UNIVERSIDADE CATÓLICA PORTUGUESA

The Determinants of Capital Structure

The impact of the 2008 financial crisis on Portuguese and Spanish SMEs

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Abstract

The capital structure and what determines it, has been one of the most, discussed subjects in the corporate finance world, mainly since the contribution of Modigliani and Miller (1958).

Empirical works on this subject are mainly focus on large firms capital structure with only a few more recent works focusing on the capital structure of small and medium enterprises (SMEs).

The financial crisis of 2008 caused by the subprime crisis led to a a credit crunch leaving small firms with their access to financing restrained.

Therefore, this work provides evidence on how the Portuguese and Spanish SMEs dealt with that restrained credit access, analysing the differences between the two countries and between the periods before, during and after the crisis

Hence, we verify that although the level of external financing of SMEs in both countries was negatively affected by the crisis, the choice between financing sources proved to be the same throughout the periods and identical between Portugal and Spain.

From an unbalanced panel data analysis of 17 814 Portuguese SMEs and 61 688 Spanish SMEs we examine some of the determinant of capital structure defined by previous theories, assets tangibility, non-debt tax shields, growth opportunities, firm's uniqueness, size and profitability, we find strong support for the pecking order theory as the best theory explaining SMEs financing decisions, with profitability having the highest influence on firms' leverage.

Keywords: Capital Structure, SME, Portugal, Spain, Financial Crisis

Resumo

A estrutura de capital e a maneira como esta é determinada tem sido, principalmente deste a contribuição de Modigliani e Miller (1958), um dos mais discutidos temas no mundo das finanças empresariais.

Estudos empíricos sobre este assunto focaram-se, sobretudo, na estrutura de capital de grandes empresas, com apenas alguns estudos mais recentes focando-se na estrutura de capital das pequenas e médias empresas (PMEs).

A crise financeira de 2008 causada pela crise do *subprime* levou a um racionamento do crédito, deixando as empresas de menor dimensão mais limitadas em termos de financiamento externo.

Assim, com este trabalho pretende-se mostrar a forma como as PMEs Portuguesas e Espanholas lidaram com estas restrições de crédito, identificando potenciais diferenças entre os dois países, mas também durante os períodos antes, durante e depois da crise.

Desta forma, verificou-se que embora o nível de financiamento externo das PME dos dois países tenha sido negativamente afetado, a escolha entre as diferentes fontes de financiamento foi a mesma ao longo dos diferentes períodos e idêntica entre os dois países.

Através de uma análise de dados em painel não balanceados para 17 814 PMEs Portuguesas e 61 688 PMEs espanholas examinou-se os determinantes da estrutura capital, em particular, a tangibilidade do ativo, os outros benefícios fiscais para além da dívida, oportunidades de crescimento, a singularidade das empresas, a dimensão e, por fim, a rentabilidade. Os resultados obtidos demonstraram que a teoria "*Pecking-order*" é a que melhor explica as decisões de financiamento das PMEs quer em Portugal como em Espanha, com a variável rentabilidade a ter a maior influência.

Palavras-chave: Estrutura de capital, Portugal, Espanha, PME, Crise Financeira.

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Chapter 1
Introduction

In the context of corporate finance, firms' decisions regarding their capital structure are of the utmost importance. The way firms decide to finance their investments may determine the success of firms when pursuing their objectives, which can be summarized into one, value maximization.

The capital structure and what determines it, has been one of the most, discussed subjects in the corporate finance world, mainly since the contribution of Modigliani and Miller (1958). Building on the latter other important theories arise, namely the Trade-off theory, the Agency costs theory and the Pecking-order theory. In turn, a set of empirical works provided evidence on whether or not those theories were able to explain firms' capital structure decisions.

Empirical studies provide a number of firm specific factors that determine firms' capital structure, using as proxies a set of variables like non-debt tax shields, profitability, age, size, risk and asset structure (Titman & Wessels, 1988). In addition, empirical studies also provided evidence that country-specific factors could influence firms' decisions.

The majority of the empirical studies regarding the determinants of capital structure focuses on larger firms[1]. However, globally, most countries business fabric is mainly composed by small and medium enterprises (SMEs). For instance Portugal and Spain business fabric is 99,9% composed by SMEs (INE, 2014; Dirección General de Industria y de la PYME PYME, 2016). The significant weight of SMEs in the economy generates the need to understand the financing decisions of smaller firms, adding to the fact that the results given by studies on larger firms may not necessarily be transferred to smaller firms

[1] Some examples of studies focusing on the capital structure of large firms are the works of Bradley, Jarrell, and Kim (1984);Rajan and Zingales (1995) and Titman and Wessels (1988).

because of firms having different characteristics. This fact led to some studies[2] focusing on SMEs being carried out more recently.

One of the main differences of SMEs and large public firms concerns the firms' choice in terms of financing. In fact, while larger firms may choose between using own funds, issuing equity or issuing debt to finance their projects, SMEs can only finance their projects through debt, as bank loans and through the use of own funds.

Considering the importance of credit on small firms survival, it is essential to consider the exogenous factors that can affect the access to credit Acting as one of these factors is the major financial and economic crisis triggered by the collapse of the sub-prime mortgage market in the US and consequent near collapse of the World financial system in the summer of 2007. Specifically, in Europe, it led to the sovereign debt crisis caused by the skepticism from investors and ensuing increase in interest rates. This translated into an important credit crunch, affecting, particularly SMEs who rely on credit in order to finance their projects, which saw their credit availability constrained, putting at risk the survival of a large number of them (Campello, Graham, & Harvey, 2010; Holton, Lawless, & McCann, 2013).

The negative economic and financial impact of this crisis in Europe caused a group of countries, particularly, Portugal, Spain, Ireland and Greece to request financial assistance in order to avoid bankruptcy (Lane, 2012). Portugal and Spain programs, in specific, were of a different nature. While the first requested assistance in 2011 from three institutions (the European Union, the European Central Bank and the International Monetary Fund) known as "Troika", in order to recover the economy through a set of structural reforms and recapitalize the financial sector, the second required financial assistance in 2012 to the European Stability Mechanism in order to bail-out its highly decapitalize banking system.

Although some recent studies[3] focus on the impact of the crisis on capital structure of the two countries referred above, few compare the before and the after in order to fully grasp how the crisis affected firms' financing decisions. Furthermore, there is no evidence provided that country-specific factors may or may not affect the capital structure of SMEs.

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[2] See for example Hall, Hutchinson, and Michaelas (2004) and Vieira and Novo (2010).
[3] See for example Ntoung Agbor Tabot, Fernandez, and Cibran (2015) for Spain and Proença, Laureano, and Laureano (2014).

Hence, this work presents evidence of the SMEs' determinants of capital structure from both countries of the Iberian Peninsula, Portugal and Spain, for a 10-year time period (2005-2015), in order to identify the main factors underlying SMEs' financing decisions while assessing if there is in fact a country-specific factor that may or may not influence them. Moreover, this work will try to identify the impacts of the global financial crisis and consequent financial assistance programs undergone by both countries on the capital structure of SMEs. For this it will be considered for each country 4 sub-periods, namely, the pre-crisis period, the crisis period, the post-crisis period, and post-rescue programs period.

Surprisingly, results do not suggest any difference between the two countries in study. For both countries evidence is provided that the pecking-order theory is the best theory to explain the capital structure decisions of both countries, although some weaker evidence suggested the trade-off theory. It is found that firms' profitability has the highest explanatory power. Additionally, except for variation with regards to non-debt tax shields we are unable to identify any differences while comparing the attributes chosen between sub-periods.

This work is composed of six chapters. Chapter 1 is the introduction. Chapter 2 consists of a literature review on capital structure and the determinants of capital structure, focusing mainly on some empirical works on the subject and the empirical hypotheses drawn from previous studies and that we intent to analyze. A contextualization of what caused the financial crisis and the specific cases of Portugal and Spain will be exposed in Chapter 3. In Chapter 4 the data and methodology will be presented followed by the results in Chapter 5. Finally, the main conclusions of this work and suggestions for future research are presented in Chapter 6.

Chapter 2
Literature Review

1. Theory of Capital Structure

There is a mix of securities and financing sources that firms can use to finance their investments and operations. This mix is the capital structure, which reflects the firms financing decisions, i.e. firms decide to finance themselves either through debt or equity or a combination of both (Stewart C Myers, 2001). Thus, the study of capital structure attempts to understand how firms choose to finance their investments and operations, focusing on finding the optimal capital structure (if one exists), or the financing decisions that maximizes the firms' market value (Durand, 1952).

The controversy around the subject of capital structure had its most important foundation in 1958 with the article "The Cost of Capital, Corporation Finance and the Theory of Investment" written by Franco Modigliani and Merton H. Miller, becoming one of the most discussed subjects in financial literature.

The ensuing discussion, around firms' capital structure and its relevance for their market value, had Modigliani & Miller's (1958) theory as benchmark from which new theories were developed by arguing the validity of the assumptions used on the former. This chapter presents the Modigliani-Miller theory and others major theories on capital structure that were built on it.

1.1. Modigliani – Miller Models

In their seminal article Modigliani and Miller (1958) presented a model supporting the theory that a firm's capital structure is irrelevant to its market value and that, hence, an optimal capital structure does not exist.

This theory is based under the assumption of perfect and efficient capital markets, where there are no transaction costs, no bankruptcy costs, no taxes and no arbitrage. Additionally, it is assumed that investors and firms have equal access to capital markets and would borrow at the same rate, that there are no information asymmetries and that firms could be divided in classes according to their expected returns. These assumptions are considered to be simplifications in order to begin dealing with the capital structure issue (Fama, 1978; Modigliani & Miller, 1958; Stewart C Myers, 2001; Stiglitz, 1969)

These simplifications lead to Modigliani and Miller (1958) proposition I, which states that a firm's market value is determined by the cash-flows of a firm capitalized at a rate (or the average cost of capital) suitable for the firms "class" and that it is independent of that firm's capital structure. To prove this the authors used two of their assumptions. First the perfect capital markets under which the proportion of debtholders and shareholders wouldn't affect the firm's cash-flows but only the way they were distributed among them. Secondly, as a result of the no arbitrage assumption, which would prevent two identical (same Modigliani and Miller's expected return class) firms from having different market values, meaning that, in equilibrium, two identical firms must always have the same market value independently of their capital structure, as different market values would give place to an arbitrage opportunity. (Hillier, Grinblatt, & Titman, 2011; Modigliani & Miller, 1958).

From proposition I, the authors are able to establish proposition II according to which the expected rate of return on the stock, i, of any firm j, that includes debt in its capital structure, and belongs to the kth class, is a linear function of leverage given by the following equation:

$$(1) \qquad i_j = p_k + (p_k - r)\, D_j/S_j$$

meaning that the expected rate of return on a firm is equal to the expected rate of the return of any firm shares in the kth class or the average cost of capital, p_k, plus a premium associated with financial risk equal to the spread between p_k and r, the interest rate or the expected rate of return of a certain stream, times the debt-to-equity ratio. The interpretation to be made from Proposition II is that, as the weight of debt in a firm's capital structure increases, the expected return from that firm for shareholders will also increase

due to the fact that they will demand a higher return as a compensation for a higher level of the firm financial risk. Hence, when a firm replaces equity funding considered to be more expensive for cheaper debt funding, the effects from each funding source will be offset and the cost of capital preserved (Modigliani & Miller, 1958).

