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Unemployment insurance benefits and corporate financing decisions: Evidence from Europe

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Abstract

This dissertation aims at presenting new empirical evidence regarding the relationship between unemployment risk and the corporate financing decisions of a firm. More precisely, the intent of the study is to understand how a variation in the costs of unemployment to the employees – using as a proxy the maximum unemployment insurance (UI) benefits a country provides - affects the levels of debt in a firm, as well as its operating performance. The findings indicate that there is no significant relationship between the UI benefits in one year and the changes in the capital structure of a firm the next year. Regarding the second question, empirical results suggest that there is a negative relationship between the two variables, i.e., an increase in the UI benefits will be associated with a decrease in the profitability of a firm the subsequent year.

Keywords:
Unemployment
Unemployment insurance benefits
Unemployment risk
Capital structure

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Resumo

Esta dissertação visa apresentar novas evidências empíricas sobre a relação entre o risco de desemprego e as decisões de financiamento duma empresa. Mais precisamente, a intenção do estudo é entender como a variação do custo de desemprego para os empregados – utilizando como proxy, o subsídio máximo de desemprego que um determinado país oferece – afeta os níveis de dívida de uma empresa, bem como o seu desempenho operacional. Os resultados indicam que não existe uma relação significativa entre os subsídios de desemprego num ano e as mudanças na estrutura de capital de uma empresa no ano seguinte. Em relação à segunda questão, os resultados empíricos sugerem que existe uma relação negativa entre as duas variáveis, i.e., um aumento nos valores de subsídio de desemprego de um país estará associado a uma redução na rentabilidade de uma empresa nesse país, no ano seguinte.

Palavras-chave:
Desemprego
Subsídio de desemprego
Risco de desemprego
Estrutura de capital

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1. Introduction

In the last few decades, there has been an ever growing importance attributed to the human resources of a company (Zingales, 2000). As a consequence, this change in the paradigm altered the way a firm treats its employees. Several policies have been introduced so as to create a friendlier and more favorable environment for the workers, as in an organizations' perspective, a satisfied and thus productive employee, is one of the most powerful drivers for success.

However, an issue sometimes forgotten and incorrectly perceived as trivial has to do with the unemployment risk the workers have to bear. This is a sensitive topic as it creates several problems, not just for the employees but also for the firms.

The aim of this paper is therefore to understand the impact the unemployment risk for the workers has on the capital structure of a firm. It will be used as a proxy for the workers' exposure to the risk of unemployment, the variations in the unemployment insurance (UI) benefit laws of several European countries, from 2001 to 2016. In other words, it will be tested whether a change in the generosity of a country in terms of its UI benefits will affect the corporate financing decisions of a firm through the influence it has on the workers' exposure to the risk of unemployment.

Based on theories and previous literature further discussed in this paper, the hypothesis developed and studied is that firms will raise their levels of debt when they observe an increase in the generosity of the unemployment insurance benefits provided to its workers. The main idea is that more generous countries in terms of its unemployment insurance benefits create an environment in which layoffs are seen as less costly for the workers. Given this, the employees are bearing less unemployment risk and consequently they demand a lower wage compensation from the firms they work for (Topel, 1984). As firms now have less incentive to maintain their levels of debt low – so as not to increase the probability of financial distress and as a consequence, increase the unemployment risk for the employees – they are now able to increase their debt financing and thus, make a profit from the returns they get from the interest tax shields as well as other aids linked with higher levels of debt.

A more in-depth explanation passes by the idea that a worker who perceives a higher risk of unemployment will be demanding a compensation for that additional risk, from the company he or she works for. This premium in the form of wages or extra benefits will be seen as a way of

compensating the worker for a potential job loss in the future (Topel, 1984; Abowd and Ashenfelter, 1981) and it will be higher, the higher the risk of unemployment. In order to deal with this matter, firms usually opt for conservative financial policies. That is owing to the fact that a capital structure with higher levels of debt will cause an increase in the probability of financial distress, thus, increasing the unemployment risk for the employees as well as the costs in compensating premiums for the company (Ofek, 1993). Subsequently, a conservative capital structure will lessen the exposure to unemployment risk as well as the costs both for the company and for the employees. However, in the case one sees an increase in the UI benefits of a country, the costs associated with unemployment will decrease both for the workers – who will receive a higher amount in case of unemployment – and for the firms – which will have to pay a lesser amount in compensations for unemployment risk. Hence, the firm will have less incentives to maintain low levels of debt and can, instead, benefit from interest tax shields.

