Third, there is, at least until the beginning of the 1990's, an increase in leverage.

Until the mid 1990's, research on the determinants of leverage ratios has focused on U.S. data. Rajan and Zingales (1995) extended the empirical research to an international level. They tested the determinants of capital structure for non-financial companies between 1987 and 1991 in the G7 countries. The covered corporations made up between 75% and 90% of the market capitalization in their respective country. Rajan and Zingales (1995) showed that country differences in leverage levels are not very large. Only Germany and the United Kingdom have lower leverage ratios compared to the other G7 countries, 5% and 15% lower, respectively. Interestingly, the factors that have been previously identified to significantly determine leverage for U.S. companies. These factors show a similar behavior on international data. Rajan and Zingales (1995) find that the significance of taxes on leverage depends strongly on the marginal investor's tax rate. Bankruptcy laws are highly country specific. U.S. laws are increasing the likelihood to keep businesses running even though they would be worth more in liquidation. Germany and the United Kingdom have strong creditor rights and force companies more easily into liquidation. The study finds that countries with stronger creditor rights have lower leverage ratios. Rajan and Zingales (1995) do not find any significant differences between market and bank based countries related to leverage.

The authors name four variables as key determinants of leverage: tangible assets, growth, size and profitability. As it became standard in research after Harris and Raviv (1991), Rajan and Zingales (1995) use a market and a book leverage ratio in their regressions. They find that the MTB ratio is the most consistent significant determinant of leverage ratios. It is, as the trade-off theory predicts, negative. Tangibility is in most regressions, so in the book and the market leverage case for each of the G7 countries, significant. The proxy for size is in most cases significant but its coefficient is not reliably positive. The weakest evidence was found on profitability. It was found significant only in half of the cases even though the relationship to leverage is in most cases negative, supporting the pecking order theory of capital structure.

Overall, it has also been shown in recent research that the "key factors" identified by Rajan and Zingales (1995) were found to be of high importance in explaining capital structure. Furthermore, they have also been proven right that it is to the biggest extent firm specific factors that drive leverage ratios.

3.2 Firm factors

Antoniou Guney, and Paudyal (2002) analyze panel data for Germany, France and the United Kingdom. They find size to be significant positive related to leverage; the same results are detected by De Jong, Kabir and Nguyen (2008), Psillaki and Daskalakis (2009) and Beck,

Demirgüç-Kunt and Maksimovic (2008). Frank and Goyal (2009) find in their study no reliable effect of size on leverage. Joeveer (2013) even observes a negative relation to leverage. In their study on capital structure in the Asia-Pacific region and their behavior during the Asian crisis of 1997, Deesomsak et al. (2004) compute several regressions in the different crisis periods of the Asian crisis. Even though size appears to be significant in some cases, it is not a reliable determinant in all regressions. As in Joeveer (2013), Deesomsak et al. (2004) find a negative relationship with leverage in some cases.

Furthermore, Antoniou et al. (2002) find mixed results on the MTB ratio, neither significance nor sign are consistent. Similar results are shown in Deesomsak et al. (2004) where the growth proxy is significant in only half of the cases. Booth, Aivazian, Demirguc-Kunt and Maksimovic (2001) and Chang, Lee and Lee (2009) show a clear significant negative relationship. Leverage goes down when the MTB ratio increases. Booth et al. (2001) show that the significant effect of the growth proxy disappears when including a country dummy variable. Hence, it is questionable how reliable this relationship is and questions the robustness of the results from other researchers who did not include country dummies. Also, Hovakimian, Opler and Titman (2001) examine the link between market and operating performance on corporate financing. They show that high MTB firms tend to have lower target debt ratios. Such firms are more likely to issue equity and less probable to capitalize with debt.

One might think that when the trade-off theory puts such an emphasis on the tax reducing effect of debt, tax itself should play a significant role in determining leverage. This is hardly the case. Antoniou et al. (2002) examine a significant link to leverage in the United Kingdom, but neither in Germany nor France. Booth et al. (2001) and Frank and Goyal (2009) find no significant relationship as well. Booth et al. (2001) argue that their insignificant results might be due to a measurement problem.

One variable that has consistently proven to be of significant importance when determining leverage is profitability (Antoniou et al., 2002; de Jong et al., 2008; Frank & Goyal, 2009; Booth et al., 2001; Fama & French, 2002). It is worth mentioning that different measures of growth and profitability deliver a different sign of their coefficients (Chang et al., 2009; Psillaki & Daskalakis, 2009). Chang et al. (2009) show that it depends on the measurement of profitability in which direction it influences leverage. Deesomsak et al. (2004) finds a similar pattern, neither significance nor direction of influence is consistent. Chang et al. (2009) show that the effect on leverage is negative when operating income is divided by total assets. The relationship to leverage is positive when operating income is divided by total sales. Chang et al. (2009) see a similar effect for growth proxies, such as the MTB and R&D expenditure. This is in line with Harris and Raviv (1991) who highlighted the sensitivity of results to the definition of variables.

Antoniou et al. (2002) also check for liquidity, earnings volatility and an equity premium. All of which have no significant effect on capital structure. Share price performance has in most cases a significant negative effect on leverage. It is worth mentioning with regards to their research that they are the only ones to include lags on each of their variables into the model. It is no surprise that lagged leverage proves to be of positive significance. The lagged size factor is significant in each of their regressions. All other lagged variables do not help to explain capital structure.

Booth et al. (2001) show that higher tangibility results in a higher long-term debt ratio and a lower overall debt ratio. This is confirmed by Frank and Goyal (2009), Hall, Hutchinson and Michaelas (2004) and de Jong et al. (2008) and backed by the reasoning that more tangible assets represent a higher collateral. A higher collateral reduces stakeholder liquidation risk in a bankruptcy event. There are mixed results revealed by Deesomsak et al. (2004) saying that tangibility is only in a few cases found to be significant and if it is, its direction is unclear. Interestingly, Joeveer (2013) finds the opposite effect, so a negative tangibility to leverage relation, when checking for large unlisted and listed companies in Eastern Europe.

One of the broadest studies on determinants of capital structure theory comes from Frank and Goyal (2009). They analyze data for public traded U.S. companies between 1950 and 2003. Besides the already mentioned results their findings are mostly independent of the leverage definition. However, firm size, the MTB ratio, and the effect of inflation are not reliable when related to the book leverage definition. Frank and Goyal (2009) divide their data set into periods of nine years between 1950 and 2003. Except for inflation and MTB value factors do not change in their significance throughout periods. This time independency supports the universal validity of capital structure theories.

The trade-off theory is based on the assumption that companies face a trade-off between a decrease in tax payments by increasing leverage and the increase in cost of bankruptcy caused by such a leverage increase. Studies by DeAngelo and Masulis (1980), Titman and Wessels (1988), Barton et al. (1989) and Prowse (1990) found a significant relationship, supporting the trade-off theory. According to the trade-off theory, NDTS, should be negatively related to leverage. De Miguel and Pindado (2001) cover all non-financial quoted Spanish companies from 1990 to 1997. Similar to Demirguc-Kunt and Maksimovic (1996), they include the NDTS into their regressions. De Miguel and Pindado (2001) show that previous research consistently found relatively low NDTS levels for companies from the U.S., Japan and Canada areas compared to that of their European counterparts. The authors examine a significant inverse relationship between the NDTS and leverage, which is more significant for Spanish firms than for U.S. companies. Their explanation is that Spanish NDTS' are simply on a higher level than in the U.S. and therefore more significant. They also find an inverse relationship between cash flow and debt. This indicates that cash and internal funds are preferred to the use of debt as a source of financing. According to de Miguel and Pindado (2001) companies avoid under-investment when they face major problems of

asymmetric information. This supports the pecking order theory of capital structure.

One of the most resilient studies comes from Chang et al. (2009), both in terms of data coverage and model calibration. Via the multiple indicators and multiple causes model, they tested a data set of over 351 industries with 13.887 observations covering 16 years of data of companies worldwide. Applying different models, they computed a ranking on the importance of each factor by counting in how many cases it is found to be significant. Growth was found to be the most significant determinant on leverage. This is followed by profitability, collateral value, volatility, NDTS and company uniqueness.

Baker and Wurgler (2002) provide evidence for the market timing theory by showing that firms are more likely to issue equity when their market values are high, relative to book and past market values. They repurchase equity when their market values are low. This means that current capital structure is strongly related to historical market values. Suggesting that capital structure is the cumulative outcome of past attempts to time the equity market. This is also in line with Hennessy and Whited (2005) who find a path dependency of leverage. Lemmon, Roberts and Zender (2008) observe nonfinancial firms on a yearly basis in the U.S. between 1965 and 2003. They find a time effect of leverage with a significant long-term effect. The authors suggest that leverage ratios are sticky to their initial leverage and that it is only industry leverage that has a stronger influence. Accordingly, company leverage does not alter much over a 20-year period. Lemmon et al. (2008) argue that at least in the long-term leverage variation is time invariant.

As outlined above, there is not a single firm specific factor that has been significant and influenced leverage in the same direction over all analyzed research. Still, what can be said is that size, MTB, profitability, NDTS and tangibility play a leading role when explaining capital structure of companies, regardless their location or company size. To stress Harris and Raviv (1991) again, variable definition plays a key role in this kind of analysis. Kayo and Kimura (2011) uses hierarchical linear modeling to assess the relative importance of time-, firm-, industry- and country-level determinants. They find that firm specific factors explain 78% of firm leverage. This underpins the assumption that when trying to explain capital structure, it is firm specific factors one should concentrate on.

3.3 Industry factors

Industry factors play a small but important role in determining capital structure factors. As shown in Bowen et al. (1982), Bradley et al. (1984) and Kester (1986) there is certain industries which are generally characterized by low leverage levels such as the food industry, electronics and pharmaceuticals. On the other side does the airline industry, the energy sector, and steel companies have high leverage ratios. Frank and Goyal (2009) show that the most significant industry factor when explaining market leverage is median industry leverage. Joeveer (2013) shows that for listed Eastern European companies it is mostly

industry factors that determine leverage ratio's variation. Ovtchinnikov (2010) investigates the determinants of capital structure not along classical industry lines but for companies that change from a regulated to a deregulated industry. After deregulation, companies experience a decrease in profitability and asset tangibility and an increase in growth opportunities. Companies' respond to that by reducing leverage. In his analysis Ovtchinnikov (2010) shows that the significance of determinants change after deregulation took place. After the deregulation, significance decreases for profitability and MTB and increases for firm size. He argues that his findings support the dynamic trade-off theory. Furthermore, Kayo and Kimura (2011) detected several important indirect industry influences of variables on firm determinants of leverage.

3.4 Macroeconomic factors

In their model on capital structure in Thailand, Malaysia, Singapore and Australia, Deesomsak et al. (2004) include firm specific variables and investigate whether the different legal, environmental, and institutional environments of the four countries lead to different outcomes when testing the firm specific factors for their significance. Their dataset covers the period from 1993 until 2001, which includes the 1997 Asian crisis. They run their regressions on three different data sets, the full sample, the pre-, and post-crisis sub samples. In that way they find that different factors are of different significance when explaining capital structure and that this significance depends on the period. One interesting pattern is a very obvious change in significance before and after the Asian crisis. Size, NDTS, and liquidity are all non-significant factors for the observed countries before the crisis. All of them become significant after the recession. This implies a strong business cycle pattern, suggesting that business cycles have a strong impact on firm specific determinants of capital structure.

Levy and Hennessy (2007) analyze the influence of macroeconomic variables on companies' leverage ratio. They show that in recessions firms substitute debt for equity. On the other side, during expansions risk sharing becomes more important and firms substitute equity for debt. In addition, they present empirical evidence that country cyclical variation is observed for firms that have less financial constraints. The authors conclude that financing constraints impact the capital structure over the course of business cycles and that more constrained companies experience a flat leverage ratio over the business cycle.

Similarly, Korajczyk and Levy (2003) show how macroeconomic conditions affect capital structure choice. They find that unconstrained firms time their capital issuance and raise funds in favorable macroeconomic conditions. Constrained firms on the other hand do not time their financing and, therefore, face worse terms. Korajczyk and Levy's (2003) evidence suggests that macroeconomic conditions account for between 12% to 51% of time-series variation in companies' leverage. Furthermore, financially constrained companies borrow when their collaterals are high. This is typically the case when returns in the equity market are high due to high corporate profits. Beck et al. (2008) examine the financing patterns of

small firms in 48 countries. Important factors related to leverage are, according to Beck et al. (2008), financial development and property rights protection. Frank and Goyal (2009) find expected inflation to be consistently significant and positively related to leverage. When expected inflation is high, firms tend to have high debt. Antoniou et al. (2002) show a significant negative relation between the term structure of interest rates and leverage. Booth et al. (2001) observe macroeconomic variables such as stock market value over gross domestic product (hereinafter: GDP), liquidity, liabilities over GDP, real GDP growth rate, and inflation. All these factors tend to be insignificant, independent of the leverage definition. Cook and Tang (2010) observe the impact of macroeconomic variables on the adjustment speed of capital structure towards target leverage. There is no influence of financial constraints on the speed of adjustment towards a target leverage rate, however, adjustment takes place faster in good than in bad economic times.

3.5 Country differences

De Jong et al. (2008) investigate firm and country specific variables of companies from 42 countries around the world via a set of cross sectional OLS regressions. Similar to other research they find that tangibility, firm size, risk, growth, and profitability have a significant influence on the leverage ratio. However, this evidence is not consistent over all 42 observed countries. De Jong et al. (2008) disagree with the outcome of other studies, e.g. Rajan and Zingales (1995), as they do not find cross-country equality of firm specific leverage determinants. Looking at country variables they examine significance for creditor right protection, bond market development, and the GDP growth rate. Furthermore, the authors suggest that there is an indirect effect of country variables on leverage as country factors significantly influence firm specific determinants. De Jong et al. (2008) find evidence that legal enforcement, creditor/shareholder right protection, capital formation, and the GDP growth rate influence leverage indirectly. Their analysis goes one step further than previous research which showed the effect of country specific factors, e.g. by Demirguc-Kunt and Maksimovic (1996), Booth et al. (2001), Claessens, Djankov and Nenova (2000) and Bancel and Mittoo (2004).

Deesomsak et al.'s (2004) clear evidence is in line with de Jong et al. (2008), except for share price performance. Deesomsak et al. (2004) find no single variable that is consistently significant across countries. Country differences are large, e.g. tangibility in Australia is of much higher importance than in all other countries. In many cases also the direction in which leverage is influenced by the single variable differs significantly. Kayo and Kimura (2011) investigate structural differences in the financing behavior between developed and emerging countries. The researchers find that the influence of country variables on leverage is of very low significance. However, similar to de Jong et al. (2008) they detect an important indirect country influence on firm specific determinants of leverage.

Psillaki and Daskalakis (2009) look at the capital structure determinants of small and medium

sized European companies. Conducting a cross-country comparison on country characteristics, asset structure, size, profitability, risk, and growth, their findings support the researchers that argue in favor of cross-country similarities. Psillaki and Daskalakis (2009) show that the institutional and financial characteristics of the respective European countries are highly similar. Differences are found on the firm level where countries show different levels of significance. They concluded that overall, country variables play a minor role in explaining capital structure. Similar to that, Booth et al. (2001) examine data for the largest companies in developing countries between 1980 and 1990. They find that capital structure decisions are in general influenced by the same variables as in Europe and the U.S. However, Booth et al. (2001) see clear indications for country specific factors in determining the capital structure of companies as the significance of firm specific factors differ across countries. Antoniou et al. (2002) analyze European countries and find no big difference between countries in terms of significant determinants. One argument could be that these countries are so similar in terms of institutional frameworks and capital market access that national borders play a subordinate role.

Hall et al. (2004) show that there are differences in the small and medium sized enterprises' capital structure (hereinafter: SME) and in their determinants across countries. The authors are uncertain by what these differences are caused. They assume that the differences are due to financial constraints, taxation, and cultural differences. Wald (1999) examines the capital structure of companies in Italy, Germany, France, Japan and the U.K. and finds that mean leverage and most firm specific factors show similarity across countries. Differences are detected in the relation of leverage with risk, profitability, size, and growth. He argues that these differences might be due to institutional reasons.

In their empirical work on capital structure in 48 countries, Beck et al. (2008) find some evidence for the relevance of country specific factors, mostly financial constraints, and property rights. They show that there is a difference depending on firm size. Small firms profit the most from a well working institutional framework, especially property right protection plays a crucial role. Nevertheless, there is not a single country specific factor that proves to be consistently significant. Joeveer's (2013) study supports this. He uses data from Eastern European countries between 1995 and 2002. Country factors show the strongest significance in leverage for small unlisted companies. This could be due to the fact that small companies are in a certain sense more country dependent than big companies who have more international exposure.

De Miguel and Pindado (2001) argue that financing constraints matter. They see a greater sensitivity of debt to cash flow fluctuation when the public debt ratio is high. According to their research, this indicates that in countries like Spain, where the bond market is inadequately developed, the advantage provided by private debt (lower agency costs of debt) is not as great as that provided by the access to the bond market (fewer financing constraints).

Similar to the literature on firm specific factors, there is no general conclusion one can draw out of the recent research on country level influence on capital structure. Empirical evidence is a bit stronger for the researchers that argue that firm specific factors are independent of company's location and that country specific determinants are of minor importance. In some cases, country variables influence factors on the firm level. This results in an indirect effect of country factors on leverage. It is the aim of this thesis can contribute to the existing research by comparing firm specific factors across countries and the influence of location itself by finding new evidence for the one or the other side.

