FINANCIAL CRISIS AND CAPITAL STRUCTURE DETERMINANTS: A STUDY OF PORTUGUESE LISTED FIRMS

Inês Lisboa

School of Technology and Management, Management for Sustainability Research Centre, Polytechnic Institute of Leiria, Morro do Lena - Alto Vieiro, P.O. Box 4163, 2411-901 Leiria, Portugal

Abstract

Firm's capital structure is not a new theme but is still relevant in financial literature. This work aims to go a step further, not only because the impact of financial crisis is analyzed, but also because stock repurchase is taken into account. First, the evolution of total, long-term, and short-term debt and loans is analyzed. Then capital structure is regressed against crisis, asset structure, non-debt tax shields, profitability, size, growth, liquidity, cash flow, age, debt serving capacity, own shares, and tax rate. Using an unbalance panel of 53 Portuguese firms from 2003 until 2015, and estimating the models with fixed effects to firms, results suggest that all variables exhibit a significant impact on debt. Although the relationship and significance depend on debt's proxy used. Results also show that short-term debt is more significant in total debt, and that crisis had a great impact, especially in loans.

Key words: *capital structure, debt, stock repurchase, financial crisis, Portugal*

1. INTRODUCTION

The firm's capital structure is not a new theme, but is still relevant nowadays. Indebted firms have high risk of failure, which in turn may increase the risk of all stakeholders. Therefore it is relevant to know the proportion of equity and debt of each firm.

There is no universal theory with regards to financial mix and no reason to expect one (Myers 2001). The choice of the capital structure is determined by a combination of diverse factors with regards to the firm's characteristics, environment, among others (Vieira 2013). Diverse studies have analyzed which determinants are relevant to explain the firm's capital structure. Some have been carry out to a single country (e.g. Bhaird & Lucey 2010, Fauzi, Basyith & Idris 2013, Handoo & Sharma 2014, Vergas, Cerqueira & Brandão 2015), while others to a group of countries (e.g. Psillaki & Daskalaskis 2009, Mateev & Ivanov 2011, Mateev, Poutziouris & Ivanov 2013). More recently, financial crisis impact on capital structure have also been analyzed (Demirguc-Kunt, Martinez-Peria & Tressel 2015, Vergas, Cerqueira & Brandão 2015). With the 2007/2008 crisis, diverse banks collapsed all over the world, and various firms went to bankruptcy. Therefore, the credit given by banks and suppliers changed. Previous studies found that in financial crisis periods the firm's indebtedness increases, and this impact is greater in small and medium enterprises (Demirguc-Kunt, Martinez-Peria & Tressel 2015).

The aim of this study is to provide new empirical evidence about the impact of 2007/2008 crisis on listed firm's capital structure. Portuguese listed firms are analyzed from 2003 until 2015. The sample is first analyzed as a whole and then is split into two: before (2003-2007), and with crisis (2009-2015). Twelve determinants are used to explain the firm's capital structure, based on the trade-off, pecking order and market timing theories. The majority of the determinants, namely: financial crisis, asset structure, non-debt tax savings, return on assets, size, growth, liquidity, cash flow ratio, age, debt serving capacity, and tax rate, were already used by previous researchers (Palacín-Sánchez, Ramírez-Herrera & Pietro 2013, Handoo & Sharma 2014, Proença, Laureano & Laureano 2014, Vergas, Cerqueira & Brandão 2015). A new determinant based on the market timing theory is added to the model: own shares ratio. The firm usually repurchase stocks to increase its market value (Baker, Powell & Veit 2003). Framed on the market timing theory, when market value decreases the firm's issue less equity, and finance its activity using debt.

This paper is relevant for the capital structure literature for diverse reasons. 1) 2007/2008 crisis is new and thus, few studies have address this impact on capital structure. Therefore this study will enlarge the

financial literature. The crisis started with the collapse of various banks around the world, so the firm's financing through bank loans may become more difficult. Moreover, diverse firms went to bankruptcy leading to changes in the credit given by suppliers and other creditors. As a consequence, liabilities' structure changed with crisis. 2) Four measures of capital structure are used: total, long-term, short-term, and bank loans debt. The majority of the studies focus on: total debt (Psillaki & Daskalaskis 2009), or two measures: long-term and short-term debt (Bhaird & Lucey 2010, Palacín-Sánchez, Ramírez-Herrera & Pietro 2013, Proença, Laureano & Laureano 2014, Vergas, Cerqueira & Brandão 2015). The impact of crisis on the firm's financing through bank loans may have been greater, so analyzing it is important. 3) Portugal is an interesting case study. It is a small-scale country almost unexplored in all the research areas, as capital structure theme. The financial crisis had great impact on the country. After the collapse of two banks in 2008, the public deficit have increased, and the country asked for Troika's help to surpass this problem. 4) A new determinant related with the market timing theory is added. This theory, of greater relevance to capital structure, is usually not taken into account by researchers, not only because it is more accurate to listed firms, but also because it is difficult to find determinants which can prove it.

Results reflect that Portuguese listed firms prefer to use short-term debt, as this result from the firm's normal activity. Moreover, the 2007/2008 financial crisis impact capital structure, especially bank loans. With recession, Portuguese listed firms have issued more bank loans to finance its activity, has short-term debt has slightly decreased. The firm's asset structure, return on assets, size, liquidity, cash flows, age, own shares, and tax rates are important determinants to explain its capital structure. Results are in line with the pecking order theory regarding the hierarchical preferences of finance: firms prefer to use internal funds, and if they are insufficient, debt increases. Issuing new equity is the last option, especially in recession periods when the firm's market value has decreased. Therefore, the market timing theory is also validated. Finally, the trade-off theory is relevant to explain the use of collateral, as fixed assets, to increase debt. When the sample is split into two, debt serving capacity and tax rate are relevant to explain the firm's capital structure, but more insignificant to explain it for the total sample.

The rest of the paper is organized as follows: after this introduction chapter, section 2 reviews capital structure theories and determinants with greater influence, and establishes the hypotheses of the study. Section 3 describes the sample, the variables selected, and methodology to be followed in the research. Results are presented in section 5. Section 6 set out the main conclusions.

2. THEORETICAL BACKGROUND AND EMPIRICAL HYPOTHESES

2.1. Capital Structure

The firm's capital structure establishes the proportion of debt and equity the firm issues. While equity does not require a repayment, debt is money invested in the firm by creditors, and it represents an obligation of payment back in an established date (or dates), with or without payment of interests (Proença, Laureano & Laureano 2014). Moreover, debt can be current if it is issued in the short-term, or non-current if it is issued for more than one year (long-term). The first one is usually related with working capital needs, while non-current liabilities with new investments. Many studies have study the firms' capital structure the last years, but Myers (2001) argued that there is not a universal theory which explains the ratio of debt and equity in a firm.

The seminal work of Modigliani & Miller (1958) argued that the firm's value is independent from its financial structure. Although this work was based on some unrealistic assumptions. Later, in 1963, the researchers introduced taxes into the model, leading to the trade-off theory (Modigliani & Miller 1963). In addition to this theory, more two theories are of great relevance to explain capital structure: pecking order and market timing theories.

