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TÍTULO DEL TRABAJO
The Effect of Sentiment on Corporate Debt Maturity

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ABSTRACT

This final degree work attempts to establish a relationship between sentiment and debt maturity, two widely known concepts in business. Both have always been studied separately although previous studies could provide some clue about an actual link between them. 150 non-financial firms belonging to six of the strongest markets have been studied for the 2008-2017 period. A fixed effects regression has been carried out in order to examine our sample (represented as panel data). Results reject the hypothesis of a non-existent relationship between sentiment and debt maturity. Similarly, firm characteristics prove to shape this connection, where the overall effect of sentiment on maturity differs depending on the firm typology. Further studies are needed for a broad and more precise understanding of the influence of each firm characteristics.

KEY WORDS: Sentiment, debt maturity, firm, firm characteristics, optimism, size, growth, profitability, consumer, investor, PCA, interaction.

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1. INTRODUCTION

The present final degree work aims to enlarge existing literature concerning corporate debt maturity and investor sentiment. On the one hand, the maturity of the debt plays a genuinely relevant role in financing decisions. Depending on the election for debt maturity, future scenarios in which a company finds itself can vary, simply because of the nature of this concept. By definition, the maturity profile defines the average remaining term of the debt. Thereby, the issuance of a long-term debt will reduce refinancing risks for any firm (other things being equal), as it provides more time to solve any cash-flow or repayment problem that might arise. Similarly, shorter-term debts could imply risks in case net cash flows corresponding to the repayment period are not above the amount to be repaid. Of course, both alternatives entail advantages as well as disadvantages, to be described in upcoming sections.

Similarly, previous literature has highlighted sentiment as a key determinant in the financial markets, affecting stock returns, market-intermediaries and management decisions among others. Sentiment is a latent factor which reveals market feelings and expectations. It is characterized by the difficulty for its measurement and has many dimensions.

Both fields have been generally studied in a separate way and no research has attempted to explain whether optimistic periods change the way firms elect the maturity of their debt. Wondering if both concepts are actually linked would provide interesting insights and could contribute to a broader view of existing literature. Additionally, proving a maturity-sentiment relationship is likely to set a basis for further investigations concerning similar topics. Our research aims to solve this question through examining 150 listed firms belonging to 6 markets spread around the world in the period 2008-2017. We have built several econometric models to estimate the impact of investor sentiment on debt maturity, by previously creating a sentiment proxy based on Consumer Confidence levels. Firm characteristics (Size, Growth and Profitability*)* were included afterwards to check whether the impact of sentiment varied in case firms presented particular characteristics. Outcomes from our study suggest that sentiment has a positive influence on debt maturity. Results are significant, showing that the more optimistic investors are the longer debt-maturity. Additionally, the analysis concerning firm characteristics offers intriguing results: even if some of our initial thoughts are backed by the study, some others are questioned. As such, further investigations are necessary to better understand how interactions between sentiment and firm-features work.

The remainder of our study is organized as follows: Section 2 introduces the two main concepts on which our analysis is built and gathers various results offered along the literature concerning the topic. Section 3 details the sample selection along with variable specifications, and descriptive statistics. Sections 4 and 5 present our research method, our main results and further analyses. Section 6 concludes the study.

2. THEORETICAL FRAMEWORK

In order to provide some insights and contextualize the aim of this final degree work, I will divide its theoretical framework into two main blocks: debt maturity and sentiment. After defining, analyzing and linking these concepts, I will present our main objective and the issues we want to give answers to.

2.1.-Debt maturity

Debt is not a flat loan. As we know the value of money changes over time, so does debt. Therefore, in addition to choosing whether debt is suitable for a particular situation, firms should focus on the maturity of this debt. We will now go deeper in the implications the maturity of a debt has.

Prior to a more detailed analysis about the aforementioned studies, a proper understanding of the implications for both short- and long-term debt is of high relevance. Of course, the repayment term will determine the characteristics and interests of the debt, as time is the most valuable resource. This is how short-and long-term debt are established: Short term debts are paid off at most in a one-year period, and long-term ones allow a later repayment. Generally speaking, financial entities do not show many obstacles for granting short-term debt. In fact, payment conditions are softer and money is granted faster, as the reason for which these loans are requested is many times linked to one-time investments and setbacks. However, short-term debt is harder to renegotiate than long-term one, because it increases future leverage and default rates (Jungherr & Schott, 2020). As such, it is essential for a firm to make sure it will be able to face the corresponding payments.

On the other hand, whenever requested amounts rise considerably, it is likely that the repayment term increases too. Long term-debt involves two to forty year-terms (where mortgages are also included). High amount debts tend to be destined to the acquisition of highly valuable assets or investments, so more time is needed to face repayments. In this case, risk is generated for the firm due to both time and the amount generated by long-term debt. Therefore, long-term debt acquisition usually requires endorsements and assurance, which prove the capability of repaying the loan. This will be reflected in commissions,

interests and duties the borrower will have to bear in order to obtain liquidity for its business. This is why "*larger and older firms borrow at longer maturities*" (Jungherr & Schott, 2020).

Stiglitz (1974) contributed to the literature by publishing a multi-period model for "The Irrelevance Theory", originally built by Modigliani and Miller in 1958. In short, this theory suggested that under perfect markets, decisions concerning the maturity structure of the debt does not affect the value of the firm. The Irrelevance Theory led to other theories that incorporated elements from imperfect markets and analyzed how their presence affected maturity. Three main imperfections were incorporated at first, comprising agency conflicts, information asymmetries and taxes.

Short-term debt proved to reduce agency conflicts (Myers, 1977). An agency conflict takes place in agent-principal relationships where both parties are expected to act in the best interest of another, whenever conditions and incentives drive the agent not to act in the best interest of its principal. Results for the research showed that *"if debt matures before the exercise growth option, maximizing value to the business can be conducted",* as it can help prevent managers from using excess cash on perquisites and non-valuable adding acquisitions. On the one hand, underinvestment could be avoided in case debt maturity is shorter than the time remaining to the execution of investment opportunities (Myers, 1977). Moreover, the less sensitive this short-term debt is to changes in the risk levels of firm assets, the less incentives shareholders will have to assume risks (Barnea, Haugen, & Senbet, 1980)

Brick and Ravid (1985) demonstrated how when the temporal structure for interest rates is not flat, the expected taxes to be paid depend upon debt maturity. More specifically, whenever the interest rate structure is ascendant, long term maturities reduce tax rates.

In the presence of information asymmetries (situations in which one economic party has more or better material information than the other) Flannery (1986) and Kale & Noe (1990) affirmed that firms involved in high quality projects use someone else's resources in the short run in order to inform the market about their positive perspectives. Diamond (1991) also established a non-monotonic relationship between credit risk and debt maturity. According to it, strong and well-qualified firms would benefit from short-term debt to face refinancing risks; weak firms would not be able to afford long-term debt due to high costs linked to adverse selection; and intermediate firms would be the ones using long-term debt more frequently.

Besides all theories where debt maturity is based on market imperfections, there are some other theories that focus on the risk-profitability trade-off due to short-term debt election.

Jun and Jen (2003) stated that even if the use of short-term debt could reduce interest costs, it also increases the risk of refinancing, as interest rates could fluctuate from one year to another. If this was the case, the lender could restrict the credit. This is why the use of short-term debt will also depend on other factors such as solvency and financial flexibility of firms, among others.

Results obtained by Jun and Jen (2003) entail that not only external forces, but also firm characteristics seem to determine the extent to which short and long-term maturity are chosen. Following this thread, García and Martínez, (2006) attempted to complete evidence about maturity date determinants, focusing mainly on the short term. They believed that firms showing stronger features would be the ones choosing short-term debt more frequently. To address this issue, they selected several determinants related to short-term encumbrance, among which individual firm effects and temporary variables were included. Results showed that there is a positive relationship between financial strength and short-term debt use. Being a more solvent firm implies a greater capacity to reinvest earnings and not to depend on third parties to collect financial resources. In line with Diamond's findings, García, and Martínez, (2006) suggest an inverted U shape relationship between short-term debt and financial solvency (also called strength). Once this relationship has been accepted, the link between financial flexibility and short-term debt maturity does not seem to be significant anymore, and so are interest rate differences. This latter result goes somehow against Brick and Ravid's, because the fact that tax amounts vary depending on the temporary structure of interest rates would not determine whether a firm chooses debt to be short-or long-term.