The last proposition presented in Modigliani and Miller (1958) article, deals with the investment policy. Having as groundwork the first two propositions, the first about firms' financial structure and the second about the cost of capital, the authors were able to determine an optimal investment policy rule. Proposition III, as it was called, stated that a firm should undertake an investment opportunity if and only if the rate of return on the investment is as large or larger than the expected rate of return of any firm shares in the firm's class. Thus, considering a firm in the kth class, an investment rate of return p^*, and that the firm is operating in the best interest of the shareholders, an investment opportunity should only be undertaken if:

$$p^* \geq p_k \tag{2}$$

consequently, proposition III tells us that a firm's investment decision is independent of how the firm chooses to finance itself as the cut-off point is given by p_k, meaning that a firm may choose to finance itself through debt, retained earnings or common shares but the investment will only be worth of exploiting given that (2) is verified.

In the 1958 article, Modigliani and Miller study the effects of taxes on their propositions, which the authors considered to have no effect on the propositions' form, although the market value of firms would then be given by capitalizing the expected return net of taxes by the appropriate capitalization rate for income net of taxes, p_k^T, for any firm in the kth class, instead of p_k. Modigliani and Miller (1958) concluded that when integrating taxes on investment decisions, stockholders could gain from having debt in the firm's capital structure, however, the magnitude of said gains was deemed too small.

In 1963, in the article "The Cost of Capital, Corporation Finance and the Theory of Investment: A Correction" Modigliani and Miller assumed that they made a mistake while examining the impacts of corporate taxes on the valuation of firms, admitting that the tax advantages of debt financing were

somewhat undervalued in their previous article. In fact, the authors showed that the market value of a firm is a function not only of the expected returns net of taxes, but also of the tax rate and the level of leverage. Consequently, the higher the level of leverage of a firm the higher are the tax advantages and, as such, the higher will be a firm's income net of taxes, and the greater will be the firm's market value. Therefore, a firm should finance itself only through debt in order to maximize its market value. (Jensen & Smith, 1984; Modigliani & Miller, 1963).

The logic behind Modigliani and Miller theories is now widely accepted and recognized to be the most important building block of the capital structure discussion, as it inspired the contributions other authors' contributions to the this litterature, by dropping some of Modigliani and Miller's model assumptions as they were not representative of the real world (Stewart C Myers, 2001; Stiglitz, 1969)

1.2. The Trade-Off Theory

The trade-off theory is built from Modigliani and Miller (1963) theory that firms maximize their market value by maximizing their use of debt due to tax advantages, and the claims of Robichek and Myers (1966) and Baxter (1967) that draw attention to the existence of bankruptcy costs that could neutralize those tax advantages (Ang, Chua, & McConnell, 1982). This theory is formalized by Kraus and Litzenberger (1973) in their State-preference model, having as argument that corporate tax advantages or tax shields on debt would be offset by the increase of financial distress or bankruptcy costs (Jensen & Smith, 1984).

Bankruptcy costs can be divided into three kinds, the direct, the indirect costs or reorganization costs and the loss of the tax shields a firm would have received had it not become insolvent (Ang et al., 1982; Baxter, 1967; Gruber & Warner, 1977). The direct costs of bankruptcy which include legal fees, accountant fees, other administrative fees and the time lost by firm's executives in the insolvency process (Gruber & Warner, 1977). The indirect costs, perhaps the most relevant ones, are the effects that financial distress has in firm's operations and operating income which include loss of profits, loss of the firm's credibility which will led to the loss customers/suppliers that will opt to go trade with other competing firms and the firm being unable to borrow funds either through debt or issuing securities except in onerous terms (Baxter, 1967).

Kraus and Litzenberger (1973) show that in a world with *n* states, there ought to be one state where firms become insolvent, meaning that firms would be unable to meet their contractual financial obligations when they are expected to, and they would incur in insolvency costs (Baxter, 1967). In other words, as the level of leverage in a firm increases, the more expensive financing through debt becomes, the higher will be the probability of firms not being able to reimburse all its debt obligations, thus the greater is the probability of a firm's having to withstand bankruptcy costs.

Hence, according to the trade-off theory firms will fund themselves through debt, up until the point where the tax shields are offset by the possible bankruptcy costs. Therefore, firms' optimal capital structure is determined by the balance between tax shields and bankruptcy costs, suggesting that firms should have moderate debt ratios (Kraus & Litzenberger, 1973; Stewart C Myers, 2001).

1.3. Agency Costs Theory

Firms are a complex network composed by owners, managers, debtholders, shareholders and other individuals. Each of these individuals has different objectives and interests leading to conflicts which are appeased by the contractual relationships between said individuals (Jensen & Meckling, 1976).

These relationships correspond to the definition of an agency relationship where an individual – the principal - delegates tasks to be completed by other - the agent. Assuming that all individuals look to maximize their utility, one can easily assume that the decisions made by the agent will not always be in the principal best interest, giving rise to conflicts. These divergences can be constrained if the principal is able to provide the right incentives to the agent and by incurring in monitoring costs that would limit the agent's contradictory decisions. Nonetheless, the agent's decisions will not always be identical to the decisions that would be in the principal best interest and therefore will cause a reduction of the principal welfare. These are the three agency costs: the incentive or bonding costs to the agent; the monitoring costs by the principal; and the loss in welfare which is called the residual loss. (Jensen & Meckling, 1976).

Under this framework Jensen and Meckling (1976) develop the agency costs theory, contributing with a positive analysis on how the financing and

investment decisions of a firm are affected by the conflicts of interest between managers, shareholders and debtholders (Jensen & Smith, 1984).

Jensen and Meckling (1976) identify two types of conflicts that may arise, conflicts between managers and shareholders, and conflicts between shareholders and debtholders (Harris & Raviv, 1991).

1.3.1. Conflicts Between Managers and Shareholders

Jensen and Meckling (1976) determined "*the agency costs of outside equity*" or the costs that the conflicts between managers and shareholders would bring to the firm. In order to do this, the authors compare the behaviour of a manager when he owns 100% of a firm to when the manager sells a fraction of his shares, losing total ownership of the firm. They conclude that when the manager is the sole owner of the company, the operating decisions will be made so that his utility is maximized. The manager's utility will be maximized by the pecuniary and non-pecuniary returns (big office, attractive staff, company car, etc.). However, when the manager sells a fraction of his shares he will only bear a portion of the costs of the perquisites he takes to himself to maximize his own utility, causing conflicts with shareholders that don't have the same interests. This divergence in interests will generate agency costs as shareholders will only be able to limit the manager's actions by incurring in monitoring costs which in turn will be reflected in the price of the firm's shares.

The manager will always tend to sell its shares in order to increase his purchasing power, however, while his fraction of equity decreases the manager will tend to utilize firm's resources in the form of perks. In addition to the appropriation of firm's resources, as the equity claim of the manager falls, his incentive to concentrate efforts in undertaking profitable investments also falls since the profitability of the firm is no longer a maximizing factor for the manager's utility, putting at risk the growth and value of the firm. All of this will increase agency costs as shareholders will have to spend more firm's resources monitoring the manager's behaviour (Jensen & Meckling, 1976).

Another conflict that may arise between managers and shareholders has to do with the free cash flow or the excess cash flow left after all positive net present value (NPV) investments have been funded. A firm that generates a significant free cash flow tends to have serious conflicts over pay-out policies

since managers will rather invest that cash in negative NPV projects or firm's inefficiencies than have it distributed to shareholders (Jensen, 1986).

This leads to the free cash flow theory suggested by Jensen (1986), according to which the answer to the agency costs of equity is debt (Stewart C Myers, 2001). This idea had already been suggested by Jensen and Meckling (1976), as they explain that if agency costs due to outside equity were positive, it will be in the interest of the shareholders to sell out their shares of a firm to the manager. The manager would become the sole owner of the firm by financing himself with debt and repurchasing all the shares, that way eliminating all the existing agency costs. In Jensen (1986) view debt would put the firm on a diet as it would be obligated to pay out cash to its debtholders or face bankruptcy, ensuring that the manager would act in the firm's best interest and reducing free cash flow (Harris & Raviv, 1991; Stewart C Myers, 2001).

1.3.2. Conflicts Between Shareholders and Debtholders

Conflicts between shareholders and debtholders occur when the risk of default exists. Shareholders have residual claims in case of bankruptcy, meaning that first the firm must pay its debt obligations before distributing anything towards its shareholders, as such, stockholders gain when debt loses value. Assuming that there is an important default risk and that managers act according to shareholders' interests. The managers will attempt to shift value from debtholders to shareholders. There many ways managers can act in order to transfer value from creditors to stockholders (Stewart C Myers, 2001).

In order to maximize equity investors' returns, managers may shift from low-risk investments to riskier investments even value-decreasing ones. Riskier investments represent higher return capture by shareholders. However, if the investments fail the downside will go to debtholders since stockholders have limited liability. This effect is commonly called "asset substitution effect" (Harris & Raviv, 1991; Jensen & Meckling, 1976; Stewart C Myers, 2001).

Additionally, Stewart C. Myers (1977) present what is generally called the "debt overhang" or "underinvestment" problem. In fact, managers are tempted to reject low-risk investments because this type of investments represent a secure stream of capital that will serve to payoff debtholders. However, low risk investment will not generate a cash-flow enough to payoff debtholders and distribute the excess returns among stockholders. Because of this, investments

are rejected and managers will pay out cash to investors (Stewart C. Myers, 1977; Stewart C Myers, 2001).

These two effects represent agency costs of debt. Jensen and Meckling (1976) argue that the optimal capital structure is obtained by offsetting the benefit of debt, presented earlier, and the agency cost of debt.

1.4. Pecking-Order Theory

A different point of view about firms' financing decisions is the pecking-order theory brought-up by Stewart C Myers and Majluf (1984) and Stewart C Myers (1984) building on Ross (1977) and Leland and Pyle (1977) works on information asymmetries and signalling. By considering information asymmetries as "*given - a fact of life*" when analysing firms with assets-in-place and investments opportunities necessitating additional financing, the authors are able to establish that firms will prefer internal finance to external finance and, when external finance is needed, debt will be issue before equity. Hence the pecking-order of financing decisions, first firms will finance their investments using internal funds (retained earnings), then by issuing debt and, if there is still need for external financing and the two other options are exhausted, firms will finance their investments by issuing equity (Stewart C Myers, 2001).

There is an information asymmetry as only managers know beforehand whether the investment's NPV is positive or not and if the shares their issuing are over or undervalued (Leland & Pyle, 1977). Indeed, when firms' managers decide to issue shares, it can be good or bad news to investors. It can be good news if the growth opportunity, that the firms are trying to finance through equity, reveals a positive NPV. It can be bad news to investors if the assets-in-place are overvalued by the market, and firms' managers try to issue overvalued stocks, transferring value from new shareholders to old shareholders (Stewart C Myers, 2001). By issuing undervalued shares, managers would transfer value from "old" shareholders to new shareholders, because new shareholders would pay less for the same fraction of the firm (Stewart C Myers, 1984).