The trade-off theory argues that there is an optimal level of debt that balance the costs of bankruptcy and others, and the benefits of tax deduction, and agency costs reduction (Modigliani & Miller 1963, De Angelo & Masulis, 1980). When the firm has positive earnings before interests, using debt will lead to its decrease and, in turn, income tax will also decrease. Moreover, as free cash flows are reduced,

managers will have less incentives to expropriate the firm's wealth (Jensen & Meckling, 1976). Leverage is a way to discipline managers, since creditors may restrict the firm's investment (Lisboa 2015). As a consequence, agency costs between the principal and managers are reduced or eliminate, and managers may follow the interests and aims of the principal. Although, for another side, due to the costs of debt, and higher interests rates, the probability of the firm's failure increases (Myers 1977). So, the optimal level is when the costs equal to the benefits of debt (Myers 1984).

The pecking order theory argues that there is no optimal debt-equity proportion. Instead, firms have a hierarchy of financing sources (Myers 1984, Myers & Majluf, 1984). The firm prefers to use first retained earnings, to reduce the firm's uncertainty and not share firm's information nor control (Proença, Laureano & Laureano 2014). When internal sources are insufficient, the firm looks for debt (Jordan, Lowe & Taylor 1998). Issuing new equity is the last option due to information asymmetries. Financial investors may be less informed than firm insiders, which may result in mispricing and, therefore, it may be more expansive to ask for equity than for other funding source (Fama & French 2002).

Finally, the market timing theory argues that firms' capital structure depends on its market value (Baker & Wurgler 2002). Firms issue equity at high prices, since managers believe that the firm's costs are low, and repurchase at low prices. Issuing equity is then related with the trend of the firm's market value. Therefore, debt is negatively related with the historical market value of the firm.

2.2. Capital Structure Determinants

Capital structure depends on a combination of various factors related with firm's characteristics and environment. (Vieira, 2013). Following previous researches (e.g. Psillaki & Daskalaskis 2009, Bhaird & Lucey 2010, Palacín-Sánchez, Ramírez-Herrera & Pietro 2013, Mateev, Poutziouris & Ivanov 2013, Handoo & Sharma 2014, Proença, Laureano & Laureano 2014, Vergas, Cerqueira & Brandão 2015), this study focuses on twelve determinants: crisis, asset structure, non-debt tax shields, return on assets, size, growth, liquidity, cash flow, age, debt serving capacity, own shares, and tax rate.

2007/2008 financial crisis had great impact in the world. Firm's bankruptcy and financial problems have increased (Statistics of Portugal Portal – INE). As a consequence, firm's had more difficulties to access to credits and its liability structure changed. Suppliers have decreased the credit given to assure that the firm will pay back. Moreover, diverse banks have collapsed, making it difficult to firms to access to new loans.

Previous researchers found that financial crisis impact the firm's capital structure. Proença, Laureano & Laureano (2014) found that Portuguese SMEs indebtedness have decreased after 2008, especially the short-term debt, due to the difficulties in accessing to loans. Moreover, Vergas, Cerqueira & Brandão (2015) found that the impact of determinants to explain debt intensity depends on the period study: before or with crisis. Demirguc-Kunt, Martinez-Peria & Tressel (2015) found that total debt and long-term ratios decline with recession, and this effect is larger for SMEs than for larger firms and public ones. Likewise the following hypothesis is established:

Hypothesis 1: Financial crisis negatively impacts debt intensity.

The firms' assets can be divided into current and non-current assets. Non-current assets are related with substitution of machinery, acquisition of new investments to increase the firm's production, among others. Usually fixed assets are stable, and considered to be more secure than short-term assets or other non-current assets (Psillaki & Daskalaskis 2009). Titman & Wessels (1988) proposed that tangible assets can be used as collateral in case of the firm's failure to pay their debt. The trade-off theory suggests that, as the liquidation value of tangible assets is higher, firms may have more access to finance using bank loans or other type of financing (Rajan & Zingales 1995, Vieira & Novo 2010). Therefore, a positive relation between asset structure and debt intensity is expected.

The potential agency costs between debt holders and managers are eliminated or, at least, reduced as well as between managers and the principal as free cash flow is reduced. Framed on the pecking order

theory, asymmetric information is reduced with more tangible assets, due to its higher liquidation value (Rajan & Zingales 1995). As a consequence, firms may easier access to debt (Proença, Laureano & Laureano 2014).

Some researchers, as Vieira & Novo (2010), Psillaki & Daskalaskis (2009), Bhaird & Lucey (2010), Cortez & Susanto (2012), Mateev, Poutziouris & Ivanov (2013), Palacín-Sánchez, Ramírez-Herrera & Pietro (2013), Handoo & Sharma (2014), Proença, Laureano & Laureano (2014), and Vergas, Cerqueira & Brandão (2015) found a positive association between debt, specially long-term debt and asset structure. To short-term debt results are mixed. While some researchers found a positive relationship, (Esperança, Gama & Azziml, 2003), other found a negative relationship (Vieira & Novo, 2010, Proença, Laureano & Laureano 2014), suggesting that firms with higher levels of tangible assets look less for short-term debt, and can use current assets as collateral for current liabilities, because can easily be converted in cash. The following hypothesis naturally follows:

Hypothesis 2: Asset structure is positively related with long-term debt, but negatively related with short-term debt.

Another determinant of capital structure is non-debt tax shields, it means, depreciation, amortization, provision, allowances for doubtful accounts, among others, over total assets. The trade-off theory suggests that non-debt tax shields is negatively related with debt intensity as firms can benefit from tax deductibility using depreciations (De Angelo & Masulis, 1980, Cortez & Susanto 2012).

Results found are mixed. While some literature found a negative relationship between non-debt tax shields and debt intensity, specially long-term debt (De Miguel & Pindado 2001), others researchers found the opposite relationship, suggesting that as depreciation result from fixed assets that can be used as collateral in case of failure, non-debt tax shields can also positively impact debt intensity, specially long-term debt, and negatively impact short-term debt (Vieira & Novo 2010, Vergas, Cerqueira & Brandão 2015). Titman & Wessels (1988) did not found any relationship between this ratio and debt intensity.

For Portuguese firms, previous studies found a positive relationship between non-debt tax-shields and long-term debt, and a negative one with short-term debt. Thus the next hypothesis follows:

Hypothesis 3: Non-debt tax shield is positively related with long-term debt, but negatively related with short-term debt.

The firm's performance also influences capital structure. Framed on the pecking order theory companies prefer to use first self-financing, then issuing debt, and finally issuing new equity (Myers 1984). Likewise, more profitable firms will need to issue less debt, decreasing the firm's financial risk (Fama & French 2002). Although, the trade-off theory suggests the contrary. High profitable firms will take advantages to increase debt to benefit from tax reduction (Modigliani & Miller 1963).

The majority of previous studies used return on assets ratio to measure the firm's profitability. A negative relationship between return on assets and debt intensity was found by Esperança, Gama & Azzim (2003), Vieira & Novo (2010), Proença, Laureano & Laureano (2014) to the Portuguese market. Firms with higher profitability are more able to generate the necessary funds internally, without needing to ask debt. The purposed hypothesis is:

Hypothesis 4: Return on assets is negatively related with debt.

The firm' size is also seem as a determinant of capital structure. Larger firms tend to be more diversified, with less probability of failure. Therefore, these firms may easier access to debts as they may have better conditions to meet their obligations compared to smaller-sized firms (Rajan & Zingales 1995). Framed on the trade-off theory, larger firms may be more indebted as transactions costs may be smaller. Small-size firms, from another side, may have more difficulties to access to debt or support higher costs related

with it. Moreover, larger firms usually have higher turnover and net results, so they may benefit from tax savings when issuing debt (Modigliani & Miller 1963).

