UNIVERSIDADE CATÓLICA PORTUGUESA

Relationship Lending and Business Restructuring of SME´s in Portugal

Master Thesis presented for the degree of
Master in Finance

by

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To my parents for their unconditional love and support on me

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Abstract

This master thesis examines the impact of Relationship Lending on insolvency companies for small and medium companies under restructuring or insolvency in Portugal. Although there is a lot of research that relates relationship lending with capital structure and banks, there is not so much related companies with insolvency. Our goal is to check the impacts that relationship lending has on those types of companies, mainly exploring the number of banks that each company works with and also a comparison on the leverage side to check what companies are better, those which are in PER process (judicial restructuring process) or those who are not. The PER process data was obtained by from CITIUS database and SABI database and comparables companies (by size, industry and employees) data was obtained on SABI database. The econometric method used was the Probit regression, analysing companies entering PER process and companies that did not enter PER process. For the analysis we aim to answer the following question: What is the impact of relationship lending in restructuring companies in Portugal?

Our research shows that there is a positive impact of the number of Banks that the companies work with and also of leverage. Considering the size and the measure of profitability which is the return on assets, there is a negative correlation between these and the probability of entering PER process.

Keywords: Relationship Lending, Restructuring companies, Portugal

Table of Contents

List of Figures

List of Tables

Chapter 1

1. Introduction

This master thesis aims to examine the influence of relationship lending in restructuring companies (in our case small and medium enterprises) in Portugal. We have selected SME´s because these are the majority of companies' existent in Portugal with almost 99,9%. Our goal is to understand the relationship of banks with those SME´s that are in a process of restructuring. Many of these companies in the case of Portugal must create a plan to improve their financial accounts and pay the debt to its stakeholders. The data obtained was from CITIUS database (companies that have PER process) and then by the sector, size and employees we built a comparable number PER sample of companies. This restructuring plan is called PER (Plano Especial de Revitalização) and is legally enforced. The SME´s that have this plan are in a financial deterioration process if they don´t change their financial decisions and save the company. We want to understand how much of these companies in PER process observe high levels of relationship lending.

To understand the meanings and all implications that result from the relationship lending with the SME, we must know what it is and the positives or negatives consequences for companies.

We will try to answer the following question: What is the impact of relationship lending with restructuring companies in Portugal?

In chapter 2 we review the existent literature on relationship lending and company insolvency. Also, we review the factors that can have an impact on the results that we want to answer.

In chapter 3 we describe the method used on the empirical analysis and how we have obtained the data. In this chapter we describe that one part of the data was obtained in CITIUS (Portuguese public Database of companies in insolvency), the companies that had PER process, and we have obtained comparables by size, industry and employees in SABI database. We describe the method used Probit and its characteristics.

In chapter 4 we describe the first analysis done and also the main results for answer the research question.

In chapter 5 we conclude that we find a positive correlation between the probability of entering PER process with the leverage levels and also with the number of banks that the companies work with. Also, taking in consideration the size and the measure of profitability which is the return on assets, there is a negative correlation between these and the probability of entering PER process.

Chapter 2

2.Relationship Lending and Company Insolvency

2.1.Relationship Lending

We must start by defining what is relationship lending and also what are restructuring companies. Then we will further develop these subjects more deeply. First relationship lending is considered by many authors as the link that companies have with banks when managing loans by direct contact between the loaner and the borrower. Udell (2006) says that relationship lending is mainly obtained on soft information. This soft information is obtained by direct contact between the loaner and an SME as it is related to loans, where the financial institution can have better information. This is not yet a very studied matter because in some cases it is difficult to find this link between companies and financial institutions. This difficulty is made by the fact that companies in a global world have more than one financial institution to finance and aid their activities. As studied by Memmel, Schmieder, & Stein(2008), one measure to see the relationship lending with the companies is the amount of debt that a bank delivers to a company. As we want to check the impact that relationship lending has with restructuring SME this will be used for this paper. Also studied by Sapienza (2002)and Udell (2006) are bank sizes. The information that they provide us is that big financial institutions have higher advantages regarding the SME that have hard information and the small financial institutions have a high advantage on soft information. The amount of loans is analysed by each loan