Stewart C Myers and Majluf (1984), under the assumption that firms could only finance its investments by issuing equity, tackled this problem by

assuming that managers always act in old shareholders' interest, meaning that they would only issue undervalued shares if the net present value of the investment opportunity more than offsets the value transfer from old to new shareholders, even if it means passing up positive NPV projects. However, the authors consider that new investors would know that managers would not be on their side. Therefore, investors will infer that if firms issue common stock it's due to the fact that the firms' assets-in-place are overvalued, consequently, investors will adjust their prices making shares prices fall. Hence, issuing common stock signals bad news to investors (Stewart C Myers, 1984, 2001).

Subsequently, Stewart C Myers and Majluf (1984) assumed that firms could finance their growth opportunities by issuing equity or debt. The authors stated that by financing through debt, managers' incentive to pass up positive NPV growth opportunities would be less than if they would have finance by issuing equity, being the general rule that one should "issue safe securities before risky ones" (Stewart C Myers, 1984; Stewart C Myers & Majluf, 1984). In fact, in the investors point of view, because debt has first claim on firms' assets and earnings, they're better off investing in debt since they are less exposed to valuation errors. Therefore, issuing debt would have a downward impact on the shares prices, however, this impact wouldn't be as significant as the impact of issuing equity, due to the fact that debt issues minimizes managers' information advantages (Stewart C Myers, 2001).

These conclusions led to the pecking order theory of capital structure, according to which firms prefer internal finance to external finance, dividends are "sticky" implying that capital expenditure cannot be financed through dividend cuts and, finally if external financing is required firms prefer debt to equity.

2. Determinants of Capital Structure – Empirical Evidence and Hypotheses

2.1. Empirical Evidence

This work focus on explaining how the 2008 crisis affected the SME' capital structures in Portugal and Spain comparing the impacts between both

countries. In order to do this, it is crucial to examine the results of other similar empirical studies and present the factors, identified in those studies, that determine the debt-to-equity ratio of firms.

According to the literature, firms' capital structures is affected by firm-specific factors such as profitability, growth, size, earnings volatility, non-debt tax shields and industry classification (Bradley et al., 1984; DeAngelo & Masulis, 1980; Harris & Raviv, 1991; Titman & Wessels, 1988). Furthermore, firms' capital structures can also be affected by country-specific factors. However, the research made on this subject has mixed results when it comes to the impact that difference in countries have on influencing firm's capital structure (Hall et al., 2004).

In their study Bradley et al. (1984) attempt to find what were the capital structure determinants that allowed to find the optimal capital structure. The authors created a model that synthesized the theoretical conclusions until that point. From this model, it was tested what were considered to be, according to the theory, the most important firm-specific factors: the level of non-debt tax shields, the magnitude of the costs of financial distress and the variability of the firm value. Results show that the costs of financial distress and the volatility of firm value are inversely related to firms' level of debt, being the last the most important factor, and that the firms' debt-to-equity ratio was strongly related to firms' industry classification. These results are in line with the theory of optimal capital structure, namely the trade-off theory. On the other hand, results showed a positive relationship between firms' leverage ratios and non-debt tax shields, going against DeAngelo and Masulis (1980) theory, according to which this type of tax shields can be considered as substitutes for interests' tax shields, thus being consistent with Scott (1977) hypothesis which states that firms who invest more in tangible assets will be able to borrow at lower interest rates as their tangible assets will serve as collateral to the debt.

Titman and Wessels (1988) present a study on the theoretical determinants of capital structure, examining them empirically. The authors defined the proxies of the theoretical attributes being examined on their model, namely, profitability, earnings volatility, size, industry classification, uniqueness, non-debt tax shields and asset structure. Results from 469 US manufacturing firms for the period between 1974 and 1984 are considered not to be conclusive. Notwithstanding, Titman and Wessels (1988) are able to establish some

relationships between the theoretical attributes and firms' capital structure, for instance, evidence showed that the uniqueness of a firm's business is negatively related to the debt levels and short-term debt ratio is inversely related to the firm size, implying that transaction costs may be an important determinant of companies' financial structure. However, results do not provide support for the impact of non-debt tax shields, asset structure, profitability and earnings volatility on firms' leverage ratios.

In their theoretical work Harris and Raviv (1991) compile all theoretical and empirical work to date on what the main determinants of capital structure are leading to the following consensus, "leverage increases with fixed assets, non-debt tax shields, growth opportunities, and firm size and decreases with volatility, advertising expenditures, research and development expenditures, bankruptcy probability, profitability and uniqueness of the product."

On a more comparative analysis between countries, Rajan and Zingales (1995) examine the determinants of capital structure across G-7 countries. The authors focused the study on 4 factors referred by Harris and Raviv (1991), specifically, tangibility of assets, uniqueness, profitability and market-to-book value (considered as a proxy for growth opportunities). Results suggested that the determinants of capital structure are similarly correlated with debt levels across the G-7 countries.

Testing the trade-off theory against the pecking order theory using a sample of 157 US firms, Shyam-Sunder and Myers (1999) are able to conclude that firms finance themselves mainly through debt. They considered that the pecking order provided the best approximation to the financial behaviour of the firms examined.

Concerning the determinants of capital structure on SME's various studies have been conducted. Hall et al. (2004) examined the determinants of capital structure for SME's across 8 European countries, Belgium, Germany, Spain, Ireland, Italy, Netherlands, Portugal and the UK. Their analysis shows that SME's capital structure and determinants vary from country to country, meaning that there are country-specific factors that affect SME's capital structure and its determinants, contrary to what was concluded in Rajan and Zingales (1995) research.

Sogorb-Mira (2005) analyse Spanish SME's capital structure determinants, particularly, effective tax rate, non-debt tax shields, growth opportunities, asset

structure, size and profitability, with evidence from 6 482 Spanish SME for the time period 1994-1998 (5 years). From the analysis Sogorb-Mira concluded that leverage is positively related with growth opportunities, size and asset structure and negatively related to, taxes, profitability, alternative tax shields, relationships could vary when analysing the determinants impact on short-term debt or long-term debt. Additionally, evidence provides support for the pecking order theory to be a good explanation for Spanish SME's financing decisions, although considering that in the case of SME pecking order theory may be justified by firm owners not wanting to lose control of the firm (Sogorb-Mira, 2005).

The evidence on the same subject as Sogorb-Mira (2005) for Portugal is brought up by Vieira and Novo (2010) concerning as capital structure determinants, non-debt tax shields, business risk, size, asset structure, reputation (age), profitability and growth. Evidence from 51 Portuguese SME for the time period 2000-2005 (5 years) shows that Portuguese SME's level of debt is negatively related to non-debt tax shields, asset structure, reputation and profitability, and a positively related to size. For the others variables considered the results were statistically insignificant. The author concludes that, like Spanish SME, the pecking order theory could be a good explanation for Portuguese SME financing decisions.

Regarding the impact of the 2008 crisis on the determinants of capital structure it is important to mention the work of Harrison and Widjaja (2014). The authors study the capital structures of 331 S&P 500 firms in the sub-periods of before (2004-2007) and after (2008-2011) the crisis. Using leverage as dependent variable and asset tangibility, profitability, size, market-to-book ratio and liquidity as independent variables, the authors conclude that when comparing the two periods, tangibility had more relevance in the post-crisis period, possibly meaning that investors are more risk averse. Moreover, results show that in the period post-crisis firms' profitability had less influence in the level of leverage possibly caused by the decrease of internal funding, and market-to-book ratio influence became much more important indicating a possible preference for debt financing during crisis period. Finally, results present a negative coefficient for the size variable, suggesting that smaller firms would have higher debt ratio.

Proença et al. (2014) study the impact of the crisis on Portuguese SME's capital structure from a sample of 12 857 for the time period 2007-2010. Contrary to the study of Vieira and Novo (2010) who consider the pecking order theory to be the best explanation of Portuguese SME's capital structure, results were consistent with both the pecking order theory and the trade-off theory, as results showed a positive relationship between asset structure and long term debt and the opposite relation with short term debt following the Scott (1977) hypothesis. Additionally, the authors identified a downward trend of Portuguese SME's leverage ratios during the financial crisis period, the same negative impact was identified by Meira (2015).

2.2. Empirical Hypotheses

The empirical evidence presented above defines a series of hypotheses to be tested in order to determine which of the theoretical models would better explain the capital structure decisions in different countries and industries. Titman and Wessels (1988) stress that the theories of capital structure have different implications to different measures of leverage. Using previous hypotheses as support, we defined a set of empirical hypotheses that we are going to test for the different measures of leverage, in particular total leverage, long-term leverage and short-term leverage.

We are going to test the relation between leverage and non-debt tax shields. According to DeAngelo and Masulis (1980) tax deductions for depreciation, investments or research and development expenses are alternates for debt tax shields. Consequently, firms with higher levels of non-debt tax shields will have lower levels of leverage (Titman & Wessels, 1988). Hence, we expect a negative relationship between leverage and non-debt tax shields.

With regard to firm size relation to leverage, larger firms, since they are more diversified, are expected to be less prone to bankruptcy than smaller firms making credit access less expensive for larger firms as they present less risk (Ang et al., 1982). Consequently, we expect a positive relation between firm size and leverage. Moreover, the riskier profile of smaller firms makes long-term debt more expensive which, in turn leads to smaller firms incurring more in cheaper short-term debt. This allows us to divided our expectation of a positive relationship between firm size and leverage into two expectations: firm size is

positively related to long-term leverage and a negative related to short-term leverage (Hall et al., 2004; Titman & Wessels, 1988).

Another factor that, according to some authors (Stewart C. Myers, 1977; Rajan & Zingales, 1995), affects firms' level of leverage is growth opportunities. The relation between this factor and leverage is going to be tested. Following Jensen and Meckling (1976) conflict between shareholders and debtholders, according to which shareholders are expected to make investments decisions that are potentially good for them at the expense of debtholders, making the latter to difficult access to credit through the use of protective covenants. Firms with more growth opportunities, usually have higher levels of this agency cost (Titman & Wessels, 1988). Thus, we expect a negative relationship between growth and leverage. Additionally, Stewart C. Myers (1977) suggested that this problem might be mitigated by firms issuing short-term debt rather than long-term debt. Bearing this in mind, we expect growth opportunities to be positive related to short-term leverage and negatively related to long-term leverage.

Creditors require guarantees, usually firms' tangible assets that may be used as collateral to protect themselves of possible defaults. Because of this, it is important that we examine the relation between the firms' assets tangibility and leverage (Hall et al., 2004; Titman & Wessels, 1988). Since higher levels of tangible assets represents more assets that can be used as collateral, we expect a positive relation between assets tangibility and leverage. Notwithstanding, according to Stewart C. Myers (1977) and Hall et al. (2004), the maturity of the loan tends to match the lifespan of the assets used as collateral. Hence, we expect assets tangibility to be positively related to long-term leverage and negatively related to short-term leverage.