García & Martínez (2006) also introduce new factors into the equation concerning firm characteristics. On the one hand, growth opportunity proved to be negatively correlated with the maturity length of the debt. Whenever a firm takes advantage of an opportunity to become stronger and more competitive, the probability to refund loans successfully rises. This hypothesis is backed by Guedes & Opler (1996) and Ozkan (2000) who provide strong support for the hypothesis that firms with more growth opportunities in their investment sets tend to have more shorter-term debt. Moreover, financial flexibility did not seem to affect financial strength although it is reasonable to think so (as issuing short-term debt could influence the financial strength of a firm).

The research was more ambitious than previous studies, because an additional objective was to check whether the size of the firm has any effect regarding this issue, and in fact, it does. The size of a firm many times determines the alternatives it has for financing, even if firm

values could limit the selection of a financing mode. In short, the bigger the size, the more alternatives for financing. In this paper, we will also devote a section to the analysis of the "size effects" regarding debt maturity.

More recently, Gonzalez (2013) went a step further by doing some research about how determinants of debt maturity structure in Spanish firms varied across firm size. Besides some of the already mentioned factors (e.g. growth opportunities, level of asymmetry of information and income tax rate) which he analyzed one by one, he also talked about asset maturity, expecting a positive relationship with short-term debt because the shorter the asset maturity, the more affordable is to reduce maturity. The paper examined the factors that Spanish firms take into consideration for choosing the maturity of their debt and see whether the agency cost hypothesis, signaling hypothesis, maturity-matching hypothesis and tax hypothesis vary with firm size.

The econometric model he built showed that small firms tend to borrow short-term debt when it comes to listed firms. Interestingly enough, the agency cost explanations in small firms showed less validity than in large ones, and a long term debt preference was highlighted for small firms with more investment in tangible assets. Results also showed different effects of asymmetric information in smaller vs medium-sized and large firms. However, there was no clear differential effect of tax expenses on debt maturity according to firm size. Finally, there was not enough support for both maturity-matching hypothesis and the tax-based hypothesis. Similar to capital structure (where firm characteristics affect whether and how much to borrow), firm size is also a determinant for debt maturity structure.

Short-term debt has become a very attractive tool for firm financing. What are the reasons why firms choose to issue this type of debt? Some of them have been already mentioned. Nevertheless, it is worth highlighting some advantages and disadvantages of a reduced maturity. Short-term debt is cheaper than long term financing in terms of issue-costs. Moreover, additional costs steaming from short-term credit renewal are not necessarily greater than long-term debt issue costs. It also allows firms to enjoy low nominal interest rates and the possibility of not having to pay for any interests in some occasions, similar to commercial credits. It can easily be adapted to firm needs, and it entails less clauses (Barclay & Smith, 1995). Similarly, it facilitates banking relationships through the contact between banks and financial intermediaries in constant renewals (Petersen & Rajan, 1994). It also helps to increase the production and profits as a result of a closer link between production and product-selling and demand trends (Emery, 2001). However, this entails two main disadvantages: financing and interest risks. The first one derives from the difficulties some

companies may face when renewing their credits. In addition, refinancing risk increases exponentially as the amount for short-term debt rises. Firms using more short-term external resources would therefore be more vulnerable to negative shocks (either micro or macro type), and whenever financial restrictions occur, these type of firms are likely to be in trouble regarding credit renewals. On the other hand, since credit renewals are based on the current market interest rate, interest rate fluctuations are likely to be higher for short-term debt.

2.3-Sentiment

Now, it is time to present the last and probably the most important foundation of this paper: sentiment. More specifically, our interest lies in analyzing the meaning of sentiment in business and study how sentiment conditions firm decision-making and performance (and to what extent).

Defining sentiment is not a straightforward task. Depending on the sphere in which an individual finds himself, the definition for it may vary. Of course, our interest lies in understanding the role sentiment plays in business. It could be defined as investor's opinion, usually influenced by emotion, about futures cash flows and investment risks (Baker & Wurgler, 2006).Regardless of the environment in which sentiment is presented, its capacity to influence decision-making is unquestionable. When it comes to business, sentiment is usually bounded to two opposite concepts: investors' optimism and pessimism (Corredor et al, 2013) .These emotions are latent and unique factors that are present in the market. Firm choices could vary based on them, because they change investors' expectations concerning the future, and it is likely that they look forward to take advantage of perceived situations in order to gain economic profit.

The impact of sentiment has historically been backed by many research studies. This influence covers a wide range of elements, from stock prices to market intermediaries. Preliminary studies deal with the effect of sentiment on prices, and subsequently its effect on other areas was explored. It is believed that optimism drives stock prices upwards, and after some time they seem to return to their original values. Stock overpricing results in negative returns, as future benefits turn out to be lower than expected. In line with this, Baker & Wurgler (2006) studied different portfolios and sentiment, aiming to verify whether proxies for beginning-of-period sentiment affect predictability patterns in stock returns. According to the authors, stocks that are difficult to value or arbitrate are more likely to be sensitive to speculative demand. Therefore, sentiment has a higher impact on them. Regression was used in order to forecast yields corresponding to some of those collections

of stock. Results challenge the classical view about the irrelevance of investors' sentiment concerning stock prices and returns (both expected and realized).

Baker and Stein (2004) pointed out that firms sharing specific characteristics are more affected by lower returns whenever optimism prevails. Stock-yields for small, young, non-dividend paying, high-growth and distressed firms are more likely to diminish, so do those for firms owning high-volatile stocks. On the one hand, age provides a remarkable result: when sentiment is positive, investors tend to go for young stocks. These include the very youngest ones, which typically steam from recent IPOs. By contrast, demand shifts towards older stocks when sentiment is negative. Additionally, characteristics such as volatility, profitability and dividend-payment are connected to variations in stock-returns when sentiment is high or low. In the presence of optimism, riskier stocks earn lower returns. Conversely, a period of low sentiment drives these stocks to earn higher returns than otherwise. Similar to young stocks, high volatility stocks happen to be hard to value and arbitrage, which drives them to fluctuate more according to sentiment.

Sentiment has also proven to have an effect in market intermediaries, markets and firms decision-making processes. Market-intermediaries are, for instance, affected by sentiment, in the sense that optimistic periods drive financial analysts to issue more forecasts that are favourable (Quian, 2009). Following this thread, it seems that firm characteristics determine the extent of sentiment's impact, as previous studies have included them in their corresponding models when dealing with this topic.

Of course, since subjectivity plays an important role here, investor sentiment is not easy to measure accurately and there is no ultimate indicator for it. Researches have tried to get closer to this ideal representation of investors' feelings by building proxies that somehow reflect stakeholders' thoughts and expectations (Baker & Stein, 2004). Alternatives to sentiment measurement have focused in consumer and investor surveys, volume and profitability of initial public offerings or the put-call ratio, among others.

Throughout literature, researchers have also made distinctions depending on the event dimension affecting sentiment. Corredor et al (2013) divided sentiment into local and global, expecting their influence to be different; and they analyzed which one prevailed in different scenarios. In order to study this topic, they focused on volatile and non-dividend paying stock portfolios. In essence, they showed how both local and global sentiments have an apparent influence in stock returns, especially in those that are more sensitive and less-

dividend paying. Of course, this seems to influence stock-returns largely, as they are affected by two factors which influence profit instead of a single one.

This is the context in which the present Final Degree Work is framed. Considering the relevant role played by sentiment in business-related decisions, we will attempt to confirm a connection between one particular firm decision (debt maturity) and sentiment. The novelty of this work steams from the fact that we offer a new path through which the knowledge about the effect of sentiment in business can be enlarged. The literature offers some studies that deal with overconfidence and crisis periods at the time of examining business decisions. However, none of them mentions sentiment per se.