officer which gathers information about their costumer so the bank can perform a better decision for each and every customer. Many of these contracts if analysed show the importance of the loan officer role in the decision making of the bank. As studied by Sandeep Dahiya, and Anthony Sauders (2017) the rules of many banks limit their loans losses. As stated by Udell (2006) and Badulescu & Badulescu (2012) smaller institutions provide higher loan levels to SME than compared to bigger financial institutions. All financial institutions not only consider big firms but also SME because the latter are highly profitable and a continuous growing sector. Regarding this situation, this is only for prevention of bankruptcy of the banks if in an imaginary but possible situation the banks started to deliver loans to bad companies. These bad companies the first thing that do is to pay their debt, leaving the bank debt as a second plan. The banks, despite of being bigger or smaller, all have an important role in the relationship lending as they primarily have insider information or more private information before anyone else. As they have a closer contact with the smaller companies they are more involved and can have better contracts and information. By the information provided they have an advantage in gathering information before the market. Also, it is used for analysing the debt status, the changes on some loans contracts and decisions that the bank might use to recover the loans amounts. Every bank can secure some of the decisions before bad news comes public because in this way the bank will suffer just some losses. These losses affect the banks because they have relationship lending with the companies that could go possibly in the wrong way.

2.2. Asymmetric Information

Typically, a restructuring company, in our case, is almost in insolvency, but can be recovered because it still has valuable assets and the amount of debt is typically high. Most of these have high debt levels and may not pay their taxes, salaries and also loans. We analyse the number of Banks as a measure of relationship lending. Banks that have stronger relationships with the companies have more information compared to other banks that are starting a lending relationship with the same company. As stated on Petersen & Rajan (1995) small and medium enterprises are highly dependent from Banks. We need to define hard information and soft information. Hard information is the information that can be provided easily to external institutions, normally in numbers, so that it can be easily compared with other types of information of different companies. Instead, soft information, is that information that Banks use in relationship lending because this information does not imply only on numbers as hard information. This is related to the relations between the Banks and the managers and how these last ones behave in changes on the market, as well as judgements. This connection between Banks and companies makes easier to gather information from the companies as this relation is very close. The bigger Banks that provide loans based on soft information have less efficiency in terms of relationship lending compared to smaller ones. This leads to what is considered as asymmetric information." *Asymmetric information, as the adjective indicates, refers to situations, in which some agent in a trade possesses information while other agents involved in the same trade do not.* " as designated in (The World Bank, Quy-Toan, 2003) . The adverse selection, monitoring cost and moral hazard are the three main aspects of asymmetric information that we will discuss in this thesis. The first one, adverse selection is defined as the lender not being capable to differentiate two projects when conceding the loan. The lender tends to give the loan to a safer

project than a riskier one. As stated by Schoar (2012) the companies have more hesitation when they enter in the default mechanism towards a specific person than a private Bank.

One aspect of soft information or qualitative information is that, it is costly and which is highly transferable with a lower cost (Cornée, 2014).

Moral Hazard is on the borrower side when he changes the goal of the initial project. The company initially says that will apply for some investment and in the end will provide the loan money to another use. This link between companies and Banks in terms of relationship lending leads to a wrong sense that this relation can have a higher cost regarding the banks that have provided the loans. Also, Moral Hazard has an important role when companies request loans as this influence the interest rates of loans (Arnoud, Boot, & Thakor, 1994). The third monitoring costs is also on the borrower´s side as it intends to take advantage of informing lower to state the earnings than it was supposed (Bebczuk, 2003). As mentioned above the banks who provide higher amount of loans have more and better information about the companies (Petersen & Rajan, 1994). If we think of the present, this could be a reason for the crisis that we have recently lived. If a bank decreases the total amount of credit loaned to a company it somehow increases the possibility of defaulting from the companies (Elsas, 2005). So, the banks don´t do that, instead, they keep loaning. However, many times the companies forget financial support and they go insolvent anyway.