3.6 Financial crisis

Research on the impact of the 2007 financial crisis on capital structure is limited. Campello et al. (2010) conducted a CEO/CFO survey investigating company behavior during the crisis. They find that access to credit lines is less valuable when company's liquidity situation is strong. They show that companies use cash savings for investments if credit lines are relatively low. This suggests a trade-off for companies between saving and investing. Companies with a strong cash position pursue their investment plans and access credit lines. This also held true during the crisis when credit was still available, at least for capital investments, technological and employment expenses. Dang et al. (2014) tested how fast firm's leverage adjusted to its target leverage ratio after the crisis. They see a negative impact of the financial crisis on adjustment speed towards the target capital structure. Duchin et al. (2010) show how corporate investments decrease in the aftermath of the financial crisis. The decline of investment is largest for companies with low cash reserves or high net short-term debt, for financially constrained firms and external finance dependent industries.

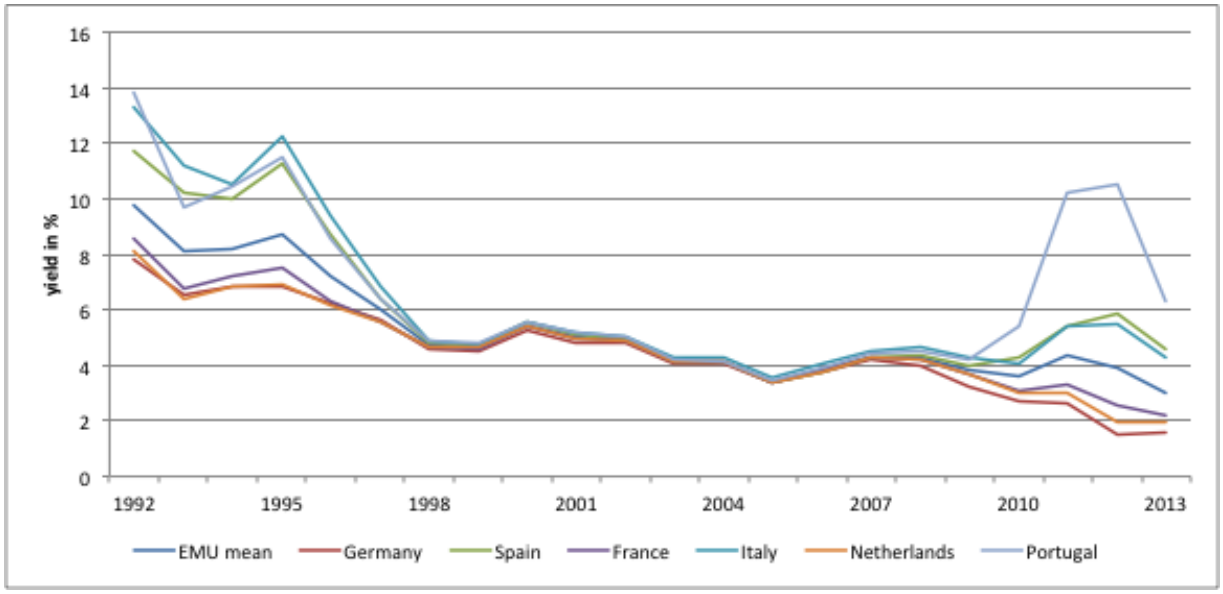
In this research, it is of high interest to see which factors drive capital structure depending on the state of the economy (pre-, during- and post-crisis). Conducting a country breakdown helps also to analyze whether there are differences in the significance of determinants of the capital structure. Extending this thought one could also say that as periphery Europe had problems accessing the capital markets, we can compare a financially constrained region (periphery) to a financially unconstrained region (core Europe). There are no studies found on leverage determinants before, during and after the 2007 financial crisis of non-financial European listed companies.

4 HYPOTHESIS AND VARIABLE CHOICE

This thesis will observe leverage determinants of listed non-financial companies in the major EMU economies under the impact of the global financial crisis. Until the 2007 financial crisis and the subsequent European sovereign debt crisis the major perception of the EMU was that its member states converged towards a homogenous economic area. One development worth highlighting is that capital market access improved for the periphery countries significantly.

Probably the single most shown figure of this process is the development of yields on 10-year government bonds in Germany, France, the Netherlands, Italy, Spain, and Portugal (see figure 1). When the Euro was announced in 1992 yields converged and showed only small differences between 1998 and 2007. The implicit assumption this development is based on is that the risk associated with the bonds' issuer country does not differ very much as all countries are EMU members. This idea was disproven when Greek's financial difficulties became publicly known. Nowadays, the differences in economic structure, country specific risk and financial stability between core and periphery Europe are quite obvious. This is reflected in the yield spread between core and periphery government bonds. The ECB specifically targets the refinancing difficulties of companies in Spain, Italy, and Portugal and adjusts its policies to address this issue.

Figure 1. Yields on 10-year government bonds of selected European countries



Source: Serien von Konvergenzkriterien der WWU - Jährliche Daten. (n.d.) In *Eurostat database – European Union Statistical Office*. Retrieved June 3, 2014, from http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=irt_lt_mcby_a&lang=de

4.1 Hypothesis and predictions

Deesomsak et al. (2004) observe leverage determinants of Singapore, Australia, Malaysia and Thailand during the 1997 Asian crisis. First, they show that the significance of leverage determinants varies across countries. In the second step, they include country dummies and examine that these dummies play a significant role when determining capital structure. Furthermore, Deesomsak et al. (2004) argue that the 1997 Asian crisis changed the role of firm specific factors within countries and that country differences became more important in times of financial turmoil. Even though the EMU is a much more homogenous area than these four Asian countries, figure 1 shows that country risk is perceived different during bad

economic times. In calm times, the market neglects country differences, in times of financial turmoil they are of high importance. Deesomsak et al. (2004) find two changes of leverage determinants: first, leverage determinants change over time within a country and second, variables that differ only on the country level are of higher significance in the post-crisis period.

This thesis will show that Deesomsak et al.'s (2004) findings are not uniquely connected to the Asian crisis but that the 2007 financial crisis lead to a similar situation in the EMU countries. Based on this idea, the hypothesis goes as follows:

i) The financial crisis and the subsequent European sovereign debt crisis had a strong influence on companies and their financing behaviour. Therefore, it is expected that there will be a change in the significance of the most important firm specific leverage determinants within countries over time.

ii) The overall economic environment between 2008 and 2012 was highly unstable in the European periphery and financial market participants became more risk-averse. The trade-off theory states that tangible assets can serve as a collateral in the case of bankruptcy and that profitable companies can bear more debt. This will be more important after 2007. Hence, tangibility and profitability will be more significant in the crisis and post-crisis period compared to that of the situation before 2007.

iii) Country differences are more important in times of financial turmoil. Financial constraints and refinancing conditions will be of higher significance in the period after 2007. It is excepted that the location of a company, core vs. periphery, is significant in determining capital structure, especially after 2007.

4.2 Variable Choice

It is of high importance to use the correct variables to test the hypothesis and to meet the outlined research purpose (see introduction). As independent variables, the four "standard" firm specific factors are included: tangibility, MTB ratio, firm size and profitability. These four variables have proven to be significant in past research and were able to explain company's capital structure to a large extent (Bradley et al., 1984; Long & Malitz, 1985; Harris & Raviv, 1991; Baker & Wurgler, 2002; Frank & Goyal, 2009; Lemon et al., 2008). Also included is a proxy for the non-debt tax shield. The reasoning is such that the NDTS is related to the key characteristic of the trade-off model. Showing its significance or insignificance can deliver some insight about the real world applicability of the trade-off framework. These factors allow hypothesis i and ii to be tested. Three more variables are additionally included: volatility of earnings as a risk proxy, an interest rate variable and country dummies. Measuring the risk of a company through its earnings' volatility acknowledges the fact that risk measures gained increasing significance after the financial

meltdown in 2007. Furthermore, an interest rate variable is included to see its effect on leverage. This is of special interest in the light of the financial crisis. It is quite astonishing that except for Antoniou et al. (2002) almost no researchers examined the influence of interest rates on leverage. Finally, a country dummy is included to observe to which extent financing behavior is related to firms' location. The financial meltdown was the most influential economic event between 2004 and 2012. It will be of interest to investigate whether there are crisis specific effects influencing firms' capital structure. By including the interest rate variable and the country dummies in the regression, it will be possible to test for hypothesis iii.

This set of variables cover with the exception of industry leverage, Frank and Goyal's (2009) "core model of leverage". There is a control for industry leverage in the full sample regressions. In the country analysis only firm specific factors are considered, so that the influence of geography and period on these determinants can be determined. In Kayo and Kimura's (2011) analysis it is shown that firm specific factors explain 78% of firm leverage. Obviously, there is a whole set of other variables that could be included and has been included in previous work. But none of these factors have been constantly significant, as e.g. taxes and liquidity (Booth et al., 2001; Frank & Goyal, 2009; Antoniou et al., 2002). From a macroeconomic perspective there is hardly a single variable that was significant over different studies. Due to the aforementioned reasons, interest rates and a country dummy are included.

Book and market leverage

Leverage can be defined in multiple ways. Two different dimensions should be highlighted. First, the maturity of debt, the question arises whether short-term debt is included into the leverage ratio or not. Second, whether to use a book or a market based approach when measuring equity. Based on de Jong et al.'s (2008) argumentation, only long-term debt is included. According to various researchers (Rajan & Zingales, 1995; Titman & Wessels, 1988; Demirguc-Kunt & Maksimovic, 1996; Booth et al., 2001; Hall et al., 2004) including short-term debt can lead to biased results. Trade credit is the main contributor to short-term debt and expectedly determined by different factors than "real" debt, such as bonds or loans. The inclusion of short-term debt would deliver less reliable results. Concerning the measurement of equity, there will be two ratios in this thesis: a book and a market leverage ratio. Welch (2004) states that the book value of equity is simply an accounting figure to equalize both sides of the balance sheet but that it has no real economic meaning. Market measured equity is closer to the firm's intrinsic value (Frank & Goyal, 2009). On the other side, Barclay, Smith and Morellec (2006) argue that book leverage is a better measurement as it ignores growth opportunities that are usually accounted for in market capitalization but that book value concentrates on the value of assets in place. Both lines of reasoning have valid points. Therefore, both leverage definitions in this study are included to increase the robustness of the findings. In some studies, the different leverage definitions lead only to slightly different evidence, e.g. Rajan and Zingales (1995), Antoniou et al. (2002), Frank and

Goyal (2009), Lemmon et al. (2008) and Chang et al. (2009) whereas in others the results differ quite significantly, e.g. Ovtchinnikov (2010), Kayo and Kimura (2011) and Booth et al. (2001). In this thesis, leverage ratios are calculated in the following way:

$$Book\ leverage = \frac{long\text{-}term\ debt}{long\text{-}term\ debt + book\ value\ of\ equity} \quad (1)$$

$$Market\ leverage = \frac{long\text{-}term\ debt}{long\text{-}term\ debt + market\ value\ of\ equity} \quad (2)$$

Tangibility

Tangibility is defined as fixed assets divided by total assets. This is in line with Deesomsak et al. (2004), Hall et al. (2004) and de Jong et al. (2008). Tangible assets can serve as a collateral in the case of bankruptcy. A higher collateral decreases the stakeholder's liquidation risk. This transfers into lower interest rate payments and leads to the ability of companies to bear more debt. This is in line with the trade-off theory (Deesomsak et al., 2004; de Jong et al., 2008). Tangibility can also be seen as a proxy for agency costs (Booth et al., 2001). The agency theory assumes that high-levered firms have a tendency towards underinvestment since management dislikes the monitoring process when raising capital for investments (Deesomsak et al., 2004). A higher tangibility ratio decreases the need for more outside observations as tangible assets serve as collateral and can easily be evaluated. This increases management's willingness to raise capital. Hence, a positive relation between the leverage ratio and tangibility is expected under the agency theory. Tangible assets are easier to evaluate than intangibles. This leads to lower information asymmetries. In the pecking order framework this makes equity issuance less costly. Therefore, companies with higher tangibility should have lower leverage ratios (Frank & Goyal, 2009). Empirically, a positive significant relation has been detected by Booth et al. (2001), Frank and Goyal (2009), Hall et al. (2004) and de Jong et al. (2008). Results are mixed in Deesomsak et al. (2004) where significance and direction of influence on leverage are inconsistent. Joeveer (2013) finds contrast to most other research in a negative relation.

Market-to-book ratio

The market-to-book ratio is used as a proxy for growth opportunities. It is measured in its standard finance definition: as market value of equity divided by book value of equity, similar to de Jong et al. (2008) and Harris and Raviv (1991). As one of the standard measures of value investing, the MTB ratio gives an idea about how the market evaluates growth opportunities of the company in relation to its book value. However, interpreting this measure is not as straightforward as one might expect. Besides the growth aspects, a possible explanation for a high MTB ratio is that firms' assets appreciated strongly due to current earning increases which is only reflected in the market but not in the book measures of accounting (Harris & Raviv, 1991). The trade-off and the agency theory expect a negative relation to leverage. With high growth opportunities, there is an incentive to gain exposure in

overly risky projects, potentially decreasing shareholder wealth. Risky exposure increases the cost of raising debt and hence, companies prefer internal or equity financing rather than debt. This leads to a negative relationship between leverage and the MTB ratio under the trade-off framework (Deesomsak et al., 2004). Another explanation is that highly levered companies are more likely to pass up profitable investment opportunities (Rajan & Zingales, 1995; Myers, 1977). Hence, companies that expect high future growth use more equity financing. Myers (1977) states that a growth opportunity is an expectation or a hope on an increase in future sales. This cannot be used as collateral in case of bankruptcy. Similar to the argument for tangible assets, companies with high growth opportunities are more risky and lenders require a higher interest payment. Therefore, management prefers equity or internal financing sources to relatively costly debt. On the other side, it is the pecking order theory that assumes a positive relation as companies with more investments should accumulate more debt over time (Frank & Goyal, 2009).

In their empirical studies, Booth et al. (2001) and Chang et al. (2009) found a significant inverse relation between leverage and the MTB ratio. In Booth et al. (2001) these results are dependent on the inclusion of a country dummy variable. In such a case the significance disappears. Inconsistent results concerning significance and coefficient sign are documented by Deesomsak et al. (2004) and Antoniou et al. (2002).

Firm size

Size is measured as the natural logarithm of revenue. This is the same definition as in Deesomsak et al. (2004), de Jong et al. (2008), Booth et al. (2001) and many others. In theory, large companies have the tendency towards a stronger diversification. Following the trade-off theory, this diversification effect reduces risk of bankruptcy, also decreasing the cost of debt. This leads to a positive relation between size and leverage (de Jong et al., 2008; Frank & Goyal, 2009). The pecking order theory is according to Frank and Goyal (2009) mostly interpreted in such a way that larger companies have more opportunity to retain earnings. This leads to less demand in leverage and hence, to an inverse relation between leverage and size. Deesomsak et al. (2004) disagree with this interpretation of the pecking order theory. Significant positive relations are found in the empirical work of Antoniou et al. (2002), de Jong et al. (2008), Psillaki and Daskalakis (2009) and Beck et al. (2008). Results shown by Deesomsak et al. (2004) and by Frank and Goyal (2009) are mixed and not reliably significant. As outlined before, Joeveer (2013) shows a negative relation to leverage.

Profitability

Profitability is measured as earnings before interest, taxes, depreciation and amortization (hereinafter: EBITDA) divided by revenue. This is similar to the definition provided by Deesomsak et al. (2004). As shown by Chang et al. (2009), different measures of profitability can lead to different results. When the ratio of operating income to total assets is used the effect on leverage is negative but positive when divided by total sales. Here, the earnings before interest and tax (EBIT) is not used, instead EBITDA was employed, in order to ignore

the effect of the non cash flow relevant depreciation and amortization (hereinafter: D&A). Furthermore, it makes more sense to relate profit to revenue. This considers the cost structure and shows how much profit a company can get out of its revenue. As discussed above, in the pecking order framework companies prefer internal to external financing, therefore, profitable companies use their internally generated funds first. This leads to a negative relation between debt and profitability. This is one of the key parts of the pecking order theory. The static trade-off theory argues that profitable companies can bear a higher debt burden. The agency theory assumes that more debt leads to more managerial discipline and this drives profits. Both arguments lead to a positive debt to profitability relation (Jensen, 1986). As Frank and Goyal (2009) explain, the dynamic trade-off theory can also lead to another conclusion than its static counterpart. As there are various frictions in the market, leverage and profitability can also experience a negative relationship as it accumulates profits (Kayhan & Titman, 2007).

Empirically, profitability in most cases is found to be significantly inverse to leverage (Antoniou et al., 2002; de Jong et al., 2008; Frank & Goyal, 2009; Booth et al., 2001; Fama & French, 2002). Mixed results are reported by Chang et al. (2009) and Deesomsak et al. (2004).

Non-debt tax shield

The NDTS is defined as D&A to total assets. This is certainly not the most accurate measure but the author is not aware of a better proxy. Besides that it is in line with many studies on this topic, e.g. Deesomsak et al. (2004) and Mittoo and Zhang (2008). Depreciation represent past investments. These cash outflows are tax deductible, so depreciation can be seen as a proxy for the NDTS. As outlined before, the NDTS reduces the potential tax benefit of debt. Therefore, there should be a negative relation between debt and the NDTS (Deesomsak et al., 2004). The key assumption of the trade-off theory is that companies face a trade-off between the tax reducing effect of leverage and the higher cost of capital when increasing leverage. When the NDTS is large, there is less incentive to increase debt. Similar to the importance of profitability to the pecking order theory, the NDTS is of importance to the trade-off theory. Empirically, de Miguel and Pindado (2001) show a negative relation of very high significance and also Deesomsak et al. (2004) examine evidence in support of the trade-off theory.

Earnings volatility

The risk proxy earnings volatility is defined as the variance of the above discussed profit measure (so the variance of the EBITDA margin), this is similar to Wald (1999) and Psillaki and Daskallakis (2009). The higher the risk, the higher the costs are of expected financial distress. This leads to a decrease in the probability that tax shields are used. Therefore, there is an inverse relation between debt and risk under the trade-off theory (Frank & Goyal, 2009). According to Psillaki and Daskallakis (2009), the pecking order framework expects a negative relation between debt and risk, as companies with high earnings volatility prefer to

accumulate cash to avoid capital shortcomings in the future (Psillaki & Daskallakis, 2009). Another aspect is that firms who volatile earnings face the risk of their cash not being sufficient to service their debt. To avoid such a problem, equity is preferred to debt (Antoniou et al., 2002; Deesomsak et al., 2004).