CEO attributes, for instance, seem to affect firm decision making. Whenever we discuss about "CEO attributes" we are mainly referring to the attitude firm managers' show. The attitude of a CEO many times determines the amount of debt used for financing, so does for equity. A firm could be doing great, making considerable amounts of profit, increasing customer loyalty and so on. However, the mentality of the person in charge of firm decisions could change things up if these do not match firm needs. For instance, managers who overestimate their firm's performance are likely to make wrong decisions.

According to Huang et al (2016) overconfident CEOs usually acquire this attitude because of self-assessment. Managers who exhibit this type of behaviour are many times influenced by the "better than the average effect". As opposed to investor's sentiments, CEO overconfidence is just a feeling, which compromises firm insiders. In this sense, as long as the CEO is driven only by its own perceptions, decisions concerning debt maturity will not be as linked to investors as otherwise.

Throughout literature, many authors have examined the impact of managers exhibiting similar behaviours. For instance, Malmendier and Tate (2011) concluded that *"overconfident CEOs undertake value destroying mergers"* because they believe that the firm is way above the actual revenue generation level. Subsequently, Malmendier, Tate and (2011) found out that overconfident managers are less likely to issue equity, and that they, are more prone to rely on debt, which increases firm leverage. In line with this, Hackbarth (2008) had already provided a framework for this thoughts by concluding that CEOs that are "biased" regarding risk conception use more debt financing because they believe the firm is more profitable and less risky than what it actually is.

Overconfidence has shown to have a substantial impact in corporate decision-making. In a previous study (Huang., Tan, & Faff, 2016), results showed how these type of managers take

short debt-maturity positions. "Optimism" drives them to behave in a way that the firm acts as if it had all the necessary characteristics for facing all the potential risks associated to a particular financing method. More precisely, they are confident about the idea that they can increase stakeholder's value by reducing costs through the use of short term refinancing. Overconfident managers tend to believe that they have access to private information which gives them competitive advantage, but that is not true at all. As such, they base their decision making in non-existent information asymmetries between managers and investors.

Interestingly enough, it seems that these financing decisions made by overconfident CEOs are not altered by liquidity risks that short-term debt financing brings with it. Additionally, it is interesting to mention that the link between managers exhibiting an overconfident behaviour and short-term debt financing is based on a higher proportion of short term debt over long term one, which indicates that managers do not necessarily have to borrow more amount than usual.

As we have noticed, CEO overconfidence drives firms to shorten debt-maturity periods. However, independent of external factors or events, firm characteristics could determine the length of this maturity too. This idea has been explained earlier in this introduction. Our discussion topic becomes more interesting when bringing market conditions into the analysis. Note that sentiment and market conditions are not equivalent concepts. The state in which a market finds itself is not a direct consequence of sentiment. However, it could provide clues about how firm decisions vary under certain scenarios. Studies comprising Market states

Gonzalez (2015) presents evidence on how the financial crisis affected the debt maturity structure of firms belonging to 39 countries in the period 1995-2012. In short, debt maturity turned out to drop considerably while the crisis lasted. On the other hand, this paper highlights the importance of external financing as a determinant for the aforementioned result, since the role of the banking sector was very important. Similarly, the effect of both the banking structure in these countries and the intensity of the crisis were studied too. According to this article, demand for short-term debt raised more than it did for long-term one, and this effect was more evident for firms that were already dependent on external financing. Apparently, this recession period was more evident for countries where bank concentration was lower and places where the banking sector was concentrated exhibited a better relationship between firms and banks, and conditions to borrow were more favourable.

As one may guess, crises that steam from the financial sector are characterized by the influence banks have on other economic agents. Obviously, firms that had previously decided not to depend so much on these institutions suffer a smaller change in debt maturity than those who had. Overall, during a crisis period banks tend to lend less money due to increased costs of access and lower availability of credit.

Technically, firm characteristics can soften (or worsen) these crisis effects. Regarding previous studies and hypotheses about the topic, Gonzalez (2015) compares its results to prior conclusions obtained throughout the literature which state that firm characteristics that affect debt maturity are relevant in a crisis period as well. Among others, results were consistent with the matching hypothesis, which indicates that firms match assets and liabilities with the aim of reducing risks. In addition, the negative influence of high quality firms on debt maturity was highlighted, together with a positive leverage-debt maturity relationship and the lack of significance for the volatility variable. The aforementioned article affirms that debt maturity for bigger firms decreased less and small firms in countries where banks played an important role were highly affected. The issue here lies in the fact that firm size influences the extent to which companies rely on both the banking sector and the private sector.

In this analysis we will put our focus on three attributes (size, growth and profitability) because of two main reasons: on the one hand, size, profitability and growth have historically been included in many studies which provided significant results. Similarly, while performing the current analysis, we concluded that those factors were the most determinant ones in shaping debt-maturity.

This Final Degree Work aims to link two fields which have traditionally been studied separately. Sentiment and debt maturity have already been examined in detail and thus, there is a deep knowledge and understanding about them. This includes the meaning, characteristics, implications and many other topics that are backed by mathematical models. Still, there is no paper which puts its focus on checking the influence sentiment has on maturity yet. So far no research has strictly tried to verify this link. As such, we will go a step further and analyse how sentiment influences firm-financing decisions concerning debt. On the other hand, while other previous studies have focused on short-term debt, this paper considers long-term debt to be the starting point in the study, meaning that we will suggest a positive sentiment-long-term debt relationship that we will develop through the upcoming sections. Our first null hypothesis is presented as follows:

H1: investor sentiment does not affect debt maturity.

We expect to reject this null hypothesis which considers that sentiment and debt maturity do not have anything in common. More specifically, we expect a positive correlation between both variables, implying longer maturities for optimistic moments.

Note that H1 does not consider any other element for establishing the aforementioned link. In other words, firm characteristics do not play any role here, but they will in our second hypothesis, where we will go a step further by gradually incorporating firm characteristics as they show their effect is significant concerning our results. As concluded in the theoretical framework, firm characteristics are a key topic in both debt maturity and sentiment. As such, we will extend out model in order to check whether the effect of sentiment varies according to them. The second null hypothesis is based on this premise.

H2: Sentiment does not affect differently when firm-characteristics are taken into consideration

Similar to H1, we expect to reject this second null hypothesis. Previous researches have deepen into how influential these characteristics are at the time of determining debt maturity of firms. Our prediction also points in this same direction, meaning that depending on the firm typology sentiments will have a greater or lower effect at the time of influencing debt maturity. H2 involves the three main firm characteristics described above: size, growth and profitability, as representatives of the aforementioned historical influence of firm characteristics.

This second attempt will allow us to make distinctions and bear out the effect firms have on maturity, checking whether firm elements emphasize or reduce previously obtained results. Initially, we believe that just because of their features and their operating methods, firms are affected differently when it comes to debt financing. In general terms, we expect firms showing strong characteristics to lean towards shorter-term debt. Firms with high growth expectations and those who have a high profitability ratio seem to be the best candidates for short-term debt election. In essence, they have more capacity to respond to negative shocks, or recover from them, at least potentially. Interest rate fluctuations can be better managed in powerful companies where high value is created and therefore, profit margins are above the average. The same thing happens with the ability to repay loans. Similarly, a high growth potential allows a firm to behave as if their profit levels were huge or they were big, basically because if the organization is growing at a fast rate, it means it will eventually have all the means to act as a powerful and already settled firm.

Throughout literature, size has been an important control variable because it has always shown to affect previous results where this control variable had not been incorporated. This time, we agree with previous researches which considered that both big and small firms end up having a higher short-term debt ratio while intermediate size firms would be the only organizations more likely to choose long-term debt.

Finally, we hope lower debt maturity values as profitability rises. Intuition drives us to link high profits with shorter-term debt because an increase in profitability is generally associated with an increased capacity of investment, a higher probability of easy recovery from future negative shocks, higher future expectations and so on.