2.3.Restructuring Companies in Portugal

Historically introducing this, as in Oliveira (2012) and Vasconcelos (2017) in the 60´s in Portugal there was a legal code of bankruptcy in which the main goal was the prevention of companies bankruptcy[1]. Two instruments existed, the "concordata"[2] and the "acordo de credores"[3]. The first instrument has the objective of trying to get something from the company before everything was lost and unrecoverable. The owner of the company before being totally unrecoverable had to go to court and call all of his creditors in a meeting to try saving his business. The second instrument was applied if the first would not get approval by all parties. This instrument created a new company (limited liability company) with the intention of saving the activity. If none of these were approved by the court the company was declared bankrupt.

In the 70´s were created several instruments. One of them was the viability contract "Contrato de Viabilidade". The difference was that this contract must be submitted to the Government with the proposal of the creditors.

Then, in the 80´s, was initially created the first court process to recover the companies. This process had to be submitted by the owner of the company in court with measures that could recover the company. This measure was then approved by the creditors.

In the 90´s was improved the previous law and a new code designated as CPEREF(Codigo de Processo Especial de Recuperação da Empresa e da Falencia)[4] was introduced. This code has differentiated the bankruptcy and recovery of a company. The owners of the companies that were in this way, they

[1] See Decreto-Lei nº 177/86, of 2/7
[2] See art. 20º Decreto- Lei 177/86, of 2/7
[3] See art 26º Decreto- Lei 177/86, of 2/7
[4] See Decreto-Lei nº 132/93, of 23/4

had a similar process at the beginning, in the case of bankrupt or recovery. If the company was shown as economically viable the process then was changed to the recovery, on the contrary, the company was declared bankrupt.

In the actual days, the code that is published is CIRE (Codigo da Insolvencia e da Recuperação de Empresas)[5]. The big difference to the old laws is that all creditors have the possibility of choosing what is the best solution to recover their money, either by liquidation, recovery or having the company integrated into the insolvency mass. For the last two, it has to be an insolvency plan

The insolvency plan, if approved, has all the conditions for making the payments to the creditors while the company has the possibility to be alive and in a long-term to growth. When is declared insolvency, there is no possibility of buying things with a loan, it has to be an immediate payment of all.

In the Portuguese case restructuring companies when they are facing very hard difficulties and cannot pay their obligations, mostly are forced to enter insolvency. Some companies make the PER for trying to solve some issues and "stand up again "in their day by day activities. The main goal of PER is not terminating the company but getting the company "good". Normally if a company has asked for an insolvency plan and then has required the PER, the first one is suspended. This plan is submitted to the voting of the stakeholders and it must be approved by 2/3 of them. Finally it gets the approval of the court.

[5] See Decreto- Lei nº 53/2004, of 18/3

2.4.Relationship Lending and Default Companies

In a globalized world we observe an even higher competition on the banking industry. Banks nowadays are competing for better loans, better market shares and better interest rate. This competition is increasing year by year but some of them, that maybe can have incorrect information by some companies, can enter into difficulties. The reason why banks keep this is that they have lower losses when entering in default and lower incentive for risk. This also can happen to companies who face their sector with high competitiveness as the cases of technological companies. There are 3 main factors that banks take in consideration when analysing companies, which are the relationship lending, the financial statements and finally the collateral[6] or the guarantee pledged. (Dima & Vasilache, 2016). This collateral has a negative correlation with loans risk, meaning that when companies do not want to be "open" to the risk, they choose the loan contracts with higher collateral. Thus we also have the inverse, companies that are willing to take the risk choose loan contracts with lower or no collateral at all.

When we speak about default risk (Bester, 1994) we need to infer the correlations between these and collateral. There is a positive correlation between the risk of defaulting and collateral. Normally banks have the tendency to provide loans to companies that are accepting the risk.