With the intent of testing the hypothesis that the levels of debt in a firm will increase when the risk of unemployment becomes less costly for the workers, three dependent variables will be tested so as to compare the results – debt-to-market value of assets, debt-to-book value of assets, and the natural logarithm of interest coverage. The independent variable for all the regressions will be the natural logarithm of the maximum total unemployment insurance benefit lagged one year since, as the study tries to understand how does this variable affects the leverage variables, it would be nonsensical to assume the change in the dependent variable would happen before the changes in the UI benefits, or even simultaneously.

Another research question this paper intends to answer has to do with the relationship between the unemployment insurance benefits provided by a country and the operating performance of the firm. The study tries to understand whether an increase in the UI benefits of a country lagged one year, leads to an increase or to a decrease in the profitability of a firm. This is a relevant question since one could look at it in two distinctive ways. On the one hand, one could expect the relationship to be positive since an increase in the UI benefits will lead to a decrease in the unemployment risk as well as to the unemployment costs for the employees and for the firm. On the other hand, one could also consider a negative relationship, i.e., an increase in the UI benefits is associated with a decrease in the operating performance of a firm. That could be due to two different factors: firstly, although very indirectly, an increase in the unemployment insurance benefits could be associated with an

increase in the costs of the firm, in the sense that, an increase in the UI benefits will lead to an increase in the taxes paid, both by firms and by the households; secondly, a higher level of UI benefits could lead the employees of a firm to feel more protected in relation to their employment situation and that could affect negatively their performance and therefore the operating performance of the firm they work for.

For this question, the dependent variable changes to the return on assets (ROA) of a firm, which will be used as a proxy for the profitability of the company in order to understand whether or not the operating performance of the firm is affected when there is an increase in the UI benefits the year before.

On the whole, the aim of this paper is to provide empirical evidence that there is a positive relationship between the generosity of a country in terms of the unemployment insurance benefits provided to the workers and the levels of debt financing. That is to say, the unemployment costs for the workers have an impact on the corporate financing of a firm - the lower the costs of unemployment the higher the levels of debt. In spite of the evident prominence of this subject, the unemployment costs for the employees, as well as the unemployment risk they have to bear, are still somewhat absent from theories in the field of corporate finance. While other studies, further discussed throughout this paper, have studied the interaction between corporate financing and labor costs focusing on how leverage is used as a strategy in the bargaining process, this paper goes the other direction. What sets this paper apart from most of the existing literature, especially in the European context, is the focus on how corporate financing is affected by the unemployment risk of the employees, a topic still fairly unexplored.

2. Theoretical framework

The risk of unemployment inevitably borne by the workers, constitutes an unemployment cost, sometimes incorrectly perceived as trivial. These costs could be associated with several different situations, for instance, there are large expenses associated with the actual process of searching for a new job (Mortensen, 1986), more precisely, these could be related with the long time workers usually have to wait before getting reemployed (Katz and Meyer, 1990). Furthermore, according to Lazear (2003) there is a certain limited amount of firm-specific skills an individual has, thus leading to a scarcity in job opportunities matching each individuals' specific skills. Moreover, the costs could be associated with the model proposed by Harris and Holmstrom (1982), in which they stated that the workers have to be assumed to be risk averse and of unknown productivity or capability, meaning, only through experience the employers can really know about an employee's capability, and thus, in an unemployment context, there is a lack of information regarding this. Several other labor market frictions can also be associated with the costs borne by the workers.

Owing to the high costs of unemployment present when a worker is involuntarily let go, both the worker and the firm will suffer substantial changes in their behavior. Previous literature found that, for the worker to be willing to bear the risks of unemployment, he or she will require an extra compensation which could take the form of higher wages, better working conditions or several extra benefits. This extra compensation, a premium, is generally specified as compensating wage differential. Firms must, therefore, compensate the workers ex ante to bear the nontrivial costs of unemployment. More precisely, Abowd and Ashenfelter (1981) presented a model in which they proved that there is a competitive equilibrium wage rate which will vary according to the unemployment risk, concluding that the compensating wage differential varies across industries and is larger the higher the risk. Similarly, Topel (1984) found strong evidence that unemployment insurance benefits have a significant impact on both wage differences and unemployment. Other authors, such as Hamermesh and Wolfe (1990), while approaching it differently, have focused on this same idea that the workers must gain a premium to bear the risk of unemployment. The two authors also found strong evidence that a large percentage of differences in wage differentials (from 14% to 41%) can be attributed to the divergences existing in unemployment risk between industries. Several authors have studied this subject looking at it in different ways, although, all of them have reached similar conclusions.

The size of the premium mentioned above will be higher, the higher the risk. One can say that an increase in risk can be associated not only with a higher probability of unemployment in a given firm, but also, with an increase in the costs incurred by workers during an unemployment spell, as well as with the worker's degree of risk aversion.