3. DATABASE

In order to obtain the data necessary to test the effects of sentiment on debt-maturity we drawn on several database. Particularly, when dealing with financial and economic issues, we make use of Osiris. This source includes information about listed companies and main non-listed ones belonging to anywhere in the World. It offers very detailed information among which data about financial reports is included. Similarly, information regarding market researches, qualifications, contact, consultants… is provided here too. Osiris uses different templates to show figures in the appropriate format for every firm type and location. With the aim of building a proxy that represents sentiment suitably, information about OECD countries has been used.

We have selected a sample of 150 firms for the period 2008-2017. It consists of 150 listed companies belonging to six main markets (Germany, Spain, US, UK, Japan and France) that operate in both the secondary and tertiary sector (industrial and service sector, respectively). All these markets have traditionally been taken into account for firm capital structure analysis for obvious reasons such as their high market-capitalization rates, transaction-volume and relevance worldwide. To make things clear, it must be highlighted that businesses have not been chosen randomly. We will put our focus on 25 firms belonging to each of the six markets presented above. These firms are amongst the most relevant companies in their respective stock-exchange markets. On the other hand, the selection of the time-period steams from the fact that this time-lapse provides enough information for our intended analysis. It is a ten year period. It is therefore large enough for the attainment of significant results. Besides, it is not directly affected by crises, which will prevent results from being biased.

The selection of data for the upcoming analysis includes financial statement data about non-financial and non-regulated firms which shows the amount of total current assets, fixed assets, net property, total assets, total noncurrent assets, liabilities, net sales, earnings before and after taxes and many others. It consists of an unbalanced panel which portrays yearly observations for each firm, comprising a total of 1500 firm-year observations, which is reduced to 1350 at the time of analysing particular data (detailed information is presented later in this section). Such panels are very common in studies where firm indicators are examined.

After making sure the information we chose is appropriate for our analysis, we will start building our indicators based on the existent information. Taking into consideration all the concepts and characteristics discussed above, we decide to build descriptive statistics for five elements considered to be the basis of our work (*maturity, sentiment, size, profitability, tangibility, growth*). This way, we attempt to obtain evolution charts corresponding to each of these components to check whether relationship among them exists over the chosen period.

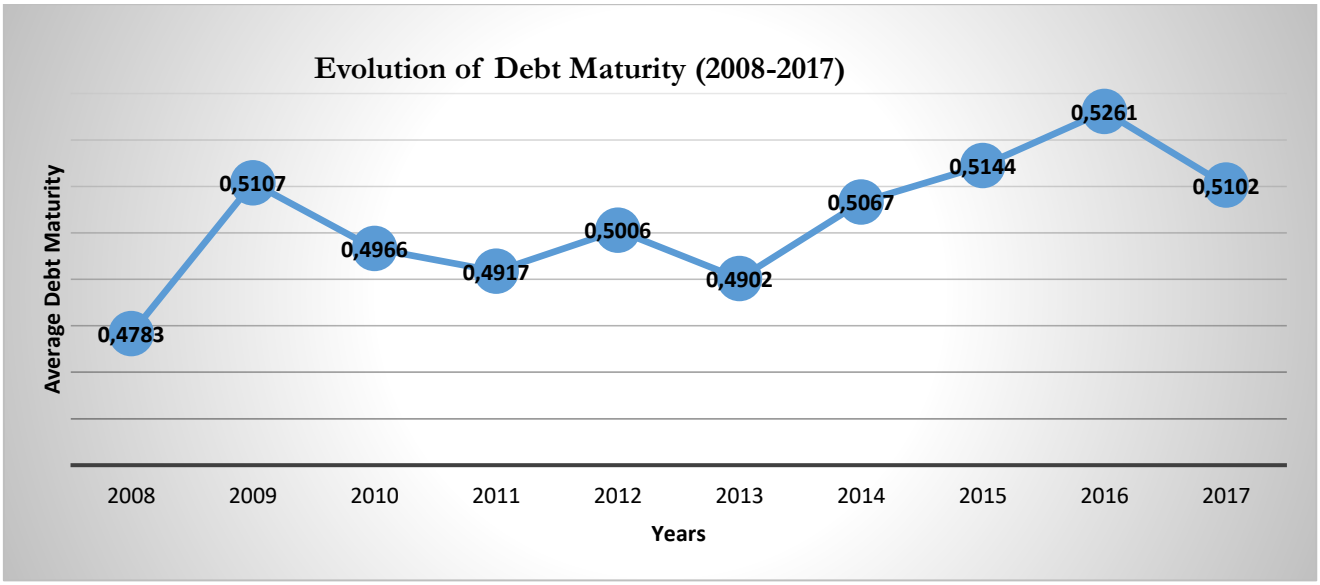
Debt maturity has been calculated through the following division: non-current liabilities/total liabilities. Our first descriptive is based upon the proportion of long-term liabilities over the total amount of liabilities corresponding to each firm for that specific year. This means that this indicator does not contain any delay as some others to be presented later on. As a result, this first component of our analysis (which will be the dependent variable in our analysis) tenders a long-term view of debt, in the sense that maturity coefficients obtained through existing data will reflect the ratio of long-term to total debt. Historically, indicators based on debt maturity have followed a similar path (González, 2014; Datta et al, 2005 among others).[1]

Graph 1 provides information about changes in debt maturity for the period 2008-2017. It consists on average debt maturity values for each year, comprising all the 150 firms included in our research. Figures along the ten-year period suggest a pretty stable evolution with a couple of ups and downs, especially at the end of the period. On the other hand, Graph 1

[1] As an example, González V. (2014) built a proxy for debt maturity which is quite resembling to ours, which he in fact has used in at least two of his papers that are published in both the Journal of Corporate Finance and the Spanish Journal of Finance and Accounting. He analysed the proportion of total debt that had more than one year maturity. In one of his researches, he offers some insights about historical creations of this same indicator. In short, most authors have used ratios that involved total and long-term debt. Differences lay on where the edge for defining long-term debt is set. Scherr and Hulburt (2001) used two specifications: weighted-average debt maturity and long term debt payable after one year (to total debt). Instead, Barclay and Smith (1995) established a three year repayment term as the boundary to define long-term debt; so did Johnson (2003) and Datta et al. (2005). Similarly Ozkan (2000) used the ratio of debt that matures in more than five years to total debt.

illustrates that, on average, top 25 firms corresponding to several markets have divided their debt-maturity options evenly. In other words, it seems that non-current liabilities haunt around a half of firms' total liabilities. However, note that from 2008 to 2013 debt maturity values are lower on average to those in the period 2014-2017. Overall, there is a negative trend in the beginning of the analysed period (2008-2017), which turns into an ascending tendency after 2013.

Graph 1: Evolution of debt maturity (2008-2017)



Source: Own elaboration

Recall the difficulty to assess sentiment and therefore to be precise at the time of giving it a numerical value. Prior literature about sentiment has varied in the way of representing sentiment in mathematical models. Again, its latent nature in the market makes it relevant because even if it is hard to quantify, it affects many business dimensions. Proxies for sentiment are abundant, so are the reasons why researchers differ in the way they estimate sentiment in their papers. In particular, our research bases sentiment on consumer confidence. This concept represents how optimistic consumers feel about the state of the economy as a whole and their particular financial situation. Depending on the confidence level, a consumer will spend more or will, by contrast, save larger amounts of money. Thus, it is reasonable to assume that in periods where the economy expands, consumer confidence levels will rise accordingly. The opposite is likely to happen when facing economic recessions such as crises. Schmeling, (2009) and Chang et al., (2011) have also used consumer confidence indexes for their analyses.