Regarding relationship lending. that is an important player on these cases is one determinant of collateral. When a company is turning to default, let´s put this way, normally banks take high interest rates and want an insurance (in this case the collateral). Also, we have the other way around, that is when the bank

[6] Collateral by definition means when a company is making a loan contract that this last one gives to the bank an asset so that it can secure the loan. If the company stops paying the loan, the bank can use that asset in order to regain is losses.

check that the company is losing the risk of default, then the bank no longer requires such high interest rates and also the insurance that has previously obtained from the company does no longer have the need to exist. So, the relation between relationship lending and collateral has a negative correlation. As informed previously, the companies have more intensive relations with the banks also have better contracts as the soft information is the major information required by the banks.

Chapter 3

3.Methodology and Data

3.1.Methodology

For our quantitative analysis of the impact of relationship lending in company restructuring in Portugal we use a binary model probit model. In our case, we analyse whether the company enters a PER process or not. The dependent variable will take 0 value or 1 depending if it did not enter the PER process or if did, respectively. The general framework of probability models, as presented by Greene (2003) is

$$\text{Prob(event j occurs)} = \text{Prob}(Y = j) = F[\text{relevant effects, parameters}] \quad (1)$$

In this case, we take in account the option of having or not having PER process, we can say that the probability of one is higher than the other.

$$\begin{aligned} &\text{Prob}[Y = 1 \mid w, za, zb] \\ &= \text{Prob}[x\beta + \varepsilon > 0 \mid x] \end{aligned} \quad (2)$$

As for a quick overview of how the model checks the variables, we can see from the graph below.

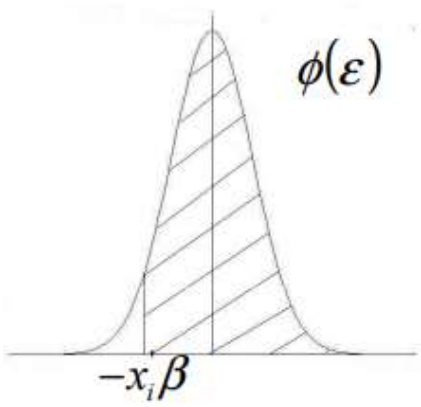


Figure 1- Probit Model

The parameters xβ in Greene (2003) are designated for the total observations of the difference between the utility functions and the parameter ε as designated the error term where are all the variables that could not be observed are. The error term is normally distributed and independent.

As the Probit model is considered one main binary model, for the objective of estimating the data that we have obtained it is usually used the method of maximum likelihood. The model is by Greene (2003) no more no less than taking each observation as part of Bernoulli distribution. The part that has a success probability F(xβ) and independent observations, takes to what is designated as joint probability or likelihood function.

$$\text{Prob}(Y1 = y1, Y2=y2,\ldots Yn=yn \mid X)=\prod_{Y=0} [1 - F(xi\beta)] \prod_{Y=1} F(xi\beta). \quad (3)$$

Normally statistics programs compute the maximum likelihood function without logarithms as a method to infer the value of β that maximizes the probability of the Data Greene (2003):

$$\frac{\partial Ln}{\partial \beta} = \sum_{i=1}^{n} \left[\frac{y_i f_i}{F_i} + (1 - y_i) \frac{-f_i}{(1 - f_i)} \right] X_i = 0$$

(4)

For the above equation f_i is the density function.

Usually, the probit maximum likelihood estimator is designated as a quasi-maximum likelihood estimator designated by QMLE Kuan (2004). Correctly performed plim(1/n)$\hat{\beta}$ = plim(1/n)(− $\widehat{H}$). In this method, we have to designate the density function for the mean of the function. It is called as quasi because it is gathered from the maximum likelihood function. If this is correctly performed persons considers this as the true maximum likelihood estimator but one thing has to be said. This can be as described if we consider all variables for the study performed. This can give a lot of work to several investigators and it is only possible to get only some variables for the study performed. The goal is only to study the main variables as by this method taking in consideration that the results are similar as the dependent variable

The main properties are:

- Consistency - The quasi-maximum likelihood estimator is poor consistent $p \lim_{n\to\infty} \hat{\beta}_{ML} = \beta$. This means that the maximum likelihood estimator for infinitesimal numbers it is the same as the estimator of the study. Also, the consistency is not the same if we have heteroscedasticity, the heterogeneity that possible is not measured correctly, the other variables that are omitted or errors in the assumption of distribution (Douc, Fokianos, & Moulines, 2017).

