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The 2008 Financial and Economic Crisis and its Effects over the Footwear Industry in Portugal

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Biographic Note

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Abstract

The recent financial crisis, considered by many researchers one of the biggest crisis since the Great Depression of 1929, has hit the European Union deeply. It has affected not only financial markets and institutions, but also non-financial companies all over the world. The constraints in the financial sector and the contagion of the sovereign debt crisis has also exacerbated significantly the willingness and ability of financial institutions to take risk on lending.

The large-scale effects caused by 2008 financial crisis, highlighted the relevance of studying the economic impacts around the world. Due to that, this dissertation examines the impact of the recent financial crisis on firm's capital structure and whether constraints on credit supply has affected corporate investments of the Portuguese footwear industry. Most of the studies focus their analysis in large economies such as UK and US, but in our dissertation, it is selected small and medium footwear firms from Portugal. Besides that, most of the literature focus their studies on crisis period, while in our investigation we go further by testing the financial variables in both crisis and post-crisis period, which is in our opinion, a distinguishing element comparing to the revised literature.

To investigate the impact of financial crisis on financing and investment policies, it is assumed a fixed effect model where we compare a set of variables along the three periods: pre-crisis, crisis and post-crisis. Our final sample includes 921 footwear firms, extracted from SABI database, for the period 2004 – 2013.

The results highlight that financial crisis has impacted negatively, both corporate investment and the leverage ratio of private firms, affecting long and short-term debt. In order to mitigate the adverse effect of credit contractions, Portuguese footwear firms issue more equity and increase trade credit. Results also reveal that after the crisis, private firms increase their leverage ratio mainly through a growth on long-term debt, which suggest for an improvement on financial market.

Key-words: Financial crisis, Corporate investments, Leverage ratio, Cash.

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1. Introduction

The recent financial crisis that began in middle of 2007 resulting from the defaults on subprime mortgages, had severe effects in the financial sector, being therefore considered by many researchers as the most serious crisis since the Great Depression of 1929.

This crisis had dramatic effects over the financial institutions with main emphasis on the collapse of Bear Stearns as well as the bankruptcy of Lehman Brother in 2008. Thus, together with several regional bank failures led to the default and disruption in the financial markets, and increased the panic and distrust, as well as reinforced the awareness of the significance of risk management on the part of financial institutions (Akbar et al., 2013).

The constraints in the financial sector and the contagion of the sovereign debt crisis have worsened the willingness and ability of financial institutions to take risk on lending, i.e., quantity of credit available for borrowers is lower and costs of borrowing are higher (Ivashina and Scharfstein, 2010).

The shocks on credit markets had severe spillover effects into other sectors and in the real economy, by limiting the financing of consumers and investments of firms (Iyer, R., et al., 2013). In response, private firms tend to reduce capital expenditures, reduce debt issuance, and cut deeply their planned dividends distributions (Campello, M et al, 2010).

In Portugal, this situation became even worse with the consecutive downgrades of sovereign debt, which led to the request at EU Commission for external help, in order to guarantee the financing condition of Portugal.

The magnitude of the 2008 financial crisis emphasizes the relevance of understanding how credit supply shocks affects financial and investment decisions of private firms. Few studies have examined the effects of financial crisis on performance and corporate investment, and the few existing studies are more focused on US and UK markets, as well as on public firms. Furthermore, most of the studies have focused their analyses only to a pre-

crisis and crisis period (2009). Indeed, this limitation related with the lack of empirical studies for a post crisis period, is an opportunity to understand how leverage ratio and investments have performed after the crisis.

In this dissertation, we provide evidence of this subject by studying the impact of actual financial crisis on Portuguese shoe firm's capital structure and whether constrains on credit supply has affected financial performance and corporate investments. Additionally, we examine how capital structure and investments of those firms are reacting after the crisis and whether or not Portuguese footwear industries are showing recovery signs after the crisis period. Based on that, we split our study in three main periods: Pre-crisis (2004-2006); Crisis (2007-2010) and post-crisis (2011-2013), and it is assumed a fixed effects model to compare a set of hypotheses along the three periods, for our sample of 921 private firms. We chose Portuguese footwear private firms for this investigation, mainly because the majority of published studies have considered large economies such as United States and United Kingdom (Chava and Purnanandam, 2011); (Duchin, R., et al.,2010); (Akbar et al., 2013), and the existing differences between economies, in terms of dimension, tax system, economy structure, may justify an alternative evidence. Besides the professional interest by footwear industry, we have chosen this manufacturing due to the big representativeness of this sector in Portuguese manufacturing industry and in the external trade, as well as due to the high homogeneity of this industrial sector, which is predominantly dominated by small and medium firms.

According to Eurostat small and medium firms (SME) represent around 99.9% of Portuguese business and are responsible for 79% of employment and 68% of internal production. Their massive importance on the economic growth, innovation, employment and technological developments, has motivated us to choose SME as the main driver of our analysis.

The results of descriptive and empirical analysis are consistent and both show that the financial crisis of 2008 has adversely affected, capital structure and investment level of Portuguese shoe firms. It reveals that footwear manufacturing decrease their leveraged ratio in approximately 11% during the crisis period. This decrease is verified in the long and short-

term debt. In order to offset the credit constraints from financial markets, shoe firms issue more equity and use more trade credit. To the analysis done on post-crisis period, the results suggest that leverage ratio of Portuguese shoe firms increase, mainly due to higher long term debt.

This dissertation is organized as follows: Literature review in Chapter 2, where we present the main theories about capital structure. Chapter 3, describes the sample and the adopted research methodology, followed by a discussion of the results presented in Chapter 4. The main findings and conclusions of the research are presented in Chapter 5.

2. Literature Review

This section presents the main theories about capital structure. Most of this work seeks to study the real effects of the crisis on the corporate sector. In a first phase, we present the main theories and models referring to the capital structure of firms. And secondly, we introduce the main results and contributions of the similar studies analyzed.