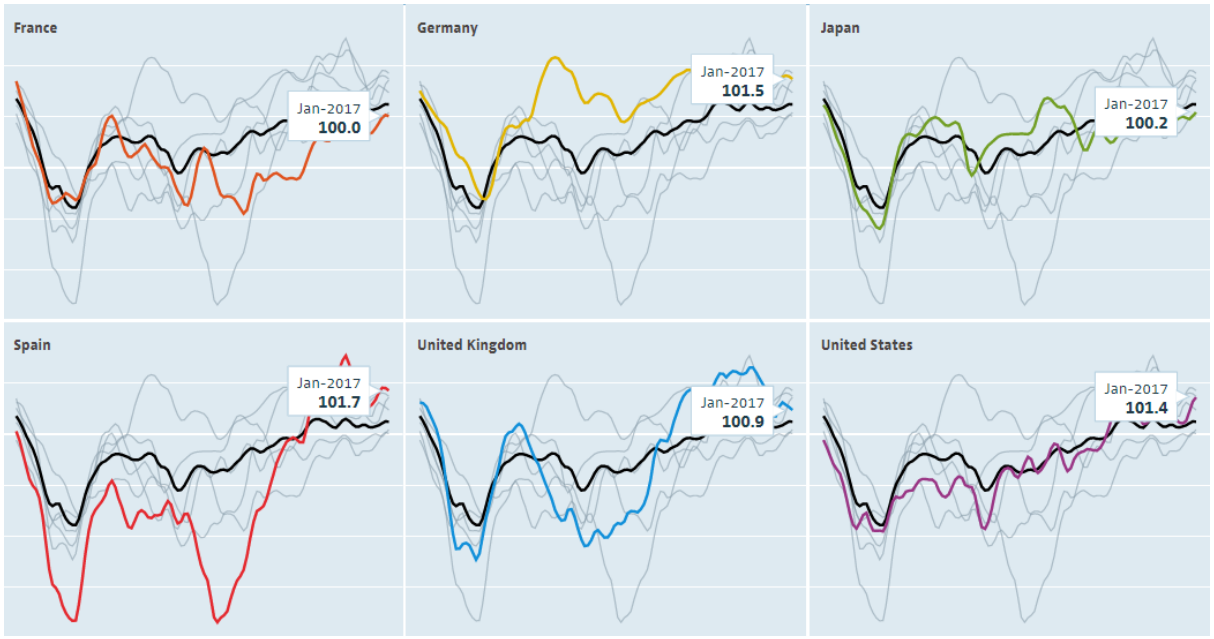
Information about consumer confidence levels has been extracted from the official webpage corresponding to OECD countries. It consists on a series of scores that indicate consumers' attitude (either optimism or pessimism) depending on whether they surpass a 100 points boundary. Scores summarize answers corresponding to a particular consumer confidence survey (called "Consumer Opinion Survey") by calculating an arithmetic average. This survey is composed of four questions involving "Assessment of financial situation over the last 12 months" "Expected financial position over the next 12 months", "Expected general economic situation over the next 12 months" and "Expected major purchases over the next 12 months". Each of them allow five possible answers (*a lot better, a little better, the same, a little worse and a lot worse*). Answers are weighted differently in order to build the final indicator: answers on the extremes are given the weight of 1; "the same" is given a weight of 0 and the remaining potential answers are worth 0.5.

We will use information about consumer confidence as a proxy for sentiment, attempting to determine whether two (or more) separate periods exist in the period 2008-2017. We are interested in identifying both an upward and downward trend in consumer confidence. This will help us in the process of studying whether consumer confidence may have an effect on debt maturity and firm characteristics.

Although it is obvious that consumers and investors are two distinct groups, many authors have used consumers' feelings about the market because it seems that there is a portion of it which is representative of sentiment.

Taking all this into account it is time to build our proxy for sentiment. Since our data set belongs to the international market, the index for sentiment will contain elements corresponding to the six countries that take part in our analysis. The starting point is accessing the webpage corresponding to OECD countries. It provides a wide range of information concerning country members along history. As mentioned above, information extracted from this webpage is located in the "Consumer Confidence Index" (CCI) subsection. We have first examined the tendency of this indicator across countries. Graph 2 illustrates the evolution of CCI from 2008 to 2017.

Graph 2: Consumer Confidence Indexes for France, Germany, Japan, Spain, UK and US (2008-2017)



Source: OECD webpage (oecd.org)

CCI evolution follows a general increasing trend represented by the black line. It seems that after the 2008 crisis consumer confidence dropped considerably and it has taken several years (around 10, to be precise) to recover its initial score. Of course it is an average tendency built based on 6 indexes that conform our research. Generally speaking, from 2013 onwards CCI for most countries began to increase gradually (with the exception of some short time periods where there was a slight decline)

Apart from graphically, this information has also been extracted in a table form for further calculations. Scores from January 2008 until December 2017 are disclosed too in the mentioned table. The rationale behind this format is that it allows the use of statistical tools in order to make estimations. For the sake of this paper we have used GRETL, one of many computer software that provide users with tools for analysing variables, correlations and estimation of coefficients, among others.

We have conducted a Principal Component Analysis (PCA) in order to extract the common element that the aforementioned markets share. For the sake of this analysis, we have named confidence levels differently, depending on the country to which they belong. Thereby, CCFR represents French confidence; CCUK corresponds to confidence levels in UK; CCGE is the code used for confidence in Germany; CCSP is the representative for confidence levels in Spain; and CCUS and CCJP stand for Consumer Confidence in the United States and Consumer Confidence in Japan, respectively. Our goal is to create a single

indicator that captures common consumer confidence patterns and comprehend the defined geographical area.

The sentiment index coefficients for each country are as follows:

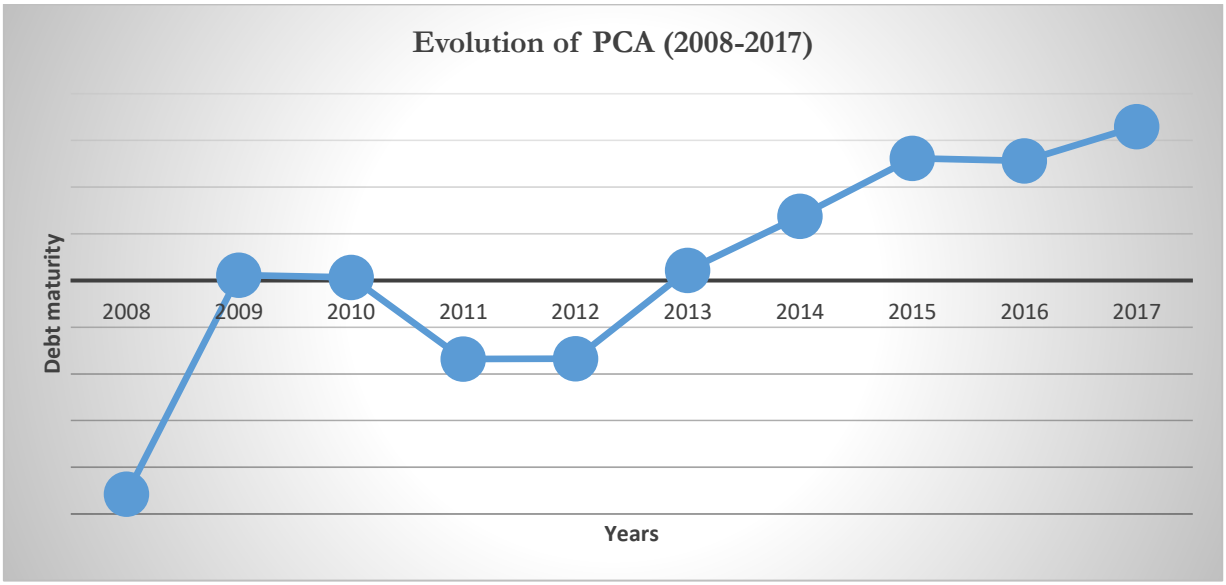
PCA = 0.3863 * CCFR + 0.3742 * CCJP + 0.4184 * CCUK + 0.4445 * CCUS + 0.4456 * CCSP + 0.3736 * CCGE

Note that all the coefficients conforming the PCA indicator are balanced, which is a positive signal because it would imply that our proxy for sentiment is not overrepresented by any of the countries in our sample. All of them are more or less evenly distributed.

The first principal component explains 71.80% of the total variance, enabling the conclusion that the first factors explain a high proportion of the common variance between the six measures. All six countries show significant positive correlation.

Note that the obtained index is built out of monthly data. In order to obtain representatives for the whole year, we have selected the figure for a particular month: December. This way, year-end values for each year will be our final values for PCA.