- Asymptotic Normality – The maximum likelihood estimator will tend to ≈N(β, I $(\beta)^{-1}$). Here the matrix asymptotic variance-covariance is

formulated by the inverse of the original matrix I (β) = E[$\partial^2 \ln L / \partial\beta\partial\beta'$](Douc et al., 2017)

- Asymptotic efficiency – The maximum likelihood estimator which has a matrix variance-covariance that cannot be larger than the matrix variance-covariance of the others consistent and normally distributed estimators. (Greene, 2003)

We will describe as Greene (2003) some measures of fitting the results given by the model. Starting by describing at least three that are used in papers for probability models. One is the Log-Likelihood function, the other is Log-interval method, and the third is the table of hits and misses. If we use one of those, it has to give the maximized value of the log-likelihood function as the report computed with only a constant term can be good to see the behaviour.

$ln\ L0\ =\ n\ [P\ ln\ P\ +\ (1\ \ P)\ log\ (1\ \ P)]$, denoting that P is the proportion of observations that are equal to 1.[7]

We need to give some information also about the pseudo R^2. This measure of fit no more no less than compares the constant term with the model used. This is only a very good measure statistically speaking if the result is zero as it is used the Poisson statistics Greene (2003). Considering all the data we have and for the specific fit method LRI, if the results obtained are between zero and one we cannot interpret and also we cannot take any idea that the LRI method increases as the fit model improves (Ribeiro, 2017).

The last measure from the three that we need to describe is the table of hits and misses. This table considers a probability of 50% that we should predict a

[7] This text was retrieved on the Lecture slides of Prof. Ricardo Ribeiro in the year 2017(Ribeiro, 2017)

one if says that the one has a higher probability than predicting a zero.(Ribeiro, 2017).

The last topic regarding the theoretical model is the marginal effects. As stated by (Williams, 1997) for discrete models, the marginal effects consider that a change from zero to one on the other variables at their means.

$$\text{Marginal Effect Xk} = \Pr(Y = 1|X, Xk = 1) - \Pr(y = 1|X, Xk = 0) \quad (5)$$

Considering all the information provided above, we will try to give an answer to the following questions in the topics restructuring or insolvent companies

1- Is the decision to enter the PER process influenced by relationship lending, measured by the number of banks that each company works with?
2- Is the decision to enter the PER process influenced by its capital structure/leverage levels?

3.2.Data

We have collected data from the CITIUS database for all the SME that have entered the PER process between 1st January from 2014 until 31st October 2017, achieving 4594 companies to analyse. After this identification of companies in PER, we collected the required data from SABI database building a cross- section sample. This data we had to split with the ones that are single persons with companies, which gave us the final data to be used of 1517 companies.

After that we also performed a comparison with companies that are in the same industry have the same turnover and the same total assets which gave the final sample. Considering the average company, 74 % of companies have PER process, work with more than 2 banks, have a turnover over 507,755 thousand euros and a ROA of 0,321.

The considered companies are Portuguese SME´s companies, with a turnover of less than EUR 50 million, total assets less than EUR 43 million and less than 250 employees.

We use a similar model to Degryse, Masschelein, & Mitchell (2004) and Sapienza (2002), analysing the balance sheets and the number of banks in relation of those SME.

Our model analyses the probability of entering the PER process and has as independent variables the size of the companies, a measure of profitability ROA (Return on Assets), the number of banks that each company works with and leverage(Debt/Assets). With this last variable we can infer if the PER process that some companies enter depends on their capital structure.

The model that we have used is the Probit model being the dependent variable the entering of the PER process.