The pecking order theory also suggests a positive relation between size and debt intensity. Larger firms have more transparence of information, with more quality and reliability. As a consequence, these firms may prefer debt. Although, the hierarchical of financing proposed by Myers & Majluf (1984) suggests the opposite relationship. Larger firms may prefer to use internal funds than debt, and so a negative relationship is proposed. The relationship between size and debt intensity may depend on the debt maturity. Smaller firms may need debt to finance its activity, but may found it difficult to access to long-term debt, while larger firms benefit from smaller cost of debt when looking for long-term debt.

Previous researchers found a positive relationship between the firm size and debt intensity, especially with long-term debt (Titman & Wessels 1988, Esperança, Gama & Azzim 2003; Vieira & Novo 2010, Chen & Chen 2011). To short-term debt the relationship may be the opposite as lager firms may prefer or use internal funds to finance their current needs (Esperança, Gama & Azzim 2003; Vieira & Novo 2010). Likewise the next hypothesis is established:

Hypothesis 5: Size is positively related with long-term debt, but negatively related with short term debt.

The firm's growth may also impact its level of indebtedness. Previous studies did not found a unique relationship between growth and capital structure. Some researchers found a positive relationship. Firms with high growth options have more opportunities to do new investments. Moreover, their probability of failure is reduced, and thus, the firm may have easier access to credit and with favorable terms (Proença, Laureano & Laureano 2014). The trade-off theory suggests that these firms usually have higher net profit, and thus issuing debt will be favorable, since they will benefit from tax deduction. For another side, the impact of growth in the firm's capital structure may be negative. Framed on the pecking order theory, firms prefer to finance their growth using retained earnings instead of asking debt (Rajan & Zingales 1995). Additionally, firms with high growth have more cash flows and less need to look for money from creditors (Handoo & Sharma 2014). These firms may also benefit from non-debt tax shields and thus the benefit of tax deductibility presented by the trade-off theory may be less valuable to these firms (De Angelo and Masulis 1980, Chen & Chen, 2011).

More recent studies found a positive relationship between growth and debt ratios (Palacín-Sánchez, Ramírez-Herrera & Pietro 2013, Proença, Laureano & Laureano 2014, Vergas, Cerqueira & Brandão 2015). Even if high growth firms prefer to use internal funds, these funds are usually insufficient, and so they may borrow debt to surpass this problem (Vergas, Cerqueira & Brandão 2015). Based on these arguments, the following hypothesis is presented:

Hypothesis 6: Growth is positively related with debt.

The firm's liquidity is also a determinant to explain capital structure. High liquid firms are firms with greater ability to meet short-term liabilities using current assets, as it shows short-term solvency (Proença, Laureano & Laureano 2014). Framed on the pecking order theory, if firms have liquidity, they will use more retained earnings, leading to a decrease in debt ratios (Myers 1984). Firms with lower liquidity ratios will have greater dependence of debts, especially short-term debts to meet their current obligations (Proença, Laureano & Laureano 2014). Based on the trade-off theory, firms with smaller levels of liquidity will have severe constrains to access to long-term debt, as they are perceived by creditors as more likely to default. Therefore the following hypothesis is:

Hypothesis 7: Liquidity is positively related with long-term debt, but negatively related with short-term debt.

Agency conflicts increase when the firm's free cash flow increases, as manager have more opportunities to expropriate the firm's wealth (Jensen & Meckling, 1976). Jensen (1986) argued that firms with high cash flows tend to issue debt to monitor and discipline managers to focus on good investment decisions instead of wasting money in projects that do not add value to the firm. Although, according with the pecking order theory, if firms have internal funds, they will use it instead of accessing to external debt (Myers & Majluf, 1984). This leads to the next hypothesis:

Hypothesis 8: Cash flow is negatively related with debt.

The firm's age can also explain its need of capital. New firms usually need more money to finance their activity as internal funds are scarce or insufficient (Vieira, 2013). Therefore, based on the pecking order theory, younger firms need to look for capital from creditors to finance their investments (Palacín-Sánchez, Ramírez-Herrera & Pietro 2013). Older firms will have higher retained earnings, and thus, will issue less debt. A negative relationship between debt ratios and age was found by Jordan, Lowe & Taylor (1998), Bhaird & Lucey (2010), and Palacín-Sánchez, Ramírez-Herrera & Pietro (2013).

Hypothesis 9: Age is negatively related with debt.

Debt serving capacity is the firms' ability to meet its obligation to pay interests (Handoo & Sharma 2014). Firms with higher debt coverage will have easier access to debt and with favorable conditions. Therefore, these firms will have less probability of failure. Framed on the trade-off theory, debt serving capacity will positively impact debt ratios. This relationship was few explored before but it can be of greater relevance, especially during crisis periods, when the probability of bankruptcy is crucial. The next hypothesis is established:

Hypothesis 10: Debt serving capacity is negatively related with debt.

The impact of own shares in the firm's capital structure was not explored before, at least as long as I know. Although, stock repurchase is directly related with issuing equity, and therefore with the firm's capital structure. Firms usually repurchase stocks to avoid decreasing in the stock price, and in turn, the firm's market value. The market timing theory suggests that the firm reduces equity when market value is low, and thus debt increases (Baker & Wrugler 2002). Own shares is also an alternative way to pay dividends, to increase the firm's liquidity, to apply the firm's free cash flows, to change the firm's capital structure, among others (Baker, Powell & Veit 2003, Pacheco & Raposo 2009, Martins 2013). Firms with high level of own shares, will have less total equity, and therefore will need more external capital from suppliers. Framed on the pecking order theory, these firms will need to issue debt to finance its activity. Moreover, as stock repurchase is a way to increase the firm's market value, creditors may perceive the firm with less risk of failure. As a consequence, based on the trade-off theory, these firms will have easier access to debt, with better conditions. This leads to the following hypothesis:

Hypothesis 11: Own shares is positively related with debt.

Finally, tax rate can be a determinant of the firm's capital structure (Handoo & Sharma 2014). Framed on the trade-off theory, managers increase debt as an alternative way to benefit from tax deduction. Likewise, if tax rate increases, and usually it depends on the firms' profit, the firm may have greater incentive to issue debt. The last hypothesis follows:

Hypothesis 12: Tax rate is positively related with debt.

3. DATA AND EMPIRICAL MODEL

3.1. Data

This study analyses Portuguese listed firms. Portugal is an interesting case study for various reasons: 1) is a small size country, almost unexplored, 2) the mean of the Portuguese firm's indebtedness is around 67% (data from 2015 obtained in Statistics of Portugal Portal – INE), 3) 2007/2008 financial crisis had great impact on the country.

Data was obtained from SABI database, where there is an extensive historical financial information. The sample covers 53 firms, during the period from 2003 until 2015, a total of 413 observations. Firms from the financial industry and football clubs were excluded, because these firms have specific accounting standards. Moreover, information about the year 2002 was also collected to calculate some ratios. 2002 was an important date in Portugal for two reasons: was the year of merger of Lisbon stock exchange in Euronext, and the year of the introduction of euro currency. 2015 is the last year with financial data available.

The sample period was separated into two: before crisis, 2003-2007, and with crisis, 2008-2015. The financial crisis have started in USA, with the collapse of Lehman Brothers in September 2008, and in November and December two banks have also collapsed in Portugal, Banco Português de Negócios, and Banco Privado Português, respectively. Consequently, Portugal underwent high public deficit in 2010, and in 2011 the country asked for Troika's help to deal with this problem. From 2011 until 2014, the economic and financial assistance program applied by Troika in Portugal led to several austerity measures. The crisis did not finished in 2014. In that year another Portuguese bank have collapsed, Banco Espírito Santo. Moreover Portugal continues to apply some austerity measures to meet the requirements imposed by Troika.