Graph 3: Evolution of PCA (2008-1017)



Source: Own elaboration

Further comments on this results will be done in Table 1 presented later in this section. However, note that the evolution of PCA clearly presents two opposite scenarios that last almost the same. We have calculated the median for PCA yearly values and results back those two separate periods. The first half of the figure shows values that are located close to or

below the X axis, which represents low confidence periods. On the other hand, there is a change in trend before 2013 after which the situation is reversed and PCA values increase considerably, suggesting the existence of positive confidence levels.

Interestingly enough, the behaviour of both debt maturity and sentiment seem to match in some way, since they are characterized by a change in trend around 2013 that led to a considerably different scenario in the following years. Consequently, it seems that debt maturity and PCA could be linked in some way. Our analysis will attempt to verify to what extent this insight has to do with an actual relationship between both variables.

Finally, the stock characteristic are proxied by size, prof y growth. Size is presented as the natural logarithm of total assets; profitability is the result of EBIT/total assets; tangibility was obtained through dividing Net PPE by Total assets; and finally growth is the result of $(sales_t\text{-}sales_{t-1})/sales_{t-}$ Note that since information for 2007 has not been gathered, data corresponding to growth is missing for the year 2008. This is where our data set becomes an unbalanced panel, as no firm provides any figure for that particular year. At the time of examining growth, only 1350 observations are included in the regression.

The next step relies on calculating average amounts for each of the elements through 2008-2017. ***Error! Reference source not found.*** shows average data for these stats.

Table 1: Average data about elements from 2008 to 2017

Years	**Maturity**	**Size**	**Profitability**	**Tangibility**	**Growth**	**PCA**
2008	0,4783	17,0409	0,0839	0,2536	-	LOW
2009	0,5107	17,1000	0,0669	0,2492	-0,0390	LOW
2010	0,4966	17,1700	0,0806	0,2365	0,0984	LOW
2011	0,4917	17,2147	0,0863	0,2312	0,0749	LOW
2012	0,5006	17,2468	0,0552	0,2341	0,0243	LOW
2013	0,4902	17,2636	0,0677	0,2370	-0,0011	LOW
2014	0,5067	17,2123	0,0686	0,2366	-0,0404	HIGH
2015	0,5144	17,1404	0,0701	0,2630	-0,0502	HIGH
2016	0,5261	17,1548	0,0579	0,2299	-0,0410	HIGH
2017	0,5102	17,2718	0,0704	0,2236	0,2108	HIGH
Total period	0,5026					
High sentiment	0,4956					
Low sentiment	0,5095					
T-test	0,10					

Source: Own elaboration

The evolution of the aforementioned descriptives is limited by each element's nature. Consequently, Maturity could only provide us with positive figures because its representing ratio ranges between 0 and 1. This time, however, they hardly vary, probably because our sample comprises top companies that are already well settled in their corresponding markets. On the other hand, both profitability and tangibility seem to remain stable during the whole ten-year period. Growth is the only element that takes either positive or negative values, together with PCA (which has recently been discussed). However, growth fluctuations are overall counterbalanced, since growth periods are preceded by decrement years. This also works for justifying how constant size remains.

As it can be appreciated, consumer confidence is divided into two distinct periods. One of them begins in 2008 and ends in the late 2012. This could be our low sentiment period, where consumer confidence is below the median for the obtained sentiment values. The other

period lasts until 2017, starting from 2013. For most elements in our work, these trends coincide. To make sure a high and low sentiment period exist, we have included three extra rows in Table 1 where, other than the total average, mean values for the apparent "optimistic" and "pessimistic" periods are included. We will firstly look at debt maturity, since our main goal relies on linking it with sentiment. Interestingly enough, maturity goes down until 2012, and since 2014 onwards, it keeps growing. Among others, this implies that the average maturity is higher for those years where sentiment is high than for those where it is low. Due to the difficulty to assess the veracity of our perception (caused by the lack of knowledge to identify significant changes in maturity ratios) we have conducted a t-test. This test rejects the null hypothesis (which suggested equal average values) with the obtainment of a 0.1 value. As a result, it is proved that average maturities for both periods are actually considered to be different from each other.

4. THE EFFECT OF SENTIMENT ON DEBT MATURITY

Since we have already described both our dataset and what we expect to achieve with this research, it is time to shape our ideas and give them a mathematical representation. We have built several models, in such a way that each of them provides us with a new insight. Models 1 and 2 represent our first null hypothesis, and the rest of them belong to the second hypothesis' solving-process. The main goal with this division is analysing both how firm characteristics and the interaction between firm characteristics and consumer confidence are linked to the maturity of the debt (on a separate manner). Our main goal will be building a combined model which reflects all our concerns and questions. However, in order to avoid mistakes we will go step by step, which implies incorporating new elements into the model as we move forward. Detailed information about this is process is provided below in sections 3 and 4.

Due to the nature of our sample the OLS estimation seems not to be suitable. We will therefore shift to a more advanced and complex method that could fit the characteristics of our dataset better. OLS estimations work for certain datasets, and can later be backed by other more sophisticated methods to check the veracity of results. In this case, all the information we obtained from Osiris database is broken down into years, which implies that our dataset contains data about particular firm features for a specific time-series. As a result, we will estimate models 1 and 2 using Panel-Data regression (fixed effects). It allows one to control for time-invariant unobserved individual characteristics that can be correlated with the observed independent variables. However, as this method will just treat firms as the

invariant factor, we have added dummy variable for each year, and we have included them in our estimations.

As it can be appreciated, the second model does not incorporate all the control variables presented in section 2. Size, Profitability, Growth and Tangibility are the most common used firm-features for this type of analyses. However, prior to this regression, we tested whether all firm characteristics were relevant using a fixed effects (panel-data) regression. Note that a one year delay was incorporated in the model, so that maturity is affected by firm characteristics belonging to the previous year. In other words, we consider debt-maturity corresponding to year *t* to be a decision that is made as a consequence of prior year's factors (sentiment, growth, size and tangibility). Of course, overlooking the one-year delay would be a mistake, because firm features corresponding to a particular year do not affect the way the firm decides to finance itself. In fact, factors such as profitability or growth are a year-end measure. One may therefore argue that firm characteristics for year *t* "take place" after the figure for debt maturity has been decided.

For the sake of this paper, we have set a p-value of 0.1 as the boundary which determines whether coefficients obtained through our regressions are determinant or not. This way, every p-value under the boundary will imply that the coefficient corresponding to that p-value is significant. Similarly, every time a p-value exceeds the 0.1 boundary, we will classify the coefficient as non-significant.

Nonetheless, since our main concern has to do with whether sentiment affects debt maturity, what truly matters is the p-value corresponding to our variable "PCA". This implies that, even if p-values for certain firm characteristics turns out to be higher than 0.1, the relevance of the model will still depend on the p-value for PCA. What determines the veracity of the results is the p-value for our main variable.

To begin with, we will present models 1 and 2. These are core elements in our analysis: model 1 attempts to explain debt maturity as a function of PCA. This is, in the end, the main question in this paper: does investor confidence influence firm decisions concerning debt maturity? Is there either a positive or negative relationship? Is this relationship significant at all? Results provided by this estimation are shown in ***Error! Reference source not found.***.