The profitability of a firm is directly related to the ability to internally finance its investments. Considering this, we are going to test the relation between profitability and leverage. Since more profitable firms have more available own funds to be used in new investments instead we expect a positive relation between firms' profitability and leverage (Stewart C Myers & Majluf, 1984; Titman & Wessels, 1988).

The final factor affecting leverage that we are going to test is firms' uniqueness. Firms with more specialized products normally impose higher costs to its workers, customers and suppliers in case of bankruptcy. This is due to the fact, that in case of bankruptcy it will be very hard to find alternate

solutions (Titman & Wessels, 1988). Since, associated with higher levels of leverage are higher risks of bankruptcy we expect a negative relation between firms' uniqueness and leverage.

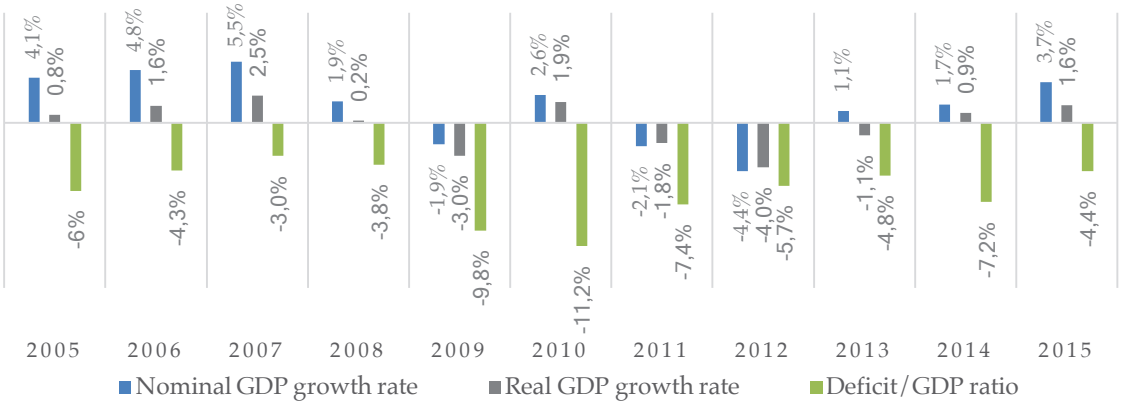
Chapter 3
The Global Financial Crisis

The global financial crisis started in the United States of America due to the sub-prime mortgage crisis in 2007, reaching its peak in 2008 (Campello et al., 2010). In the period prior to the crisis there was a credit boom and rise in house prices, where institutions issued sub-prime mortgage, i.e. a type of mortgage issued to borrowers that have a default risk higher than the average usually with higher interest rates. Nonetheless, as Bernanke (2010) stated "judged in relation to the size of global financial markets, prospective sub-prime losses were clearly not large enough on their own to account for the magnitude of the crisis". What led to the global financial crisis were the problems with mortgage and credit markets spilling into interbank, repo and ABCP (asset-backed commercial paper) markets. In fact, the credit boom led to the increase in the issuance of mortgage backed securities, related to the growth of the shadow banking system (Gorton & Metrick, 2012) Financial intermediaries used securitization particularly through ABPC programs and repo conduits, in order to finance the mortgage loans, hence the mortgage backed securities. However, when runs on ABCP programs occurred, meaning lenders refuse to refinance the commercial paper when it comes due (Covitz, Liang, & Suarez, 2013) and repo conduits had 100 % haircuts financial intermediaries were unable to finance themselves leading to liquidity problems and cases of bankruptcy like the cases of Bearn Stearns and Lehman Brothers (Gorton & Metrick, 2012). These factors connected to major banks around the world having high exposures to losses in asset-backed securities in the U.S markets caused the crisis to spread having repercussions worldwide, particularly in Europe, repercussions caused what was called the European sovereign debt crisis (Lane, 2012).

1. The Financial Crisis: The Case of Portugal

From the beginning of the XXI century until the crisis period the Portuguese economy has been in a slump (Reis, 2013). From slight increases in the annual GDP in the earlier 2000's the economy fell into a recession in 2003 with the GDP falling - 0,93% that year. The following years the economy began to recuperate always with slight increases, and in 2007, the beginning of the financial crisis, Portugal economy seemed to do well with GDP increasing 2,79%, the first increase above 2% in the last 7 years. However, crisis impacts began to show in 2008 with minor increase of 0,20% and a new recession in 2009 with GDP decreasing – 2,98%.

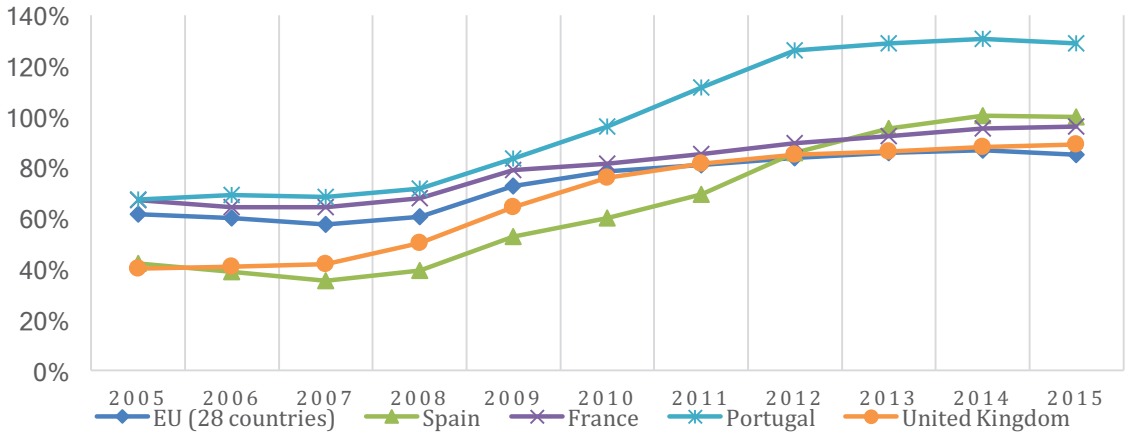
FIGURE 1:
Portugal GDP growth rate and deficit/GDP (%) ratio, 2005-2015



Source: OECD, 2017

As Figure 1 shows, the Portuguese economy entered its worst cycle in 2008, with major decreases in GDP adding to significant increases in budget deficits. Portuguese economy followed the trend of other European economies that showed strong increases in sovereign debt (Figure 2). With the financial crisis investors started to repatriate the funds that were invested abroad, reassessing their exposure to foreign positions. Moreover, it led to a reassessment of growth forecasts and asset prices. In turn, countries which were already dependent on external funding before the crisis had even more severe impacts (Lane, 2012; Milesi-Ferretti & Tille, 2011).

FIGURE 2:
Public debt evolution in Europe (% GDP), 2005-2015

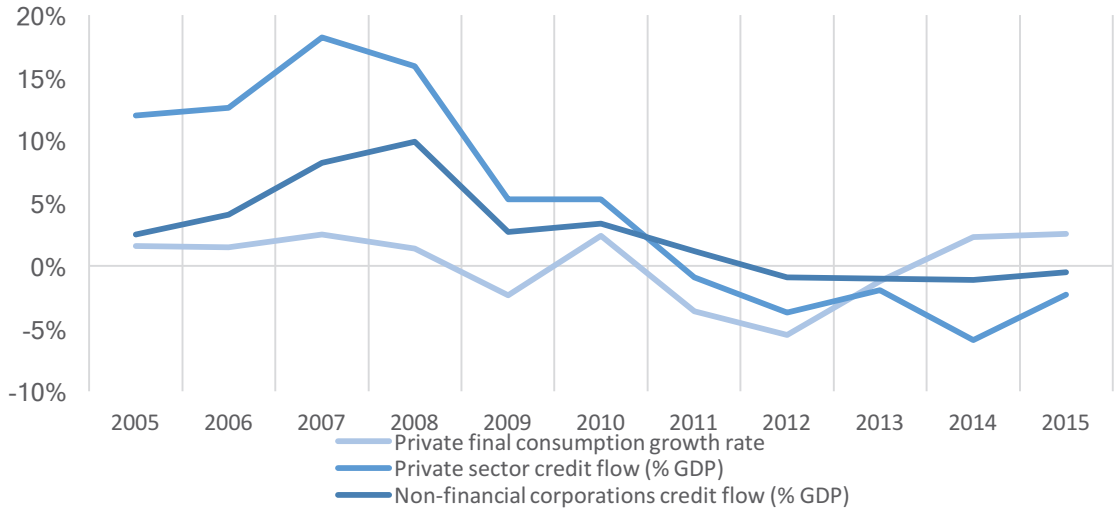


Source: Eurostat, 2017

The increase in deficit and sovereign debt, the low GDP growth rates, investors reassessing risks pulling-back from countries with higher external liabilities and, consequently, rising spreads on sovereign debt bonds, made access to financial markets more and more difficult throughout Europe (Milesi-Ferretti & Tille, 2011). Unable to refinance or repay the government debt without assistance, the Portuguese government requested for financing assistance in April 2011 to the European Union, the European Central Bank and the International Monetary Fund, which resulted in a 3-year adjustment program.

The adjustment program had three pillars. The First pillar consisted in a fiscal consolidation strategy in order to stop the trend of increasing public debt-to-GDP ratio. The second pillar focused in structural reforms, particularly reforms on the labour market, judicial system, and in the network of housing, industry and services sectors, in the attempt to motivate potential growth and competitiveness and at the same time creating jobs. Finally, the third pillar aimed at maintaining stability in the financial sector mainly by deleveraging banks' balance sheets, fortifying banks capitalization and upgrading bank supervision. The first two pillars presented, led to a period of austerity with tax increases and benefit reforms having a negative impact in the economy as they translated into a decrease in private consumption. Furthermore, the stabilization of the financial sector and ensuing deleveraging of banks' balance sheets in addition to the increase of interest rates cause by the sovereign debt crisis made access to bank credit even more restrictive (Union, 2014).

FIGURE 3:
Private consumption and credit flow[4] evolution in Portugal, 2005-2015



Source: Eurostat; OECD, 2017

From Figure 3, it is easily perceivable the decrease in both private consumption and credit during the crisis and adjustment program period and how this presented a major problem to firms, particularly SMEs, who financing relied heavily on the domestic financial sector since they did not have access to international financial markets and had to deal, at the same time, with decreasing revenues and a constrained access to the credit market. Iyer, Peydró, da-Rocha-Lopes, and Schoar (2014) study the impact of the crisis in the credit supply and concluded that there was, indeed, a credit crunch and that this reduction was stronger for smaller firms who had weaker relationships with banks.