A crucial matter for this paper is whether or not these compensating wage differentials, associated with the unemployment risk, affect the firm's financing decisions. Though, one could look at this in another perspective, i.e., what if an increase in the leverage of the firm has an impact in the unemployment risk? An increase in the financial leverage of a company will have an impact on the company's probability of entering into financial distress. As previously studied by several authors, Ofek (1993) found that a firm's response to financial distress has several dimensions, one of which being employee layoffs. Since a company in financial distress usually has to lay off workers so as to be able to meet its debt obligations, this will lead to an increase in the workers' exposure to lay off risk. Given this, it is reasonable to assume that if a firm raises its levels of leverage, the costs associated with the compensating wage differentials will also increase, owing to the increase in the risk the workers will have to bear. Despite this conclusion, this paper goes the other direction. The aim is therefore to understand what the impact is, if any, the unemployment risk has on the firm's financing decisions.

The trade-off theory, which is the traditional theory of capital structure and the one in which this paper will be focused on, stresses the existence of an optimal level of equity capital and debt. This ideal level between equity and debt can only be achieved by a balance between tax benefits and the costs of financial distress (Kraus and Litzenberger, 1973). In accordance with Myers (1984), a firm following this strategy will have to set an ideal debt-to-value ratio and then continuously move towards the goal. As stated in this theory, the total value of a levered firm will be equal to the total value of an unlevered firm plus the present value of the tax shields the firm will get from debt, less the present value of the costs of financial distress. In other words, the net present value of a debt issue will equal the net present value of the tax shields plus the net present value of the costs of financial distress.

$$NPV[Debt\ issue] = NPV[Tax\ Shield] + NPV[Costs\ of\ Financial\ Distress] \quad (1)$$

As aforementioned, an increase in the leverage used by a firm will lead to a higher probability of unemployment, which will inevitably raise the compensation that a worker will require to be willing to bear the extra risk. Based on this, Agrawal and Matsa (2013) provided empirical evidence for the presence of an additional term in the above mentioned equation (Eq. 1). The equation they proposed, Eq. 2, has a new term representing the variation in labor expenses.

$$NPV[Debt\ issue] = NPV[Tax\ Shield] + NPV[Costs\ of\ Financial\ Distress] + \Delta\ Labor\ Expense \quad (2)$$

Whereas the second term in the equation represents the ex post costs in the case the firm truly becomes financially distressed, the last term of this equation represents the amount that a firm will spend on labor expenses, i.e., the costs paid ex ante by the company due to labor market frictions.

It is important to bear in mind that this claim for a greater compensation does not mean workers have to directly observe the changes in the firm's level of debt. The influence that financing decisions play on the risk of unemployment can be observed indirectly, through signals. It has been proven that people searching for a job can correctly perceive whether a firm is financially healthy or not (Brown and Matsa, 2012). Building on this, it is nonsensical to believe that the workers of the firm cannot accurately perceive these changes in the unemployment risk as well.

Other papers have analyzed this relationship between UI benefits, or the risk of unemployment, and the corporate financing decisions, yet having different approaches. Linked with the growing importance of human capital that has been noticed in recent years, several authors have studied this relationship though looking at how employees and the way they are treated in the company affect corporate financing decisions. Bae, Kang and Wang (2011) have reached the conclusion that firms which treat their workers fairly, tend to have, and to maintain, lower levels of debt. Related with this, although more specific, Verwijmeren and Derwall, (2010) found that firms that take the costs of bankruptcy for their employees into account, usually operate with lower levels of debt. Both papers reached the same conclusion that low levels of corporate debt are associated with firms that care about their workforce, which is also associated with the conclusions of Chemmanur, Cheng and Zhang (2013) who found evidence that the labor costs of a firm will limit its use of debt.