2.1 Main theories on capital structure

Firm's capital structure is one of the main topics of corporate finance, and can be defined as the way how firms use equity or debt to finance their investments/ assets. Although there are different types of approaches, we get the impression that there is not yet a solid theoretical structure capable to explain how companies are financing themselves.

This section presents in a very synthesized way the main theories about capital structure.

2.1.1 Traditional Approach

The traditional approach of capital structure focuses its analysis into an optimal capital structure that maximizes firm's value. Durand (1952) was the pioneer of this traditional methodology, referring that the cost of debt tends to be lower than equity capital, meaning that, by using debt capital, firms can increase its value or lower the cost of capital.

In his *Net Income Operating Method – NOI Method*, the author defends that capital structure has impact on firm's value. In his approach, the cost of debt remain stable until it is reached a specific amount of debt, but from a certain point, the cost of debt increases due to the high level of risk. For that reason, companies should increase the level of debt until get a minimum level of capital costs, meaning that at this phase firms are in its optimal capital structure, which leads to the maximization of firm's value. From the optimal combination, the use of debt in excess contributes to a decrease on firm's value, since the weighted cost of debt would be higher than the weighted cost of capital. In sum, according with Durand (1952), firms

should seek for an optimal capital structure in order to minimize financing costs and increase firm's value.

The studies related with capital structure has become more relevant with Modigliani and Miller (1958) theory, becoming therefore one of the main topics discussed in the financial theory. In their first publication, the authors propose that capital structure is not relevant to create market value, supporting the idea that the debt ratio comparatively to the equity ratio is irrelevant to the firm's point of view.

This approach adopted many assumptions, among which: nonexistence of taxes; unlimited debt without default risk; absence of failure; agency costs as well as absence of information asymmetry. Based on this assumption, the authors conclude that the market value of a company is not directly linked with its capital structure, demonstrating that the expected profitability of a leveraged firm is equal to a non-leveraged firm by adding a risk premium. The authors also highlight in this article, that taxes does not affect the capital structure of companies.

In order to correct such statement, Modigliani and Miller (1963) reformulate the assumption of nonexistence of taxes. The authors recognize that leveraged firms might have fiscal benefits, which affects positively the weighted costs of capital and naturally leads to an increase of firm's value.

2.1.2 Other approaches

Despite the controversy raised with Modigliani and Miller methodology, many authors have taken it as a starting point to develop new hypothesis related with capital structure, which some of them will be explained below:

- Trade-off Theory

The trade-off theory supports the idea that leveraged firms might have fiscal benefits, but on the other hand, companies are susceptible to a bankruptcy and agency costs.

According to Myers (1984), leveraged firms, face two opposite effects: a positive effect coming from fiscal benefits, and a negative effect associated to bankruptcy costs, being therefore possible to calculate the capital structure that optimize the firm's value.

Regarding the agency costs, Jensen and Meckling (1976) were the main drivers of this theory, which links the agency problems with the capital structure of companies. The authors describe the agency relationship as a mutual agreement between principal (shareholder) and the agent (manager). The principal (constituted by one or more parties) hire an agent in order to act in its behalf, being so transmitted to the agent enough power to take decisions. Because both parties have different interests, and the agent has more information, the principal cannot ensure 100% that the agent is performing in conformity and in accordance with principal's best interests. In order to minimize the interest conflict between the principal and the agent, a mechanism is developed, which will incur in costs for the companies, and this is what is denominated as agency costs. Jensen and Meckling (1976), highlight that the costs originated by the conflicts between the principal and the agent as well as the bankruptcy costs, might influence the decision of corporate financing.

- The Pecking Order Theory

This theory deals with the idea that one party (agent) has more information than the other (principal).

The study developed by Myers and Majluf (1984), explains how investments decisions are influenced by financial decisions, when managers (agent) have more information about assets value, than shareholders (principal). According to the authors, if there is information asymmetry, the companies shall use first dividends to finance the new projects, and then issue debt/bonds, and the last option shall be by the increase of equity in order to avoid a high level of risk.

While for Myers and Majluf (1984), capital structure is a way to resolve problems related with investments, Ross (1977) assumes that investments decisions are fixed, and that capital structure is a way to inform the market. Based on the agency theory and the information asymmetry between shareholders and managers, the author conclude that financing policy can be used to signal the market information about the quality of the firm, decreasing therefore eventual problems of information asymmetry. The author highlight that the market gets a positive interpretation of leveraged firms, due to the high level of expected cash flows.

“When corporations decide on the use of debt finance, they are reallocating some expected future cash flows away from equity claimants in exchange for cash up front. The factors that drive this decision remain elusive despite a vast theoretical literature and decades of empirical tests”, (Frank and Goyal, 2009).

2.2 Similar studies

During the last few years, a growing number of papers study the causes and consequences of the financial crisis. Most of the studies focus on financial aspects of the crisis and try to understand whether loose lending standards contributed to the problems, but only few papers study the real effects of the crisis on the corporate sector.

The investigation of Akbar et al. (2013) study how credit contractions during the financial crisis of 2007-2009 affect the financing and investment policies of private companies in United Kingdom. In order to go ahead with the examination, the authors got a sample of 4.973 private firms with office registered in UK and they adopted a fixed effect

model for the research methodology. The results obtained suggest that the financial crisis has adversely effected the total debt ratio of private firms, and was more significant in the short-term debt and trade credit¹ channels. Consequently, private firms hold more cash and issue more equity during the crisis period to offset the negative effects of credit contractions. The results also reveal that credit shocks has negatively affected the performance and investments of private firms. Furthermore, the increase in cash reserve and the decrease on investment would suggest that firms might have raised funds through equity for managing their cash balances.

Similarly, with the previous paper, Duchin, R., et al. (2010) also examined the effect of the recent financial crisis on corporate investments. The authors focused their analysis mainly during the financial crisis (1 July 2007 until 30 June 2008), and they found out that corporate investment declined significantly (6.4%) following the onset of the crisis, specifically by 0.109% of assets relative to an unconditional mean of 1.695% of assets (per quarter). They also stated in their publication that the decline is larger for firms with lower cash reserves or high net short-term debt, or even for those industries extremely dependent of external finance.