3.2. Definition of variables

The dependent variable of the study, debt intensity, is measured using four alternative ratios: total debt ratio (**TDebt**) is the ratio of total liabilities to total assets, long-term ratio (**LDebt**) is the ratio of long-term liabilities over total assets, short-term debt (**SDebt**) is the ratio of current liabilities to total assets, and finally, bank loans ratio (**BDebt**) is the portion of loans on the firm's total assets. These definition are similar with those of Psillaki & Daskalaskis (2009), Mateev & Ivanov (2011), Haan (2012), Mateev, Poutziouris & Ivanov 2013, Palacín-Sánchez, Ramírez-Herrera & Pietro (2013), Handoo & Sharma (2014), and Proença, Laureano & Laureano (2014).

The literature of capital structure presents several determinants of capital structure. This paper analyzes the impact of twelve determinants: financial crisis, asset structure, non-debt tax shields, return on assets ratio, size, growth, liquidity, cash flow ratio, age, debt serving capacity, own shares ratio, and income tax rate.

Financial crisis (**Dcrisis**) is a dummy variable which equals to one when is a recession year, and zero otherwise. It is included to detect the impact of financial crisis on capital structure. As explained before, 2003 till 2007 are considered years before crisis, while 2008-2015 are considered recession years. Asset structure (**AS**) is the ratio of net fixed assets over total assets, and it analyzes the weight of collateral assets in total assets (Palacín-Sánchez, Ramírez-Herrera & Pietro 2013, Handoo & Sharma 2014, Proença, Laureano & Laureano 2014). Non-debt tax shields (**NDTS**) is the quotient between annual depreciations and total assets (Proença, Laureano & Laureano 2014, Vergas, Cerqueira & Brandão 2015). Return on assets (**ROA**) is the ratio of earnings before interest and taxes on total assets, and it is a proxy of the firm's profitability (Palacín-Sánchez, Ramírez-Herrera & Pietro 2013, Handoo & Sharma 2014, Proença, Laureano & Laureano 2014). **Size** is measured as the natural logarithm of the firm's assets (Chen & Yu 2011, Mateev, Poutziouris & Ivanov 2013, Palacín-Sánchez, Ramírez-Herrera & Pietro 2013, Proença, Laureano & Laureano 2014, Vergas, Cerqueira & Brandão 2015). **Growth** is the annual change of turnover, and it is a proxy of the firm's progress (Proença, Laureano & Laureano 2014). Liquidity (**Liq**) is the ratio of current assets over current liabilities, and it measures the firm short-term liquidity (Mateev, Poutziouris & Ivanov 2013, Handoo & Sharma 2014, Proença, Laureano &

Laureano 2014). Cash flow ratio (**CF**) is the ratio of cash flow over total assets, and it measures the funds internally generated (Mateev, Poutziouris & Ivanov 2013). **Age** is defined as the number of years the firm has been operating, and it measures the firm's reputation (Palacín-Sánchez, Ramírez-Herrera & Pietro 2013, Handoo & Sharma 2014). Debt serving capacity (**DSC**) is the earnings before depreciation, interest and taxes over the total interest, and it measures the ability to pay the interests (Handoo & Sharma 2014). Own shares ratio (**OS**) is the ratio of the firm's own shares over total assets. Finally, income tax rate (**T**) is the income tax divided by the earnings before taxes, and it depends on the levels of profit (Handoo & Sharma 2014)

Table 1 presents the summary statistics of the variables presented before, namely: mean, maximum, minimum, and standard deviation.

Table 1. Descriptive Statistics

	Mean	**Median**	**Maximum**	**Minimum**	**Std. Dev.**
TDebt	0.5777	0.5637	3.9746	0.0024	0.3971
LDebt	0.1912	0.1505	2.4055	0.0000	0.2108
SDebt	0.3866	0.3648	2.3351	0.0010	0.2957
BDebt	0.2257	0.1958	1.0609	0.0000	0.2044
AS	0.2414	0.1666	0.9299	0.0000	0.2327
NTDS	0.0388	0.0270	0.4751	0.0000	0.0452
ROA	0.0185	0.0244	0.8104	-2.0873	0.1733
SIZE	18.3962	18.3481	22.3307	12.3847	1.8297
Growth	0.4476	-0.0000	112.2694	-1.000.000	5.9146
LIQ	15336999	5184078	0.0000	-0.0000	0.0000
CF	0.0457	0.0501	0.9430	-1.7221	0.2186
AGE	3.6528	3.7842	4.5433	0.6932	0.6547
DSC	509.5045	2.1675	170621.8	-4.239.895	8487.918
OS	-0.0112	0.0000	0.1154	-0.4050	0.0454

This table presents descriptive statistics, namely mean, maximum, minimum, and standard deviation, for the variables include in the model: Tdebt (total liabilities over total assets), LDetb (total long-term liabilities over total assets), SDebt (total current liabilities over total assets), BDebt (bank loans over total assets), AS (net fixed assets over total assets), NDTS (depreciation over total assets), ROA (return on assets ratio), size (natural logarithm of the firm's assets), growth (annual change in turnover), Liq (total current assets over total current liabilities), CF (total cash flows over total assets), age (natural logarithm of the number of years since the firm foundation until the year of analysis), DSC (earnings before depreciation, interest and taxes over the total interest), OS (own shares over total assets).

Analyzing table 1 the following facts emerge. 1) In mean, the firms' indebtedness is 58%, which is smaller than the number present by the Statistics of Portugal Portal (INE) which was 67%. This could be explained because the sample only analyze listed firms, and these firms can have different capital structure compared to small-size and medium enterprises. Although, the number found is also smaller than the one showed by Vieira (2013) that found that debt level of Portuguese listed firms was 69%. This result suggests that with crisis the firm's indebtedness have decreased, as it is expected in hypothesis 1. 2) Short-term debt is more relevant than long-term debt to finance the firm's assets. This result can be explained since firms have working capital needs, and thus, need more current liabilities.

Moreover, due to the crisis, issuing long-term debt increases the firm's risk and therefore, can be less likely. 3) Bank loans are in mean 23%. 4) Fixed assets represent, in mean, 24% of the total assets, and annual depreciations 3%. 5) Return on assets is, in average, positive, as well as growth, liquidity, and cash flow. These results suggest that in mean, the firms are in a good financial situation as generate profits, are increasing through the years, and have free cash flows. 6) The firm's age is in mean 45 years old, but there are younger and older firms in the sample. 7) Debt serving capacity is in means positive, but is very volatile, suggesting great differences among the firms in the sample. In mean, the firms in the sample have greater possibility to repay debts. Finally, 8) own shares ratio is in mean 1%, suggesting that the firm's repurchase stock to increase its future market value or change investors' perception.

Table 2 presents the correlation matrix of the dependent and independent variables.