MODEL 1: Maturity = $c + \beta$*PCA_1 + year dummies

MODEL 2: Maturity = $c + \beta$*PCA_1 + α*growth_1+ γ*size_1 + ε *profitability_1 + year dummies

Table 2: Results for Fixed Effects Estimation (1)

	Model 1		Model 2	
	Coefficient	p-value	Coefficient	p-value
PCA	0.2684*	0.0762	0.2668*	0.0697
Size			0.0302***	0.0017
Profitability			0.0254	0.3734
Growth			−0.0239**	0.0186
Intercept	0.5055***	0.0000	−0.6927*	0.0958
Year dummies	YES		YES	
X^2	0.8170		0.8290	
Observations	1350		1200	

Source: Own elaboration

Model 1 provides a 0.2684 coefficient for consumer confidence with a 0.0762 p-value, which suggests that PCA has, in fact, an effect on debt maturity. More specifically, the positive sign of this coefficient implies that the more confident investors are in a particular year, the more likely is for firms to choose long term debt to finance themselves. Similarly, model 2 shows a 0.2668 coefficient and a p-value of 0.0697 for PCA. Again, the relationship between investor confidence and debt maturity proves to be positive and significant, where debt maturity increases as consumer confidence raises. Results indicate that p-values for PCA in both models are below 0.1. This is probably the most important conclusion in this section, as we are now good to reject our first null hypothesis H1. However, we now have access to information concerning firm characteristics. All of them seem to be significant except for profitability (whose p-value is above 0.3). Size shows a positive coefficient that amounts to 0.0302; the coefficient for profitability is around 0.0254 and growth seems to be negatively correlated with debt-maturity, as the coefficient obtained is around -0.0235. Something to be highlighted in this estimation is that only growth contains a negative sign in its coefficient. Implications for this include the reduction of debt-maturity as a firm grows, but this time when a firm is more profitable, it looks like maturity tends to increase. The theoretical framework belonging to this work referenced some authors who intended to prove the effect firm characteristics have on debt maturity. García, and Martínez (2006) for instance, suggested a positive relationship between financial strength and short-term debt use as a result of their research. Also, they attempted to prove the relevance of size on debt

maturity, and results seemed to be relevant for the link between those two features. In 2013 Gonzalez also made some research concerning asset tangibility and asset maturity (among others) and built models in which debt maturity was incorporated to check the effect those firm features had on it. The next section is devoted to checking whether the interaction between investor sentiment and firm features affects debt-maturity significantly.

5. THE ROLE OF STOCKS CHARACTERISTICS IN THE IMPACT OF SENTIMENT

As explained in previous sections, the effect of firm characteristics in many business dimensions has traditionally been accepted and demonstrated. Huang et al (2016) incorporated size as a variable in their models for assessing the effect of CEO overconfidence on debt maturity. Similarly, Gonzalez (2014) examined determinants for debt maturity across firm size by splitting his simple into small, medium-size and large firms. Besides, the relevance of other firm characteristics such as growth opportunities and asset maturity was proven. Profitability has also been used as a control variable in previous literature (García & Martínez, 2006)

In this section we will analyse the role played by firm characteristics on sentiment, and the effect this sentiment has in debt maturity as a result. The introduction of this new idea is represented through an interaction concerning our proxy for investor sentiment (PCA) and the corresponding firm characteristic, as we will study them one at a time.

Results belonging to firm characteristics and interactions are presented in upcoming models. Note that everything in this part is subject to the previous statement of the positive maturity-sentiment relationship. The tendency for debt maturity will still be positive unless the following factors are strong enough to counterbalance the effect of PCA. Models 5 to 11 estimated below are calculated in order to check the extent to what each of the firm characteristics presented before affect debt-maturity. This set of fixed effects regressions aim to obtain results for the role firm characteristics play on sentiment considering that firm features also influence investors' decision-making process. We have incorporated this interaction in our model by multiplying PCA by the corresponding firm-characteristic.

In short, the data that our models incorporate the insight that not all firms are equally affected by sentiment, but firm characteristics bias them. We are assuming previous studies were correct at the time of determining how each characteristic influenced debt maturity, and that is what our model reflects.

In essence, we aim to obtain more detailed information about the additional effect optimism has on big firms. This analysis consists in carrying out fixed effects regressions concerning each characteristic and incorporating it in our base model. The final step will deal with merging all our models into a single one so that every studied item is included. This last phase in our set of regressions will provide relevant information about our topic, and will lead us to a deep reflection and conclusion-making.

Previous estimations suggested that size affected debt maturity positively. Models 3 and 4 incorporate size and the interaction between size and investor confidence. This new relationship is represented by multiplying our proxy for investor sentiment by size, therefore providing us with a more clear understanding of how both variables interact. While model 3 only analyses the interaction between PCA and size, model 4 attempts to check how this aforementioned interaction affects the model when the rest of the control variables are incorporated too.

MODEL 3: Maturity $=c + \beta$ *PCA_1 + α *size_1+ year dummies + γ*PCA*size

MODEL 4: Maturity = $c + \beta$*PCA_1 + α*growth_1+ γ*size_1 + ε *profitability_1 + year dummies + λ*PCA*size

Table 3: Results for Fixed Effects Estimation (2)

	Model 3		Model 4	
	Coefficient	p-value	Coefficient	p-value
PCA	0.3109**	0.0398	0.3235**	0.0387
PCA*size	−0.0021***	0.0069	−0.0032***	0.0053
Size	0.0297***	0.0007	0.0401***	0.0001
Profitability	-	-	0.0161	0.5741
Growth	-	-	−0.0263***	0.0097
Intercept	−0.7015*	0.0946	−0.8671**	0.0387
Year dummies	YES		YES	
R^2	0.8193		0.8302	
Observations	1350		1200	

Source: Own elaboration

Results shown in Table 3: Results for Fixed Effects Estimation present a positive relationship between PCA and debt maturity for model 5. The coefficient obtained (0.3109) suggests that periods in which confidence happens to rise, maturity increases accordingly. The PCA coefficient, on the other hand, appears to be significant: its corresponding p-value amounts to 0.0390. Due to the fact that all p-values which are below 0.1 are taken as significant, this one is too. Additionally, there is an interesting result showing up at this point: the new element incorporated in the model (PCA*size) shows a negative coefficient. This means, size appears to influence consumer confidence in such a way that the result of the interaction affects debt maturity negatively. This result is also significant, as the p-value is below 0.01.

At this point, model 6 represents the influence of not only firm characteristics but also the interaction between firm size and investor confidence on maturity. Most of the results obtained could be explained in a way that is very similar to previous models. This implies that both size and growth offer significant results, even if their signs are different to each other: while the coefficient for profitability is positive and amounts to around 0.0161, growth shows a -0.0263 coefficient with its corresponding 0.0097 p-value. Both results are similar to those obtained in previous regressions for models 3 and 4, and basically suggest that as size increases debt maturity lengthens. Conversely, it shows how a firm's growth rate is negatively correlated with maturity.

Size has shown to have a positive link with debt maturity during the whole analysis. In other words, results indicate that the bigger the size of the firm, the longer the debt maturity. Of course, we are referring to relative terms, as other variables could create the opposite effect and therefore, the overall balance would be negative. We expected strong firm features to negatively affect debt maturity, so positive size coefficients do not reject our second null hypothesis regarding this particular element. However, García J and Martínez P (2006) had already researched about size effects on debt maturity, and according to them there is an inverse relationship between firm size and short corporate debt-maturity, justified by the amount of possibilities among which firms can choose as they get bigger.

The positive relationship between size and debt maturity is somehow counterbalanced with the introduction of this interaction. PCA*Size brings a negative sign into the equation which reduces the effect of the original characteristic. It looks like whenever firms achieve a considerable dimension, the additional effect of sentiment on debt maturity is negative. Our thoughts about the tendency of big size firms to use short-term debt is reflected in this coefficient.

Models 5 to 8 follow the same structure as models 5 and 6: growth and profitability are incorporated into the model together with their respective interaction with PCA. Table 4: Results for Fixed Effects Estimation shows results obtained after estimating models 7 and 8 using fixed effects regression. In particular, these models focus on analysing the role played by growth in all this issue.

MODEL 5: Maturity =c + β *PCA_1 + α *growth_1+ year dummies + γ*PCA*growth

MODEL 6: Maturity = c + β*PCA_1 + α*growth_1+ γ*size_1 + ε *profitability_1 + year dummies + λ*PCA*growth

Table 4: Results for Fixed Effects Estimation (3)

	Model 5		Model 6	
	Coefficient	p-value	Coefficient	p-value
PCA	0.2665*	0.0711	0.2650 *	0.0718
PCA*growth	0.0031	0.7374	−0.0065*	0.0827
Size			0.0322***	0.0014
Profitability			0.0267	0.3504
Growth	−0.0214	0.1033	−0.0184	0.1592
Intercept	−0.172654	0.6514	−0.7241*	0.0838
Year dummies	YES		YES	
R^2	0.8279		0.8294	
Observations	1200		1200	

Source: Own elaboration

As shown in the table above, the inclusion of growth into our equation has not altered the veracity of PCA's relevance in model 5. It is true that its p-value is slightly higher than in previous estimations where size (or no control variable) was included. However it is still valid. . Note that this does not bias our result: as long as the veracity of PCA results is not altered, we won't give that much weight to p-values concerning firm characteristics. The coefficient for PCA is 0.2383, in line with some previous estimations, and the sign is still positive as always. On the other hand, growth shows a negative coefficient. This is not something new; as previously analysed, this variable is usually negatively linked to debt-maturity, suggesting that the higher growth-ratio a firm has, the more likely is that the

organization either shifts to short term debt or increases short-term debt percentage. Some variables might show high p-values by themselves, but when combined with others, results may provide lower p-values (recall that it would not influence our result much as long as PCA coefficients are significant).