In the same line as the previous authors, Ivashina and Scharfstein (2010) study the effect of the banking panic on the supply of credit to the corporate sector, by examining data on syndicated loans² from both commercial and investment banks. The authors conclude that during the financial crisis, new lending drops substantially across all types of loans. They state that, on one hand, some of this decline is linked with a decrease in demand, due to cuts on firm's expansion plan during recession period. On the other hand, this drop may also be connected with a decrease in the supply of credit, which affects adversely some banks more than others and affects automatically the distribution of credit in the economy. According to

¹ Trade Credit is a short term financing source used mostly by Business to Business operators, and this consists of an agreement between costumer and supplier, where costumer purchase goods or services on account, paying the supplier at a later period (normally deferred to 30/ 60 / 90 days).

² Syndicated loans consists with bank loans in which a lead bank "originates" a loan and lines up other financial institutions to share a portion of the loan.

the authors, the drop in the credit supply put upward pressure on interest rate spreads, and lead to a greater fall in lending than one seen in a typical recession.

Kahle and Stulz (2010), they examine the financing policies adopted by non-financial firms, from the start of the financial crisis (third quarter of 2007) to its peak (first quarter of 2009). They conclude that, before the fall of *Lehman Brothers* there is no evidence of a systemic supply shock, since American industrial firms do not show evidence of a drop in the net debt issuance. During the first year of the crisis, small and unrated firms decrease their cash holdings, not because they borrow less, but instead, because they raise less equity. The authors state that debt financing drops significantly for all types of firms after Lehman Brothers fall, but even though, small and unrated firms are the most affected.

Campello, M et al, (2010) have however innovated their analysis by doing a survey between 1.050 CFO in US, Europe and Asia in order to evaluate if their firms are credit constrained during the global financial crisis of 2008. Their study indicates that constrained firms planned deeper cuts in tech spending, employment and capital spending. Besides that, this work puts in evidence that constrained companies also burned through more cash, drew more heavily in lines of credit, and sold more assets to finance their own operations. Most of the companies under analysis were obliged to bypass attractive investment opportunities and others needed to cancel or postpone their planned investments.

More recently, Arslan-Ayaydin, Ö., et al. (2014), developed a study denominated as “*Financial flexibility, corporate investment and performance: Evidence from financial crisis*”, where the impact of financial flexibility on the investment and performance of East Asian firms over the period 1994-2009 is investigated. The sample is constituted by 1.068 firms, and places particular emphasis on the period of Asian crisis (1997-1998) and the recent crisis (2007-2009). The results demonstrate that firms can achieve financial flexibility primarily through conservative leverage policies and less commonly by holding large cash balances. Financial flexibility seems to assume an important factor of investment and performance during a crisis period. The authors mention that firms financially flexible prior to the crisis, have a greater ability to take investment opportunities, they are much less

dependent on the availability of internal funds to invest and also they perform better than less flexible firms during the crisis.

Summarizing, all the studies presented above, conclude that the recent financial crisis initiated in middle 2007 symbolize a barrier to access the credit supply, affecting negatively the capital structure of the companies.

3. Methodological Aspects

The main aim of this research is to analyze the impact of financial crisis on financing and investment decisions of footwear industry. This study is structured in three parts: In the first part, we intend to analyze the impact of the financial crisis on capital structure of Portuguese footwear industries. In the second part, we aim to examine whether or not those firms have changed their financing policies as a consequence of the crisis, and in the last part we will test if the investment level of those firms was affected or not by credit constrains and if those firms are showing recovery signs after the crisis.

In this section we start by doing a descriptive statistical analyses followed by an empirical study based in the model developed by Akbar et al. (2013), when he studied the impact of financial crisis in UK private firms by adopting a fixed effects model.

3.1 Hypothesis

This study tests the following hypothesis:

- **Hypothesis 1:** *“Leverage ratio of firms that are dependent on bank loans is sensitive to variations in the supply of bank loans”* (Chava and Purnanandam, 2011). It aims to highlight the significant variations in the credit supply during the crisis period, and whether or not leverage ratio of Portuguese footwear industry was affected by the credit constrains.
- **Hypothesis 2:** *“Small firms, which do not have access to capital markets, increase the use of trade credit when faced by limited, or no availability of credit from financial institutions”,* (Petersen and Rajan, 1997). We also intend to test the hypothesis from Akbar et al. (2013), when he argues, *“Firms issue more equity to offset the adverse effect of credit contractions”*.

- **Hypothesis 3** – “Investments declines significantly following the onset of the crisis”, (Duchin, R., et al., 2010). The main objective is to examine whether or not investment of private firms was negatively affected by financial crisis and whether private firms are showing recovery signs after crisis period.

3.2 Model

Our empirical study will follow the model developed by Akbar et al. (2013), when he studied the impact of financial crisis in 4.973 private firms of United Kingdom. The applicability of this model is based on panel data by running a fixed effects regression. The use of panel data can have a potential concern of unobserved heterogeneity. However, as referred by the author, fixed effect model will help to capture the unobserved time-invariant heterogeneous firm characteristic.

$$Y_{it} = \lambda_{1i} + \Pi_1 * crisis_{it} + \delta_2 * \sum X_{it} + \delta_3 * crisis_{it} * \sum X_{it} + \mu_{it} \quad (I)$$

The dependent variable (Y_{it}) is a measure of firm’s leverage ratio, sources of financing or investment. The variable (λ_{1i}) is the firms fixed effects; (Π_{1i}) is the differential slope coefficient and indicates how much is the slope coefficient between crisis and pre-crisis period. The variable crisis is a dummy variable equal to “zero” for the pre-crisis and “one” for the crisis period. The interactive term (δ_3) represents the change in response relative to the periods under analysis, and (X_{it}) is a set of independent variables under firms control (Return on assets (ROA), cash flows (CF) and Log (Assets) as a proxy of growth).