Table 2. Correlation Matrix

	TDebt	LDebt	SDebt	BDebt
TDebt	1			
LDebt	0.6850 ***	1		
SDebt	0.8546 ***	0.2070 ***	1	
BDebt	0.5193 ***	0.4832***	0.3529 ***	1
AS	0.0943 **	0.1569 ***	0.0148	-0.0453
NTDS	0.3071 ***	0.1223 **	0.3252 ***	-0.0799 *
ROA	-0.4521 ***	-0.2467 ***	-0.4313 ***	-0.2151 ***
SIZE	-0.2304 ***	0.0018	-0.3106 ***	0.0408
Growth	-0.0751	-0.0528	-0.0631	-0.0619
LIQ	-0.1128 **	-0.1058 **	-0.0760	-0.1315 ***
CF	-0.2637 ***	-0.2607 ***	-0.1683 ***	-0.1404 ***
AGE	0.0282	0.1918 ***	-0.0989 **	0.2142 ***
DCS	-0.0152	-0.0456	0.0121	-0.0609
OS	0.1483 ***	0.0474	0.1654 ***	0.1361 ***
T	-0.0242	-0.0204	-0.0180	-0.0158

*, **, *** Significant at the 10%, 5% and 1% levels, respectively.

Panel B reflects the correlation matrix for all the variables include in the model: Tdebt (total liabilities over total assets), LDetb (total long-term liabilities over total assets), SDebt (total current liabilities over total assets), BDebt (bank loans over total assets), AS (net fixed assets over total assets), NDTS (depreciation over total assets), ROA (return on assets ratio), size (natural logarithm of the firm's assets), growth (annual change in turnover), Liq (total current assets over total current liabilities), CF (total cash flows over total assets), age (natural logarithm of the number of years since the firm foundation until the year of analysis), DSC (earnings before depreciation, interest and taxes over the total interest), OS (own shares over total assets), t (income tax divided by the earnings before taxes).

Analyzing table 2, the correlation between the debt variables is too high, but these are alternative ratios so this correlation is not relevant. The correlation between total and short-term debt is greater, but as it was explained before, short-term debt is more relevant than long-term debt. Regarding bank loans, are more related with long-term debt, because usually firms look for bank loans with a larger maturity.

The correlation between debt variables and independent variables, when are statistically significant, present the expected signs, except liquidity. Less liquid firms are more indebted, because its self-funding is not sufficient, and thus issuing more debt is a way to deal with its financial needs. These results are in line with the pecking order theory. The firm's growth, debt serving capacity, and tax rate look statistically irrelevant to explain capital structure. The independent variables are not correlated, at least not to a significant extent.

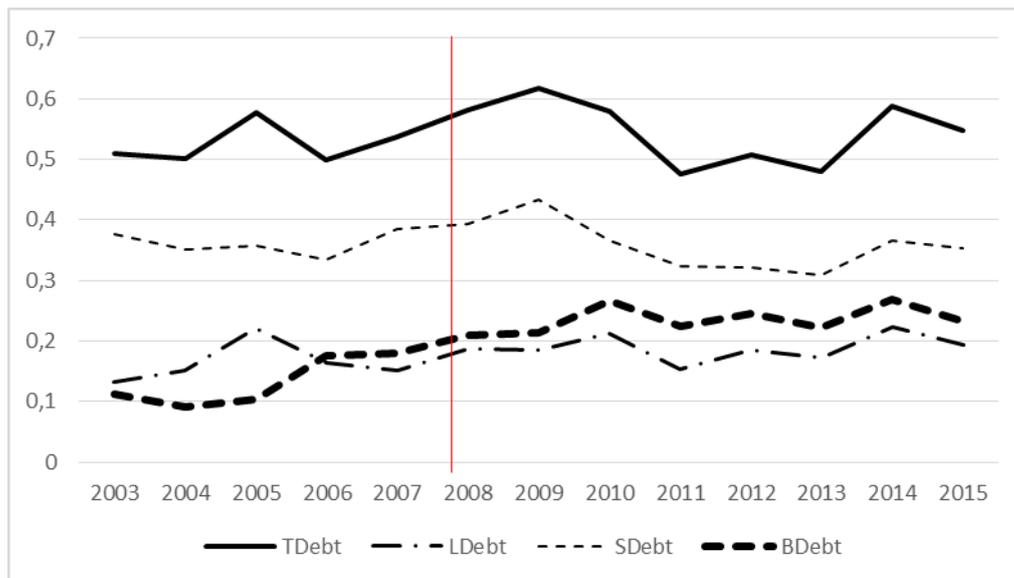Illustration 1 provides the evolution of the average debt ratio over the period of analysis.

Illustration 1. Evolution of the debt ratios

The previous illustration shows that bank debt have increased with 2007/2008 financial crisis, contrary to the expectation in hypothesis 1. With crisis the financial performance of most firms have decreased, and thus, internal funds were insufficient to finance their activity. Moreover, credit from suppliers and other have decreased to deal with firm's financial problems. As a consequence, short-term debt have decreased. Likewise, the firms have looked for external capital, especially banks loans. The maximum value for the portion of bank loans that finance the firm's assets was in 2010, with a value around 27%. This year was the year when Portugal asked for Troika's help to deal with the high public deficit.

Long-term debt shows the same tendency before and with crisis. Short-term debt has decreased after 2009, presenting the lowest values from 2011 until 2013, when the austerity measures were more several in the country. Finally, total debt follows the variation of long and short-term debt ratios. The highest value was in 2009, after the financial crisis started, while the smallest was in 2010-2012.

This illustration suggests that financial crisis impact debt structure, especially after the year of 2009 until the year of 2014. This result gives consistence for this study.

3.3. Model

The regression model to validate the hypotheses established is specified as follows:

$$Debt_{i,t} = \alpha + \beta_1 \times Dcrisis_{i,t} + \beta_2 \times AS_{i,t} + \beta_3 \times NDTS_{i,t} + \beta_4 \times ROA_{i,t} + \beta_5 \times Size_{i,t} + \beta_6 \times Growth_{i,t} + \beta_7 \times Liq_{i,t} + \beta_8 \times CF_{i,t} + \beta_9 \times Age_{i,t} + \beta_{10} \times DSC_{i,t} + \beta_{11} \times OS_{i,t} + \beta_{12} \times T_{i,t} + U_i + \varepsilon_{i,t}$$

The debt intensity is regressed against financial crisis (Dcrisis), asset structure (AS), non-debt tax shields (NDTS), return on assets (ROA), size, growth, liquidity (Liq), cash flow ratio (CF), age, debt serving capacity (DSC), own shares ratio (OS), and income tax rate (T). "i" represents the individual firms and "t" the year analyzed; "U" is also added to incorporate the fixed effects of firms (cross-section); and ε represents the error of the model.

The model was estimated using the ordinary least square methodology (OLS) with fixed effects for firms. Random effects were also analyzed, but analyzing the Hausman test, fixed effects are more accurate to estimate the model. Results of the Hausman test are present in the next table.

Table 3. Hausman test

	TDebt	LDebt	SDebt	BDebt
Hausman test	66.8926 ***	19.8162 *	58.9547 ***	44.9642 ***

*, **, *** Significant at the 10%, 5% and 1% levels, respectively.

4. EMPIRICAL RESULTS AND DISCUSSION

The results of the regression of the firm's capital structure against the determinants used in this study are present in table 4.