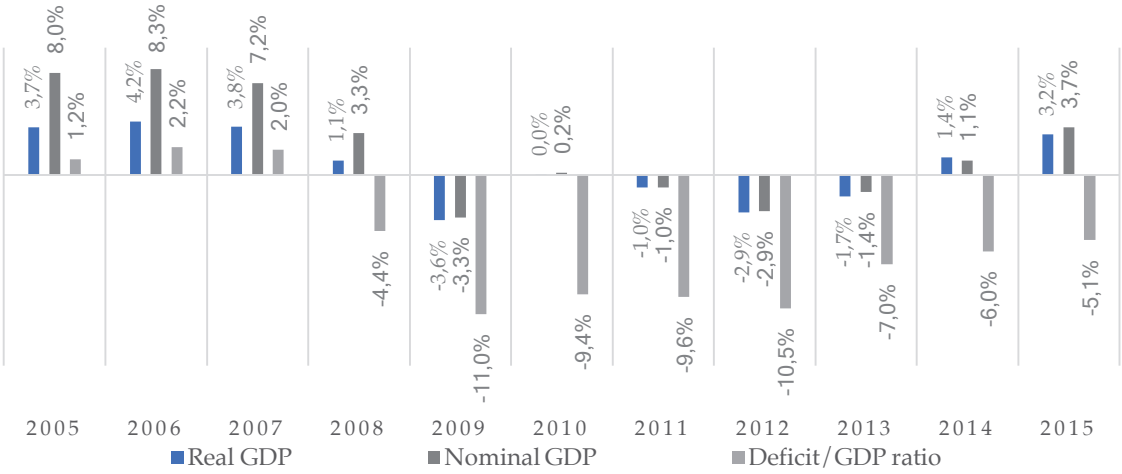
However, by the end of the adjustment program in June 2014 the economy gave positive signs, with GDP (Figure 1) and private consumption rising, the smoothing of the decreasing trend of private credit flow and increasing trend of public debt (Figure 2). Nonetheless the Portuguese economy was a long-way from being considered a healthy economy with a deficit-to-GDP ratio of 4,4% (Figure 1) and a public debt-to-GDP ratio of 129% in 2015 (Figure 2).

[4] The indicator private sector credit flow represents the liabilities incurred along a year by non-financials corporations, households and non-financial. Financial flows represent the difference between the first balance sheet of the year and the last (EUROSTAT).

2. The Financial Crisis: The Case of Spain

In the period leading up to the beginning of the crisis the Spanish economy looked healthy having yearly real GDP growths of around 4%, a government budget surplus (see Figure 4) and public debt-to-GDP ratio within the European Fiscal rules as showed in Figure 2 (Lane, 2012).

FIGURE 4:
Spain GDP growth rate and deficit/GDP (%) ratio, 2005-2015



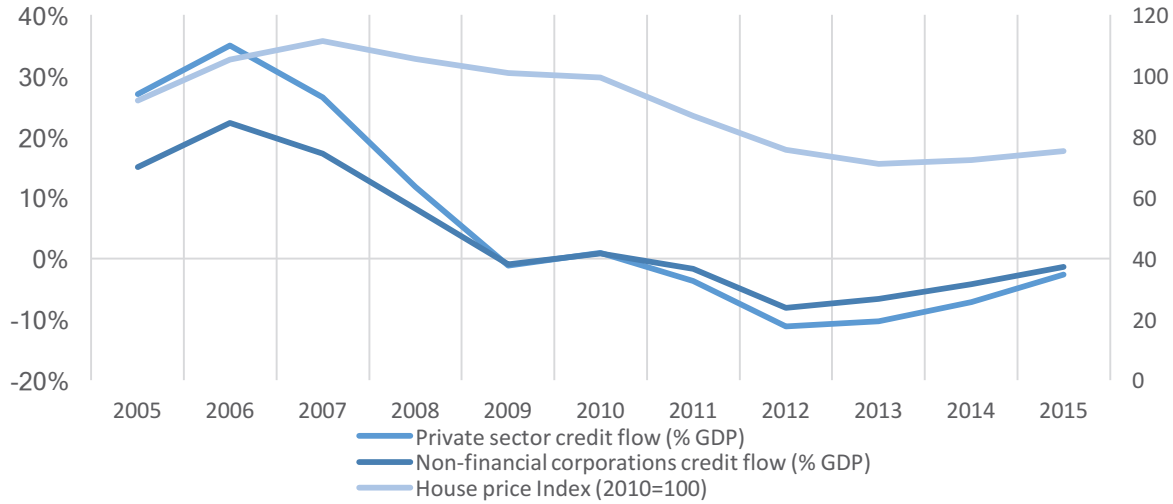
Source: OECD, 2017

When trying to understand the repercussions of the financial crisis in the Spanish economy, it is essential to refer the Spanish real estate market. During the period prior to the crisis the housing market was one of the main factors of the GDP growth, in fact, the construction sector explained 22% of the GDP in 2007 (Ortega & Peñalosa, 2012). This associated with an average mortgage rate in Spain lower than in the Euro area led to an important increase of mortgage loans and loans to construction firms, explaining the credit and house pricing boom as in Figure 5 shows (Akin, Montalvo, Villar, Peydró, & Raya, 2014). The reliance on a highly leverage housing market in addition to lower credits standards were the main reason behind the severe impact of the crisis in the Spanish economy.

The tightening of financing conditions caused by the crisis and consequent decreasing demand in the housing sector led to the collapse of the housing market with real estate and construction firms that could no longer sell houses in order to repay their debts, leading to a high number of defaults and in some

cases firms filing for bankruptcy. The default on loans caused by the collapse left banks with liquidity problems which determined the late request for a rescue package of 100 billion euros from the European Stability Mechanism in order to bail-out the Spanish financial sector which, in turn, motivated the increase of the public debt-to-GDP ratio (See Figure 2) (Lane, 2012).

FIGURE 5:
Spain credit flow (% GDP) and House price index, 2005-2015



Source: Eurostat, 2017

The Spanish budgetary situation was badly affected. As Figure 4 shows from a GDP growth of 3,8% and a 2% budget surplus in 2007, the Spanish economy fell into a recession caused by the crisis and aggravated by the decrease in revenue, in turn, caused by the collapse of the housing markets, with a negative GDP growth of - 3,6% and a deficit of 11% in 2009 (Lane, 2012). This decreasing trend continued in the years after when in 2012 the financial assistance requested delayed the economic recovery that would only began to show with positive GDP growths in 2014 and 2015, although maintaining an important budgetary deficit (Figure 4).

The Spanish economic and financial situation and consequent rising interest rates posed a major problem for SMEs in terms of credit availability, in fact as figures 5 shows there was a credit crunch in all the private sector and that this crunch equally affected the credit flow for non-financial corporations, a problem affecting the majority of European countries (Holton et al., 2013).

Chapter 4
Data and Methodology

The objective of this study is to understand the determinants of capital structure of Portuguese and Spanish SMEs, how they were affected by the financial and economic crisis and if there is some difference in SMES' financing decisions between both countries. This chapter provides the description of the sample and variables used in order to answer this work research questions.

1. Data

The sample used in this empirical study was retrieved from *Sistema de Análise de Balanços Ibéricos* (SABI) database provided by Bureau van Dijk[5]. The initial sample was composed by firms that for the period of 2005-2015 followed the criterions from the European Commission definition of SME[6]:

- Less than 250 employees;
- Annual turnover not exceeding 50 million Euros;
- Annual balance sheet total not exceeding 43 million Euros.

Furthermore, following previous works practice, (Frank & Goyal, 2003; Harrison & Widjaja, 2014; Proença et al., 2014; Sogorb-Mira, 2005; Titman & Wessels, 1988), only domestic firms independent privately held[7] and firms outside the financial and insurance sectors were considered in the dataset which represent a total of 24 866 Portuguese firms and 76 610 Spanish firms. Finally, all observations that had missing variable values, negative or null EBIT,

[5] SABI provides financial reports of 2 000 000 Spanish firms and 500 000 Portuguese firms. Bureau van Djik also manages a wide range of Databases with financial reports from firms and banks around the world.
[6] European Commission Recommendation 2003/361/EC, 6 May 2003.
[7] Firms considered could not be a subsidiary of a big firm or part of a group of companies.

total assets[8] or equity[9] and other inconsistent variable values were excluded, leading to the final sample of 17 814 Portuguese firms and 61 688 Spanish firms and to a total of 82 975 and 423 252 observations, respectively, for the period in study Table 1 presents the distribution of our sample of firms from each country by industry and the weight of each industry according to the country industry code[10]

TABLE 1 :
Firm distribution by industry

Industry	Number of Portuguese Firms	Weight distribution	Number of Spanish Firms	Weight distribution
Agriculture Forestry and Mining	645	3,6%	1 676	2,7%
Manufacturing	4 323	24,3%	14 807	24,0%
Utilities	40	0,22%	269	0,44%
Construction	2 398	13,5%	8 860	14,4%
Wholesale and Retail trade	7 401	41,5%	22 650	36,7%
Hotels and Restaurants	927	5,2%	3 017	4,9%
Transport and Communications	411	2,3%	3 316	5,4%
Business services	873	4,9%	5 022	8,1%
Education, Health, Social work and others	796	4,5%	2 071	3,4%
TOTAL	17 814	100%	61 688	100%

From Table 1 we can see that our firm samples for Portugal and Spain are similar on what it concerns the industry distribution, in fact, for both countries we have a sample of the business fabric mainly composed by firms in the wholesale and retail trade industry, manufacturing industry and construction industry.

[8] Some variables used were scaled by Total Assets.

[9] Negative equity is understood as the firm being technically bankrupt.

[10] CAE Rev. 3 for Portugal and CNAE 2009 for Spain, more information concerning the industry code of each country is provided in http://www.ine.pt/ine_novidades/semin/cae/CAE_REV_3.pdf and http://www.cnae.com.es/lista-actividades.php, respectively.

2. Methodology

In this sub-section, is presented the dependent and independent variables computation and the econometric methodology used in order to test our empirical hypotheses for both countries during 4 different periods, pursuing our objective to understand the impact of the crisis on SMEs capital structure. The first period from 2005-2007 represents the period prior to the crisis, although the beginning of the crisis is traced back to 2007 it only reached its peak in 2008 (Campello et al., 2010; Gorton & Metrick, 2012), the second from 2008-2010 is the crisis period, where the impacts of the financial crisis starts to show in the economic growth and credit markets of Portugal and Spain as presented in chapter 3, the third period, or the post-crisis period, goes from 2011-2013 this period is characterized by the financial assistance programs that both countries had to request. The fourth and last period was chosen as it represents the period where both countries have ended their respective financial assistance programs, and it goes from 2014-2015. Nonetheless, about this final period, a remark must be made, Portugal's assistance program ended in June 2014 while Spain's ended in December 2013, although for comparison sake we will consider 2014 as the first year after the adjustment programs.

2.1. Variables

In order to test the theoretical hypotheses formulated in Chapter 2 it is necessary to define a way to measure the determinants of capital structure, namely non-debt tax shields, assets tangibility, growth opportunities, firm size, uniqueness and profitability. A number of previous works defined proxies to these attributes, consequently the proxies used in this study will be based on empirical works previously conducted, particularly, Titman and Wessels (1988), Rajan and Zingales (1995), Michaelas, Chittenden, and Poutziouris (1999), Hall et al. (2004) and Harrison and Widjaja (2014).

According Michaelas et al. (1999), as a mean to be able to compare the different variables between firms we must standardize the measures used by deflating, where appropriate, the variables by total assets.