From an empirical point of view, this relation has not been proven to be as high of importance as the factors explained before. The strongest evidence for this is found in Psillakis and Dsakallakis (2009) and in Wald (1999). At best, mixed results are reported in Mittoo and Zhang (2008) and Deesomsak et al. (2004). Antoniou et al. (2002) find no significant relationship.

Interest rate variable

The interest rate is measured as the average annual yield on 10-year government bonds of the respective country. It is the only macroeconomic variable included in the model. Measuring interest rates on the country level, allows the different capital market access across countries to be taken into account, which is to say, the financial constraints companies face due to their location. One would expect that the cost of debt is one of the key determinants of companies' financing behavior. This is shown by Barry, Mann, Mihov and Rodriguez (2008) when they examine that company debt issuance increases when current interest rates are low. In a survey among European firms on their capital structure, Bancel and Mittoo (2004) find that interest rates have a high influence on the timing of debt issues.

It is interesting that even though interest rates are a very straightforward indicator of financing behavior, they have received very little attention in the academic community when trying to explain leverage ratios. The interest rate environment changed from 2004 to 2012 quite tremendously. While yields on government bonds strongly increased in the countries of the European periphery, the European Central Bank (hereinafter: ECB) lowered their repurchasing rates from 4,25% in 2004 to 0,75% in 2012 to avoid a credit contraction. These efforts have been of, at best, mixed success. Therefore, it will be interesting to see how important the different levels of interest rates are for the leverage ratios in the specific countries. High interest rates reduce firm's value. Companies with high interest payment obligations face a higher risk of bankruptcy (Antoniou et al., 2002). It seems natural that managers time their financing decisions and hence, issue debt in times of low overall interest rates. In the trade-off world, the cost of capital is directly compared to its benefits from the debt tax shield. Under increasing costs of capital due to high interest rates, an increase in leverage becomes less profitable. The break even point with tax benefits is reached earlier. Hence, in a trade-off world an inverse relation between the interest rate and leverage is to be expected. Under the pecking order theory, a similar argumentation is followed. With expensive debt, equity financing is more likely. An inverse relation between leverage and the interest rate is anticipated. This has also been proven to hold empirically by Antoniou et al. (2002).

Table 1. List of variable behavior according to theory

Tangibility	positive	Trade-off theory; agency theory
	negative	Pecking order theory
Market-to-Book	positive	Pecking order theory
	negative	Trade-off theory
Firm Size	positive	Trade-off theory
	negative	Pecking order theory
Profitability	positive	Static trade-off theory; agency theory
	negative	Pecking order theory; dynamic trade-off theory
Non-debt tax shield	positive	
	negative	Trade-off theory
Earnings volatility	positive	
	negative	Pecking order theory; trade-off theory
Interest rates	positive	
	negative	Trade-off theory; Pecking order theory

Country dummy

Another variable included into the analysis are country dummies. This research specifically observes the differences in leverage determinants across six major EMU members, in order to investigate whether there are significant country specific effects. Going one step further, this will allow for the detection of the main differences in the observed countries in their capital market access during the crisis and post-crisis period. This means, a possible interpretation of the country dummies is that they serve as a proxy for financial constraints.

Industry dummy

To control for industry effects industry dummies are included in the full sample regressions. The classification of the individual companies is conducted along the Thomson Reuters Business Classification (TRBC), businesses are classified into the categories of technology, healthcare, consumer goods & services, energy, basic materials, industrials, telecommunication services and utilities.

5 METHODOLOGY

The data used is period average cross sectional data. Linear regressions are estimated through the ordinary least square method similar to de Jong et al. (2008), Frank and Goyal (2009) and Deesomsak et al. (2004). Taking averages reduces the effect of random fluctuations in the variables and the possibility of measurement errors (Deesomsak et al., 2004). Hence, results are likely to be more reliable, compared to a non-average method. All regressions are estimated with both, market and book leverage as dependent variable. This increases the robustness of the results.

In the first step, the data set is separated between countries. This creates four data sets per country: pre-crisis, crisis, post-crisis and the all-periods case. I used both, market and book leverage, as a dependent variable.

$$Y_i = \propto + \sum(\beta_j * x_j) + \varepsilon_i \qquad (3)$$

Where Y is the leverage ratio (either market or book leverage) of the respective country; $\propto$ is the intercept; x_j is the firm specific factor j and β_j is the coefficient of factor j. ε_i is the residual. x_j factors can be size, profit, market-to-book ratio, risk, tangibility or the non-debt tax shield.

In the second step, the full sample is analyzed, so all country data together. Leverage is regressed on firm specific factors, interest rates and country dummies. The interest rate variable shows the same value for each country. This leads to multicollinearity when additionally an intercept is included. The result section shows the models including the intercept and without the interest rate variable as this is the statistically more valid approach. The models without intercepts but with interest rates can be found in the appendix. In the regressions below country dummies are measured against Portugal, which is not included as a dummy itself.

Writing the above full sample model in a more formal way leads to the following equation,

$$Y_i = \propto + \sum(\beta_j * x_j) + \sum(\beta_l * z_l) + \varepsilon_i \qquad (4)$$

Where Y is the leverage ratio; $\propto$ is the intercept; x_j is the firm specific factor j and z_l are the country dummy variables; β is the respective coefficient for factor j or l and ε_i is the residual. x_j factors can be size, profit, market-to-book ratio, risk, tangibility or the non-debt tax shield. The country dummies z_l can be Germany, France, the Netherlands, Italy and Spain.

These market and book leverage regressions are ran four times: on the pre-crisis, the crisis, the post-crisis and the all-periods data set. This allows for the capturing of country specific effects reflected in the country dummies. Furthermore, the sensitivity of the variables will be compared when the interest rate variable is included and the intercept is excluded. Comparing the different regressions, allows for the observation of how the different variables change between periods.

To increase the robustness of the results, full sample regressions are conducted as just described additionally controlling for industry effects. As before, country dummies are measured against Portugal and the seven industry dummies are measured against the technology sector.

Formally,

$$Y_i = \propto + \sum(\beta_j * x_j) + \sum(\beta_l * z_l) + \sum(\beta_m * ind_m) + \varepsilon_i \qquad (5)$$

Y is the leverage ratio; $\propto$ is the intercept; x_j is the firm specific factor j; z_l are the country dummy variables and ind_m are the industry dummies; β is the respective coefficient for factor j, l or m and ε_i is the residual. x_j factors can be size, profit, market-to-book ratio, risk, tangibility or the non-debt tax shield. The country dummies z_l can be Germany, France, the Netherlands, Italy and Spain. Additionally to the variables explained before there is a series of industry dummies ind_m: the energy sectors, basic materials, industrial companies, consumer goods & services firms, the telecommunication sector, utility companies and the healthcare industry.

The diagnostics part checked each regression on outliers and their influence on the estimated model. Furthermore, normality in the residuals is checked, for homoscedasticity, collinearity and linearity of the relation between independent and dependent variables. Even though some observations have more influence on the OLS model estimation process, there was nothing too astonishing. Therefore, it is not necessary to exclude any data points. In all regressions, the residuals followed a normal distribution. In one of the more than 100 regressions there has been slight signs of heteroscedasticity (on the 5% level). All other models were identified to be homoscedastic. Collinearity was found to be no issue as well. Checking for non-linearity delivered in some cases mixed results were found on the country level. This applies mostly to the regressions with few observations, e.g. period regressions on Portugal. Here, one single outlier has high influence on the whole relationship. When checking the full sample models, no signs for non-linearity were found. Therefore, it was decided best to follow the models shown above.

Having estimated all these regressions, the independent variables are tested on their significance via a series of t-test. The model's goodness-of-fit via R^2 and F-tests are considered in order to evaluate how meaningful the overall models are.

A best-fit model is estimated for all four full sample regressions and for the all-period country regressions. It is estimated through a general-to-specific approach and determined different models through a series of t-tests. They are then compared via the Akaike Information Criterion (hereinafter: AIC). The AIC deals with the trade-off between a model's complexity and the goodness of fit. It introduces a penalty when using more parameters, as too many variables can result in an over-fitting of the model.

6 DATA DESCRIPTION

This paper is an empirical study on the determinants of capital structure for non-financial companies in the major economies of the EMU. The countries included are Germany, France, Italy, Spain, the Netherlands and Portugal. Even though Portugal is not the sixth largest economy in the EMU, it is included into the analysis (instead of Belgium which ranks as number six), as it is one of the strongest hit countries by the 2007 financial crisis. It is believed to be of high importance for the purpose of this study. Companies observed are non-financial companies listed on the major share index in their respective country. Only companies that report results for the whole time span between 2004 and 2012 are included. It is understood that this makes results exposed to a survivorship bias, a common problem in capital structure research (Welch, 2004; Rajan & Zingales, 1995), but the purpose of this research is to analyze how capital structure changed for surviving companies. Additionally, it needs to be emphasized that observing the largest listed companies of the respective countries does not represent the economy as a whole. On the other side, if the results are of high significance they could be interpreted as a proxy for other companies facing the same economic framework (Rajan & Zingales, 1995). The reasoning for using only non-financial companies is that the balance sheet structure of financial firms is significantly different to all other sectors as shown e.g. by Hovakimian et al. (2001). This is also in line with common practice in capital structure research. Balance sheet data is on a yearly basis and is extracted in a standardized format from Reuters' Datastream database. Yields on 10-year government bonds are extracted from the European statistical office Eurostat. The data set consisted of originally 157 non-financial companies but was reduced to 125 companies due to missing observations of some variables. First, the full data set will be described, which includes all countries and differentiates between a pre-crisis (2004-06), a crisis (2007-09), and a post-crisis (2010-12) period. Then, the country level will be examined to discuss specific developments that are worth highlighting, again split up in a pre-crisis, crisis and post-crisis period.

6.1 Data description: full data set

6.1.1 Full sample: factor description

Over all countries and periods, book leverage was on average 39,5%, which is 10% more than market leverage with 29,2%. Only for very few companies is book leverage below market leverage. This is due to the reason that usually market valuation of equity is above the book evaluation of equity. Recalling the respective leverage definitions from the previous sections should make that clear. Corresponding to this is the MTB ratio, which is 2,4 in the all-periods data set. Looking at its development since 2004, a clear trend is visible.

The MTB ratio went down from 3,0 in the pre-crisis period, to 2,3 during the financial crisis and decreased even further to 1,8 during the European sovereign debt crisis. This should not come as a surprise. Just after the economy recovered from the dot-com bubble in 2000, the Federal Reserve Bank lowered interest rates to stimulate the economy. Due to a recovering economy and due to an increase in money supply, investors intensified their equity exposure. As the book valuation of equity is rather static and market capitalization went up, the MTB ratio increased as well in the pre-crisis period. Furthermore, the MTB ratio serves as proxy for growth opportunities. In the pre-crisis period, the future was seen somehow better than it turned out to be and the market believed in the possibility of further growth. With the Lehman Brother's bankruptcy in 2007 and the resulting collapse of the financial markets, MTB ratios went down as well. The overall economic climate changed in Europe, especially in the periphery, for the worse when government debt exploded due to bank bail-out programs and a crisis in the "real economy". Due to the overall bad economic climate, there is a further drop in the MTB ratio. First, this comes from decreasing market capitalization as investors decrease their equity exposure and second, from a more negative evaluation of growth possibilities.

This is also reflected in the development of the leverage ratios. While mean book leverage changed only very little between 2004 and 2012, market leverage increased from an average of 24,3% in the pre-crisis time, to 30,0% during the crisis, and 33,2% in the post financial crisis period. Leverage levels differ significantly over companies and range, in our sample between 0% and 90%. It is noteworthy to consider how profitability developed. Recall that it is measured as EBITDA over revenue. It even slightly increased from the pre-crisis to the crisis period (+0,9%)- with an average standard deviation of 16,3% over all times. The high and relatively stable level of profits might be unexpected at first: it needs to be considered that there is a strong survivorship bias. Note that: bankrupt companies are not included in these figures.

Risk, measured as volatility of profitability, is between 1,6% and 2,2% and therefore relatively stable when comparing the single periods. Measuring it as the volatility of profitability for the whole time span from 2004 to 2012 it goes up to 3,7%. This seems reasonable, as profitability in different companies does not differ that much compared to the year after or the year prior. When there is a trend, e.g. due to cost reduction plans, these effects need time to be stronger reflected in the volatility over a longer time span.

Table 2. Descriptive statistics - full data set

Full sample	Pre-crisis						Crisis					
	Mean	Median	Minimum	Maximum	St. Dev.	Observations	Mean	Median	Minimum	Maximum	St. Dev.	Observations
Market leverage	24,3%	22,8%	0,0%	66,0%	15,9%	125	30,0%	27,2%	0,1%	84,1%	18,4%	125
Book leverage	38,5%	38,0%	0,0%	82,5%	20,2%	125	40,7%	37,6%	0,9%	90,6%	21,1%	125
Size	15,80	15,89	12,40	18,90	1,50	125	16,10	16,20	12,50	19,10	1,40	125
Profitability	21,2%	18,1%	-38,2%	80,8%	16,2%	125	22,1%	18,4%	1,6%	82,3%	17,6%	125
Risk	2,2%	1,4%	0,1%	23,6%	3,1%	125	1,9%	1,4%	0,0%	10,5%	1,7%	125
NDTS	4,6%	4,0%	0,1%	20,1%	2,9%	125	4,4%	3,7%	0,0%	22,8%	3,1%	125
Tangibility	32,9%	30,3%	3,9%	95,1%	21,4%	125	31,3%	29,3%	2,4%	90,7%	21,0%	125
Market-to-Book	3,00	2,36	0,50	26,30	2,70	125	2,30	1,89	0,50	11,90	1,60	125

	Post-crisis						All periods					
	Mean	Median	Minimum	Maximum	St. Dev.	Observations	Mean	Median	Minimum	Maximum	St. Dev.	Observations
Market leverage	33,2%	32,3%	0,0%	80,6%	20,9%	125	29,2%	28,1%	0,2%	72,3%	17,0%	125
Book leverage	39,3%	37,7%	0,1%	80,0%	20,1%	125	39,5%	37,9%	0,9%	78,6%	19,3%	125
Size	16,20	16,30	12,40	19,40	1,40	125	16,00	16,15	12,50	19,10	1,40	125
Profitability	22,3%	18,5%	3,2%	82,8%	17,0%	125	21,9%	18,1%	-6,4%	80,7%	16,3%	125
Risk	1,6%	1,1%	0,1%	12,5%	1,7%	125	3,7%	2,4%	0,4%	27,3%	4,1%	125
NDTS	4,2%	3,8%	0,1%	17,5%	2,6%	125	4,4%	3,8%	0,1%	18,4%	2,8%	125
Tangibility	29,5%	26,8%	0,9%	92,3%	20,6%	125	31,2%	28,8%	2,8%	91,2%	20,3%	125
Market-to-Book	1,80	1,51	0,50	7,80	1,10	125	2,40	2,01	0,70	11,80	1,50	125

Furthermore, the NDTS varies between 0,1% and 18,4% in the all-periods sample. The mean value over the different periods is stable at around 4,4%. There are huge differences in the tangibility ratio as measured by property, plant, and equipment divided by total assets. In all periods there is a standard deviation of roughly 20%. Ratios range between 1% and 95%. This is mostly due to different industries. The energy sectors, as well as steel and industrial companies, usually have large and expensive machinery. The service industry or retailers on the other hand, have low tangibility ratios. Tangibility is highly industrially dependent. Therefore, this ratio is not so much affected by the financial crisis.

6.1.2 Correlation analysis

In the correlation matrix of the full sample data over all periods there is a slightly inverse relation between market leverage and the NDTS of -0,15. The MTB ratio has a stronger and highly significant negative relation to market leverage with -0,33. Risk, profit, and size have a small positive correlation to leverage but none of them are significant. Tangibility and interest rates are moderately positive and significantly related to market leverage. This first impression is partly surprising. As explained in the previous section, it is expected that a higher interest rate will cause a lower leverage ratio. Size and profit's correlation to leverage is insignificant and the correlation is around zero. Hence, a meaningful interpretation is hardly legitimate. Tangibility and market leverage are significantly positive correlated, as expected by the trade-off and the agency theory. The results of the NDTS and the MTB are in line with the trade-off theory as well. Still, it is too early in the analysis to conduct a deep interpretation. What can be said is that the insignificant relation of size, profit, and risk to market leverage was not expected. It will be interesting to see whether this is the same in the multivariate analysis.

This is just a first insight into the relationships between the single variables. The matrix shows a negative relation of size to all other factors, most of these relations are significant. The results suggest that large companies have significantly lower growth prospects as reflected in the MTB ratio and that they are less profitable. Large companies also have significantly less volatile earnings. This is in line with the trade off theory. The significant relations between the level of interest rates and size and between risk and tangibility can hardly be meaningfully interpreted at this point.