The distinguishing factor in our study is the creation of two dummy variables, as described in the table below:

Table 1 - Dummy Variables

D1	D2	Description	Period
0	0	Pre-Crisis	2004 - 2006
1	0	Crisis	2007 - 2010
0	1	Post-Crisis	2011 - 2013

The identification of three periods (and the two dummies) is supported by figure 1 regarding the world footwear exports:

- 2004 - 2006: Pre crisis period, i.e., period without significant evidence of financial breakdowns and with easy access to obtain credit from banks.
- 2007 - 2010: Crisis Period, considered as a period with lower liquidity in the market, and credit constrains.
- 2011 - 2013: Post-Crisis Period, characterized as a period of expansion and higher liquidity.

Figure 1 - World Footwear Exports in USD in 2004-14



Source: World Footwear 2015 Yearbook, APPICAPS.

In order to investigate the effect of the credit crisis on firm's capital structure, financing policies and on investment level, we will use the following proxy (key financial ratios) for the dependent variable:

1 – Leverage Ratio

$$Total\ Debt_{it} = \frac{Total\ Debt_{it}^3}{Total\ Assets_{it}} \quad (II)$$

2 – Alternative Source of Financing

$$Long\ Term\ Debt_{it}^4 = \frac{Non\ Current\ Liabilities_{it}}{Total\ Debt_{it}} \quad (III)$$

$$Short\ Term\ Debt_{it}^5 = \frac{Current\ Liabilities_{it}}{Total\ Debt_{it}} \quad (IV)$$

$$Trade\ Credit_{it} = \frac{Creditors_{it}}{Total\ Debt_{it}} \quad (V)$$

$$Equity_{it} = \frac{Shareholders\ Equity_{it}}{Total\ Assets_{it}} \quad (VI)$$

3 – Investment

$$Investment = \frac{Tangible\ Assets_{it}}{Total\ Assets_{it}} \quad (VII)$$

³Total Debt include Non-Current Liabilities (Long Term Debt, Other Non-Current Liabilities) and Current Liabilities (Short Term Debt, Trade Credit, and Other Current Liabilities).

⁴ Long Term Debt is equal to non-current liabilities, i.e., a debt with a due date longer than one year.

⁵ Short Term Debt is equal to current liabilities, i.e., a debt or obligation that are due within one year.

The study extends model (I) by incorporating total debt, long-term debt, short-term debt, trade credit, equity and investments as dependent variables, which will be regressed against the firm level control variables and crisis/ post crisis dummy, as highlighted below:

$$\begin{aligned} \text{Total Debt} = & \beta_0 + B_1 * \text{ROA} + \beta_2 * \text{Log(Assets)} + \beta_3 * \text{Crisis} + \beta_4 * \text{Post crisis} + \beta_5 \\ & * \text{ROA} * \text{Crisis} + \beta_6 * \text{Log(Assets)} * \text{Crisis} + \beta_7 * \text{ROA} * \text{Post crisis} + \beta_8 \\ & * \text{Log(Assets)} * \text{Post Crisis} + \mu_{it} \end{aligned} \quad (\text{VIII})$$

$$\begin{aligned} \text{Long Term Debt} = & \beta_0 + B_1 * \text{ROA} + \beta_2 * \text{Log(Assets)} + \beta_3 * \text{Crisis} + \beta_4 * \text{Post crisis} \\ & + \beta_5 * \text{ROA} * \text{Crisis} + \beta_6 * \text{Log(Assets)} * \text{Crisis} + \beta_7 * \text{ROA} * \text{Post crisis} \\ & + \beta_8 * \text{Log(Assets)} * \text{Post Crisis} + \mu_{it} \end{aligned} \quad (\text{IX})$$

$$\begin{aligned} \text{Short Term Debt} = & \beta_0 + B_1 * \text{ROA} + \beta_2 * \text{Log(Assets)} + \beta_3 * \text{Crisis} + \beta_4 * \text{Post crisis} \\ & + \beta_5 * \text{ROA} * \text{Crisis} + \beta_6 * \text{Log(Assets)} * \text{Crisis} + \beta_7 * \text{ROA} * \text{Post crisis} \\ & + \beta_8 * \text{Log(Assets)} * \text{Post Crisis} + \mu_{it} \end{aligned} \quad (\text{X})$$

$$\begin{aligned} \text{Trade Credit} = & \beta_0 + B_1 * \text{CF} + \beta_2 * \text{Log(Assets)} + \beta_3 * \text{Crisis} + \beta_4 * \text{Post crisis} + \beta_5 * \text{CF} \\ & * \text{Crisis} + \beta_6 * \text{Log(Assets)} * \text{Crisis} + \beta_7 * \text{CF} * \text{Post crisis} + \beta_8 \\ & * \text{Log(Assets)} * \text{Post Crisis} + \mu_{it} \end{aligned} \quad (\text{XI})$$

$$\begin{aligned} \text{Equity} = & \beta_0 + B_1 * \text{ROA} + \beta_2 * \text{Log(Assets)} + \beta_3 * \text{Crisis} + \beta_4 * \text{Post crisis} + \beta_5 * \text{ROA} \\ & * \text{Crisis} + \beta_6 * \text{Log(Assets)} * \text{Crisis} + \beta_7 * \text{ROA} * \text{Post crisis} + \beta_8 \\ & * \text{Log(Assets)} * \text{Post Crisis} + \mu_{it} \end{aligned} \quad (\text{XII})$$

$$\begin{aligned} \text{Investments} = & \beta_0 + B_1 * \text{CF} + \beta_2 * \text{Log(Assets)} + \beta_3 * \text{Crisis} + \beta_4 * \text{Post crisis} + \beta_5 * \text{CF} \\ & * \text{Crisis} + \beta_6 * \text{Log(Assets)} * \text{Crisis} + \beta_7 * \text{CF} * \text{Post crisis} + \beta_8 \\ & * \text{Log(Assets)} * \text{Post Crisis} + \mu_{it} \end{aligned} \quad (\text{XIII})$$

Similarly, with the author Akbar et al. (2013), we use cash flow as independent variable in the trade credit and investment regression, while for the remaining regressions we use instead, the return on assets and their interaction with crisis and post crisis dummy.