The independent variable that we will try to explain is the SME capital structure which will be measured by total debt (TD) given by the ratio of total

debt and total assets, however, the theories tested have different effects on different types of debt, as such we will also consider as independent variables long-term debt (LTD), given by the ratio of long-term debt[11] and total assets, and short-term debt (STD), given by the ratio of short-term debt and total assets (Hall et al., 2004; Michaelas et al., 1999; Titman & Wessels, 1988). Thus, our independent variable are as follows:

- $\text{TD} = \frac{\text{Total Debt}}{\text{Total Assets}}$
- $\text{LTD} = \frac{\text{Long-term Debt}}{\text{Total Assets}}$
- $\text{STD} = \frac{\text{Short-term Debt}}{\text{Total Assets}}$

Concerning our independent variables, we choose the proxies most used in the empirical literature as the observable indicators for the determinants of capital structure (Titman & Wessels, 1988), particularly:

- Assets Tangibility $= \frac{\text{Fixed Assets}}{\text{Total Assets}}$ (Hall et al., 2004; Rajan & Zingales, 1995);
- Non-debt Tax Shields $= \frac{\text{Depreciation}}{\text{Total Assets}}$ (Michaelas et al., 1999; Titman & Wessels, 1988);
- Growth = % change in total assets (Titman & Wessels, 1988);
- Uniqueness $= \frac{\text{Selling Expenses}}{\text{Sales}}$ (Titman & Wessels, 1988);
- Size = $\ln$ Sales (Rajan & Zingales, 1995; Titman & Wessels, 1988);
- Profitability $= \frac{\text{EBIT}}{\text{Total Assets}}$, where EBIT stand for Earnings before interest and taxes (Harrison & Widjaja, 2014; Michaelas et al., 1999; Titman & Wessels, 1988).

2.2. Econometric Model

In this study, since we have an unbalanced panel data set, we will utilize panel data methodology so that we can examine our theoretical hypotheses. According to Hsiao (1986) and Baltagi (1995), panel data models have clear

[11] Following Michaelas et al. (1999) long-term debt is the firm's debt repayable beyond one year including long term bank loans and other long term liabilities; short-term debt is the firm's debt repayable within one year such as current portion of bank loans and other currents liabilities.

advantages when compared to cross-section and time-series data. In particular, panel data allows for a higher number of observations, leading to an increase of the degrees of freedom and contributing for the reduction of the correlation between independent variable problem, also called multicollinearity, hence providing more efficient estimates (Baltagi, 1995). Another advantage of panel data is that it allows the use of variable-intercepts models, such as, the fixed-effects model and the random-effects model. These models introduce a firm, industry and/or year specific effects into the regression. By doing this, the biases caused by individual effects being omitted and correlated with the independent variables are avoided or at least mitigated (Baltagi, 1995). Taken into account these advantages our model regressions can be defined as follows:

$$(3) \quad Y_{it}=\beta_0+\beta_1 TANG_{it}+\beta_2 NTDS_{it}+\beta_3 GROWTH_{it}+\beta_4 UNIQ_{it}+\beta_5 SIZE_{it}+\beta_6 PROFIT_{it}+\alpha_i+\varepsilon_{it}$$

Where:

- Y_{it} = Dependent variable, in particular Total Debt (TD_{it}), Long-term Debt $(LTD)_{it}$ or Short-term Debt (STD_{it}) for the *i* firm on the year *t*;
- $TANG_{it}$= Assets tangibility for the *i* firm on the year *t*;
- $NTDS_{it}$= Non-debt tax shields for the *i* firm on the year *t*;
- $GROWTH_{it}$= Growth rate for the *i* firm on the year *t*;
- $UNIQ_{it}$= Uniqueness of the *i* firm on the year *t*;
- $SIZE_{it}$= Size of the *i* firm on the year *t*;
- $PROFIT_{it}$= Profitability for the *i* firm on the year *t*;
- α_i= unobserved time-invariant firm-specific effect[12]
- ε_{it}= random error term

A problem that commonly arises from the variable-intercepts models is to determine if the individual effects are fixed-effects or random-effects (Michaelas et al., 1999). To deal with this problem and determine which estimation method one should apply, it is usually employed the Hausman (1978) specification test. This test compares the two estimators, a consistent fixed-effect estimator with the efficient random-effects estimator. The null hypothesis is that the latter is,

[12] An unobservable firm-specific effect that can be considered, for instance, firms' executives managerial or entrepreneurial skills. Moreover, since we have an unbalanced panel data and we could not compute a risk proxy due to missing values, we can also consider risk to be an unobservable firm-specific effect.

indeed, the consistent and efficient estimator and consequently there should no significant difference between both estimators. If the null hypothesis is rejected, that means that the individuals effects are not properly modeled by the random-effects model and that the adequate model is the fixed-effects.

After running the Hausman test[13] for our regressions in the different periods results suggested that the fixed-effects model was the most adequate.

[13] See Appendix 1 for Hausman test results.

Chapter 5
Results and Discussion

This section provides all the results from the preliminary analysis and our model regressions obtained using Stata statistical package.

1. Preliminary Analysis

The descriptive statistics from our dependent and independent variables are presented in Table 2.

From Table 2 we can see that the mean of total debt ratio is similar between both countries 61,7% in Portugal and 60% in Spain for the whole period remaining similar throughout the sub-periods. However, statistics show that there is a downward trend of total debt ratio when we analyze the sub-periods averages. These results are in line with the idea of credit constrain caused by the financial crisis. Moreover, the means for long-term debt and short-term debt seem confirm that on average SMEs rely more on short-term debt than on long term debt. In fact, on average for the overall period STD amounts to 38,1% for Portugal and 41,6% for Spain while LTD amounts to 23,6% in Portugal and 18,4% in Spain, these relationships are verified throughout the sub-periods, namely, the period prior to the crisis from 2005-2007, the crisis period from 2008-2010, the period after the crisis from 2011-2014 and the period after representing both countries having finished their respective financial assistance programs. However, an important downward trend is only verified in STD while LTD remains stable.

Comparing our overall period averages with other previously studies conducted on either we can identify some similarities as well as some disparities. For instance, the evidence that Portuguese SMEs rely more on

short-term debt was also found by Vieira and Novo (2010) for the period of 2000-2005 with an average STD of 48,7% and an average LTD of 12,6% and Proença et al. (2014) with an average STD and LTD of 49% and 17%, respectively for the period of 2007-2010. Additionally, our TD average for the global period of 61,7% is very similar with Vieira and Novo (2010) 61,3% TD average and our crisis period 64,2% TD average close to the 67% average found by (Proença et al., 2014).

Concerning the results for Spain we identified a similarity, between our 60% TD average for whole period with Sogorb-Mira (2005) TD average of 61,4%, for the more distant period of 1994-1998. However distant, the author found the same SMEs relationship between short-term debt and long-term debt with an average of 52,4% and 8,9%.

From Table 2 we infer that on average for the overall period Portuguese SMEs tangible assets represent 20,6% of the firms' asset structure while in Spain tangible assets represent 29,5%. Notwithstanding, looking at the means period by period we notice that the tangibility ratio shows slight increases from in the first three periods and a minor decrease in the last period for Spain and opposite behavior for Portugal with slim decreases in the first three periods ending with a meager increase in the last period. With respect to non-debt tax shields, we see that for the overall period depreciation represents on average 4,2% of total assets for Portugal and 3,9% for Spain, with the variable decreasing overtime. Focusing on the growth variable an important remark is the important decrease of the average between the pre-crisis (2005-2007) period, the crisis period (2008-2010) and the post-crisis period (2011-2013) only stabilizing in the post adjustment program period (2014-2015). This important decrease led to that for the overall period the growth rate for SMEs was on average of 8,8% for Portugal and 6,1% for Spain, these average growth rates represent circa to half of the average growth rates for the pre-crisis period of 16,2% for Portugal and 12,5% for Spain. The expense-to-sales ratio of SMEs is presents a whole period average of 54,3% for Portuguese firms and 55,3% for Spanish firm. Analyzing this indicator period by period we see that there is a downward trend which suggests a decrease in sales and, in turn, supports the fact that private consumption has decreased during and after the crisis period. The SIZE variable shows that the average size of Portuguese SMEs was approximately 6 588 000 € in terms sales while the average size of Spanish SMEs

was approximately for the total period, the average size was stable throughout the periods. In terms of profitability we can see that the worst the period was the post-crisis period with the average profitability dropping near 10% in Portugal and 30% in Spain in relation to the period prior to the crisis.

Before presenting the results, it is important to dismiss the problem of multicollinearity between variables. As such, Table 4 shows the correlation matrix between the variables for the periods of the study. According to Gujarati and Porter (2003) a problem of multicollinearity may be present if the correlations values are higher than 0,8. However, we can see high correlations values for between NTDS and TANG and SIZE and TANG, nonetheless these values are close to those found by Titman and Wessels (1988) who consider that they do not represent a serious issue in terms of robustness.

TABLE 2 :
Variables descriptive statistics

Variables		2005-2015		2005-2007		2008-2010		2011-2013		2014-2015	
		Portugal	Spain	Portugal	Spain	Portugal	Spain	Portugal	Spain	Portugal	Spain
TD											
	Mean	0,617	0,600	0,681	0,656	0,642	0,600	0,572	0,571	0,559	0,547
	Std. Dev.	0,213	0,230	0,188	0,213	0,200	0,229	0,218	0,234	0,225	0,236
	Min.	0,000	0,000	0,018	0,000	0,000	0,000	0,000	0,003	0,000	0,000
	Max.	1,864	1,235	1,864	1,053	1,023	1,019	1,073	1,235	1,025	1,024
LTD											
	Mean	0,236	0,184	0,243	0,180	0,248	0,189	0,219	0,189	0,228	0,177
	Std. Dev.	0,193	0,178	0,199	0,174	0,194	0,183	0,185	0,179	0,191	0,172
	Min.	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	Max.	0,992	1,000	0,992	1,000	0,974	0,972	0,975	0,975	0,971	0,980
STD											
	Mean	0,381	0,416	0,438	0,475	0,393	0,411	0,352	0,382	0,332	0,370
	Std. Dev.	0,208	0,217	0,208	0,215	0,205	0,216	0,201	0,211	0,200	0,208
	Min.	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	Max.	0,991	1,000	0,991	0,998	0,981	1,000	0,991	0,999	0,981	0,998
TANG											
	Mean	0,206	0,295	0,225	0,277	0,212	0,313	0,185	0,301	0,197	0,289
	Std. Dev.	0,209	0,228	0,211	0,219	0,209	0,230	0,202	0,233	0,210	0,230
	Min.	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	Max.	0,996	1,019	0,996	1,000	0,995	1,000	0,993	1,015	0,990	1,019
NTDS											
	Mean	0,042	0,039	0,054	0,045	0,046	0,042	0,034	0,035	0,033	0,030
	Std. Dev.	0,040	0,037	0,046	0,041	0,040	0,038	0,033	0,034	0,033	0,031
	Min.	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	Max.	0,690	1,661	0,605	1,661	0,690	0,846	0,619	1,557	0,570	0,949
GROWTH											
	Mean	0,088	0,061	0,162	0,125	0,086	0,034	0,037	0,025	0,058	0,051
	Std. Dev.	0,638	0,201	1,189	0,235	0,369	0,198	0,218	0,164	0,233	0,165
	Min.	-0,882	-0,950	-0,815	-0,950	-0,838	-0,930	-0,798	-0,940	-0,882	-0,870
	Max.	149,355	4,840	149,355	4,840	27,597	4,630	5,779	4,190	5,650	1,630
UNIQ											
	Mean	0,543	0,553	0,613	0,556	0,527	0,577	0,540	0,534	0,498	0,535
	Std. Dev.	3,987	2,357	7,637	0,631	1,171	4,228	2,710	0,888	0,312	0,653
	Min.	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	Max.	1059,900	836,000	1059,900	142,667	174,060	836,000	324,320	217,857	14,394	97,056
SIZE											
	Mean	6,588	7,207	6,658	7,250	6,619	7,221	6,634	7,166	6,442	7,166
	Std. Dev.	1,451	1,114	1,416	1,072	1,410	1,077	1,499	1,145	1,486	1,193
	Min.	0,000	0,000	0,000	0,000	0,693	0,000	0,000	0,000	0,693	0,000
	Max.	10,819	10,812	10,819	10,810	10,666	10,812	10,698	10,798	10,810	10,809
PROFIT											
	Mean	0,062	0,066	0,062	0,081	0,062	0,066	0,051	0,053	0,067	0,059
	Std. Dev.	0,064	0,068	0,061	0,076	0,061	0,066	0,058	0,058	0,072	0,066
	Min.	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
	Max.	1,723	7,254	0,883	7,254	0,883	2,292	1,117	3,502	1,723	2,824
Number of observations		82 975	423 252	19 883	123 957	26 502	122 466	16 489	103 048	20 101	73 781