The model is

$$PERP_j = \beta_0 + \beta_1 Bank_j + \beta_2 Size_j + \beta_3 Lev_j + \beta_4 ROA_j + \mu_j \quad (6)$$

Second let us explain the variables of the model above.

	Variables	Definition
Dependent Variable	PER Process ($PERP_j$)	*Dummy variable that takes* 1 *if the Company has PER process and takes* 0 *Otherwise*
Independent Variables	Number of Banks ($Banks_j$)	*Number of Banks that each company works with*
	Size ($Size_j$)	ln($Turnover$)
	Leverage (Lev_j)	$Ln\left(\frac{Total\ debt}{Total\ Assets}\right)$
	Return on Assets (ROA_j)	$\frac{Net\ Income}{Total\ assets}$

The variable $PERP_j$ is a dummy variable that observes the value one if the company is in PER process and zero otherwise. Considering the independent variables, we want to understand the impact that the relationship lending has among capital structure on the probability of companies restructuring. The model that we use we only show which factors increase the probability of entering PER process, number of banks and capital structure. For this analysis the most important independent variables are these that can capture the effects. As stated above on the literature review and also on the theoretical model, when a company has link, with more than one bank, information is not so valuable in

terms of loans. So, for this reason, we expect a negative relation of the number of banks that each company works with ($Banks_j$) and the PER process as found in Degryse et al. (2004). As, the review of the literature says we use a measure of profitability. For this case, we have used the return on Assets (ROA_j). The companies that have a higher profitability will tend to perform better and have less probability of insolvency. This variable is also good because it is a measure of financing the activities of the company. Another variable that we have used is the size of each company ($Size_j$). For this, we have used the logarithm of the total turnover. The final independent variable that we used is leverage (Lev_j). This is very used as said by Frank & Goyal (2003) the pecking-order-theory is one of the most important regarding corporate leverage. Normally, if a company has to be financed externally, they have the preference of debt instead of equity. We can check that this preference is related to the lower cost of information when it is needed to send to financial institutions. More leveraged companies will be more subject to financial distress costs, and hence observe higher probability of PER process.

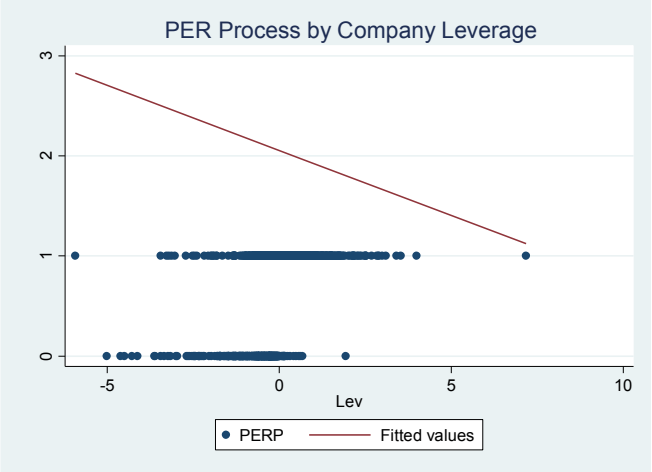
Chapter 4

4. Empirical Results

4.1.Preliminary Statistics

Our main goal is to check the relationship between companies entering the PER process and relationship lending and capital structure (measured as leverage). On figure 2, we observe the relation between the PER process and leverage. Figure 3 relates the size of the companies with the ones that have entered PER process. The figure 4 relates the PER process and the number of banks.

Figure 2- PER process by Leverage



Analysing Figure 2 above we observe higher leverage levels in the companies that already entered PER process.