3.3 Data and Sample

Data is extracted from SABI database, managed by *Bureau van Dijk* for the period 2004 – 2013. In order to achieve the objective of this dissertation we extracted only Portuguese footwear industries, classified as CAE REV 3⁶, aggregated in the division “1520. Manufacture of footwear”. Our sample contains annual data coming from balance sheet, cash flow statement and profit & loss. It includes 2.578 Portuguese footwear industries but the ones that do not contain observations for the period 2004 – 2013 were excluded. After the selection of criteria, the sample was reduced to only 921 firms where data was fully available for the key variables of the research.

⁶ For further details, please consult http://www.ine.pt/ine_novidades/semin/cae/CAE_REV_3.pdf

4. Results

In this section is presented the analysis of results regarding the effect of the credit crisis on capital structure of footwear industry in Portugal. In order to facilitate the review, we start by a descriptive statistical analyses followed by an empirical study.

4.1 Descriptive Analysis

The descriptive analysis is subdivided into three parts: i) the effect of credit crisis on the leverage ratio; ii) the analysis of the components of capital structure individually to understand the channel of supply shocks in Portuguese industry, and how those variables are responding in a post crisis period and iii) the analysis how investments were affected by credit supply shocks, and how are they performing after the crisis. Since we have paired sample⁷ and we aim to compare means along the three periods, then we will use an ANOVA (one way)⁸. For each dependent variable is tested the significance and is calculated the mean for the three periods, which will allow us to understand some characteristics of our sample.

⁷ Paired data is characterized by measuring in different ways the same individuals, which in our case are footwear companies.

⁸ To utilize ANOVA (one-way) data needs to have the following conditions: only one variable / factor and more than two conditions. In our study, we meet the pre-requisite, since we have the three conditions related with, pre-crisis, crisis and post-crisis period.

Impact of financial crisis on leverage ratio

The table below highlights that the amount of total debt (ratio: debt/total assets) is relatively high, which suggest that the capital structure of our sample contain more debt than equity, i.e., the firms selected in our samples are financing themselves mainly through debt.

Table 2 - Evolution of Total Debt

Total Debt		Mean	Var %	<i>p value</i>	
Pre Crise	Crise	78%	-	0,019	***
	Pos Crise			0,673	
Crise	Pre Crise	70%	-11%	0,019	***
	Pos Crise			0,001	***
Pos Crise	Pre Crise	80%	13%	0,673	
	Crise			0,001	***
Total		75%	1%		

ANOVA (one-way) of paired data to compare multiple means of the three periods and with a confidence interval of 95%. ***, **, *, represent the mean difference for each period for a level of significance of 1%, 5% and 10% respectively.

The high debt ratio of those firms that in pre-crisis period (2004-2006) represented 78% of total assets, drops substantially (11%) during the crisis period. This is consistent with the findings of Iyer, R., et al. (2013) and Akbar et al. (2013) that conclude that the flow of credit of private firms was reduced during the crisis. The variance on leverage ratio from one period to the other is statistically significant for a level of significance of 5%. In other words, this means, that the difference in total debt ratio between pre crisis vs crisis and crisis vs post crisis is expressive, confirming that firms that have faced a negative impact on credit supply during the crisis, have however reversed this scenario after the crisis period.

Alternative source of financing

Indeed, it was demonstrated above that during the crisis period, firms have faced significant reduction on credit supply. This suggest that total debt is an important variable and it becomes appropriate to understand the other players clustered to the debt. We therefore examine in

the table 3, 4, 5, the evolution of each component of capital structure, in order to understand if during the crisis, firms have changed or not their sources of finance to offset the limitation or non-availability of credit from financial institutions.

Table 3 - Evolution of Long Term Debt

LT Debt		Mean	Var %	p value	
Pre Crise	Crise	13%	-	0,000	***
	Pos Crise			0,896	
Crise	Pre Crise	11%	-21%	0,000	***
	Pos Crise			0,000	***
Pos Crise	Pre Crise	13%	19%	0,896	
	Crise			0,000	***
Total		12%	-1%		

ANOVA (one-way) of paired data to compare multiple means of the three periods and with a confidence interval of 95%.

***, **, *, represent the mean difference for each period for a level of significance of 1%, 5% and 10% respectively.

The results in table 3 and 4, demonstrate the evolution of long and short-term debt for the three periods under analysis. These results highlight that short-term debt (overall 86%) as a fraction of total debt is higher than long-term debt as proportion of total debt, not only during the crisis period but also before and after the crisis.

The output on table 3, which refers to the long-term debt, is statistically significant for the periods under analysis, and the variances on mean show a clearly reduction of 21% in long-term debt from the pre-crisis to the crisis period. This is in conformity with the results presented by several authors that argue that contractions in credit supply have negatively affected leverage ratio of private firms during the crisis period. Though, is also possible to verify an increase of long-term debt in a post crisis period. These findings suggest that when conditions on credit market improve and credit becomes easier to obtain, private firms increase their long-term debt issuance.

Table 4 - Evolution of Short Term Debt

ST Debt		Mean	Var %	p value	
Pre Crise	Crise	86%	-	0,000	***
	Pos Crise			0,001	***
Crise	Pre Crise	89%	2%	0,000	***
	Pos Crise			0,000	***
PosCrise	Pre Crise	86%	-3%	0,001	***
	Crise			0,000	***
Total		86%	-1%		

ANOVA (one-way) of paired data to compare multiple means of the three periods and with a confidence interval of 95%. ***, **, *, represent the mean difference for each period for a level of significance of 1%, 5% and 10% respectively.