Table 3 :
Correlation matrix of the explanatory variables by country and period

Portugal							Spain						
2005-2007							2005-2007						
	TANG	NTDS	GROWTH	UNIQ	SIZE	PROFIT		TANG	NTDS	GROWTH	UNIQ	SIZE	PROF
TANG	1,000						TANG	1,000					
NTDS	0,430	1,000					NTDS	0,242	1,000				
GROWTH	0,010	-0,006	1,000				GROWTH	-0,073	-0,124	1,000			
UNIQ	-0,011	-0,018	0,006	1,000			UNIQ	-0,089	-0,138	-0,004	1,000		
SIZE	-0,340	-0,167	-0,008	-0,032	1,000		SIZE	-0,190	-0,172	0,024	0,095	1,000	
PROFIT	0,032	0,165	0,049	-0,010	-0,007	1,000	PROF	-0,083	0,047	0,098	-0,074	0,037	1,000
2008-2010							2008-2010						
	TANG	NTDS	GROWTH	UNIQ	SIZE	PROFIT		TANG	NTDS	GROWTH	UNIQ	SIZE	PROF
TANG	1,000						TANG	1,000					
NTDS	0,412	1,000					NTDS	0,364	1,000				
GROWTH	-0,004	-0,036	1,000				GROWTH	-0,068	-0,123	1,000			
UNIQ	-0,056	-0,085	0,015	1,000			UNIQ	-0,023	-0,027	0,009	1,000		
SIZE	-0,296	-0,106	0,004	0,025	1,000		SIZE	-0,168	-0,115	0,015	-0,038	1,000	
PROFIT	0,026	0,159	0,076	-0,035	0,003	1,000	PROF	-0,077	0,066	0,105	-0,015	0,070	1,000
2011-2013							2011-2013						
	TANG	NTDS	GROWTH	UNIQ	SIZE	PROFIT		TANG	NTDS	GROWTH	UNIQ	SIZE	PROF
TANG	1,000						TANG	1,000					
NTDS	0,372	1,000					NTDS	0,338	1,000				
GROWTH	-0,045	-0,030	1,000				GROWTH	-0,093	-0,102	1,000			
UNIQ	-0,026	-0,037	0,003	1,000			UNIQ	-0,074	-0,091	0,023	1,000		
SIZE	-0,276	-0,026	0,027	-0,015	1,000		SIZE	-0,141	-0,043	0,075	0,059	1,000	
PROFIT	-0,005	0,164	0,199	-0,018	0,009	1,000	PROF	-0,065	0,093	0,142	-0,047	0,078	1,000
2014-2015							2014-2015						
	TANG	NTDS	GROWTH	UNIQ	SIZE	PROFIT		TANG	NTDS	GROWTH	UNIQ	SIZE	PROF
TANG	1,000						TANG	1,000					
NTDS	0,382	1,000					NTDS	0,355	1,000				
GROWTH	-0,034	-0,012	1,000				GROWTH	-0,094	-0,055	1,000			
UNIQ	-0,161	-0,253	-0,011	1,000			UNIQ	-0,094	-0,124	0,013	1,000		
SIZE	-0,251	-0,026	0,041	0,252	1,000		SIZE	-0,133	-0,003	0,131	0,082	1,000	
PROFIT	-0,025	0,140	0,214	-0,109	-0,012	1,000	PROF	-0,056	0,123	0,173	-0,052	0,089	1,000

2. Empirical Results

We will now present the results from our unbalanced panel data regression using the fixed-effects model to examine the validity of the empirical hypotheses that we made in chapter 2. As we attempt to understand what were the main impacts of the financial crisis on the determinants of capital structure of Portuguese and Spanish SMEs while comparing them, we present the regressions by country and for all the sub-periods presented above, namely, the pre-crisis period (2005-2007), the crisis period (2008-2010), the post-crisis period (2011-2013). The regressions will be divided in three tables, table 5 having as dependent variable TD, table 6 having as dependent variable LTD and finally table 7 having as dependent variable STD. For a better understanding, we will analyze each table separately comparing the results in the end.

Let us begin our analysis of Table 4 by commenting the adjusted R^2 values and overall significance tests results. We can see, that the adjusted R^2 ranges from 83% to 96,3% for Portugal and from 80,09% to 98,7% for Spain, these percentages represent how much of the variability of the dependent around its mean is explain by the model, suggesting that our model fits our data. Moreover, for the overall period, sub-periods and both countries the overall significance test suggest that our model variables are as whole statistical significant.

From a quick analysis of Table 4 we can see that the relationships between dependent and independent variables are similar across periods and countries. In order to determine the similarities, we will now examine each of the variables separately and examine if we should reject or not our empirical hypotheses.

As predicted, for both Portugal and Spain, in the overall period of the study and throughout the sub-periods we notice that the firms' asset tangibility (TANG) is positively related with total debt (TD) and significant for a 1% level of confidence, except for Portugal in the post-crisis period where the variable is statistically insignificant. The same, significant for a 1% level of confidence, relationship can be found between long-term leverage (LTD) and assets tangibility (TANG) for both countries and all periods as we can see in Table 5.

Moreover, Table 6 show us that assets tangibility (TANG) is significantly and negatively related to short-term leverage (STD) for all periods and both countries. These results are in line with what was expected, the arguments put forth by Titman and Wessels (1988) and the results found by Hall et al. (2004).

TABLE 4 :
Regression Estimates period by period for Portugal and Spain (TD)

TD	2005-2015		2005-2007		2008-2010		2011-2013		2014-2015	
Variables	Portugal	Spain	Portugal	Spain	Portugal	Spain	Portugal	Spain	Portugal	Spain
Constant	0,462*** (0,008)	0,288*** (0,003)	0,647*** (0,017)	0,672*** (0,007)	0,403*** (0,016)	0,174*** (0,006)	0,321*** (0,020)	0,258*** (0,007)	0,460*** (0,021)	0,418*** (0,010)
TANG	0,078*** (0,004)	0,050*** (0,002)	0,045*** (0,009)	0,030*** (0,003)	0,032*** (0,008)	0,077*** (0,004)	-0,007 (0,013)	0,041*** (0,004)	0,028*** (0,011)	0,026*** (0,005)
NTDS	0,463*** (0,017)	0,387*** (0,008)	-0,275*** (0,032)	-0,143*** (0,011)	-0,048 (0,031)	-0,140*** (0,014)	0,038 (0,060)	0,037** (0,015)	0,124*** (0,046)	0,001 (0,021)
GROWTH	0,018*** (0,001)	0,154*** (0,001)	0,004*** (0,000)	0,097*** (0,001)	0,048*** (0,002)	0,107*** (0,001	0,089*** (0,004)	0,123*** (0,000)	0,101*** (0,003)	0,128*** (0,002)
UNIQ	0,000*** (0,000)	0,001*** (0,000)	0,000 (0,000)	0,000 (0,000)	0,011*** (0,001)	0,001*** (0,000)	0,001*** (0,000)	0,002*** (0,001)	0,011*** (0,004)	0,002*** (0,000)
SIZE	0,021*** (0,001)	0,039*** (0,000)	0,010*** (0,003)	-0,001 (0,001)	0,037*** (0,002)	0,057*** (0,001)	0,040*** (0,003)	0,043*** (0,006)	0,016*** (0,003)	0,019*** (0,001)
PROFIT	-0,320*** (0,008)	-0,116*** (0,003)	-0,438*** (0,016)	-0,306*** (0,004)	-0,308*** (0,013)	-0,132*** (0,005)	-0,333*** (0,022)	-0,263*** (0,007)	-0,388*** (0,014)	-0,345*** (0,006)
Adj. R^2	0,830	0,809	0,910	0,9374	0,963	0,941	0,949	0,952	0,950	0,987
F-test	617,17***	7 046,12***	164,28***	3 317,18***	302,89***	2 553,06***	156,85***	1 947,88***	357,40***	1 698,32***

The statistics presented are computed across 82 975 and 423 252 observations for Portugal and Spain, respectively, for2 the period of 2005-2015; 19 883 and 123 957 observations for the period of 2005-2007; 26 502 and 122 466 observations for the period of 2008-2010; 16 489 and 103 048 observations for the period of 2011-2013; 20 101 and 73 781 observations for the period of 2014-2015; Standard-errors in parenthesis; *** denotes p-value<0,01; **denotes p-value<0,05; * denotes p-value<0,1

TABLE 5 :
Regression Estimates period by period for Portugal and Spain (LTD)