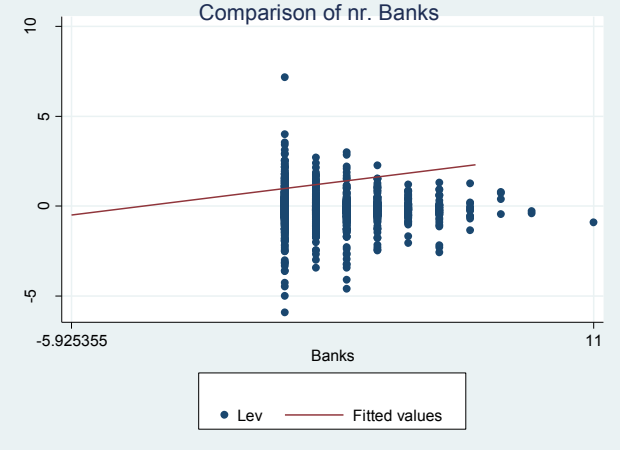


Figure 3- Comparison of nr.Banks

On the graph above figure 3 we can infer that the companies that have less leverage work with more banks as relationship lending is hence related to higher leverage levels. As the relationship lending increases the leverage level, the companies that want to have higher leverage they will have multiple relations. On this graph we can check a trend as on our sample the companies that are more efficient they have less bank relations.

Table 1 - Preliminary Statistics

	Mean	Median	Std. Dev.	Min	Max
PERP	0,741	1,000	0,438	0,000	1,000
Banks	2,071	1,000	1,481	1,000	11,000
Size	6,230	6,308	1,777	-1,273	10,446
ROA	-0,321	-0,007	7,122	-272,668	5,696
Lev	-0,115	-0,113	0,870	-5,925	7,175
Nr. 1517 Observations					

For companies that have PER Process*

Variable	Mean	Median	Std. Dev.	Min	Max
Banks	2,010	1,000	1,454	1,000	9,000
Size	5,832	5,978	1,697	-1,273	10,446
ROA	-0,443	-0,030	8,271	-272,668	5,696
Lev	0,104	-0,012	0,770	-5,925	7,175
***For 1124 Observations**					

Table 2 -Probit model with PER

For companies that don´t have PER Process*

Variable	Mean	Median	Std. Dev.	Min	Max
Banks	2,244	2,000	1,546	1,000	11,000
Size	7,367	7,635	1,488	0,588	10,730
ROA	0,027	0,015	0,109	-0,688	0,700
Lev	-0,741	-0,512	0,835	-5,007	1,932
***For 393 Observations**					

Table 3 -Probit model without PER

On table 1 we can observe that for the mean companies 74% entered in PER process, works with 2 banks, have more than 6 thousand euros in total assets but also, we observe that companies have a profitability ratio return on assets -0,321 (debt/total assets) and leverage -0,115 for the data obtained of 1517 companies.

We computed how many companies entered PER process and how many didn´t. On table 2 and 3 we can compare the same measures for the mean companies. We observe that companies that entered PER process work with 2 banks, the total assets is 5 thousand euros compared to 7 thousand euros in companies that did not entered PER process. For the profitability ratio the value for the return on assets is -0,443 compared to 0,027 in companies that did not entered PER process. The companies that entered PER process have in mean leverage of 0,104 compared to -0,741 for the companies that did not entered PER process.

4.2. Empirical Results

In this part, we present the results of the estimation performed on the sample obtained so we can understand how the relationship lending relates to the companies having PER process. As described previously the model used was the Probit model so we can estimate the coefficients, marginal effects of the independent variables compared to the dependent variables and last a prediction of the probability that the company will enter in a PER process.

The results are described in table 4

Table 4 - Probit model and Marginal Effects

	Probit Model	**Marginal effects**	
Variables			
Banks	0,094***	0,021***	2,10%
	(0,029)	-0,006	
Size	-0,394***	-0,089***	-8,90%
	(0,042)	(0,006)	
ROA	-0,149962	-0,034	-3,40%
	(0,099)	(0,024)	
Lev	0,892***	0,202***	20,20%
	(0,114)	(0,012)	
Constant	3,315***	-	
	(0,280)	-	
Log L	-599,281		
Pseudo R^2	0,310		

All specifications are for 1517 observations. Standard errors in parenthesis. *** Denotes p-values<0.01, ** denote p-values <0.05, * denote p-values

Analysing table 4 we can see that there is a strong link between the probability of being in PER process and Leverage levels and also with the number of Banks that firms work with as this information is explained by Degryse et al. (2004).