Table 3. Correlation matrix - full data set

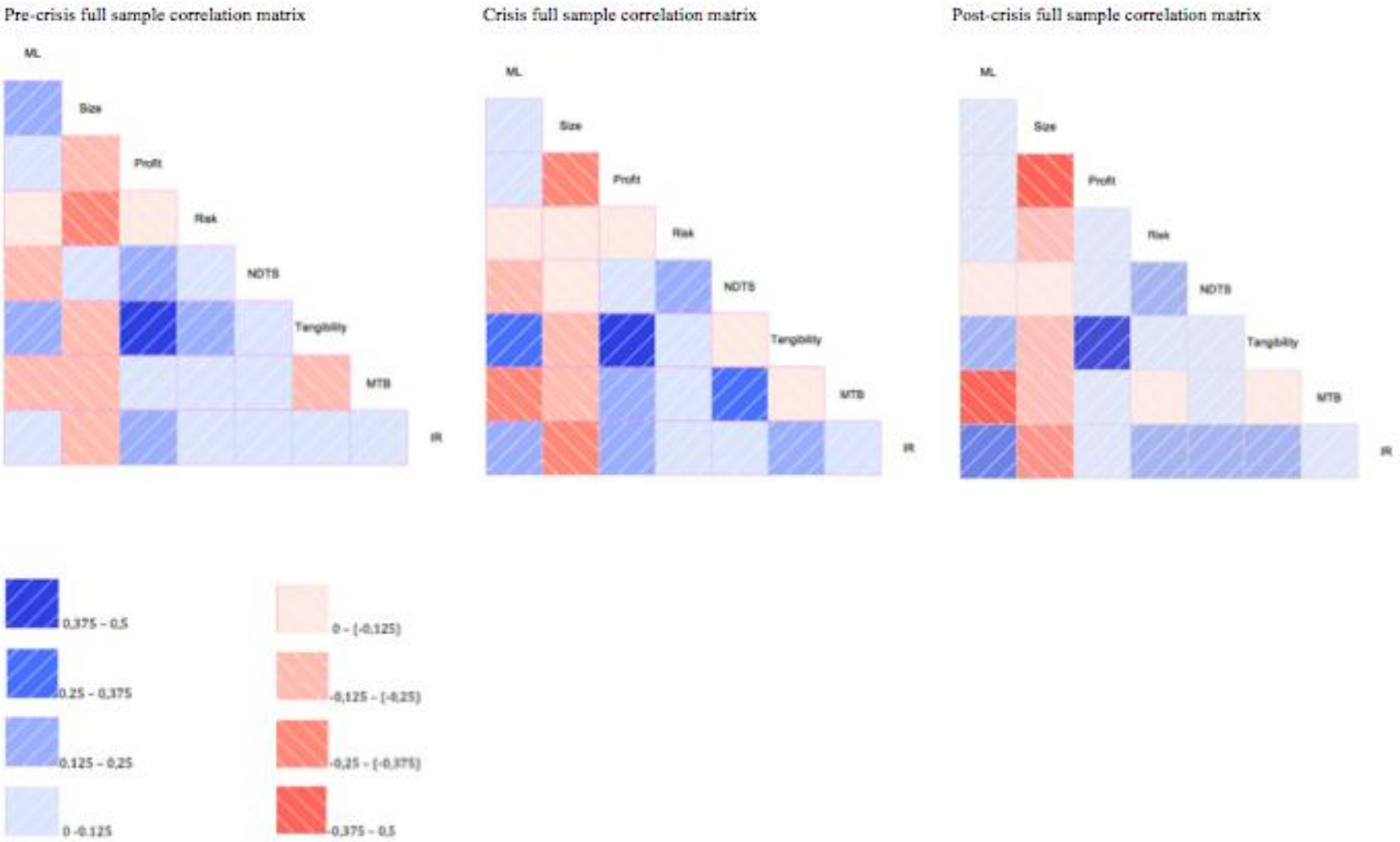
Full sample n = 125	Market leverage	Size	Profit	Risk	NDTS	Tangibility	MTB	Interest rate
Market leverage	1,00							
Size	0,10	1,00						
Profit	0,06	-0,39 ***	1,00					
Risk	0,00	-0,38 ***	0,28 **	1,00				
NDTS	-0,15 °	-0,02	0,14	0,10	1,00			
Tangibility	0,28 **	-0,21 *	0,49 ***	0,36 ***	0,02	1,00		
MTB	-0,33 ***	-0,22 **	0,08	0,01	0,20 *	-0,18 *	1,00	
Interest rate	0,32 ***	-0,43 ***	0,13	0,08	0,13	0,25 **	0,14	1,00

The relatively strong relationship between tangibility and profit indicates that companies that are engaged in sectors with traditionally a lot of tangible assets, like energy and industrial companies also have higher EBITDA margins. The riskier an investment, the more profitable it should be. Although the correlation is only moderately positive but significant, it confirms one of the most fundamental assumptions in finance.

Table 4 shows how the correlations developed over the different observed periods. Blue indicates positive correlations and red inverse correlations. The more intensive the color is, the stronger the correlation that exists.

Higher risk is associated with higher possible profits. This means that the risk variable normalized in the post-crisis period. There is an unexpected development when the anticipated positive correlation of risk and the MTB ratio turns into a negative relation in the post-crisis period. Higher growth opportunities are associated with higher risk. On the other hand the MTB ratio is an indicator for the future whereas risk, as it is defined here, expresses the status quo. From this perspective, an interpretation of this relationship might not be very meaningful.

Table 4. Correlation matrix of different periods - full data set



6.2 Data description: country data

6.2.1 Country level: factor description

Leverage ratios differ significantly between countries. The Netherlands has the lowest average leverage ratios (21,0% full sample average) closely followed by France (23,9%). With a certain distance Germany shows the third lowest ratios (29,1%). Italy (32,1%) and Spain (35,5%) are close together, whereas Portugal with a full sample average leverage ratio of 44% is by far the country with the highest average figure. As mentioned before this is partly due to the fact that market capitalization decreased more strongly in the periphery than in core Europe. This led to higher market leverage in Italy, Spain, and Portugal. Another effect is the faster recovery of these busts of the core European markets compared to periphery Europe. Looking at the pre-crisis data, the Netherlands and France have the lowest leverage ratios with 17,3% and 21% respectively. In the middle there are Italy, Germany, and Spain with leverage at roughly 25%. Portugal is with 35,3% even before the crisis the country had the highest ratio. This means it cannot only be a crisis effects that drives Portugal's high leverage levels. It will be analyzed in the multivariate analysis which factors determine leverage. In all observed countries, market and book leverage narrow their difference over time. This corresponds to a decreasing MTB ratio in all countries between 2004 and 2012. The strongest drops are in Spain, France, and Italy. This shows that the market had high growth expectations that were not fulfilled. The economies grew unsustainably until 2007 and subsequently crashed. The MTB ratio shows the bubble that was created and burst.

The most profitable companies, on average, are in Italy. It might be surprising that the periphery countries have higher EBITDA margins than Germany. Again, there is a strong survivorship bias and a bias towards large and international companies in the data set. Furthermore, EBITDA measures earnings before interest, tax, and D&A. This means, when applying slightly different accounting rules, these figures might not express the exact same definitions. This is in line with what one might expect, risk, so the volatility of the EBITDA margins, is lowest in Germany, followed by the other core European countries. Italian and Spanish companies, however, have almost double as high of fluctuations in their profitability ratios.

Table 5. Descriptive statistics - country samples

	Germany			Netherlands			France		
	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
Market leverage	26,7%	30,4%	30,3%	17,3%	21,5%	24,1%	21,0%	24,2%	26,4%
Book leverage	33,9%	37,8%	35,7%	32,3%	32,1%	33,5%	35,6%	33,3%	32,0%
Size	16,78	16,93	17,09	15,59	15,83	16,01	16,36	16,58	16,66
Profitability	16,4%	16,4%	17,2%	22,4%	23,9%	25,0%	16,8%	19,2%	19,2%
Risk	1,2%	2,0%	1,2%	2,0%	1,9%	1,4%	2,2%	1,4%	1,0%
NDTS	5,0%	4,5%	4,3%	4,7%	4,2%	4,0%	3,7%	3,5%	3,3%
Tangibility	27,9%	24,3%	24,7%	37,1%	34,7%	34,4%	23,0%	22,7%	22,9%
Market-to-Book	2,23	2,07	1,79	3,08	2,31	2,03	3,24	2,03	1,71
Interest rate	3,7%	3,8%	2,3%	3,8%	4,1%	2,6%	3,8%	4,1%	3,0%

	Italy			Spain			Portugal		
	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
Market leverage	24,8%	33,0%	38,6%	27,6%	37,1%	41,8%	35,3%	44,3%	52,4%
Book leverage	39,5%	43,5%	44,3%	45,7%	50,8%	46,8%	55,2%	62,6%	58,0%
Size	15,38	15,65	15,81	15,11	15,52	15,62	14,45	14,63	14,77
Profitability	31,9%	30,7%	29,3%	23,3%	25,4%	25,4%	18,7%	18,5%	19,0%
Risk	2,2%	1,8%	2,5%	3,8%	2,5%	2,3%	2,0%	1,7%	1,5%
NDTS	5,3%	4,9%	5,1%	4,8%	5,0%	4,4%	5,1%	5,1%	5,1%
Tangibility	35,9%	33,3%	31,5%	43,7%	42,7%	34,8%	41,8%	43,3%	39,5%
Market-to-Book	2,97	2,04	1,74	3,46	2,81	1,85	3,16	3,78	2,08
Interest rate	4,0%	4,5%	5,0%	3,8%	4,2%	5,2%	3,8%	4,4%	8,7%

The NDTS declines in almost all countries and so does tangibility. The large difference in tangible assets across countries is interesting. Portugal and Spain had ratios of above 40% before and during the crisis but dropped below this benchmark in the post-crisis period. The high ratios are due to a bias towards a large proportion of energy, construction and industrial companies in the periphery compared to more service oriented businesses especially in Germany and France. A possible explanation for the decline in tangibility is the fact that companies got rid off unnecessary equipment that binds their capital throughout the crisis. This would explain the stronger tangibility decline in the periphery as well.

Size, measured as the natural logarithm of revenue, is largest in Germany and France. The biggest EMU countries are placed in these two core markets. Size differences between all countries are not notably large. This indicates that a meaningful comparison of the different countries is possible. It would be more difficult to put very small companies in relation to very large companies from other countries.

Interest rates, measured as yields on 10-year government bonds, are very close across countries in the pre-crisis period (see figure 1). When the market started taking into account country risk again, yields went up in Italy, Spain, and Portugal but decreased in Germany, the Netherlands, and France. This shows a clear distinction by the market between core and periphery Europe. It also indicates that the periphery countries face higher financial constraints. How these interest rate proxies influence leverage ratios is analyzed in the multivariate analysis.

6.2.2 Industry classification per country

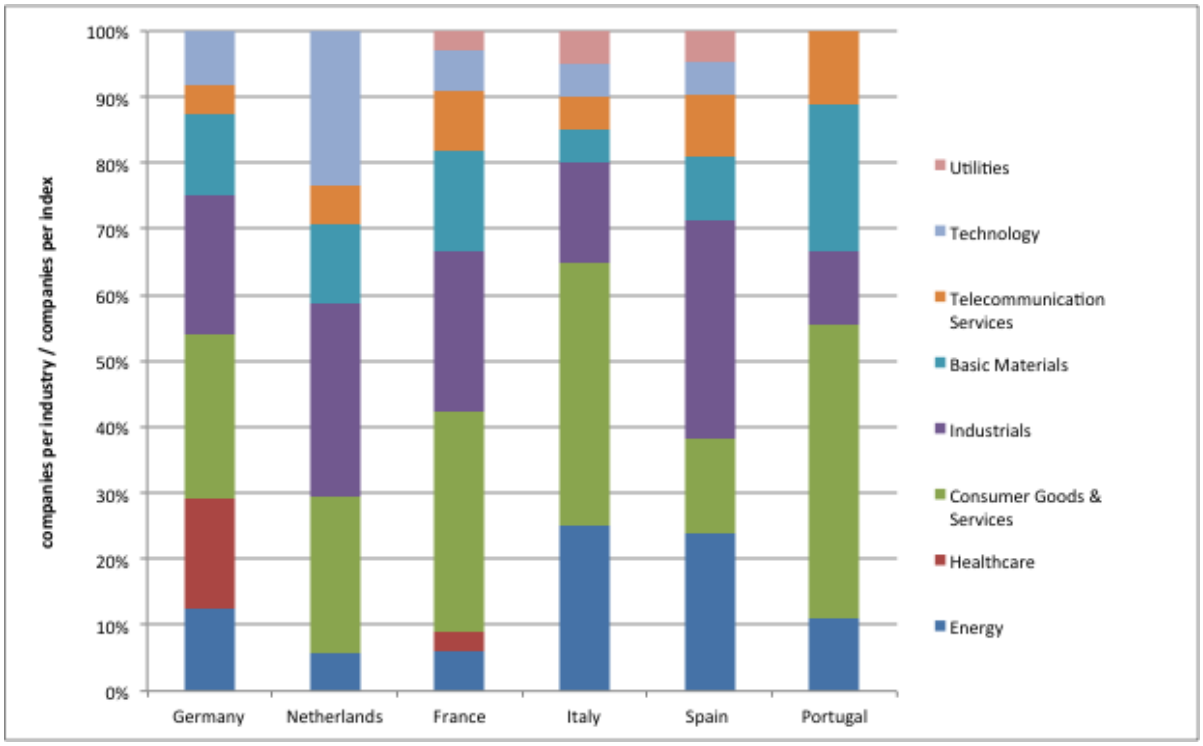
The focus of this analysis is on firm specific leverage determinants and country differences. It does not explicitly cover industry groups. Nevertheless, this is an issue that needs to be discussed. A possible concern is that country differences are driven by the differences in the industry composition of the share index and not so much by country differences itself. Firm level determinants could be driven by industry characteristics as well but there has not been any evidence in previous research that this is the case. As possible differences in leverage determinants between core and periphery Europe are explicitly examined, it is interesting to see whether these two regions share the same industrial composition.

Figure 2 shows that across all six EMU members it is either industrials or consumer goods & services that are the dominating industry group. Infrastructure and construction companies gained importance during the Spanish housing boom before the 2007 financial crisis. Industrial companies make up for the largest part of the Spanish IBEX 35 (33%). Industrials companies make up the largest industry group in the Netherlands as well (29%). The consumer goods & services sector dominates indexes in Portugal (44%), Italy (40%), France (33%), and Germany (25%). The energy sector is quite strong in Italy (25%) and Spain (24%). Germany has a significant healthcare industry (17%); they are the only country with

this industry. The basic materials sector is the second largest industry group in Portugal (22%), third in France (15%), and around 10% in all other countries except for Italy (5%). Technology plays an important role in the Netherlands (24%). Telecommunication services have a similar share in every country, with usually one or two companies being engaged in this industry. It is hardly possible to find an industry pattern to distinguish between core and periphery countries over industries.

If there be significant country differences in the multivariate regressions, which allow a differentiation between core and periphery Europe, it should not be due the industrial composition of these countries as neither core nor periphery Europe share a common industrial decomposition.

Figure 2. Sector grouping per country



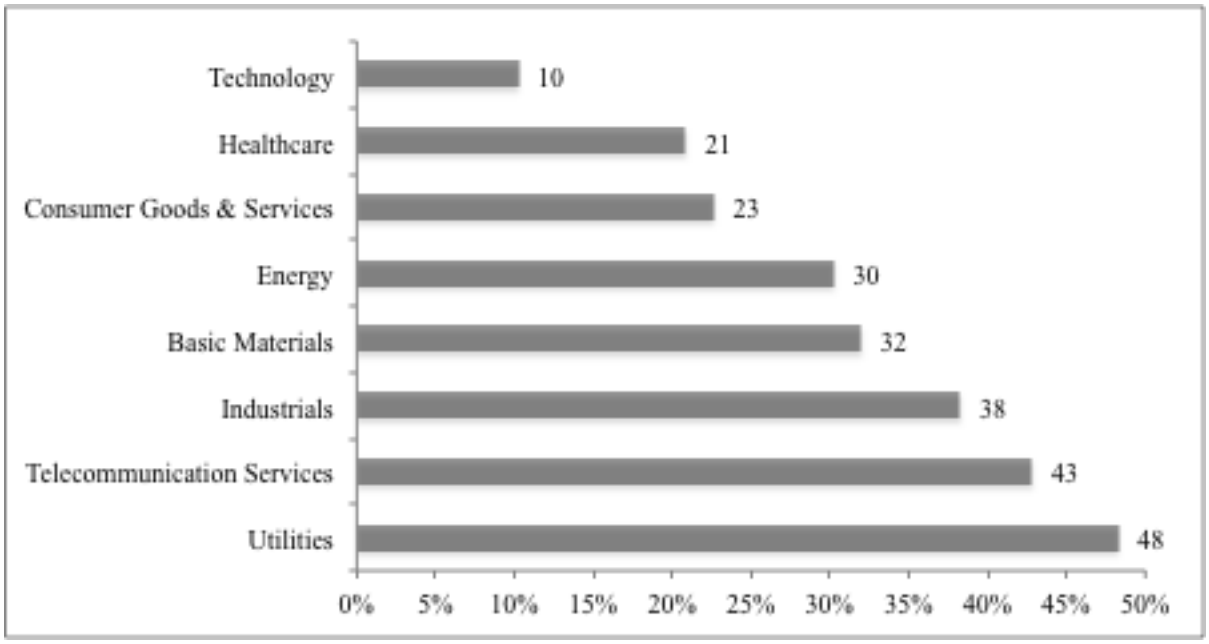
Note. Classification according to Thomson Reuters Business Classification (TRBC)

Figure 3 shows the average leverage ratio per industry group. More than 50% of Portugal's companies are based in low leverage sectors, consumer goods & services and the energy sector. Still, it has the highest average leverage of all countries. The Netherlands have a relatively even mix between low leverage companies, technology and consumer goods & services mostly and high leverage business such as industrials.

Still the Netherlands has the lowest leverage ratios across all countries. Italy's companies are to 65% based in the energy and the consumer goods & services sector. Italy has higher leverage ratios than Germany, even though Germany is more strongly exposed to high leverage businesses such as the automotive industry, industrial companies and basic

materials. It seems that the different levels of leverage per country can only be partly determined by the industrial composition of the index. Other factors determining the leverage ratio could be country specific factors such as capital market access, leverage thresholds accepted by national investors, etc. There are no patterns in the industrial composition of the stock indexes that allow a categorization into core and periphery Europe. Significant differences between leverage determinants in core and periphery Europe are due to the country differences. The effect is not expected to be due to the industrial decomposition but related to other effects.