Table 4. Results for the total sample

	TDebt	LDebt	SDebt	BDebt
C	1.5750 **	0.2315	1.3436 **	-2.3286 ***
Dcrisis	0.0278	0.0096	0.0183	0.0849 ***
AS	-0.0227	0.1479 **	-0.1706 **	-0.0836
NTDS	2.3978 ***	0.1268	2.2710 ***	-0.2349
ROA	-0.4409 ***	-0.2157 ***	-0.2252 ***	-0.2879 ***
SIZE	-0.1272 ***	-0.0608 **	-0.0663 ***	0.1082 ***
Growth	0.0004	-0.0002	0.0006	0.0002
LIQ	-0.0000 **	-0.0000 **	-0.0000 *	-0.0000 **
CF	-0.0217	-0.1869 ***	0.1653 ***	0.0123
AGE	0.3445 ***	0.2877 ***	0.0568	0.1504 **
DSC	-0.0000	-0.0000	-0.0000	-0.0000
OS	0.7389 *	0.3558	0.3831	0.0641
T	-0.0000	-0.0000	-0.0000	-0.0000 ***
Adj. R2	65.44%	52.00%	73.43%	57.13%
F-Statistic	14.9276 ***	8.9693 ***	21.3346 ***	10.8056 ***

*, **, *** Significant at the 10%, 5% and 1% levels, respectively.

This table presents the estimates of the whole sample (2003-2015) of debt: column 1 - Tdebt (total liabilities over total assets), column 2- LDetb (total long-term liabilities over total assets), column 3 - SDebt (total current liabilities over total assets), BDebt (bank loans over total assets), on DCrisis (dummy variable which equals to one when is a recession year and zero otherwise), AS (net fixed assets over total assets), NDTS (depreciation over total assets), ROA (return on assets ratio), size (natural logarithm of the firm's assets), growth (annual change in turnover), Liq (total current assets over total current liabilities), CF (total cash flows over total assets), age (natural logarithm of the number of years since the firm foundation until the year of analysis), DSC (earnings before depreciation, interest and taxes over the total interest), OS (own shares over total assets), t (income tax divided by the earnings before taxes.

Analyzing the previous table results show that the impact of the determinants depend on the proxy of capital structure analyzed. The estimated model explains around 65% of total debt, 52% of long-term debt, 73% of short-term debt, and 57% of bank loans debt. For short-term debt, the explanatory power of the model is higher than those found by Vieira & Novo (2010), and Proença, Laureano & Laureano (2014) for the Portuguese market, the others R-square are in line with the previous ones found.

Crisis only impact bank loans ratio, and the relationship is contrary to the expect one. With crisis, Portuguese listed firms have increased bank loans to finance its activity. Demirguc-Kunt, Martinez-Peria & Tressel (2015) found that firm's indebtedness decreases during recession periods, and the impact is greater for SMEs than to public firms. Financial markets had greater impact with the 2008 crisis. The majority of the firm's stock price decreased, as well as the firm's market value. Likewise, framed on the market timing theory, the firms have increased their finance through bank loans to deal with their financial needs. To the other debt ratios the impact of the financial crisis is insignificant, contradicting the Statistics of Portugal for the firm's indebt. Although, the majority of the Portuguese firms are small and medium size (represent around 99% of the firms, Statistics of Portugal Portal – INE), which can explain this result. Therefore, hypothesis 1 is not validated.

Asset structure has a positive impact on long-term debt and a negative impact on short-term debt as it was expected in hypothesis 2. Fixed assets can be used as collateral in case of the firm's failure to pay its accounts. Therefore, firms with more fixed assets can easier access to long-term debt, framed on the trade-off theory. Moreover, net fixed assets have higher liquidation value, which contributes to the decreasing of information asymmetries. The pecking order theory also suggests this positive relationship. This result is similar with the one found by Vieira & Novo (2010), Psillaki & Daskalaskis (2009), Bhaird & Lucey (2010), Mateev, Poutziouris & Ivanov (2013), Palacín-Sánchez, Ramírez-Herrera & Pietro (2013), Handoo & Sharma (2014), Proença, Laureano & Laureano (2014), and Vergas, Cerqueira & Brandão (2015). Usually firms with more fixed assets look for long-term debt and not for short-term debt. Investment' results are not immediate, i.e. only after some time the firm can benefit from the return of the investment made, and thus can start paying its debts. Moreover, short-term liability is usually insufficient to finance fixed assets. Likewise a negative relationship between asset structure and short-term debt is found, as it was by Vieira & Novo (2010), Proença, Laureano & Laureano (2014). To total debt and bank loans asset structure is not statistically significant.

Non-debt tax shields positively impacts total and short-term debt. This relationship contradicts the expectation established in hypothesis 3. The trade-off theory suggests that firms use depreciations and similar to benefit from tax deductibility (Modigliani & Miller 1963). Moreover, as depreciations are related with fixed assets, the greater the value of depreciations, the higher the firm's fixed assets, which can be used as collateral in case of the firm's failure.

Concerning return on assets, more profitable firms look less for debt, as it was expected in hypothesis 4. This result goes in line with pecking order theory as well as the results found by Vieira & Novo (2010), and Proença, Laureano & Laureano (2014). More profitable firms have higher self-financing and thus use less debt due to the hierarchical financial preference proposed by Myers (1984).

Larger firms issue less debt, except bank loans. Larger firms usually are more profitable, and thus, based on the pecking order theory, can use internal funds to finance its activity. Regarding bank loans, as larger firms have more transparency of information, greater credit history and reputation have easier access to

bank loans, with better cost conditions. This explains the increase in bank loans debt. Moreover, framed on the market timing theory, as the firm's market value have decreased because of the financial crisis, firms prefer to issue debt than equity. Results are similar to those of Chen & Chen (2011), and goes in line with the expected for short-term debt in hypothesis 5.

More liquid firms are less indebted. In hypothesis 7 it was established that more liquid firms looked less for short-term debt, but not for long-term debt as they can have better conditions regarding income taxes. Although, results found are consistent with the pecking order theory, liquid firms have more internal funds, and therefore, issue less debt. Similar results were found by Proença, Laureano & Laureano (2014).

Regarding cash flows, firms with more free cash flow have less long-term debt. Based on the pecking order theory, these firms have self-funding, and thus, do not need to look for debt or to issue new equity (Myers 1984). Although, to short-term debt the relationship found is the contrary, firms with greater cash flows have more short-term debt. This result can de explain due to the crisis. During recession periods, suppliers usually reduce credit given to avoid risks and uncertainties. Firms with more cash flows have greater possibility to repay credits, and thus can easier access to them.

The firm's age also explain its capital structure, but in the opposite direction than the expected one. Older firms look more for total, long-term, and short-term debt. This result suggests that due to the longer relationship of the firm with creditors, these firms may easier access to debt to finance its activity, Moreover, framed on the trade-off theory, these firms may benefit from tax deduction (Modigliani & Miller 1963).

Firms with more own shares issue more total debt as expected in hypothesis 11. These firms have less equity, usually due to decreases in the firm's market value as supported by the market timing theory. Therefore, these firms need to look for debt to finance its activity. Although this impact is only significant to total debt. Finally, tax rate is only relevant to explain bank loans, and the relationship is contrary to the expected one in hypothesis 12. Firms with smaller tax rate have more bank loans to finance its assets. This may be due to the interests the firm pay, which in turn reduce the firms' earnings before interests, and income tax. Moreover, firms with smaller tax rate may want to make new investments to increase profits in the future. The firm's growth, debt serving capacity are not relevant to explain its capital structure.

As a synthesis, results confirm the pecking order theory, the firms prefer to use internal funds than issuing debt. The market timing theory plays also an important role on capital structure of listed Portuguese firms. When the firm's market value decreases, firms look more for debt. Finally, the trade-off theory is only relevant to explain the firms' asset structure and non-debt tax shield.