Regarding the size and the return on assets there is a negative relationship between this factor and the probability of entering a PER process. Considering the variable Banks there is a negative relationship between that and the companies that have PER process as informed by Degryse et al, (2004). They consider the probability of defaulting with the banks becomes shorter which gives to us the information that banks increase the information obtained. Last considering the coefficients we can say that the model is statistically significant.

The marginal effects measure, is the expected change in the dependent variable in an independent variable, keeping all others constant. Considering this on table 4 we can check that a change on 1% on de PERP variable will lead to a change of 20,20% with the others constant and leads also to a change 2,1% on the number of banks. Those two described are the most relevant to our study here.

One measure of goodness fit of the model is the table of hits and misses. Despite that (Greene, 2003) does not give so much importance about the value to use when considering this prediction, it is considered the normal probability to use og 0,50%. With our information, we have constructed the following table of hits and misses.

		Company has PER Process	**Company doesn´t has PER Process**	**Total**
Observed Data	Company has PER Process	205	188	393
	Company doesn´t has PER Process	52	1072	1124
	Total	257	1260	1517

Table 5 - Table hits and misses

As previously discussed we needed to predict the probability of a company in a situation of insolvency to enter in a PER process. In this case the results were

Predict That a company will enter in PER

Considering a probability		≥	0,5		
	Mean	Median	Std. Dev.	Min	Max
PERP	0,743	0,817	0,244	0,000	1,000

Table 6 - Table of predictability

From the table 6 we can say that on our sample the companies that are still not in PER process 74,3% will have in the future a PER process.

Chapter 5

5. Conclusion

With this master dissertation we study the impact of Relationship Lending and leverage on solvency conditions of SME companies. The main research question was "What is the impact of relationship lending in restructuring companies in Portugal?" In order to do so, we have collected from a public database the companies that entered the PER process and matched these with comparable to check those who were not, according to the company's sizes, turnover and employees and computed through a regression model that could give a significant answer for our question by a probabilistic model.

From the estimation, we found that there is a positive impact on the number of Banks that the companies work with and also with leverage. Those two were the most relevant but we have also considered others like the size and a measure of profitability. We have concluded that globally the model was statistically significant.

To conclude, our results showed that for SME in Portugal there is a positive correlation between the probability of entering PER process with the leverage levels and also with the number of banks that the companies work with. Also, taking in consideration the size and the measure of profitability which is the return on assets, there is a negative correlation between these and the probability of entering PER process. With our model we had some disadvantages regarding the data required. The types of loans may be for future papers can lead to better results because we could check if the banks are borrowing with better information or not. With this, we could take other types of conclusions.

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Appendix

Table 4

Probit - Full regression

				Number of obs	=	1,517
				Wald chi2(4)	=	154.45
				Prob > chi2	=	0.0000
Log pseudolikelihood = -599.28089				**Pseudo R2**	**=**	**0.3095**
		Robust				
PERP	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Banks	0,09431	0,02896	3,26000	0,00100	0,03755	0,15107
size	-0,39378	0,04209	-9,36000	0,00000	-0,47627	-0,31129
ROA	-0,14996	0,09931	-1,51000	0,13100	-0,34460	0,04468
Lev	0,89201	0,11377	7,84000	0,00000	0,66902	1,11500
_cons	3,31484	0,27992	11,84000	0,00000	2,76620	3,86348
Average marginal effects						
Number of obs = 1517						
Delta-method						
dy/dx	**Std. Err.**	**z**	**P>|z|**	**[95% Conf.**	**Interval]**	
Banks	0,02139	0,00649	3,29000	0,00100	0,00866	0,03411
size	-0,08931	0,00579	-15,42000	0,00000	-0,10066	-0,07795
ROA	-0,03401	0,02369	-1,44000	0,15100	-0,08045	0,01243
Lev	0,20230	0,01173	17,24000	0,00000	0,17930	0,22530