Surprisingly, the table above relative to the evolution of short-term debt⁹, point out that during the crisis there was a slight increase (2%) on current liabilities. At a first sight it seems to be fairly contradictory with the findings of Akbar et al. (2013) that defends that *financial crisis has impaired the short-term financing channels for private firms*. However, when we go through the table 5, referring to the trade credit evolution, it shows a significant increase on trade creditors¹⁰ during the crisis period. This suggest that private firms use more trade credit during the crisis, as a way to overcome the reduction in the supply of credit from financial institutions.

Table 5 - Evolution of Trade Credit

Creditors		Mean	Var %	p value	
Pre Crise	Crise	34%	-	0,000	***
	Pos Crise			0,009	***
Crise	Pre Crise	40%	16%	0,000	***
	Pos Crise			0,000	***
PosCrise	Pre Crise	32%	-27%	0,009	***
	Crise			0,000	***
Total		34%	-5%		

ANOVA (one-way) of paired data to compare multiple means of the three periods and with a confidence interval of 95%. ***, **, *, represent the mean difference for each period for a level of significance of 1%, 5% and 10% respectively.

⁹ The ratio of short-term debt is referring to the current liabilities, which includes short-term debt, trade credit, and other current liabilities.

¹⁰ Trade Credit, is encompassed in current liabilities, which in our dissertation we denominate as short-term debt.

Thus, based on the results presented on table 4 and 5, we conclude that the increase on current liabilities during the crisis period is mainly associated with the higher use of trade credit during the crisis (+16%), to offset the reductions of short-term credit provided by banks. Isolating the effect of trade credit from the current liabilities, then we would verify a decrease on short-term debt during the crisis. This result is then in accordance with Akbar et al. (2013), that suggests that *flow of credit to small firms is squeezed following a tight monetary policy*.

The results in table 6, which refers to the equity issued by private firms are statistically significant for all periods in analysis and the variance on mean show a clearly increase (26%) on equity issued during the crisis period.

Table 6 - Evolution of Equity

Equity		Mean	Var %	p value	
Pre Crise	Crise	22%	-	0,023	***
	Pos Crise			0,213	
Crise	Pre Crise	30%	26%	0,023	***
	Pos Crise			0,000	***
Pos Crise	Pre Crise	20%	-49%	0,213	
	Crise			0,000	***
Total		24%	-12%		

ANOVA (one-way) of paired data to compare multiple means of the three periods and with a confidence interval of 95%. ***, **, *, represent the mean difference for each period for a level of significance of 1%, 5% and 10% respectively.

This is consistent with the existing literature of Leary (2009), Lin and Paravisini (2010) and Akbar et al. (2013) who document that equity issued by private firms increase following contractions in the supply of credit. In other words, this means that private firms issue more equity when conditions in the credit market deteriorate and credit becomes harder to obtain.

To conclude, and accordingly with Akbar et al. (2013), the results presented above suggest that contractions on credit supply have affected negatively the total debt of private firms. In response, private firms issue more trade credit and issue more equity to offset the adverse effect of contractions. After the crisis period, the results reveal an increase of

leverage ratio of footwear firms, indicating a possible improvement on credit markets, and easiest to obtain credit from banks.

Impact of financial crisis on investment

In order to examine whether or not investments of private firms were affected by financial crisis we compared the mean of investments during pre-crisis, crisis and post crisis. The results reported in the table 7, show that the variable is statistically significant for all periods under analysis. Furthermore, it suggests that the inability of firms in getting credit had led to a reduction in their investments (approx. 13%) during the crisis period (2007-2010).

Table 7 - Evolution of Investment

Investments		Mean	Var %	p value	
Pre Crise	Crise	25%	-	0,000	***
	Pos Crise			0,004	***
Crise	Pre Crise	22%	-13%	0,000	***
	Pos Crise			0,039	***
Pos Crise	Pre Crise	23%	+5%	0,004	***
	Crise			0,039	***
Total		22%	-4%		

ANOVA (one-way) of paired data to compare multiple means of the three periods and with a confidence interval of 95%.

***, **, *, represent the mean difference for each period for a level of significance of 1%, 5% and 10% respectively.

These results are in line with the existing literature of Duchin, R., et al. (2010) which reported that the investment of the US public firms declined following the recent subprime crisis. Similarly, Akbar et al. (2013) and Campello, M et al, (2010) also defends that firms have decreased their investments during the crisis period due to difficulties on obtaining credit from financial institutions.

In addition, these studies only cover crisis period, and we therefore, have decided to extend the existing literature by incorporating the post crisis period to our analysis. The conclusion is that after the crisis period, investments tend to follow the same trend as total debt ratio, i.e., investment level increases after a slowdown period.

4.2 Regression Analysis

The results of the estimation of model described above are presented in the table 8 and 9. The main variable of interest is the crisis and post crisis dummy, and we are mainly interested on the sign and significance of these two variables.

Table 8 - Effect of financial crisis on leverage ratio

Variables	Model (1)		Model (2)		Model (3)	
	Total debt		Long term debt		Short term debt	
ROA	-1,0273	***	-0,0706	***	0,0737	***
	(-8,5769)		(-2,8217)		(2,76)	
Log(Assets)	-1,3814	***	0,3044	***	-0,1105	*
	(-4,5954)		(4,8458)		(-1,6489)	
CF	-		-		-	
	-		-		-	
Crisis	-0,0880	***	-0,0592	***	0,0359	***
	(-3,723)		(-2,5904)		(6,737)	
Post crisis	0,0264	***	0,0160	***	-0,2989	***
	(2,706)		(3,000)		(-12,1849)	
Crisis*ROA	-0,3222	**	0,0112		-0,0063	
	(-2,0332)		(0,337)		(-0,1792)	
Crisis*Log(Assets)	-0,0118		0,1561	*	-0,0512	
	(-0,0281)		(1,7787)		(-0,5474)	
Crisis*CF	-		-		-	
	-		-		-	
Post Crisis*ROA	-0,8874	***	0,0367		-0,0361	
	(-5,9297)		(1,1743)		(-1,0825)	
Post Crisis*Log(Assets)	0,0298		0,0374		1,1000	***
	(0,071)		(0,4265)		(11,7495)	
Post Crisis*CF	-		-		-	
	-		-		-	
C	1,1808	***	0,0605	***	0,8848	***
	(14,5835)		(3,5758)		(49,0203)	
No of obs	9.210		9.210		9.210	
R2	0,085		0,019		0,039	

T-Statistics are reported in parentheses; ***, **, *, represent that coefficient is significant for a level of significance of 1%, 5% and 10% respectively.