Regarding model 6, PCA shows almost the same figures as in model 5, implying that the coefficient is positive, close to 0.267 and with a p-value lower than 1, which makes it significant for our research. However, it includes all the control variables besides the interaction between the proxy for investor sentiment (PCA) and growth. Talking about control variables, they do not change much compared to previous results: growth still has a negative sign while profitability and size are positively correlated with debt-maturity. Again profitability shows a high p-value, and similar to model 5, it is still above 1. There is an interesting result coming out this time: PCA*growth contains a negative coefficient, far from the 0.0031 coefficient obtained previously. Fortunately, this time the coefficient is relevant as its p-value is 0.08827 (lower than 1). One may argue that a negative coefficient in this variable makes more sense, as growth by itself had already provided negative results through all our analysis. This implies that model 8 rejects our second null hypothesis concerning growth.

Conversely to size, growth shows a negative tendency in all our estimations. As mentioned in profitability results' section, as long as it does not compromise the validity of PCA regression we won't discard its effect which is shortening debt maturity. The negative coefficient would back García, P.J. and Martínez, P's hypotheses concerning growth, so would for Guedes and Opler's paper.

PCA*growth follows a similar pattern as the one growth does when it is examined on its own. The negative sign obtained in previous tables suggests that growth appears to have a negative effect also when interacting with PCA. This would imply that when sentiment is incorporated into the equation, growth opportunities influence firm decision making concerning debt-maturity because it shortens it.

Models 7 and 8 are the last two equations we will look at before attempting to build our final model, comprising all the previously analysed variables. This time we will analyse profitability as a control variable, together with its interaction with PCA.

MODEL 7: Maturity =c + β *PCA_1 + α *profitability_1+ year dummies + γ*PCA*profitability

MODEL 8: Maturity = c + β*PCA_1 + α*growth_1+ γ*size_1 + ε *profitability_1 + year dummies + λ*PCA*profitability

Table 5: Results for Fixed Effects Estimation (4)

	Model 7		Model 8	
	Coefficient	p-value	Coefficient	p-value
PCA	0.2383	0.1141	0.2361	0.1076
PCA*profitability	0.0472***	0.0001	0.0471***	0.0012
Size			0.0324***	0.0007
Profitability	0.0092	0.7445	0.0400	0.1648
Growth			−0.0244**	0.0172
Intercept	−0.1074	0.7832	−0.6599	0.1111
Year dummies	YES		YES	
R^2	0.8194		0.8306	
Observations	1350		1200	

Source: Own elaboration

Following this thread, profitability also has maintained positive coefficients throughout all our estimations. Again, we considered high profitability levels to be a "strong" firm feature which would shorten debt maturity, but it does not. Even if the p-value for profitability has always turned out to be above 0.1, it has not made PCA coefficients non-significant. After all, the main focus of the analysis lies in determining the link of sentiment and debt maturity. Consequently, results concerning profitability are considered to be valid.

Interestingly enough, while profitability didn't offer clear results due to high p-values, it seems that the additional effect that it causes when linking it to sentiment becomes significant. The sign for these coefficients is positive, which would not reject out second null hypothesis

As shown above (in models 3,4,5 and 6), our proxy for investor sentiment was relevant in both the "simple" model (where just PCA and the corresponding control variable were estimated), and the extended model which also incorporated the remaining control variables. Results for PCA are taken as significant since its p-value in both models is very close to 0.1, thus it does not cause any trouble in our anañysis. Both models show similar scenarios

concerning investor confidence: coefficients are around 0.24 and are both positive, in line with previous estimations.

This time, however, estimations for both profitability and PCA*profitability show a positive coefficient in Table 5: Results for Fixed Effects Estimation. It is intriguing to check that the interaction between this control variable and the proxy for investor confidence is very relevant (considering a very low p-value), while for profitability on its own it is not. The introduction of profitability into the model alters significance levels whenever other firm characteristics are ignored. As such, when studying the impact on sentiment through profitability as a single factor results are not relevant The same thing happens in model 10, and this time size has a positive coefficient (which is in fact, very relevant), while p-value for profitability is above 0.1.

6. CONCLUSIONS

The analysis carried out in this final degree work provides interesting results. In all our estimations, PCA appears to have a significant impact on debt maturity. This suggests that sentiment (represented by a consumer confidence index) would actually influence decisions concerning the maturity of debt-financing. Optimistic periods would lengthen the maturity of the debt, as we expected. This statement in fact backs traditional studies that deal with the effect of sentiment on different business dimensions such as market intermediaries, firm decision-making processes and stock returns.

Regarding firm characteristics, growth has behaved according to our expectations, confirming shorter maturities for high-growth firms. Results back Ozkan (2000), García and Martínez, (2006) and Guedes and Opler (1996), reinforcing our premise which suggested high expectations for rapidly growing firms. Whenever a firm aims to expand and real possibilities exist, there is an overall feeling that the firm will be stronger in the future, and thus financing decisions may be affected by it.

On the other hand, size is partially consistent with predictions. We expected shorter debt-maturity periods for big firms, considering their ownership of more abundant resources and the capacity to face short-term loans easily. Size appears to affect debt maturity positively in our analysis, and the additional impact of sentiment on debt maturity as a consequence of size is close to the inverted U shape relationship García and Martínez, (2006) presented comprising debt maturity and firm solvency. This would imply that the inconsistency in our results could steam from growth affecting both big and small firms in a similar way. Also, note that inconsistencies could be rooted in the nature of the sample; after all, it includes 150

top firms belonging to six markets. The selection of great-sized firms influences the process of determining the effect of sentiment in smaller firms, as the smallest firms in our sample are still huge compared to average businesses. A deeper analysis is needed to polish our results involving size.

Finally, profitability is not consistent with our estimations. Intuition drove us to link high profits with shorter-term debt because an increase in profitability is generally associated with an increased capacity of investment, a higher probability of easy recovery from future negative shocks, higher future expectations and so on. Companies that are huge do not assure their profits will always be high. Whenever profitability is high, however, it is more likely that investors are more confident with organizations because their financial situation improves with no doubt. If profitability increases, perhaps its link to investor sentiment is tighter as there is a very clear evidence that the firm is doing better. Of course, the company will own more capital which could be invested after the economic year. Results are totally opposite to this idea, providing positive coefficients at the time of linking debt maturity with profitability. Similarly, they are also contrary to the matching hypothesis. As such, further analysis is needed to address this characteristic.

Limitations in this Final Degree Work are mostly linked to struggles that steam from utilizing distinct approaches to explain one of our control variables: size. We intended to confirm that big-size firms would take a shorter-maturity position and at the same time suggest that smaller firms are more affected by sentiment. The truth is that our sample didn't allow us to properly tackle the latter objective, as examined firms are so large that even the smallest in the sample happen to be way bigger than most companies in the world. Our results do not reject our hypothesis concerning size, partly because the model was not perfectly tailored to our needs: we did get results for the effect of sentiment in big firms, but our sample didn't allow us to properly identify its effect in smaller companies. Other models involving smaller firms should be examined in order to be more accurate at the time of examining the influence of size in this topic.

Nevertheless the main objective of this work has been achieved. We have confirmed that sentiment determines debt maturity structure to some extent, where optimistic periods lengthen debt repayment terms. Additionally, our study confirms that firm characteristics are a very important factor to be taken into account, as the typology of each business also influences decisions concerning debt.

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