Figure 3. Leverage breakdown of industry groups



*Note.*Classification according to Thomson Reuters Business Classification (TRBC)

7 MULTIVARIATE ANALYSIS

This part of the analysis presents the evidence for the country regressions. For each country there are two regressions per period: market leverage and book leverage. More determinants appear to be significant for market than for book leverage. Overall, I found that it is mostly the same determinants that influence the results. Furthermore, coefficients seem to be relatively stable and, with a few exceptions, do not show different signs depending on the model specification. As mentioned in the introduction, book leverage is also regressed on its potential determinants to increase the robustness of my results. For the full data set, a set of regressions is conducted also controlling for industry effects, which increases the robustness of the findings even more.

7.1 Country level: period and country regressions

As mentioned before, my hypothesis states that interest rates, tangibility, profitability, and country dummy variables became statistically more significant in periphery compared to core Europe and in the post-crisis and crisis period compared to the pre-crisis situation in the same country. In this part of the analysis, leverage cannot be tested for interest rates, as they are on a country-specific level, the same applies for country dummies. This is done in the next step. Unless otherwise mentioned, the result descriptions will be expressed through market leverage. It will be explicitly mentioned if book leverage is utilized.

My hypothesis can be partially confirmed when the findings for the market leverage regressions is discussed. Even though the evidence is not overwhelming, there is a clear pattern in the Netherlands, Germany, and Italy that profitability becomes more significant in the crisis and post-crisis period compared to the pre-crisis state. On the other side, there is no obvious regional pattern. It is not possible to argue that company's profitability played a more important in role in the periphery compared to the core or vice versa. Worth mentioning is that in almost all cases higher profitability caused higher leverages. This is in line with the static trade-off and the agency theory. When companies generate more profits and a higher free cash flow, their ability to pay interest increases and they are more likely to take on debt. This might be due to the reasons, that with a high EBITDA margin, loan and bond conditions improve and leverage gets more attractive.

The second factor addressed in the hypothesis is tangibility. There is some indication that tangibility influenced leverage positively during the crisis but switched to a negative relation in the post-crisis period. If tangibility is looked at as a proxy for collateral this factor might improve debt conditions for companies during the crisis. When the crisis was over, the security aspect was not as important anymore for capital structure decisions. There are no indications that tangibility is significant in explaining leverage ratios. This result does not support the given hypothesis.

Looking at the other factors, it is observable that there is some evidence that size influences leverage ratios, especially in Germany and France. In Germany, size became more significant in the post-crisis period compared to that of the crisis. In all observed regressions, the effect of size is positively related to leverage. This gives strong evidence to the trade-off theory that argues that large companies are more diversified which has a risk and, hence, a cost of debt reducing effect.

Table 6. Country regression results

	Market leverage Netherlands				Market leverage France				Market leverage Germany			
	Pre-Crisis	Crisis	Post-Crisis	Full sample	Pre-Crisis	Crisis	Post-Crisis	Full sample	Pre-Crisis	Crisis	Post-Crisis	Full sample
Size	0,006	0,008	0,005	0,004	0,011	0,027	0,032	0,016	0,027	0,028	0,027	0,029
	0,343	*0,118*	*0,325*	*0,501*	*0,010* *	*0,000* ***	*0,000* ***	*0,003* **	*0,001* **	*0,000* ***	*0,000* ***	*0,000* ***
Profit	0,176	0,256	0,480	0,242	-0,163	-0,161	0,106	-0,225	0,615	0,258	0,558	0,390
	0,468	*0,294*	*0,043* *	*0,310*	*0,560*	*0,373*	*0,611*	*0,442*	*0,432*	*0,596*	*0,120*	*0,347*
MTB	-0,007	0,008	-0,058	0,001	0,008	-0,056	-0,148	-0,008	-0,069	-0,100	-0,138	-0,093
	0,665	*0,817*	*0,112*	*0,981*	*0,090* °	*0,008* **	*0,000* ***	*0,525*	*0,005* **	*0,000* ***	*0,000* ***	*0,000* ***
Risk	0,517	-0,842	1,675	-0,148	-0,729	-4,228	-3,452	0,029	-3,249	-0,173	-0,323	-2,187
	0,713	*0,495*	*0,484*	*0,784*	*0,293*	*0,046* *	*0,264*	*0,974*	*0,519*	*0,917*	*0,876*	*0,106*
Tangibility	0,089	0,101	-0,017	0,167	0,248	0,232	0,001	0,222	-0,308	0,230	0,275	0,152
	0,655	*0,632*	*0,935*	*0,437*	*0,060* °	*0,132*	*0,994*	*0,210*	*0,367*	*0,447*	*0,269*	*0,520*
NDTS	0,472	-0,076	3,556	0,994	-0,189	-1,546	-0,013	-0,411	-0,291	-1,201	-1,692	-1,364
	0,702	*0,966*	*0,017* *	*0,452*	*0,897*	*0,243*	*0,993*	*0,816*	*0,866*	*0,390*	*0,286*	*0,302*
Regression: $Y_i = \propto + \sum (\beta_i * x_i) + \varepsilon_i$												
Signif. codes: 0,001 '***'; 0,01 '**'; 0,05 '*'; 0.1 '° '												
	Market leverage Spain				Market leveage Italy				Market leverage Portugal			
	Pre-Crisis	Crisis	Post-Crisis	Full sample	Pre-Crisis	Crisis	Post-Crisis	Full sample	Pre-Crisis	Crisis	Post-Crisis	Full sample
Size	0,016	0,021	0,036	0,034	0,024	0,031	0,045	0,030	0,046	0,054	0,054	0,068
	0,099 °	*0,043* *	*0,000* ***	*0,000* ***	*0,005* **	*0,002* **	*0,000* ***	*0,002* **	*0,064* °	*0,213*	*0,048* *	*0,033* *
Profit	-0,070	0,016	0,051	0,267	0,207	0,132	0,577	0,302	0,266	0,777	-0,222	0,240
	0,797	*0,957*	*0,849*	*0,315*	*0,397*	*0,618*	*0,021* *	*0,233*	*0,757*	*0,681*	*0,709*	*0,663*
MTB	0,002	-0,027	-0,058	-0,062	-0,024	-0,073	-0,160	-0,067	-0,073	-0,029	-0,088	-0,097
	0,949	*0,602*	*0,228*	*0,181*	*0,296*	*0,113*	*0,001* ***	*0,085* °	*0,357*	*0,594*	*0,050* °	*0,085* °
Risk	-0,213	4,793	3,228	1,421	-0,985	-3,528	1,367	0,755	-0,773	-2,248	1,100	-4,754
	0,860	*0,097* °	*0,309*	*0,167*	*0,544*	*0,281*	*0,324*	*0,594*	*0,905*	*0,860*	*0,910*	*0,422*
Tangibility	0,306	0,266	0,084	-0,079	-0,009	0,089	-0,346	-0,110	-0,105	-0,491	-0,486	-0,771
	0,281	*0,247*	*0,670*	*0,736*	*0,966*	*0,729*	*0,121*	*0,650*	*0,818*	*0,535*	*0,237*	*0,149*
NDTS	-1,657	-2,439	-3,327	-2,550	-1,717	-0,194	-2,719	-1,618	-1,432	-2,700	2,509	2,440
	0,145	*0,171*	*0,063* °	*0,092* °	*0,139*	*0,891*	*0,039* *	*0,198*	*0,851*	*0,687*	*0,347*	*0,522*
Regression: $Y_i = \propto + \sum (\beta_i * x_i) + \varepsilon_i$												
Signif. codes: 0,001 '***'; 0,01 '**'; 0,05 '*'; 0.1 '° '												

Table 6. Country regression results continued

	Book leverage Netherlands				Book leverage France				Book leverage Germany			
	Pre-Crisis	Crisis	Post-Crisis	Full sample	Pre-Crisis	Crisis	Post-Crisis	Full sample	Pre-Crisis	Crisis	Post-Crisis	Full sample
Size	0,002	0,004	-0,001	-0,003	0,016	0,026	0,029	0,019	0,034	0,032	0,024	0,033
	0,870	*0,527*	*0,925*	*0,677*	*0,007* **	*0,001* ***	*0,000* ***	*0,004* **	*0,000* ***	*0,000* ***	*0,001* **	*0,000* ***
Profit	0,386	0,178	0,546	0,307	0,046	-0,224	0,069	-0,045	0,267	-0,060	0,368	0,226
	0,335	*0,601*	*0,107*	*0,382*	*0,906*	*0,352*	*0,785*	*0,896*	*0,737*	*0,903*	*0,383*	*0,595*
MTB	0,026	0,098	0,002	0,062	0,020	0,005	-0,076	0,016	-0,058	-0,072	-0,073	-0,073
	0,352	*0,055* °	*0,973*	*0,158*	*0,005* **	*0,863*	*0,055* °	*0,293*	*0,017* *	*0,007* **	*0,025* *	*0,001* **
Risk	0,929	-2,421	0,995	-0,244	-1,735	-4,796	-2,548	-0,731	2,152	0,196	-0,125	-1,682
	0,687	*0,180*	*0,777*	*0,760*	*0,078* °	*0,085* °	*0,493*	*0,491*	*0,676*	*0,907*	*0,960*	*0,223*
Tangibility	-0,009	0,128	-0,037	0,168	0,272	0,258	0,021	0,256	-0,275	0,164	0,253	0,090
	0,977	*0,669*	*0,903*	*0,595*	*0,134*	*0,205*	*0,913*	*0,226*	*0,430*	*0,592*	*0,394*	*0,713*
NDTS	2,497	-0,267	5,142	2,433	0,005	-1,330	-0,636	-1,052	-1,912	-1,189	-1,184	-1,470
	0,230	*0,916*	*0,019* *	*0,223*	*0,998*	*0,447*	*0,747*	*0,618*	*0,285*	*0,401*	*0,531*	*0,283*
Regression: $Y_i = \propto + \sum (\beta_i * x_i) + \varepsilon_i$												
Signif. codes: 0,001 '***'; 0,01 '**'; 0,05 '*'; 0.1 '° '												
	Book leverage Spain				Book leverage Italy				Book leverage Portugal			
	Pre-Crisis	Crisis	Post-Crisis	Full sample	Pre-Crisis	Crisis	Post-Crisis	Full sample	Pre-Crisis	Crisis	Post-Crisis	Full sample
Size	0,021	0,020	0,034	0,035	0,021	0,024	0,035	0,023	0,071	0,063	0,047	0,074
	0,110	*0,116*	*0,002* **	*0,003* **	*0,027* *	*0,023* *	*0,002* **	*0,030* *	*0,013* *	*0,143*	*0,055* °	*0,025* *
Profit	-0,025	0,125	0,376	0,430	0,221	0,146	0,693	0,339	0,458	0,445	-0,103	0,140
	0,946	*0,733*	*0,277*	*0,219*	*0,449*	*0,633*	*0,020* *	*0,250*	*0,534*	*0,795*	*0,850*	*0,792*
MTB	0,023	0,005	-0,030	-0,036	0,041	0,016	-0,066	0,015	-0,010	0,008	-0,041	-0,042
	0,603	*0,935*	*0,614*	*0,540*	*0,146*	*0,751*	*0,165*	*0,734*	*0,875*	*0,871*	*0,207*	*0,341*
Risk	0,383	4,853	1,388	2,036	-1,127	-4,198	2,190	0,859	-7,728	-3,843	0,093	-5,704
	0,818	*0,175*	*0,726*	*0,133*	*0,561*	*0,270*	*0,189*	*0,604*	*0,217*	*0,745*	*0,992*	*0,336*
Tangibility	0,425	0,399	0,026	-0,019	0,093	0,203	-0,317	-0,009	-0,434	-0,560	-0,559	-0,875
	0,277	*0,174*	*0,918*	*0,952*	*0,712*	*0,500*	*0,225*	*0,974*	*0,302*	*0,448*	*0,165*	*0,110*
NDTS	-2,810	-2,912	-3,230	-3,531	-2,468	-0,122	-2,896	-1,957	-3,786	-1,816	4,120	2,213
	0,078 °	*0,194*	*0,145*	*0,076* °	*0,080* °	*0,941*	*0,060* °	*0,184*	*0,561*	*0,766*	*0,143*	*0,549*
Regression: $Y_i = \propto + \sum (\beta_i * x_i) + \varepsilon_i$												
Signif. codes: 0,001 '***'; 0,01 '**'; 0,05 '*'; 0.1 '° '												

The MTB ratio plays a dominating role in two core European countries, France and Germany. Leverage ratios in both countries are mostly negatively influenced by the MTB. Recalling the MTB and the leverage definition, it is a mathematical fact that with an increase in the market capitalization and all other variables equal, market leverage decreases and the MTB increases. This leads to an inverse MTB to market leverage relation. The MTB findings in the case of the book leverage regressions are similar to the market leverage case but less significant. Looking at the MTB ratio as a growth proxy, shows that a company has a certain level of growth opportunities. To participate in this growth, investors prefer equity to leverage. Hence, leverage decreases, which results in an inverse relation even in the book leverage regressions. Furthermore, MTB gains more importance in the post-crisis era in Germany, France and Italy. Investors are then more willing to invest in growth opportunities via equity compared to the crisis and compared to the periphery countries.

The results for the risk variable are disappointing. It appears not to be significant in all regressions except for France during the crisis. Also the sign of its coefficient is inconsistent. In core Europe, risk is mostly inversely related to leverage. In Spain on the other hand, risk shows a positive relation to leverage. There are no signs that it changed its significance or the direction of influence during the crisis.

The NDTS became of higher importance during the post-crisis period in the Netherlands, Spain, and Italy. This gives little evidence for the fact that NDTS played a stronger role in periphery than in core Europe. As expected, the relation is negative in most cases. It is only the Netherlands showing a positive NDTS to market leverage relation.

Overall results are weak in the market leverage case and even worse for the book leverage regressions. The best-fit models might provide an outcome that allows a more meaningful interpretation.

7.2 Country level: best-fit model

As outlined in the methodology section, besides regressing leverage on different factors, I also determine the best-fit model for each country based on the full sample data set (over all periods). Even though there were six factors plus the intercept included in the initial model, relatively few factors are sufficient enough to define the best model for market leverage. This is due to the general-to-specific selection process. It eliminates factors that appear to be not significant according to their t-value and as a result other factors gain on importance. The derived models are compared through the AIC, which penalizes models that use more factors than their peers. Hence, the best-fit models following the AIC approach incorporate relatively few factors.

First, it is interesting that some factors that appear to be of importance did not do so in the regressions above. This allows for the opportunity to evaluate the findings from before in a

different light. Second, there is no obvious pattern in the core vs. the periphery models. The size variable plays a strong role in explaining capital structure. It is significant in all regressions and is always positively related to leverage. In short, size is the dominant factor when explaining leverage. The importance of the MTB ratio was highlighted earlier. Here it is shown that it is in the best model for Italy and Portugal as well. Another possible explanation for the MTB's negative coefficient is that a growth opportunity is nothing physical but rather the expectation that future payoffs will be higher. Growth companies have higher expected future earnings and bear a higher risk. This leads to an increase in the cost of debt. In such a case, management prefers internal sources or equity financing over debt issuance (Myers, 1977). This results in an inverse relation to leverage. The findings for the NDTS are interesting. The significant and negative relation in the case of Spain makes perfect sense. An increase in the NDTS decreases the tax benefits of debt. Therefore, it has an inverse relation to leverage. A meaningful interpretation of a positive influence of the NDTS, as shown in the case of the Netherland, is hardly possible.

Table 7. Best model per country

Best model market leverage												
Netherlands		France		Germany		Spain		Italy		Portugal		
Intercept	-0,456	Intercept	-0,552	Size	0,031	Size	0,031	Size	0,028	Size	0,056	
	0,112		*0,120*		*0,000*	***	*0,000*	***	*0,000*	***	*0,001*	**
Size	0,030	Size	0,045	MTB	-0,086	NDTS	-2,561	MTB	-0,054	MTB	-0,062	
	0,070	°	*0,036*	*	*0,000*	***	*0,014*	*	*0,111*		*0,015*	*
Profit	0,541	Tangibility	0,183	Risk	-2,274					Tangibility	-0,462	
	0,001	**	*0,143*		*0,078*	°					*0,125*	
NDTS	1,322											
	0,167											

Signif. codes: 0,001 '***'; 0,01 '**'; 0,05 '*'; 0.1 '° '

Tangibility's coefficient is, as seen in the case of France, positively and negatively related to leverage in the case of Portugal. This shows that tangibility plays a role when determining leverage. One explanation for France could be that an increase in the tangible assets relative to revenue is an increase in the collateral, which leads to interest rate reductions and makes it attractive to take on more debt. This argument follows the trade-off reasoning. The pecking order theory offers another explanation: as tangible assets are easier to evaluate, information asymmetries are reduced which makes equity issuance less costly and more attractive. This leads to a negative relationship as in the Portugal case. The importance of tangibility provides some evidence for my hypothesis stating that it is an important factor for leverage, even though there is no evidence that it plays a more important role in the periphery compared to core Europe. When the evidence for my hypothesis concerning profitability in the previous section was moderate to good, however here there was no supporting evidence found. Profit is of high significance, not in the core but for the Netherlands. The significance is high and positive, supporting the trade-off theory idea that more profitable companies have it easier to repay debt, get therefore better conditions and increase leverage as a result.

When comparing the country level regressions, there are some interesting results. Size is the most important factor when explaining leverage. Its significance is highest in the crisis and post-crisis period. Similar evidence is found for the MTB ratio. Its importance increased towards the post-crisis period in Germany, France, and Italy. MTB is able to explain leverage in the all-period case in Portugal, Spain and Germany. Similar but weaker evidence is given for profitability. It gained importance in the post-crisis period in the Netherlands, Germany and Italy but is not of such high significance as size or the MTB ratio. Very much alike as profitability is the effect of the NDTS. Its importance increased in the post-crisis period in the Netherlands, Spain and Italy and appears in the best model estimation for the Netherlands and Spain. Results for tangibility and risk are weak, even though tangibility plays some role in the best model estimation of France and Portugal.