The results from the estimation of Model (1) show that all variables are statistically significant with exception of variable Log (Assets) interacted with the dummies crisis and post-crisis. As expected, the coefficient on crisis dummy is negative and statistically significant, which suggest that the financial crisis has adversely affected firm's leverage ratio. Regarding the dummy post crisis, the results show a positive and significant coefficient, leading us to conclude that after the crisis, credit supply is further facilitated and firms are more willing to obtain financial credit. These results are according with the descriptive analysis reported above in the table 2.

The coefficient of return on assets (ROA) is negative and statistically significant at a significance level of 1% and 5% in all periods under analysis, which means that the most profitable firms used less debt during the crisis period, decreasing therefore their level of leverage. This is also consistent with the pecking order theory, which imply that the most profitable firms use less debt, since they prefer internal financing when available, than external source. Indeed, an increase in debt has the potential to lower revenues as more money is spent servicing that debt, especially during the crisis period, where the supply credit is more restricted, representing in principle, an higher interest rate to be paid.

The coefficient of Log (Assets), as a proxy of firm's growth, is negative and statistically significant, which corroborate the results of Stulz (1990) by finding a negative relation between firm's growth and debt, i.e., firms with higher opportunities of growth show a lower level of debt than firms with lower level of growth. This relation between debt and growth has been especially highlighted in some studies of agency theory. Stulz (1990) is one of the supporters arguing in his study that "*financing policy matters because it reduces the agency costs of managerial discretion. These costs exists when management values invest more than shareholders do and has information that shareholders do not have*". He defends the existence of two costs: "*an overinvestment cost, because management invest too much in certain circumstances*", and "*an underinvestment costs caused by management's lack of credibility when it claims it cannot fund positive NPV¹¹ project with internal resources*".

¹¹ NPV equals to Net Present value.

The results on the first regression highlight that the credit supply is an important determinant of firm's financing decisions. Since total debt encompasses all forms of debt, it becomes then appropriate to understand the other components of total debt, and therefore, understand how private firms handled with credit supply shocks. In order to investigate this further, the same model is run on long-term and short-term debt, presented in Model (2) and Model (3) respectively, in the table 8.

The output on Model (2), reveal that all variables are statistically significant with exception of ROA interacted with crisis and post crisis dummy, as well as Log (Assets) interacted with post crisis dummy. The coefficient on crisis dummy is negative and statistically significant at 1% level, and the coefficient on post crisis dummy is positive and statistically significant as well. The negative sign on crisis dummy is in accordance with the descriptive analysis, revealing that financial crisis has impaired the long-term financial channels for private firms, which means that lenders may have squeezed the availability of credit to these firms. On the other hand, the positive sign on post crisis dummy show a higher use of long-term debt, possibly due to an increased confidence of financial markets and on private firms, after the crisis period.

The results on Model (3), regarding the short-term debt, presents statistically significance for all variables excluding the dummy variables interacted with ROA, and crisis dummy interacted with Log (Assets), that are statistically insignificant. The positive sign on crisis dummy and a negative sign on post crisis dummy confirm the earlier results on descriptive analysis, revealing an increase of current liabilities during the crisis, and a lower use after the crisis. These results are not consistent with the findings of Akbar et al. (2013), that shows in his study that short-term debt of private firms are adversely affected by crisis, because “ *as private firms are generally considered risky, lenders may have squeezed the availability of credit to these firms...* ”. However, by analyzing the Model (4) for trade credit, it seems that the result of regression is consistent with our descriptive analysis on table 4 and 5, where was concluded that the increase on current liabilities during the crisis period was camouflaged by the higher use of trade credit, and not particularly due to the increase on short-term loans. If, trade credit was isolated from current liabilities, then we would verify a decrease on short-term loans during the crisis period, and the opposite effect after the crisis.

Table 9 - Financial crisis and alternative sources of financing and investments

Variables	Model (4)		Model (5)		Model (6)	
	Trade credit		Equity		Investments	
ROA	-		1,0295 ***		-	
	-		(8,6658)		-	
Log(Assets)	0,8682 ***		1,5349 ***		-0,1082 ***	
	(12,5802)		(5,1476)		(-2,0651)	
CF	0,5452 ***		- ***		-0,3192 ***	
	(3,4566)		-		(-2,665)	
Crisis	0,0150 ***		0,0558 ***		-0,0854 ***	
	(13,090)		(4,187)		(-4,4821)	
Post crisis	-0,1235 ***		-0,3426 ***		-0,2009 ***	
	(-4,8895)		(-3,1387)		(-10,4733)	
Crisis*ROA	-		0,3277 **		-	
	-		(2,0852)		-	
Crisis*Log(Assets)	0,2508 ***		0,1472		0,2358 ***	
	(2,6019)		(0,3534)		(3,2217)	
Crisis*CF	-0,3076		- ***		-0,5424 ***	
	(-1,287)		-		(-2,9881)	
Post Crisis*ROA	-		0,8797 ***		-	
	-		(5,9262)		-	
Post Crisis*Log(Assets)	0,4469 ***		1,1618 ***		0,7504 ***	
	(4,6361)		(2,7892)		(10,2494)	
Post Crisis*CF	-0,4204 *		-		-0,8666 ***	
	(-1,7014)		-		(-4,618)	
C	0,1029 ***		-0,2238 ***		0,2806 ***	
	(5,5334)		(-2,7864)		(19,8747)	
No of obs	9.210		9.210		9.210	
R2	0,124		0,095		0,029	

T-Statistics are reported in parentheses; ***, **, *, represent that coefficient is significant for a level of significance of 1%, 5% and 10% respectively.