To analyze the main differences in the impact of the chosen determinants to explain the firm's capital structure in periods with and without crisis, the sample was split into two. In tables 5 and 6 the results of the same model are presented to periods before crisis (2003-2007), and with crisis (2008-2015), respectively.

Table 5. Results for before crisis period (2003-2008)

	TDebt	LDebt	SDebt	BDebt
C	0.3672	-2.3451 **	2.7123 ***	-4.7928 ***
AS	-0.1546	0.2467 **	-0.4012 ***	-0.3395 **
NTDS	1.3971 **	0.6723	0.7248	2.8385 ***
ROA	-0.5731 ***	-0.3298 *	-0.2433	-0.0711
SIZE	0.0169	0.0810	-0.0642	0.2437 ***
Growth	0.0628 **	0.0498	0.0130	-0.0274
LIQ	-0.0000	0.0000	-0.0000	-0.0000
CF	0.1233 **	-0.2564 ***	0.3796 ***	0.1910 ***
AGE	-0.0367	0.2621 **	-0.2988 **	0.1238
DSC	-0.0005 *	-0.0006 **	0.0001	-0.0004
OS	-0.3807	-0.1092	-0.2715	-0.1201
T	-0.0472 **	-0.0157	-0.0314 *	-0.0512 **
Adj. R2	88.37%	73.15%	89.21%	56.60%
F-Statistic	24.3866 ***	9.3886 ***	26.4378 ***	5.0149 ***

*, **, *** Significant at the 10%, 5% and 1% levels, respectively.

This table presents the estimates to period before crisis (2003-2007) of debt: column 1 - Tdebt (total liabilities over total assets), column 2- LDetb (total long-term liabilities over total assets), column 3 - SDebt (total current liabilities over total assets), BDebt (bank loans over total assets), on DCrisis (dummy variable which equals to one when is a recession year and zero otherwise), AS (net fixed assets over total assets), NDTS (depreciation over total assets), ROA (return on assets ratio), size (natural logarithm of the firm's assets), growth (annual change in turnover), Liq (total current assets over total current liabilities), CF (total cash flows over total assets), age (natural logarithm of the number of years since the firm foundation until the year of analysis), DSC (earnings before depreciation, interest and taxes over the total interest), OS (own shares over total assets), t (income tax divided by the earnings before taxes.

Table 6. Results for the crisis period (2008-2015)

	TDebt	**LDebt**	**SDebt**	**BDebt**
C	0.0166	-0.4912	0.5078	-2.9017 ***
AS	0.0819	0.1111	-0.0291	-0.0500
NTDS	-1.3781 **	-1.8894 ***	0.5113	-1.5149 ***
ROA	-0.4520 ***	-0.1735 ***	-0.2785 ***	-0.2713 ***
SIZE	-0.0911 *	-0.0303	-0.0608 *	0.11490 ***
Growth	0.0013	0.0003	0.0009	0.0007
LIQ	-0.0000	-0.0000	0.0000	-0.0000
CF	0.1812 **	-0.0823 *	0.2634 ***	0.0574
AGE	0.6309 ***	0.3582 ***	0.2727 ***	0.3096 ***
DSC	-0.0000	0.0000	-0.0000	0.0000
OS	1.6986 **	0.6393	1.0593 **	0.5687
T	-0.0000 **	-0.0000 *	-0.0000 **	-0.0000 ***
Adj. R2	78.56%	65.83%	82.32%	67.55%
F-Statistic	19.2441 ***	10.5947 ***	24.1845 ***	11.3687 ***

*, **, *** Significant at the 10%, 5% and 1% levels, respectively.

This table presents the estimates to period of crisis (2008-2015) of debt: column 1 - Tdebt (total liabilities over total assets), column 2- LDetb (total long-term liabilities over total assets), column 3 - SDebt (total current liabilities over total assets), BDebt (bank loans over total assets), on DCrisis (dummy variable which equals to one when is a recession year and zero otherwise), AS (net fixed assets over total assets), NDTS (depreciation over total assets), ROA (return on assets ratio), size (natural logarithm of the firm's assets), growth (annual change in turnover), Liq (total current assets over total current liabilities), CF (total cash flows over total assets), age (natural logarithm of the number of years since the firm foundation until the year of analysis), DSC (earnings before depreciation, interest and taxes over the total interest), OS (own shares over total assets), t (income tax divided by the earnings before taxes.

When the sample is split into two the main conclusions are found with some exceptions. Debt serving capacity is significant to explain total and long-term debt of the firms before crisis. Contrary to the expected, firms with greater possibilities to repay their accounts look less for debt. This result goes in line with the pecking order theory, since if firms have more internal funds they do not need to issue debt.

Moreover, tax rate is significant to explain the firm's capital structure during and before crisis periods. Firms with smaller tax rates look are more debt to finance its activity. As debt increases the firm's financial costs, earnings before interests decreases, and consequently, the income payment also decreases.

Non-debt tax shields negatively impact total, long-term, and bank debt in periods with crisis. This result goes in line with hypothesis 3, and results found by De Angelo & Masulis (1980), and Cortez & Susanto (2012). Framed on the trade-off theory, when depreciations increase the firm benefit from tax savings, and thus do not need to look for debt to have this benefit. The firms' growth positively impacts its total debt in periods before crisis. This result is consistent with the pecking order theory. Firms with higher growth rates, usually have more turnover and net profits and thus can use internal funds to finance its activity. Finally, the variables included in the model have greater explanatory power when the sample is split in two.

5. CONCLUSIONS

This paper analyzes the determinants of capital structure of Portuguese listed firms during the period from 2003 until 2015. Findings show that 2008 financial crisis had greater impact on bank loans ratio, but not in the others debt ratios. Portuguese listed firms, have slightly reduced short-term liabilities with crisis, but in turn, bank loans have increased, as firms need to finance their activity. Framed on the pecking order theory, firms prefer to use first internal funds, and then issue debt. Concerning debt, firms prefer liabilities that do not obligate the payment of interests, as for example creditors from suppliers, than issuing bank loans. In fact, the results obtained suggest that Portuguese listed firms prefer to use short-term debt, as it is the major part of the firm's debt.

Results confirm that asset structure, non-debt tax shields, return on assets, size, liquidity, cash flows, age, own shares and tax rate are relevant determinants to explain Portuguese listed firms capital structure. Although the impact and significance depend on the proxy used.

In line with the pecking order theory I found evidence that more profitable firms, with more liquidity, and large size are less indebted, since these firms prefer first to use self-funding. Moreover, based on the trade-off theory, firms with high levels of asset structure have more long-term debt ratios, but less short-term ones as fixed assets can be used as collateral in case of failure. The market timing theory is also relevant to explain capital structure choices. When the firm's market value decreases, the firm repurchase stocks in order to increase it in the future and to attract more financial investors.

When the sample is split into two: before crisis (2003-2007), and with crisis (2008-2015), the impact and significance of some determinants are different. Debt serving capacity is a significant to explain total and long-term debt before crisis, tax rate is significant to explain the firm's capital structure before and in periods of crisis.