In this part of my thesis the evidence suggests that in different periods different factors influence company's capital structure, especially with regards to the 2007 financial crisis. Although there are significant country differences, my findings from the research do not indicate that leverage is influenced by different factors when comparing core to periphery Europe. So far, the findings do not suggest that a division between core and periphery Europe is reasonable.

7.3 Full sample: period regressions

In this part of the analysis, leverage is regressed on a data set that combines all six single countries. Company's origin is differentiated through country dummy variables. The interest rate variable that serves as a proxy for financial constraints is the same for companies from the same country. To avoid multicollinearity, it is necessary to either exclude the intercept or the interest rate variable. In this section, only results without the interest rate variable are presented. Findings where the interest rate is included into the model and the intercept is left out can be found in the appendix. As before, regressions with market and book leverage as dependent variables are conducted to increase the robustness of the results. Except for the MTB ratio, results for market and book leverage are almost identical.

The most prominent result in this part of the analysis is the same as above. Size is the most dominant leverage factor in the single period, as well as in the all-period regressions. The confidence level in the all-period case is 99%. Similarly as described in the section above, size increases in significance from the crisis to the post-crisis period. The explanation is the same as before. Large companies are more diversified and therefore bear less risk. This effect became more significant between 2010 and 2012 and so does size influence on leverage. The risk reduction leads to lower cost of debt and hence, increases leverage, causing a positive relation between size and leverage. These results hold true for both, the market and the book leverage case.

Table 8. Full sample results excluding interest rate

	Market leverage full sample				Book leverage full sample			
	Pre-Crisis	Crisis	Post-Crisis	All periods	Pre-Crisis	Crisis	Post-Crisis	All periods
Intercept	-0,174	0,106	0,075	-0,026	-0,109	0,011	-0,147	-0,093
	0,316	*0,604*	*0,716*	*0,890*	*0,630*	*0,966*	*0,544*	*0,692*
Size	0,036	0,031	0,043	0,039	0,041	0,036	0,051	0,044
	0,001 **	*0,016* *	*0,001* ***	*0,002* **	*0,004* **	*0,019* *	*0,001* ***	*0,004* **
Profit	0,023	0,099	0,309	0,160	0,062	0,078	0,457	0,215
	0,818	*0,381*	*0,004* **	*0,124*	*0,635*	*0,569*	*0,000* ***	*0,095* °
MTB	-0,002	-0,040	-0,098	-0,033	0,015	0,010	-0,033	0,007
	0,715	*0,000* ***	*0,000* ***	*0,001* ***	*0,027* *	*0,427*	*0,028* *	*0,546*
Risk	-0,121	-0,097	0,911	0,147	-0,062	-0,680	1,513	0,098
	0,800	*0,911*	*0,298*	*0,689*	*0,920*	*0,518*	*0,143*	*0,829*
Tangibility	0,208	0,128	-0,050	0,065	0,225	0,195	-0,091	0,100
	0,007 **	*0,155*	*0,524*	*0,446*	*0,025* *	*0,077* °	*0,327*	*0,341*
NDTS	-1,383	-0,635	-0,790	-1,171	-1,692	-0,772	-0,730	-1,282
	0,003 **	*0,213*	*0,154*	*0,017* *	*0,006* **	*0,214*	*0,262*	*0,034* *
GER	-0,144	-0,254	-0,355	-0,263	-0,266	-0,277	-0,357	-0,309
	0,020 *	*0,001* ***	*0,000* ***	*0,000* ***	*0,001* **	*0,002* **	*0,000* ***	*0,000* ***
FR	-0,191	-0,315	-0,396	-0,305	-0,258	-0,320	-0,389	-0,330
	0,002 **	*0,000* ***	*0,000* ***	*0,000* ***	*0,001* **	*0,000* ***	*0,000* ***	*0,000* ***
NE	-0,217	-0,323	-0,369	-0,309	-0,274	-0,326	-0,347	-0,324
	0,000 ***	*0,000* ***	*0,000* ***	*0,000* ***	*0,001* ***	*0,000* ***	*0,000* ***	*0,000* ***
IT	-0,127	-0,214	-0,262	-0,198	-0,185	-0,200	-0,271	-0,219
	0,038 *	*0,003* **	*0,000* ***	*0,002* **	*0,021* *	*0,023* *	*0,001* ***	*0,006* **
SP	-0,107	-0,144	-0,200	-0,143	-0,139	-0,139	-0,214	-0,161
	0,068 °	*0,030* *	*0,002* **	*0,018* *	*0,070* °	*0,084* °	*0,005* **	*0,032* *

Regression: $Y_i = \propto + \sum(\beta_i * x_i) + \sum(\beta_i \times z_i) + \varepsilon_i$

Signif. codes: 0,001 '***'; 0,01 '**'; 0,05 '*'; 0.1 '° '

The MTB ratio shows significance on an even higher overall level (on the 99,9% confidence interval) in the market leverage case. As already outlined, the high significance in the market leverage case can be explained by the effect that an increase in market capitalization has on market leverage. This should partially explain MTB's high significance level. Especially, with regards to the fact that in the case of book leverage significance is much lower. Interestingly, market leverage and the MTB ratio show a negative relation in all regressions, whereas it does so for book leverage only in one out of the four regressions. Negative relations indicate the preference of investors to participate in growth via equity. A positive relation assumes that growth is preferably financed with debt.

As stated in my hypothesis, the significance of factors is expected to change over the three different periods. At the end of the crisis, investors and management alike, started focusing again on the future. The MTB ratio as a predictor for growth opportunities influenced capital structure more when the worst of the 2007 financial crisis was over.

The evidence found for tangibility is contradictory to my hypothesis. It was assumed that the collateral proxy is more significant in times of financial distress and in an uncertain macroeconomic climate. This is not the case. Tangibility shows significance on a confidence interval of 99% in the pre-crisis period (on market leverage) and has a positive influence on leverage due to its risk reducing effect for investors, as higher tangibility means higher liquidation value in the case of bankruptcy. Furthermore, we see a significant effect of the NDTS on leverage with a p-value for the t-test below 1% in the pre-crisis period for both, market and book leverage, and with a p-value below 5% in the all-periods market and book leverage regression. This shows that the NDTS has an effect on leverage. The evidence on profitability supports my hypothesis that this factor increases in significance in the post-crisis period. More profitable companies can more easily serve debt, get better financing conditions, and thus prefer debt over equity when increasing their capital base. Even after the crisis markets are still conservative in investing into debt and so profitability plays a more important role in capital structure decisions. Therefore, a jump is seen in the significance of profitability. Risk, as it is measured here, plays no role in determining leverage ratios.

Two, size and the MTB ratio, out of the four determinants of the "core model of leverage" as characterized by Frank and Goyal's (2009) are found to be significant on at least the 99% confidence level in the all-period case. Profit appears to be of slight significance (p-value of 9,5%) whereas tangibility shows no significance in the all-period case. Following these findings, it is possible to partly confirm the validity of the "core model of leverage".

Let us now turn the attention to the variables that were not included in the country regressions: interest rate and the dummy variables. Looking at the country dummies, it is observable that company's location matters significantly in determining its leverage ratio. There is significance for all country dummies in the all-period regression in the market and the book leverage case. As expected, the country effect is very strong during the 2007

financial crisis. The country dummies are even more significant during the European sovereign debt crisis. This should not be surprising, as financial constraints became even larger in the post-crisis period. SMEs might even face worse refinancing conditions. An obvious counter argument is that these measured country effects can also be caused by other factors. Examples include the difference in the financing behavior of companies based in the different national markets, or that traditionally, e.g. companies in Portugal take on more debt than in the Netherlands. Of course, factors like country specific economic behavior contribute to the significance of the country dummies as well. On the other side, it cannot be neglected that their significance was lower during the pre-crisis period. Therefore, it seems to be the case that it is crisis effects that mostly drive country dummies' significance. The question that arises then is what these crisis effects could possibly be. It is factors that are not captured by other variables in the regression. These effects are not firm specific as the country dummy is the same for all companies within a country. These dummies could represent capital market access and financial constraints. This was an issue for the large public companies in the European periphery since 2007. For companies from core Europe this has not been so much of a problem.

The reader should remember what was explained in the methodology section. Due to multicollinearity, a dummy for Portugal was not included. This implicitly means that all other country effects are measured against Portugal. There is a clear distinction between core and periphery countries. It seems to matter greatly that a company is based in France, the Netherlands or Germany, but not in Portugal. This effect is strongest after 2007. On the other side, it does not matter for companies so much where on the Iberian Peninsula they are based, in Spain or in Portugal. Italy's results also show clearly that it does not want to be confused with Portugal. This evidence is even stronger in the book leverage regressions.

When conducting regressions with different country dummy combinations there is one clear pattern. It is significant whether a company is from the core or the periphery but not from which core or periphery country exactly. If e.g. the significance is tested against a core country, it matters if the company is from the core or from the periphery but not so much from which core country exactly. If dummies are measured against a periphery country, it matters more if it is from Portugal or not within the periphery countries. For the core country companies it matters only that they are not from the periphery.

These findings fully support my hypothesis. After 2007 a company's "home" increased in significance when explaining leverage ratios. It is not so important in which specific country a company is based but it matters significantly whether it is in the core or in periphery Europe. As expected this effect increases strongly during the crisis period.

The interest rate variable has not found to be significant in any of the observed cases (see appendix A). This is a surprising result as it was expected that the cost of debt and its different size across countries significantly influences leverage ratios. One possible

explanation is that the effect of the interest rate, as a proxy for financial distress, is already picked up by the country dummies.

More regressions were conducted to see how sensitive country dummies and the interest variables react against different variable combinations. When excluding the interest rate variable, firm specific factors do not change. In the post-crisis and the full sample case, country dummies are more significant when the interest rate variable is not included into the model. This supports the aforementioned idea that the interest rate picks up some of the country effects and vice versa. When excluding the country dummies, the role of the interest rate changes. It is of no significance in the pre-crisis period but slightly significant during the crisis. When the European sovereign debt crisis starts and is at its peak in the post-crisis period, the interest rate variable's p-value for the t-test is below 1%, making it highly significant. The importance of the cost of debt, which can be seen as a proxy for financial distress or for problems in capital market access, increases in the crisis and reaches its peak in the post-crisis period, which is the European sovereign debt crisis. This provides additional support for the country dummy interpretation. After 2007, it is of great significance whether a company is based in core or periphery Europe, as they face very different financing constraints. Interest rates are measured as yields on 10-year government bonds of the company's respective government. This shows how strongly financing access of companies are related to country specific risk.

7.4 Full sample: best-fit model

When looking at the best model for market leverage in the full sample data, there is again a couple of obvious things that can be observed. Country dummies are highly significant. As discussed before, it is important not to be Portugal (country dummies' significance is compared relative to Portugal).

This difference is more significant for core than for periphery countries. During the crisis, the Spanish country dummy disappears from the best-fit model. This supports the earlier statement that it does not matter so much where on the Iberian Peninsula a company is based. In the other models it matters whether a company is from core Europe and Italy compared to Portugal but during the crisis it did not matter if a company is based in Spain or in Portugal. Both countries faced similar financial constraints and similarly difficult macroeconomic environment. Once more the analysis highlights the importance of size and the MTB ratio in determining leverage. Tangibility plays a role in the pre-crisis and the crisis period and gets replaced by profitability in the post-crisis period. The importance of profitability for the post-crisis era was predicted. Evidence on tangibility is contrary to the hypothesis' prediction. As before, risk is insignificant and the NDTS only appears in the pre-crisis and in the full sample regressions.

Table 9. Best model full sample

Pre-crisis		Crisis		Post-crisis		All periods	
Size	0,025 *0,000* ***	Size	0,034 *0,000* ***	Size	0,045 *0,000* ***	Size	0,039 *0,000* ***
Tangibility	0,200 *0,001* **	MTB	-0,039 *0,000* ***	Profit	0,286 *0,001* ***	Profit	0,210 *0,009* **
NDTS	-1,429 *0,001* **	Tangibility	0,193 *0,006* **	MTB	-0,098 *0,000* ***	MTB	-0,035 *0,000* ***
GER	-0,136 *0,023* *	GER	-0,236 *0,001* ***	GER	-0,341 *0,000* ***	NDTS	-1,173 *0,015* *
FR	-0,192 *0,001* **	FR	-0,285 *0,000* ***	FR	-0,374 *0,000* ***	GER	-0,273 *0,000* ***
NE	-0,222 *0,000* ***	NE	-0,299 *0,000* ***	NE	-0,352 *0,000* ***	FR	-0,316 *0,000* ***
IT	-0,132 *0,021* *	IT	-0,186 *0,005* **	IT	-0,240 *0,000* ***	NE	-0,314 *0,000* ***
SP	-0,120 *0,033* *			SP	-0,177 *0,004* **	IT	-0,208 *0,001* ***
						SP	-0,142 0,014 *

Signif. codes: 0,001 '***'; 0,01 '**'; 0,05 '*'; 0.1 '° '

7.5 Full sample: industry effects

As explained in section 6.2.2, it is not possible to classify the share indexes of Germany, France, the Netherlands, Italy, Spain, and Portugal into two groups along their industrial composition. In this part of the analysis, industry dummies are included to observe their effect on the significance of the other variables.

The first observation is that the factors' beta change only slightly when industry dummies are included. Only in a few cases where the betas are close to zero, the direction of influence on leverage changes. Second, results are robust when including industry dummies. Looking at firm specific factors, in the crisis period tangibility and the NDTS increase in significance when the industry variables are included. On the other hand, size and profit are more significant in the post-crisis period when the industry effects are excluded. The most interesting question is whether the industry dummies take away some of the country specific effects. This would mean that the differences are not due to regional patterns but are caused by the industrial composition of the respective share index. In general, this is not the case. In the pre-crisis case, the dummies for Germany, France and the Netherlands are less but are still highly significant when including industry effects. With regards to industry effects, in the pre-crisis case it does not significantly matter from which periphery country a company is coming. The significance of Italy and Spain's dummies in relation to Portugal almost disappears.

Table 10. Full sample results including industry dummies

	Market leverage full sample incl. sectors				Book leverage full sample incl. sectors			
	Pre-Crisis	Crisis	Post-Crisis	All periods	Pre-Crisis	Crisis	Post-Crisis	All periods
Intercept	-0,214	0,093	0,132	0,035	-0,087	0,051	-0,051	0,023
	0,237	*0,640*	*0,504*	*0,854*	*0,698*	*0,835*	*0,824*	*0,921*
Size	0,032	0,025	0,031	0,027	0,029	0,024	0,033	0,026
	0,006 **	*0,046* *	*0,015* *	*0,024* *	*0,047* *	*0,110*	*0,023* *	*0,077* °
Profit	0,011	0,048	0,237	0,108	0,014	0,002	0,354	0,122
	0,916	*0,654*	*0,022* *	*0,286*	*0,912*	*0,986*	*0,003* **	*0,317*
MTB	0,002	-0,040	-0,089	-0,030	0,017	0,008	-0,022	0,008
	0,770	*0,000* ***	*0,000* ***	*0,001* **	*0,011* *	*0,516*	*0,105*	*0,450*
Risk	-0,333	0,213	1,143	-0,064	-0,417	-0,212	1,646	-0,177
	0,498	*0,798*	*0,155*	*0,858*	*0,497*	*0,836*	*0,080* °	*0,680*
Tangibility	0,224	0,159	-0,098	0,057	0,220	0,200	-0,162	0,090
	0,012 *	*0,093* °	*0,247*	*0,548*	*0,046* *	*0,087* °	*0,099* °	*0,426*
NDTS	-1,625	-1,023	-1,178	-1,380	-1,965	-1,106	-0,913	-1,496
	0,001 **	*0,047* *	*0,040* *	*0,007* **	*0,002* **	*0,080* °	*0,170*	*0,014* *
GER	-0,126	-0,229	-0,316	-0,225	-0,219	-0,243	-0,309	-0,253
	0,043 *	*0,001* **	*0,000* ***	*0,000* ***	*0,005* **	*0,004* **	*0,000* ***	*0,001* ***
FR	-0,186	-0,311	-0,385	-0,290	-0,238	-0,310	-0,370	-0,303
	0,002 **	*0,000* ***	*0,000* ***	*0,000* ***	*0,002* **	*0,000* ***	*0,000* ***	*0,000* ***
NE	-0,192	-0,302	-0,327	-0,271	-0,220	-0,292	-0,292	-0,266
	0,002 **	*0,000* ***	*0,000* ***	*0,000* ***	*0,004* **	*0,000* ***	*0,000* ***	*0,000* ***
IT	-0,102	-0,187	-0,241	-0,168	-0,155	-0,178	-0,251	-0,182
	0,090 °	*0,006* **	*0,000* ***	*0,006* **	*0,040* *	*0,032* *	*0,001* ***	*0,013* *
SP	-0,094	-0,141	-0,210	-0,136	-0,124	-0,141	-0,230	-0,151
	0,106	*0,023* *	*0,000* ***	*0,019* *	*0,087* °	*0,063* °	*0,001* ***	*0,029* *
ENY	0,016	0,013	0,147	0,080	0,128	0,097	0,228	0,151
	0,808	*0,850*	*0,027* *	*0,218*	*0,123*	*0,254*	*0,004* **	*0,053* °
BM	0,098	0,046	0,132	0,098	0,134	0,073	0,154	0,118
	0,120	*0,489*	*0,039* *	*0,110*	*0,088* °	*0,370*	*0,039* *	*0,111*
IND	0,097	0,157	0,209	0,165	0,206	0,218	0,283	0,241
	0,080 °	*0,008* **	*0,000* ***	*0,002* **	*0,003* **	*0,003* **	*0,000* ***	*0,000* ***
CGS	0,085	0,106	0,129	0,103	0,182	0,155	0,166	0,164
	0,099 °	*0,053* °	*0,012* *	*0,038* *	*0,005* **	*0,022* *	*0,006* **	*0,007* **
TEL	0,190	0,264	0,322	0,261	0,370	0,346	0,375	0,371
	0,007 **	*0,001* ***	*0,000* ***	*0,000* ***	*0,000* ***	*0,000* ***	*0,000* ***	*0,000* ***
UT	0,184	0,179	0,339	0,255	0,348	0,263	0,398	0,335
	0,065 °	*0,078* °	*0,001* ***	*0,008* **	*0,006* **	*0,037* *	*0,001* ***	*0,004* **
HC	0,135	0,107	0,122	0,115	0,189	0,143	0,158	0,164
	0,098 °	*0,207*	*0,125*	*0,134*	*0,063* °	*0,173*	*0,088* °	*0,077* °

Regression:

$$Y_i = \propto + \sum(\beta_j * x_j) + \sum(\beta_l * z_l) + \sum(\beta_{i,n} * ind_{i,n}) + \varepsilon_i$$

Signif. codes: 0,001 '***'; 0,01 '**'; 0,05 '*'; 0.1 '° '

The highly significant findings for country dummies (99,9% confidence level) in the crisis and post-crisis period are confirmed when industry dummies are included into the regressions. This increases the robustness of my results and gives a strong foundation for the interpretation of the country effects. Looking at the all-period case, it is obvious that for both leverage definitions, country differences are of high significance. As before, due to multicollinearity, the interest rate variable can only be included when the intercept is excluded. The interest rate is not significant in any case when industry dummies are included.
Let me now elaborate on the specific industries. The dummies for the seven specific sectors are measured against the technology industry. The technology industry has the lowest leverage level across all observed sectors, 10% on average. The other dummies are compared against the technology sector. When a company defines its capital structure it highly matters whether or not it is based in the telecommunication industry. The telecommunication sector dummy is highly significant throughout all-periods. During the crisis there is a similar effect for industrial companies. Especially, in the post-crisis period the sector matters. The dummies

for industrials, telecommunication and utility companies show the highest level of significance. Obviously, firm's leverage is significantly determined by whether a business is based in one of the three mentioned sectors or in the low leveraged technology industry. These three sectors are also the highest levered industries overall (see figure 3). For companies based in one of these three sectors it is more important that they are based in a highly levered industry than for companies based in sectors where average leverage is typically low and close to the leverage level of the technology sector. The proof for book leverage is in general slightly weaker than for market leverage, but it shows the same patterns.