In the model (4), dummy crisis and post crisis are statistically significant and have respectively positive and negative coefficient. The positive sign on dummy crisis, suggest that trade credit tend to increase during the crisis period to offset the shocks on credit supply.

This follows the findings of Nilsen (1999) and Petersen and Rajan (1997), who argue that the increase of trade credit comes from the squeezed credit supply.

Analyzing the variable Log (Assets) and its interaction with crisis and post crisis dummy, we conclude that the greater is the dimension of the firm, the greater is the importance of using trade credit to finance themselves. The variable cash flow is statistically significant at 1% level and with positive coefficient, suggesting that firms with large cash flows use more trade credit. When interacted with the dummy crisis, we find out statistic insignificance. However, when interacted with post crisis dummy, it shows a negative sign with statistical significance of 10%. This means that after the crisis period, private firms with higher cash flows use a lower percentage of trade credit to finance themselves.

The Model (5) is the same regression run to equity issue. The output show that all variables are statistically significant with exception of variable Log (Assets) interacted with dummy crisis.

The positive coefficient of the crisis dummy is consistent with the above descriptive analysis and with the existing literature of Leary (2009) and Akbar et al. (2013), who argues that consecutive credit contractions results into an increase of equity issuance. In other words, private firms issue more equity to minimize the effect of credit supply contractions. On the other hand, the negative coefficient of the post-crisis dummy reveal that after financial markets being more relieved, private firms tend to slowdown the equity issues, and they increase therefore the use of external source of financing.

The variable ROA and the interaction with crisis and post crisis dummy have a positive coefficient, which suggest that the most profitable firms tend to issue more equity. The variable Log (Assets) has a positive sign on coefficient that means that firms with higher growth will issue more equity.

The Model (6) is run for investment. The output show that all variables are statistically significant at level of 1%. The negative coefficient of crisis dummy is consistent with the above descriptive analysis and the findings of Duchin, R., et al. (2010) and Akbar et al. (2013), which argue that during the crisis it become harder to obtain credit from financial markets, and consequently firms have decreased their investments due to credit restrictions.

Surprisingly, the coefficient on post crisis dummy present as well a negative sign, which suggest that although financial markets are less restrictive on credit concession after the crisis, private firms seems to be very cautious regarding their investments. Although statistically significant, this result is not consistent with the descriptive analysis.

To summarize, the results presented above suggest that the financial crisis from 2007 to 2010 has adversely affected the leverage ratio of Portuguese shoe industry. Results reveal as well, that firm's with higher dimension and with higher profitability, measured respectively through Log (Assets) and ROA, present lower leverage ratio during the crisis period. Examination of individual components of capital structure show that financial crisis has affected both long-term debt, short-term debt and trade credit. In other words, this means that, during the crisis period, Portuguese firms have reduced long-term debt due to the difficulties to obtain credit from financial institutions. Current liabilities of footwear industry were affected as well by crisis period. We found statistical evidence that Portuguese firms increased trade credit to finance themselves through their suppliers, in order to offset the restricted credit supply. This result is more representative on firms with higher cash flows and with higher dimension. Another resource used by private firms was to issue more equity to hedge themselves from the negative effect of credit contractions. Finally, the results of investment regression reveal that it declines during the crisis period. However, although verified a growth on leverage ratio after the crisis period, especially on long term debt, it's not yet visible in our empirical analysis any recovery signs on investments during the post crisis.

5. Conclusion

This dissertation examines how shocks to the credit supply during the financial crisis of 2008, have affected financing and investments policies of Portuguese footwear industries. Simultaneously, and as a distinguishing factor comparing with the reviewed literature, we extended our analysis to a pre-crisis period in order to understand the behavior of capital structure and the trend of investments of those firms. To investigate the effect of financial crisis on Portuguese shoe industry, we first subdivided our analysis into pre-crisis (2004-2006), crisis (2007-2010) and post-crisis period (2011-2013). After that, we run a fixed effects model for our sample of 921 footwear firms, and it was analyzed six financial variables along the three periods.

The further results, highlight that financial crisis have impaired in long and short-term financial channels, affecting adversely the leverage ratio of Portuguese footwear industry. As a consequence, and in order to mitigate the adverse effect of credit contractions, private firms issue more equity and increase trade credit to finance themselves through their suppliers. From the analysis done to a post crisis period, the results suggest that after 2011, credit supply is more facilitated and firms are as well more willing to obtain financial credit, resulting naturally from the macroeconomic growth on footwear industry. The strengthening of confidence on financial markets allowed private firms to intensify their leverage ratio, especially through an increase on long-term debt. On the other hand, results reveal that after the crisis, private firms tend to slowdown the use of trade credit and the equity issues, and subsequently they increase the use of external source of financing. Finally, the results of investment regression reveal that private firms are vulnerable to variations in the credit supply, presenting a decline of investments during the crisis. Results however, suggest that after the crisis, private firms are still very cautious on their investments, even though markets are more flexible to the credit concession.

Despite the valid results presented in this dissertation and its contributions in the post crisis analysis, which we consider as a distinguisher factor when compared with the revised literature, it contains certain limitations. The first one regards to the time interval of the study.

Although the study covers the three periods, which is a distinguishing factor comparing to the revised literature, it would be more accurate if we had a longer interval for the post crisis period, which corroborate the idea that private firms are showing recovery signs after the crisis. The second limitation regards to the database, that has very restricted information about characteristics of total liabilities, which is limiting the range of the study and the conclusions.

Finally, we end up with some suggestions that would encourage further research in this area. The first one would be the extension of post-crisis to a longer interval, which would help to corroborate whether or not private firms are recovering and performing positively since the crisis period. In order to have a better picture about the financial performance, further research, should also consider the impact of financial crisis on cash flows and on invested capital of private firms during the three periods. Last suggestion and according with Akbar et al. (2013) it would be interesting to investigate the role of relationship lending during the crisis period, because it has been argued that “*a longer relationship with the lender helps firms pay lower interest rates and pledge little collateral for loans*” (Boot and Thakor, 1994).

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