These results are relevant for policy makers and firms managers. Results evidence the most relevant determinants that explain the firm's capital structure. Likewise, some rules can be applied to avoid the firm's bankruptcy, and managers may understand how they can increase the firm's profit. Moreover, conclusions show the different impact on long-term, short-term, and bank loans debt. The majority of the studies do not analyze the impact of the determinants in bank loans debt ratio. Although with 2008 financial crisis many banks all over the world collapsed due to bad credit. Therefore, understanding which factors mostly explain the use of bank loans is of greater relevance. This study also contributes to academics. It is analyzed a country, Portugal, almost unexplored, and where the financial crisis had greater impact. The country asked for Troika's help to surpass the public deficit, and diverse contraction measures were applied, which directly impact the firm's indebtedness. Finally, I included the impact of stocks repurchase on the firms' capital structure. This variable is related with the market timing theory, almost unexplored by previous studies. Listed firms issue more equity when market value is high, and prefer debt when market value decreases.

For future research it would be interesting to apply the same model for other markets to confirm the robustness of the results. Moreover, analyzing Portuguese small and medium enterprises could be a way to extend results and compare the main differences of the firms concerning their dimension.

REFERENCES

Baker, H, Gary, E & Veit, E 2003, 'Why companies use open market repurchases: A managerial perspective'. *The Quarterly Review of Economics and Finance*, vol. 43, no.3, pp. 483-504.

Baker, M & Wurgler, J 2002, 'Market timing and capital structure'. *Journal of Finance*, vol. 57, no.1, pp. 1-32.

Bhaird, C & Lucey, B 2010, 'Determinants of capital structure in Irish SMEs'. *Small Business Economics*, vol. 35, pp. 357-375.

Chen, C & Yu, C 2011, 'FDI, Export, and Capital Structure'. *Management International Review*, vol. 51, no.3, pp. 295-320.

Chen, S & Chen, L 2011, 'Capital structure determinants: An empirical study in Taiwan', African Journal of Business Management, vol. 5, no.27, pp. 10974-10983.

Cortez, M & Susanto, S 2012, 'The Determinants of Corporate Capital Structure: Evidence From Japanese Manufacturing Companies'. *Journal of International Business Research*, vol. 11, pp. 121-134.

De Angelo, H & Masulis, R 1980, 'Optimal capital structure under corporate and personal taxation'. *Journal of Financial Economics*, vol. 8, no.1, pp. 3-29.

De Jong, A, Kabir, R & Nguyen, T 2008, 'Capital structure around the world: The roles of firm- and country-specific determinants'. *Journal of Banking and Finance*, vol. 32, pp. 1954–1969.

De Miguel, A & Pindado, J 2001, 'Determinants of capital structure: new evidence from Spanish panel data'. *Journal of Corporate Finance*, vol. 7, pp. 77-99.

Demirguc-Kunt, A, Martinez-Peria, M & Tressel, T 2015, 'The impact of the global financial crisis on firms' capital structure', *Policy Research Working Paper*, WPS7522.

Esperança, J, Gama, A & Azzim, M 2003, 'Corporate debt policy of small firms: an empirical (re)examination'. *Journal of Small Business and Enterprise Development*, vol. 10, pp. 62-80.

Fama, E & French, K 2002, 'Testing trade-off and pecking order predictions about dividends and debt'. *The Review of Financial Studies*, vol. 15, no.1, pp. 1-33.

Fauzi, F, Basyith, A & Idris, M 2013, 'The determinants of capital structure: An empirical study of New Zealand-listed firms'. *Asian Journal of Finance & Accounting*, vol. 5, no.2, pp. 1-21.

Handoo, A & Sharma, K 2014, 'A study on determinants of capital structure in India'. *IIMB Management Review*, vol. 26, pp. 170-182.

Ine, Statistics of Portugal Portal. Retrieved from https://www.ine.pt/xportal/

Jensen, M 1986, 'Agency costs of free cash flow corporate finance and takeovers'. *American Economic Review*, vol. 76, no.2, pp. 323–329.

Jensen, M & Meckling, W 1976, 'Theory of the firm: Managerial behaviour, agency cost and ownership structure'. *Journal of Financial Economics*, vol. 3, pp. 305–360.

Jordan, J, Lowe, J & Taylor, P 1998, 'Strategy and financial policy in UK small firms'. *Journal of Business Finance and Accounting*, vol. 25, pp. 1-27.

Lisboa, I 2015, 'Family impact on capital structure: Does financial crisis matter?' *Journal of Business and Economics*, vol. 6, no.2, pp. 306-316.

Martins, A 2013, 'Small businesses, share buybacks, tax auditing and the use of valuation methods: An analysis of the Portuguese case'. *Journal of Applied Accounting Research*, vol. 14, no.1, pp. 74-85.

Mateev, M & Ivanov, K 2010, 'How SME uniqueness affects capital structure: Evidence from Central and Eastern Europe panel data'. *Quarterly Journal of Finance and Accounting*, vol. 50, no.1, pp.115-143.

Mateev, M., Poutziouris, P & Ivanov, K 2013, 'On the determinants of SME capital structure in Central and Eastern Europe: A dynamic panel analysis'. *Research in International Business and Finance*, vol. 27, pp. 28-51.

Modigliani, F & Miller, M 1958, 'The cost of capital, corporation finance and the theory of investment. *American Economic Review'*, vol. 48, no.3, pp. 261–297.

Modigliani, F & Miller, M 1963, 'Corporate income taxes and the cost of capital: A correction'. *American Economic Review*, vol. 53, pp. 433-33.

Myers, S 1977, 'Determinants of corporate borrowing'. *Journal of Financial Economics*, vol. 5, pp. 147–175.

Myers, S 1984, 'The capital structure puzzle'. *Journal of Finance*, vol. 39, no.3, pp. 575–592.

Myers, S 2001, 'Capital structure'. *Journal of Economic Perspectives*, vol. 15, no.2, pp. 81-102.

Myers, S & Majluf, N 1984, 'Corporate financing and investment decision when firms have information that investors do not have'. *Journal of Financial Economics*, vol. 13, no.2, pp. 187–221.

Pacheco, L. & Raposo, C 2009, 'The determinants of initial stock repurchases'. *Management working papers*, no.5, Católica Porto Business School, Universidade Católica.

Palacín-Sánchez, M, Ramírez-Herrera, L & Pietro, F 2013, 'Capital structure of SMEs in Spanish regions'. *Small Business Economics*, vol. 41, pp. 503-519.

Proença, P, Laureano, R & Laureano, L 2014, 'Determinants of capital structure and the 2008 financial crisis: Evidence from Portuguese SMEs'. *Social Behavioral Sciences*, vol. 150, pp.182-191.

Psillaki, M & Daskalaskis, N 2009, 'Are the determinants of capital structure country or firm specific?' *Small Business Economics*, vol. 33, pp. 319-333.

Rajan, R & Zingales, L 1995, 'What do we know about capital structure? Some evidence from international data'. *Journal of Finance*, vol. 50, pp. 1421-1460.

Titman, S & Wessells, R 1988, 'The determinants of capital structure choice', *Journal of Finance*, vol. 43, pp. 1-19.

Vergas, N, Cerqueira, A & Brandão, E 2015, 'The determinants of the capital structure of listed on stock market nonfinancial firms: Evidence for Portugal'. *FEP working papers*, no. 555 (ISSN: 0870-8541).

Vieira, E 2013, 'Determinantes da estrutura de capital das empresas portuguesas cotadas'. *Revista Portuguesa e Brasileira de Gestão*, vol. 12, no.1, pp. 38-47.

Vieira, E & Novo, A 2010, 'A estrutura de capital das PME: Evidência no mercado português'. *Estudos do ISCA*, vol. 4, no.2, http://dx.doi.org/10.1234/ei.v0i2.578.