LTD	2005-2015		2005-2007		2008-2010		2011-2013		2014-2015	
Variables	Portugal	Spain	Portugal	Spain	Portugal	Spain	Portugal	Spain	Portugal	Spain
Constant	0,351*** (0,009)	0,275*** (0,003)	0,334*** (0,026)	0,243*** (0,009)	0,406*** (0,028)	0,218*** (0,007)	0,243*** (0,028)	0,191*** (0,008)	0,398*** (0,028)	0,217*** (0,011)
TANG	0,114*** (0,005)	0,216*** (0,002)	0,102*** (0,013)	0,293*** 0,004	0,086*** (0,014)	0,289*** (0,004)	0,067*** (0,017)	0,263*** (0,005)	0,150*** (0,015)	0,278*** (0,006)
NTDS	-0,075*** (0,020)	-0,001*** (0,007)	-0,102** (0,049)	-0,052*** 0,014	-0,281*** (0,055)	-0,084*** (0,015)	-0,088 (0,083)	0,003 (0,016)	0,020 (0,062)	-0,054 (0,024)
GROWTH	0,004*** (0,001)	0,030*** (0,001)	0,002*** (0,001)	0,036*** 0,001	0,009*** (0,003)	0,024*** (0,001)	0,015*** (0,005)	0,018*** (0,001)	0,028*** (0,004)	0,040*** (0,002)
UNIQ	0,000 (0,000)	0,000*** (0,000)	0,000** (0,000)	-0,002*** 0,000	-0,005** (0,002)	0,000*** (0,000)	0,002*** (0,000)	-0,001*** (0,000)	-0,011* (0,006)	-0,003** (0,001)
SIZE	-0,019*** (0,001)	-0,021*** (0,000)	-0,014*** (0,004)	-0,019*** 0,001	-0,023*** (0,004)	-0,016*** (0,001)	-0,004 (0,004)	-0,011*** (0,001)	-0,029*** (0,004)	-0,016*** (0,001)
PROFIT	-0,200*** (0,010)	-0,073*** (0,003)	-0,271*** (0,024)	-0,117*** 0,005	-0,196*** (0,023)	-0,026*** (0,006)	-0,104*** (0,030)	-0,063*** (0,007)	-0,178*** (0,019)	-0,123*** (0,007)
Adj. R^2	0,716	0,765	0,813	0,853	0,732	0,888	0,866	0,908	0,876	0,927
F-test	230,07***	4 096,45***	43.18***	1348,64***	35,07***	961,91	14,44***	584,82***	56,30***	506,62***

The statistics presented are computed across 82 975 and 423 252 observations for Portugal and Spain, respectively, for2 the period of 2005-2015; 19 883 and 123 957 observations for the period of 2005-2007; 26 502 and 122 466 observations for the period of 2008-2010; 16 489 and 103 048 observations for the period of 2011-2013; 20 101 and 73 781 observations for the period of 2014-2015; Standard-errors in parenthesis; *** denotes p-value<0,01; **denotes p-value<0,05; * denotes p-value<0,1

TABLE 6:
Regression Estimates period by period for Portugal and Spain (STD)

STD	2005-2015		2005-2007		2008-2010		2011-2013		2014-2015	
Variables	Portugal	Spain	Portugal	Spain	Portugal	Spain	Portugal	Spain	Portugal	Spain
Constant	0,111*** (0,010)	0,013*** (0,003)	0,313*** (0,027)	0,429*** (0,009)	-0,003 (0,030)	-0,043*** (0,008)	0,078*** (0,029)	0,066*** (0,008)	0,063** (0,029)	0,201*** (0,012)
TANG	-0,036*** (0,005)	-0,166*** (0,002)	-0,057*** (0,014)	-0,264*** (0,004)	-0,054*** (0,014)	-0,212*** (0,005)	-0,073*** (0,018)	-0,222*** (0,005)	-0,122*** (0,015)	-0,252*** (0,007)
NTDS	0,538*** (0,021)	0,388*** (0,008)	-0,173*** (0,051)	-0,091*** (0,015)	0,232*** (0,058)	-0,055*** (0,017)	0,126 (0,086)	0,034* (0,018)	0,104* (0,063)	0,055** (0,025)
GROWTH	0,014*** (0,001)	0,124*** (0,001)	0,002*** (0,001)	0,061*** (0,001)	0,040*** (0,003)	0,083*** (0,001)	0,074*** (0,005)	0,105*** (0,002)	0,072*** (0,004)	0,088*** (0,002)
UNIQ	0,000*** (0,000)	0,001*** (0,000)	0,000** (0,000)	0,002*** (0,000)	0,016*** (0,003)	0,001*** (0,000)	-0,001*** (0,000)	0,003*** (0,000)	0,022*** (0,006)	0,004*** (0,001)
SIZE	0,040*** (0,001)	0,060*** (0,000)	0,024*** (0,004)	0,018*** (0,001)	0,059*** (0,004)	0,073*** (0,001)	0,044*** (0,004)	0,054*** (0,001)	0,045*** (0,004)	0,034*** (0,002)
PROFIT	-0,120*** (0,010)	-0,043*** (0,003)	-0,167*** (0,025)	-0,190*** (0,005)	-0,112*** (0,024)	-0,105*** (0,006)	-0,229*** (0,032)	-0,200*** (0,007)	-0,210*** (0,019)	-0,223*** (0,008)
Adj. R^2	0,727	0,801	0,814	0,893	0,742	0,898	0,877	0,920	0,883	0,942
F-test	298,44	8 974,89***	17,48***	1600,42***	71,79***	2169,06***	69,49***	1701,36***	116,53***	918,95***

The statistics presented are computed across 82 975 and 423 252 observations for Portugal and Spain, respectively, for2 the period of 2005-2015; 19 883 and 123 957 observations for the period of 2005-2007; 26 502 and 122 466 observations for the period of 2008-2010; 16 489 and 103 048 observations for the period of 2011-2013; 20 101 and 73 781 observations for the period of 2014-2015; Standard-errors in parenthesis; *** denotes p-value<0,01; **denotes p-value<0,05; * denotes p-value<0,1

With regards to non-debt tax shields, we infer from Table 4, 5 and 6 that the expected relation is not verified in Portugal or in Spain in some of the periods. In fact, results show that for the overall period, contrary to what was expected, NTDS is positively related to leverage, and short-term leverage for 1% significance level and significantly negatively related with long-term leverage. According to Michaelas et al. (1999), this indicates that SMEs managers do not consider tax effects on their short-term financing decisions although providing some evidence that managers do consider tax effects in the longer term. Additionally, analyzing the sub-periods we can see some differences between them. In the pre-crisis period the expected relationship is verified for both countries for 1% confidence level, the same happening in the crisis period with exception for Portugal that showed a significant positive relationship between NTDS and STD. For the periods after the crisis, the significant results show the same not expected relationship. This suggests that before the crisis SMEs managers in Portugal and Spain had tax effects in consideration when taking capital structure decisions, however this seems to have change in the crisis and after crisis years with a possible explanation might be the fact that in those years it became more difficult and expensive for small businesses to access credit (Iyer et al., 2014) and might had led managers to disregard tax effects from their financing decisions. Nonetheless, our results are similar with what was found by Proença et al. (2014) and (Michaelas et al., 1999).

Moving to the growth opportunities variable we can see from the three tables, that it has a significant and positive relation with all three dependent variables used, in both countries and for all periods. Although the positive relation was the expected, with respect to STD, a negative relation was expected regarding TD and LTD. These results make us reject our empirical hypotheses that supported the trade-off theory by the means of the agency costs. However it provides evidence of the pecking order theory according to which smaller fast growing firms will tend to issue more equity since they are not able to generate sufficient internal funds to finance all their investments (Michaelas et al., 1999).

The uniqueness of a firm seems to have a very small impact on capital structure decisions, however being statistical significant we can see examining the coefficients that, except for some cases, they are not higher than 1%. Nonetheless, we must state that the expected relationship is not verified, contrary to what Titman and Wessels (1988) found.

On what firm size is concerned, we can see from table 4 that our hypotheses that leverage is positively related to size, for a 1% confidence level, aside from on statistically insignificant result (Spain, 2005-2007). This is in line with results from authors such as Hall et al. (2004) and Vieira and Novo (2010). However, looking at table 5 and 6 we can observe that the expected relations between size and long-term leverage and between size and short-term debt are not verified. These three results put together suggests that Portuguese and Spanish SMEs level of leverage increases with size, but they tend to prefer more and more on short-term debt as they increase. This may be due to the high transaction costs small firms have to face when they resort to long-term finance (Titman & Wessels, 1988).

Our profitability hypothesis is verified for the overall period, sub-periods and in both countries with 1% significance level. This provides strong evidence of the pecking order theory.

In terms of differences across countries, from the regressions made, we cannot identify disparities. In fact, we may conclude that SMEs determinants of capital structure are in fact pretty similar across both countries.

On what it concerns differences between sub-periods, or economic cycles, except for non-debt tax shields before and after the crisis, the rest of the determinants examined did not show any variation between the four periods.

Chapter 6
Conclusion

The subject of capital structure has been one of the most discussed subjects of the financial world, mainly, since the seminal work of Modigliani and Miller (1958).

The 2008 financial crisis more commonly known as the subprime mortgage crisis started in the US and had major repercussions on the rest of the world. Portugal and Spain were both severely affected by the impacts of the financial crisis in Europe, the two countries went to through financial assistance programs in order to avoid bankruptcy and recover the economy.

With a business fabric composed almost completely by small and medium enterprises, it is important to understand what happens to this firms on such a severe time.

This work provides insight on the capital structures theories that better explain the financing decisions of SMEs in Portugal and Spain while comparing both countries and trying to identify possible effects of the financial crisis on the capital structure decisions.

With a panel of 17 814 Portuguese SMEs and 61 688 Spanish SMEs divided in four periods, before the crisis (2005-2007), during the crisis (2008-2010), after the crisis (2011-2013) and after the financial assistance programs (2014-2015) we were able to determine that there no major differences between both countries.

We find that Portuguese and Spanish SMEs ability to finance themselves rather than their capital structure decisions, that overall remain stable across all periods, was affected by the financial crisis, with access to credit being more restricted.

Additionally, our results provided us some evidence that the financing decisions of Portuguese and Spanish SMEs can be explained by both the Pecking-order theory and Trade-off theory. In fact, we find that for all the periods in study and for both countries assets tangibility is positively related

with total leverage and long-term leverage while being negatively related with short-term debt. Non-debt tax shields are negatively related to leverage in the period prior to the crisis and in the during the crisis period, showing the opposite relation for the overall period and for the two periods after the crisis. However, evidence being stronger for pecking-order theory with profitability being the most influential variable. For all measures of leverage, we find that growth opportunities are positively relate in both countries and for all the periods. Firms uniqueness however positively to leverage for most periods, this variable shows little impact on the level of leverage. Additionally, we find firm size, against expectations, being negatively related to long-term leverage and positively related to short-term leverage. Nonetheless it shows the expected positive relation with total leverage for all periods and both countries. Finally, our variable with most explanatory variable was profitability which we find to be negatively related to all measures of debt providing strong support for the pecking-order theory.

Some limitations must be referred, the use of the SABI database limited our number of observations, as some of them were excluded for lack of information.

A future work suggestion is a similar work comparing a higher number of countries as to determine if there is in fact some country-specific factors that may determine the capital structure decisions.

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Appendix

Appendix 1 - Hausman test results

	2005-2015		2005-2007		2008-2010		2011-2013		2014-2015	
	Portugal	Spain	Portugal	Spain	Portugal	Spain	Portugal	SPain	Portugal	Spain
TD	554,8***	9 309,78***	252,63***	12 334,01***	480,84***	7 855,97***	215,17***	1 560,5***	117,7	608,08***
LTD	215,78***	1 772,32***	81,45***	493,10***	99,84***	782,93***	102,26***	333,80***	38,91	151,24***
STD	273,04***	7 558,63***	44,39***	2922,92***	117,04***	3 976,54***	31,97	1602,38***	41,23	397,11***

*** denotes p-value<1%