In this section of the analysis there is additional evidence for the prominent role size, the MTB ratio, and the NDTS play. Their significance changes over the different periods. These findings support my hypothesis in such a way that firm specific factors change their importance corresponding to the specific period. Results for profitability show a similar pattern, as this factor is more important in the post-crisis period. Evidence on tangibility does not support my hypothesis that tangible assets play an important role in determining leverage during the crisis. The significant results of the NDTS give additional proof to the trade-off theory of capital structure. Companies' origin is of high significance when explaining leverage and has the highest significance during the crisis. As expected, for companies it matters whether they are based in core or in periphery Europe. This effect is robust when including industry dummies. The interest rate proxy is only significant when country dummies are excluded.

7.6 Findings compared to previous research

As outlined in the literature review, there is no common set of variables that is able to explain leverage across all previous studies. Nevertheless, there are leverage determinants that became evident in the majority of papers as a key determinant. These factors are size, the MTB ratio, profitability, and tangibility. In this work the strong importance of size and the MTB variable is confirmed. NDTS plays a considerable role as well and to smaller extent also profitability and tangibility.

The dominant determinant of the empirical work in this paper is size. It shows to be significant in most regressions and is included in every best-fit model. Even though size is considered to be one of the key factors in most other studies, such strong evidence is unusual. Antoniou et al. (2002), Psillaki and Daskalakis (2009) and Beck et al. (2008) find a positive and significant relation of size and leverage. Mixed results are found by Frank and Goyal (2009) and Deesomsak et al. (2004), who observe no reliable size effect. My data set covers a time span with the worst economic crisis since the Great Depression in 1929. The importance of size as a contributor to risk reduction might have played an exceptionally important role during these exceptional economic times. De Jong et al. (2008) covers 42 countries between 1997 and 2001. In their analysis, Germany, Spain and Portugal's size variables are not

significant at all. The period independent high significance found in my analysis for Germany's and France's size factor is in line with Antoniou et al. (2002). Similarly, the role of the MTB ratio and its relation to market leverage is highlighted. Overall, the strong evidence provided by my data, is similar to findings of Booth et al. (2001) and Chang et al. (2009). The significant inverse relation to leverage disappears in Chang et al.'s (2009) case when they include a country dummy. Such an effect is not visible in my analysis. Inconsistent results for MTB are found by Antoniou et al. (2002) and Deesomsak et al (2004). In this work, the strongest relation is found for Germany, France and partly Italy. De Jong et al. (2008) find the exact same evidence. Antoniou et al. (2002) and Rajan and Zingales (1995) confirm this effect.

At several occasions the importance of variable definition is pointed out. Chang et al. (2009) show that when they divide EBIT by total assets the effect on leverage is negative but positive when EBIT is divided by revenue. A positive relationship is found for EBITDA divided by revenue. A partly significant and positive relation from my research is in contrast to most previous studies, e.g. Antoniou et al. (2002), de Jong (2008), Frank and Goyal (2009), Booth et al. (2001) and Fama and French, (2002). In terms of country specific significance for profit, significance is found (p-value of 5%) for this factor in Germany, Italy and the Netherlands in the post-crisis period. As in Rajan and Zingales (1995), in my data set there is no significance for France's profitability variable. Antoniou et al. (2002), de Jong et al. (2008) and Psillaki and Daskalakis (2009) find a very strong effect for France.

Booth et al. (2001) observe that capital structure decisions are, in general, influenced by the same variables in Europe and the U.S. In this analysis there is clear evidence that the significance of firm specific leverage determinants is strongly country dependent. This is confirmed by the studies of Psillaki and Daskalakis (2009) and Antoniou et al. (2002). As in Deesomsak et al. (2004) it is found in my analysis that in certain countries specific factors are of very high significance and show no sign of impact on leverage in other countries. This is for example the case with the strong influence of the MTB ratio in France and Germany compared to the Netherlands, Spain, and Portugal. Kayo and Kimura (2011) find the influence of country variables on leverage to be of very low significance but acknowledge an indirect effect of the country level variables on firm specific factors. Hall et al. (2004) observe differences in firms' leverage determinants across countries. They explain this with financial constraints, tax issues, and cultural differences. De Miguel and Pindado (2001) favor a similar argument, stating that financing constraints can explain the different leverage determinants across countries. They argue that the difference in leverage determinants between U.S. and Spanish companies arises from an inadequately developed bond market in Spain. Wald (1999) detects differences across countries in the relation of leverage with risk, profitability, size, and growth. According to Wald (1999) these differences are due to institutional reasons.

Deesomsak et al. (2004) observe leverage of companies in Singapore, Malaysia, Thailand, and Australia. Similar to this study here, they include country dummies and an interest rate variable depending on the country in which the companies are based. Deesomsak et al. (2004) find the same effects as in this analysis. Country dummies are of high significance and the interest rate shows no significance, at least in combination with the country dummies. The period results from my research are somewhat different in comparison with Deesomsak et al. (2004). Their significances are more consistent over the different periods. They only see the factors profitability and tangibility becoming more important from the pre- to the post-crisis period. Furthermore, their data shows no significance for the growth proxy but size is of comparable importance as in the here presented findings. Risk, on the other side, is found by Deesomsak et al. (2004) to be significant on the 1% level. In the above regressions, there are no signs of significance of the risk variable. Looking at country dummies, Deesomsak et al. (2004) observe a similar importance in their Asia-Pacific data set as is represented in my analysis. In contrast to the Asia-Pacific region, the EMU is a much more homogenous economic area. Nevertheless, after the macroeconomic shock in 2007, the still existing heterogeneity of the EMU became obvious. Markets might have overestimated national differences between EMU members after 2007 as much as they undervalued the differences before (see figure 1). This can be seen by the increase in significance of the country dummies during the crisis and in the post-crisis period. The heterogeneity and the country dummies' high significance in the Asia-Pacific data set were not caused by the Asian crisis. Asia-Pacific is simply a region comprised of countries with significantly different legal, cultural and regulatory differences, in contrast to the EMU.

Evidence found in this thesis is similarly to previous studies on companies' capital structure. The importance of size and the MTB ratio is confirmed by prior research. The mixed results in this study on tangibility and profitability are unexpected compared to other papers but not unusual. There is no factor that has proven to be significant over all observed research. As other scholars who conducted a cross-country comparison, in my analysis there are no strong differences in the significance of firm specific factors across countries and in the different periods. Hence, this research adds proof to the literature that argues that firm specific factors are independent of company's location.

On the other side, the findings on country dummies and the interest rate variable add additional proof to existing work on the topic stating that it is of high importance where a company is based and in which economic environment it is functioning. This means, although firm specific factors are not different across countries, the country itself plays a crucial role when explaining firm's capital structure.

8 INTERPRETATION

8.1 Empirical results in the light of capital structure theories

In chapter four, the model's variables are defined and the capital structure theories' predictions about the influence of the independent variables on leverage are explained. In this section, it will be analyzed whether theory rightly anticipated these relations.

The analysis clearly shows that company size has a significant positive relation to leverage. This is anticipated by the trade-off theory. As outlined before, the reasoning under the trade-off framework is such that large companies have more revenue generating business units. This decreases their dependency on a single business unit or product and hence, increases diversification. As more diversification is associated with lower risk, larger companies are less vulnerable and have a reduced probability of bankruptcy. This decreases the cost of debt, which makes it more attractive for companies to take on debt. As there is a positive size – leverage relation in more than 100 conducted regressions, there is no proof that the pecking order theory, which argues that larger companies are more likely to use their retained earnings and have therefore a negative relation to leverage, is valid.

A growth opportunity is nothing "physical" but the simple expectations of an increase in future earnings. This expectation cannot serve as a collateral, like tangible assets, but is perceived more as a risky investment by investors. Therefore, companies with high growth opportunities face higher costs of debt.

This results in a negative relation between leverage and the MTB ratio. The pecking order theory makes a much simpler point. It argues that investments are more often financed with debt. Companies with high growth opportunities invest more and have, as a result, more leverage on their books (Frank & Goyal, 2009). This leads to a positive leverage to MTB relationship. Another explanation is that when market capitalization increases in value, this increases the MTB as well and, per definition, decreases market leverage. This results in a negative MTB to leverage relation. This mathematical explanation should not be forgotten, as it should be partly responsible for the inverse market leverage to MTB ratio relation. This explanation is supported by the fact that in the book leverage scenario the MTB coefficient is more often positive. For the market leverage regressions, MTB is to the vast majority inversely related to leverage. In the book leverage cases, my findings are mixed.

Table 11. List of variable behavior according to theory - restated

Tangibility	positive	Trade-off theory; agency theory
	negative	Pecking order theory
Market-to-Book	positive	Pecking order theory
	negative	Trade-off theory
Firm Size	positive	Trade-off theory
	negative	Pecking order theory
Profitability	positive	Static trade-off theory; agency theory
	negative	Pecking order theory; dynamic trade-off theory
Non-debt tax shield	positive	
	negative	Trade-off theory
Earnings volatility	positive	
	negative	Pecking order theory; trade-off theory
Interest rates	positive	
	negative	Trade-off theory; Pecking order theory

Even though profitability is only in some cases significant, its relation to leverage is mostly positive. This favors the static trade-off theory and contradicts the pecking order framework. The key argument of the pecking order theory is that companies prefer internal funds to debt. It is easier and cheaper for management to use internal resources. When issuing debt, management needs to compensate investors for information asymmetries. This results in higher costs compared to the use of internal funds. A company with high profits is therefore expected to keep earnings as internal funds or to use them straight away to finance new projects. In the pecking order framework this results in a negative relation to leverage. The static trade-off theory assumes on the other hand that profitable companies get more favorable conditions when taking on debt. This increases the incentive to use leverage and results in a positive leverage to profitability relation. The agency theory assumes that more debt leads to more managerial discipline and this is more valued when firms are profitable. Both arguments lead to a positive debt to profitability relation (Jensen, 1986). My findings provide evidence for the static trade-off and the agency theory and contradict one of the cornerstone assumptions of the pecking order framework.

The NDTS for the trade-off framework is of similar importance as profitability for the pecking order theory. The higher the NDTS, the lower the effects of the debt tax shield. When the NDTS increases, the incentive to take on more debt to reduce tax payments decreases. This leads to an inverse relation between the NDTS and leverage. In the full sample case the NDTS increases in significance when controlling for industry variables. The largest part of my findings supports the trade-off theory.

Though already highlighted, the ability of tangible assets to serve as a collateral and its risk reducing effects result in the improvement of a company's financing conditions. This is the trade-off theory explanation of a positive leverage to tangibility relation (Deesomsak et al.,

2004: de Jong et al., 2008). The pecking order framework highlights the information asymmetry reducing effect of tangible assets. Tangible assets are easier to evaluate than intangible assets and make it easier for outside investors to evaluate a company, which increases the likelihood of equity issuances over debt (Frank & Goyal, 2009). This results in an inverse relation of leverage and tangibility. Even though my findings are not completely consistent, they suggest that the trade-off theory provides the correct explanation. Most regressions show a positive leverage to tangibility relation, which allows for the interpretation of tangible assets as a collateral in case of bankruptcy.

Risk or earnings volatility has in most of my regressions a negative relationship to leverage. The cost increasing effect risk has on debt leads to an inverse relation in the trade-off framework. Volatile earnings can lead to a decrease in earnings as well. Companies suffering under volatile earnings are more likely to face difficulties in serving their financial obligations. Following the pecking order theory, in such cases, management prefers equity over debt (Antoniou et al., 2002; Deesomsak et al., 2004). As in the trade-off theory, the pecking order theory anticipates a negative relation between leverage and risk. Looking at the level of significance, there is no evidence that risk, as it is measured here, has a significant influence on leverage at all.

There are no explicit statements on how interest rates influence financing behavior according to the different theories. Implicitly, both theories assume that an increase in interest rates makes debt financing less attractive. This is confirmed by most regressions conducted on this topic. The positive interest rate to leverage effect observed in some of my regressions can be explained as well. Deesomsak et al. (2004) argue that nominal interest rates include an inflation expectation. Under such an assumption, companies might shift financing from equity to debt when interest rates go up. The idea is that with higher future inflation real interest payments in the future are lower.

Both, the trade-off and the pecking order theory are universal theories. When an explanation is given as to how certain factors should behave under certain circumstances based on these two theories, these explanations and their predictions enjoy universal validity. The fact that my research found that factors change throughout different periods and across countries contradicts the fundamental claim of these theories. On the other side, this does not mean that they do not help to explain what determines capital structure decisions. To check their validity in a more reliable way, they must be tested in specific scenarios. The only conclusion that can be drawn is that both theories are not completely sufficient to explain what happened to leverage determinants in my data set. But, this does not decrease their overall credibility. My outcomes are much better predicted by the trade-off than by to the pecking order theory. Not in a single case do leverage determinants behave as anticipated by the pecking order theory. Although, this is not a tailored analysis to test explicitly for this theory, the predictive power of the pecking order framework is disappointing in my analysis.

8.2 Hypothesis check and policy implications

8.2.1 Hypothesis check

To restate the hypothesis:

i) The financial crisis and the subsequent European sovereign debt crisis had a strong influence on companies and their financing behaviour. Therefore, it is expected that a change in the significance of the most important firm specific leverage determinants within countries over time.

ii) The overall economic environment between 2008 and 2012 was highly unstable in the European periphery and financial market participants got more risk-averse. The trade-off theory states that tangible assets can serve as a collateral in the case of bankruptcy and that profitable companies can bear more debt. This will be more important after 2007. Hence, tangibility and profitability will be more significant in the crisis and post-crisis period compared to the situation before 2007.

iii) Country differences are more important in times of financial turmoil. Financial constraints and refinancing conditions will be of higher significance in the period after 2007. It is excepted that the location of a company, core vs. periphery, is significant in determining capital structure, especially after 2007.

This hypothesis can be confirmed partly. My hypothesis is briefly related to my findings at several occasions in this thesis. It is correct that certain factors change their significance over the different periods, namely the MTB ratio and profitability both of which became more significant in the crisis and in the post-crisis period. Such evidence was not found for tangibility. This means part i) of the hypothesis cannot be rejected. That tangibility and profitability are more important during the crisis and afterwards is only true for profitability. Hence, part ii) of the hypothesis can only be partly confirmed.

Interest rates are significant when excluding country dummies. In this case they show a strong periodical pattern, meaning they are of higher significance in the crisis and post-crisis period. These findings can also be due to the fact that the interest rates pick up country effects. Evidence for country dummies is clear. Country differences play a significant role in all periods, mostly during and after the crisis. This evidence is robust over market and book leverage and also when controlling for industry effects. Furthermore, it matters significantly whether companies are based in core or periphery Europe. This means hypothesis iii) cannot be rejected. Going beyond my hypothesis, it is necessary to state the importance of size, the MTB and the NDTS as leverage determinants and the relatively unimportant role of risk.

Some key point to take away from these results are:

i) Location matters: companies' leverage ratios, no matter if book or market, are strongly determined by the country the company is based in. The most important characteristic regarding this is whether the company is based in core or periphery Europe. We can interpret the country dummies as the difference in the access to capital over countries. In other words, these are financial constraints companies face and it is evident that companies based in Germany, France and the Netherlands have much less problems accessing finance than their counterparts in Italy, Spain, and Portugal.

ii) The revenue size of a company determines its leverage ratio significantly. Large companies have larger diversification of revenue sources. Even when small companies were not investigated explicitly: large companies in the periphery are financially constrained; SMEs in the same country are assumed to face even worse conditions.

iii) Tangibility as collateral proxy does not significantly matter in times of macroeconomic shocks. During the financial crisis, companies did not face severe financial constraints due to firm specific characteristics. The more important reason is the economic environment companies are embedded into and related to that the associated macroeconomic risk these companies face. This country specific risk became more important than the size of the collateral or earnings volatility in the crisis and post-crisis period.

8.2.2 Policy implications

If any policy aims to reduce financial constraints in the periphery countries, it needs to target businesses through country specific instruments. Applying the same policies in the whole Euro Area would neglect the differences between core and periphery Europe and could lead to new economic distortions in the EMU.

The financial constraints companies in the southern Europe face did not disappear with the end of my observations in 2012 but are still of high importance. Mario Draghi, President of the ECB argues that access to credit is much more difficult for SMEs in Spain and Portugal than for those in Germany and Austria (P.W. - The Economist, 2014a). They argue that the gap between the credit lines companies would be able to receive in normal times and what they actually get now is responsible for about one third of the GDP downturn during the crisis. What Mr. Draghi assumes is that there is not enough funding available to increase debt issuance (P.W. - The Economist, 2014a). As a reaction to this problem and after an inflation of 0,5% in May 2014, the ECB announced, in the beginning of June three actions to bring inflation back down to just below 2% and to improve the situation in the countries hit strongest by the crisis (P.W. - The Economist, 2014b). First, the ECB decreased its main lending rate of 0,25% to 0,15%. Furthermore, it lowered its deposit rate from 0% to -0,1%. This in fact means that banks are charged when parking their money at the ECB. The aim is to increase the incentive for banks to lend out more money, especially to the European periphery. This is connected with the hope that more credit supply leads to a faster economic

recovery. On the other side, banks might increase their lending rates to compensate for the negative ECB deposit rate. Second, the ECB wants to promote long-term funding to banks that support periphery companies. To do so, it implemented two four-year lending programs to banks. These schemes aim to support the "real economy" by trying to increase lending to businesses. Since the financial crisis, banks deleverage their balance sheets. Some banks might still try to reduce loan exposure and avoid lending out money, especially to the periphery; an area that is still associated with higher risk. The described policy would be ineffective in such a case. Third, the ECB strengthens the liquidity base in the Euro Area. Banks are now allowed to borrow as much as they want in the ECB's weekly operations. The collateral banks have to provide for these operations remain on the same level.

The ECB aims to decrease financial constraints faced by companies based in the periphery. Therefore, it decreased the main lending rate and the deposit rate to encourage the market to invest in companies based in Southern Europe. It also set up a long-term lending scheme and provides additional liquidity. As the financial constraints are still quite severe and as they are partly responsible for the slow recovery, the ECB tries to fight the low credit supply. The number of companies that name restricted capital access as their biggest problem increased in the last two years in the periphery and fell in Germany (The Economist, 2014). In a Credit Suisse paper the bankers argue that without adequate access to credit, productive potential gets destroyed. Also the emergence of new firms is highly challenging, as they will hardly be able to find financing sources (Credit Suisse Economics Research, 2013). Therefore, it is in fact important to improve financing access, especially in the periphery. The actions taken by Mr. Draghi however, are not appropriate to fight this problem. As highlighted in my analysis, leverage is highly dependent on the company's country of origin. The ECB policy does not account at all for this problem. Providing more liquidity and increasing money supply, does not necessarily mean that SMEs in Southern Europe get better capital market access. Banks in the periphery still have large amounts of non-performing loans on their portfolios. Hence, they are highly reluctant when taking on new loans onto their books, especially in the riskier SME segment (Thompson & Atkins, 2014). A simple liquidity increase is unlikely to change that. According to the Financial Times, the "monetary transmission mechanism" is broken (Jones, 2014). An increase in money supply cannot fix this problem. According to Ken Wattret (Thompson & Atkins, 2014), Euro Area head economist at BNP Paribas, there are three things that hold back banks from increasing lending: the lack of funding, the lack of capital, and their risk aversion. Wattret states that the first reason has gone, the second one is getting better, but the last is not improving. As argued above, the credit constraints in the periphery are not due to higher firm specific earnings volatility compared to core Europe, they are also not due to a lack of liquidity in the financial markets, rather they are due to country specific, macroeconomic risk. It is this risk that needs to be reduced. From my perspective, the only possibility for credit supply in periphery Europe to improve is by reestablishing trust. This should be done by labor market reforms, a cutback of bankruptcy, a better entrepreneurial environment to encourage self-starters founding new businesses, and to create an overall improved business environment, e.g. by keeping corporate taxes at least stable (a reduction is hardly possible, considering the debt obligations governments in the periphery

face). The ECB is wrong when it assumes that the solution can be found in flooding the system with money. On the contrary, this might even be dangerous. When the housing sector boomed and burst in Spain, this was due to cheap money coming in from core Europe. With the cheap money from the ECB now, no one can guarantee that it will be delivered to the right sectors, e.g. the trade or service sector in Spain instead of the bubble prone construction business (Credit Suisse Economics Research, 2013). What is presently necessary is not another construction boom in Spain, but competitive SMEs that receive not free but financing conditions that do not demolish entrepreneurial incentives. The actions that need to be taken are country specific because the problems are country specific. Spain needs to deepen its labor market reforms, a gradual reduction of the government deficit, liberalization, and a more competitive market environment (Lagarde, 2014). Among others, issues Portugal faces are an enhancement in competiveness, a shift of economic output towards the tradable sector, and improvement in the efficiency of the judicial system (Portas, Albuquerque & da Silva Costa, 2014). Italy's aim should be to create a more flexible labor market, a liberalization of product markets, a restructuring of public services, and reforms to build a more efficient public administration; which should include: a more effective legislative and civil justice system (Padoan, 2014). The problems are diverse and country specific. The ECB should accompany the local governments and institutions throughout these reform processes. Actions need to be tailored to the specific local circumstances. The watering can principle, where the ECB simply increases money supply is too easy of an answer that cannot produce long lasting sustainable improvements. Undergoing reforms is the harder way. Interesting enough, Germany faced similar problems in the 2000s, that the crisis countries face now: an inefficient public service system, a rigid labor market, and a too costly welfare state. The process Germany had to go through was hard as well but it paid off and made it the growth driver in Europe that it is today. Italy, Spain, and Portugal have to undergo reforms and transformations to regain the trust of investors. This will lead to an improvement in capital market access and ultimately to sustainable growth. In the best case, the policies of the ECB will not cause much harm, in the worst case, it sets the wrong incentives: miss allocated money flows where and the creation of a new bubble. Country differences matter greatly; ignoring them is unjustifiable.

CONCLUSION

This thesis tested leverage determinants with a new data set and related the findings to the pecking order and the trade-off theory. The relationships of size, profitability, the NDTS, and tangibility to leverage support the trade-off framework. The predictive power of the pecking order framework is inexistent for my data set.

In the light of the 2007 financial crisis, country specific differences in leverage and in its determinants were investigated. Special attention was given to the fact that the periphery suffered more severely under the recession then core Europe. Additionally, it was analyzed how and if leverage determinants changed their level of significance or their direction of influence on the debt to capital ratio in the three different observed periods. Size was found to

be positively significant over all periods. The important role of the MTB ratio and its mostly inverse relation to the leverage ratio needs to be highlighted as well. Especially in France, Germany, and Italy this is an important factor. Profitability gained on importance in the post-crisis period in the Netherlands, Germany, and Italy but is not of such high significance as size or the MTB ratio. Similar to that is the NDTS for which the importance increased in the post-crisis period in the Netherlands, Spain and Italy. It appears as well in the best model estimation for the Netherlands and Spain and it gets more significant when controlling for industry effects. Results for tangibility and risk are weak, even though tangibility plays some role in the best model estimation of France and Portugal. No factors are found in the country regression section that can be specifically attributed to the core or the periphery. Neither are there factors that change their level of significance or coefficient sign over periods consistently over countries. With this evidence, there is no clear differentiation between core and periphery Europe possible.

In the full sample regressions, more striking evidence is found that justify a differentiation into core and periphery Europe. As before, size plays the dominant role and the MTB is of high significance in the post-crisis and crisis period. Profitability becomes of high importance for leverage again after the 2007 financial crisis. Tangibility and the NDTS play a role only in the pre-crisis period. The findings found here on country differences are of high significance and behave as predicted. This means, companies' origin is very important to understand leverage. It matters greatly whether companies are based in core or in periphery Europe, especially during the 2007 financial crisis. These results are robust when including industry dummies. A sensitivity analysis found evidence that the interest rate variable is significant when country dummies are excluded and more important in the crisis and post-crisis period.

Moreover, I tested and discussed my hypothesis that in the crisis and post-crisis period interest rate, tangibility, profitability and country dummy variables became statistically more significant compared to the pre-crisis situation in the same countries. My analysis showed that this is true for country variables, for the interest rate variable and partly for profitability but not for tangibility. Nevertheless, factors' significance does change in period comparison and a differentiation in core and periphery Europe is statistically and economically reasonable.

My results are mostly in line with previous studies on firms' leverage ratios. The important role my work found for size and the MTB ratio is, although not with this significance, in line with previous research. The relatively weak evidence for the influence of tangibility and profitability and the strong country differences of firm specific variables are nothing unusual. The strong evidence found for country dummies prove that a company's location matters.

The above findings indicate that the European periphery is financially much more constraint than core Europe. These country differences need to be addressed with country specific policies. The watering can principle applied by the ECB by increasing money supply misjudges the true causes of the credit crunch, which is country specific macroeconomic risk.

Future research should search deeper into the relation of country specific factors and leverage, and incorporate more proxies for financial constraints into the analysis.

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APPENDIXES

TABLE OF APPENDIXES

Appendix A: Full sample regressions including interest rate

	Market leverage full sample				Book leverage full sample			
	Pre-Crisis	Crisis	Post-Crisis	All periods	Pre-Crisis	Crisis	Post-Crisis	All periods
Size	0,036	0,031	0,043	0,039	0,041	0,036	0,051	0,044
	0,001 **	*0,016* *	*0,001* ***	*0,002* **	*0,004* **	*0,019* *	*0,001* ***	*0,004* **
Profit	0,023	0,099	0,309	0,160	0,062	0,078	0,457	0,215
	0,818	*0,381*	*0,004* **	*0,124*	*0,635*	*0,569*	*0,000* ***	*0,095* °
MTB	-0,002	-0,040	-0,098	-0,033	0,015	0,010	-0,033	0,007
	0,715	*0,000* ***	*0,000* ***	*0,001* ***	*0,027* *	*0,427*	*0,028* *	*0,546*
Risk	-0,121	-0,097	0,910	0,147	-0,062	-0,680	1,513	0,098
	0,800	*0,911*	*0,298*	*0,689*	*0,920*	*0,518*	*0,143*	*0,829*
Tangibility	0,208	0,128	-0,050	0,065	0,225	0,195	-0,091	0,100
	0,007 **	*0,155*	*0,524*	*0,446*	*0,025* *	*0,077* °	*0,327*	*0,341*
NDTS	-1,383	-0,635	-0,790	-1,171	-1,692	-0,772	-0,730	-1,282
	0,003 **	*0,213*	*0,154*	*0,017* *	*0,006* **	*0,214*	*0,262*	*0,034* *
IR	-0,045	0,024	0,009	-0,005	-0,028	0,002	-0,017	-0,017
	0,316	*0,604*	*0,716*	*0,890*	*0,630*	*0,966*	*0,544*	*0,692*
GER	-0,149	-0,240	-0,300	-0,274	-0,270	-0,275	-0,466	-0,348
	0,018 *	*0,003* **	*0,096* °	*0,016* *	*0,001* **	*0,006* **	*0,028* *	*0,013* *
FR	-0,194	-0,308	-0,346	-0,314	-0,259	-0,319	-0,486	-0,364
	0,002 **	*0,000* ***	*0,031* *	*0,002* **	*0,001* **	*0,000* ***	*0,010* *	*0,004* **
NE	-0,221	-0,315	-0,317	-0,319	-0,276	-0,325	-0,450	-0,360
	0,000 ***	*0,000* ***	*0,054* °	*0,002* **	*0,001* ***	*0,000* ***	*0,020* *	*0,004* **
IT	-0,121	-0,217	-0,229	-0,204	-0,181	-0,201	-0,334	-0,239
	0,049 *	*0,003* **	*0,048* *	*0,009* **	*0,024* *	*0,024* *	*0,015* *	*0,013* *
SP	-0,111	-0,140	-0,170	-0,149	-0,141	-0,139	-0,273	-0,181
	0,060 °	*0,036* *	*0,114*	*0,049* *	*0,066* °	*0,086* °	*0,031* *	*0,052* °
	Regression: ML ~ -1 + Size + Profit + MTB + Risk + Tangibility + NDTS + IR + DE + FR + NE + IT + SP				Regression: BL ~ -1 + Size + Profit + MTB + Risk + Tangibility + NDTS + IR + DE + FR + NE + IT + SP			
Signif. codes: 0,001 '***'; 0,01 '**'; 0,05 '*'; 0.1 '° '								

Appendix B: Full sample including industry dummies and interest rate

	Market leverage full sample incl. sectors				Book leverage full sample incl. sectors			
	Pre-Crisis	Crisis	Post-Crisis	All periods	Pre-Crisis	Crisis	Post-Crisis	All periods
Size	0,032	0,025	0,031	0,027	0,029	0,024	0,033	0,026
	0,006 **	*0,046* *	*0,015* *	*0,024* *	*0,047* *	*0,110*	*0,023* *	*0,077* °
Profit	0,011	0,048	0,237	0,108	0,014	0,002	0,354	0,122
	0,916	*0,654*	*0,022* *	*0,286*	*0,912*	*0,986*	*0,003* **	*0,317*
MTB	0,002	-0,040	-0,089	-0,030	0,017	0,008	-0,022	0,008
	0,770	*0,000* ***	*0,000* ***	*0,001* **	*0,011* *	*0,516*	*0,105*	*0,450*
Risk	-0,333	0,213	1,143	-0,064	-0,417	-0,212	1,646	-0,177
	0,498	*0,798*	*0,155*	*0,858*	*0,497*	*0,836*	*0,080* °	*0,680*
Tangibility	0,224	0,159	-0,098	0,057	0,220	0,200	-0,162	0,090
	0,012 *	*0,093* °	*0,247*	*0,548*	*0,046* *	*0,087* °	*0,099* °	*0,426*
NDTS	-1,625	-1,023	-1,178	-1,380	-1,965	-1,106	-0,913	-1,496
	0,001 **	*0,047* *	*0,040* *	*0,007* **	*0,002* **	*0,080* °	*0,170*	*0,014* *
IR	-0,056	0,021	0,015	0,006	-0,023	0,012	-0,006	0,004
	0,237	*0,640*	*0,504*	*0,854*	*0,698*	*0,835*	*0,824*	*0,921*
GER	-0,132	-0,217	-0,218	-0,210	-0,222	-0,236	-0,347	-0,244
	0,036 *	*0,005* **	*0,203*	*0,058* °	*0,005* **	*0,013* *	*0,084* °	*0,067* °
FR	-0,190	-0,304	-0,299	-0,277	-0,239	-0,306	-0,404	-0,295
	0,002 **	*0,000* ***	*0,051* °	*0,005* **	*0,002* **	*0,000* ***	*0,024* *	*0,013* *
NE	-0,197	-0,295	-0,235	-0,257	-0,222	-0,288	-0,328	-0,257
	0,001 **	*0,000* ***	*0,134*	*0,009* **	*0,004* **	*0,001* ***	*0,074* °	*0,030* *
IT	-0,095	-0,190	-0,185	-0,161	-0,152	-0,179	-0,273	-0,177
	0,116	*0,006* **	*0,092* °	*0,031* *	*0,045* *	*0,032* *	*0,033* *	*0,047* *
SP	-0,098	-0,137	-0,156	-0,128	-0,126	-0,140	-0,250	-0,146
	0,092 °	*0,027* *	*0,121*	*0,076* °	*0,083* °	*0,067* °	*0,034* *	*0,092* °
ENY	0,016	0,013	0,147	0,080	0,128	0,097	0,228	0,151
	0,808	*0,850*	*0,027* *	*0,218*	*0,123*	*0,254*	*0,004* **	*0,053* °
BM	0,098	0,046	0,132	0,098	0,134	0,073	0,154	0,118
	0,120	*0,489*	*0,039* *	*0,110*	*0,088* °	*0,370*	*0,039* *	*0,111*
IND	0,097	0,157	0,209	0,165	0,206	0,218	0,283	0,241
	0,080 °	*0,008* **	*0,000* ***	*0,002* **	*0,003* **	*0,003* **	*0,000* ***	*0,000* ***
CGS	0,085	0,106	0,129	0,103	0,182	0,155	0,166	0,164
	0,099 °	*0,053* °	*0,012* *	*0,038* *	*0,005* **	*0,022* *	*0,006* **	*0,007* **
TEL	0,190	0,264	0,322	0,261	0,370	0,346	0,375	0,371
	0,007 **	*0,001* ***	*0,000* ***	*0,000* ***	*0,000* ***	*0,000* ***	*0,000* ***	*0,000* ***
UT	0,184	0,179	0,339	0,255	0,348	0,263	0,398	0,335
	0,065 °	*0,078* °	*0,001* ***	*0,008* **	*0,006* **	*0,037* *	*0,001* ***	*0,004* **
HC	0,135	0,107	0,122	0,115	0,189	0,143	0,158	0,164
	0,098 °	*0,207*	*0,125*	*0,134*	*0,063* °	*0,173*	*0,088* °	*0,077* °
	Regression: ML ~ -1 + Size + Profit + MTB + Risk + Tangibility + NDTS + IR + DE + FR + NE + IT + SP + ENY + BM + IND + CGS + TEL + UT + HC				Regression: BL ~ -1 + Size + Profit + MTB + Risk + Tangibility + NDTS + IR + DE + FR + NE + IT + SP + ENY + BM + IND + CGS + TEL + UT + HC			
	Signif. codes: 0,001 '***'; 0,01 '**'; 0,05 '*'; 0.1 '° '							