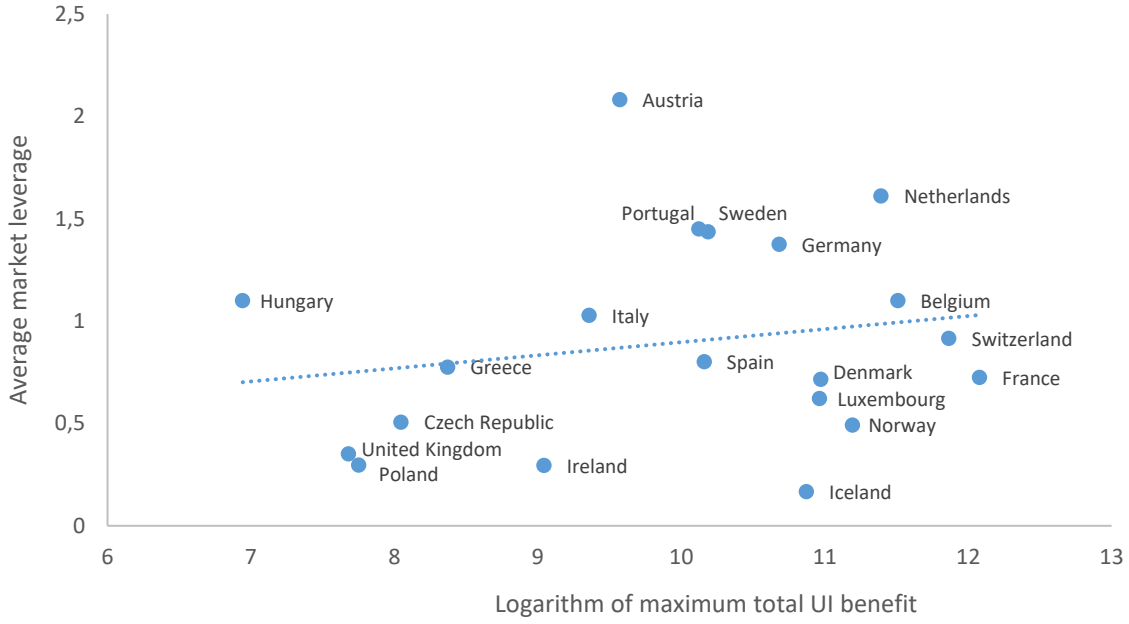
On the other hand, on an entirely different perspective, Matsa (2010) concluded on his study that high levels of liquidity will likely lead the workers to increase their wage demands and consequently, a firm can choose to have higher levels of debt so as to be able to improve its bargaining power.

The aim of this empirical study is therefore to analyze the changes in the unemployment insurance (UI) benefits given to the workers, as shocks to the last term of Eq. 2 and in that way, understand the impact on corporate leverage decisions. The main idea here is that if a worker is entitled for a more generous UI benefit, this means that the unemployment is less costly, and so, the worker will require a lower compensating wage differential and, most likely, this will enable firms to raise debt financing, benefiting in that way from tax shields as well as other benefits linked with an increase in debt.

3. Data and empirical framework

3.1 Unemployment insurance benefits and corporate borrowing

Literature on the topic suggests that the decisions on the corporate financing of a firm are affected by numerous variables, including – but not limited to – the generosity of a country in terms of its unemployment insurance benefits. More precisely, Agrawal and Matsa (2013) found empirical evidence that, for US firms, when workers are eligible for more generous insurance benefits, firms are able to increase their levels of debt. Built on this idea, Graph 1 plots the relationship between the average market leverage of the firms in a given country and the natural logarithm of the maximum total unemployment insurance benefit an employee is entitled to. The graph shows a positive relationship between the two variables, that is, an increase in the logarithm of maximum total benefit corresponds to an increase in the average market leverage. However, one ought to bear in mind that the relationship shown in the graph may not be causal.



Graph 1 - Relation between the average market leverage and the natural log of the maximum total potential UI benefits, 2016. The graph schemes the relationship between average market leverage and the log maximum total benefit in 2016. Average market leverage is computed as the average of total debt divided by total market value of the firm in each country. The logarithm of maximum total UI benefit was computed as the logarithm of the product of the maximum weekly UI benefit and the maximum number of weeks a country provides this benefit. Although small, the relation seems to be positive, that is, an increase in the logarithm of the maximum total benefit seems to be associated with an increase in the average market leverage of a country. The variables to compute the average market leverage were taken from Thomson Reuters Datastream, and the variables used to calculate the log maximum UI benefit were extracted from the OECD "Benefits and Wages: Country policy descriptions" website.

With the intent to better understand the relationship between the two above mentioned variables, data on UI benefits was manually collected from the OECD "Benefits and Wages: Country policy descriptions". For this research, some European Union countries as well as countries belonging to the European Free Trade Association (EFTA) were included. Detailed country-specific information about unemployment benefits as well as exhaustive information on particular policy parameters can be found on these documents from 2001 to 2016. For each of the countries under analysis, and for each year, it was extracted, when possible, the maximum weekly wage benefit allowance – *log max benefit* - along with the maximum number of weeks that a country provides UI benefits – *log max duration*. When it was not possible to find direct information on these variables, calculations or assumptions had to be made[1]. Given the vast discrepancy between countries' legislation in terms of labor law, so as to homogenize, for both variables and for all the countries it was assumed that the worker in question was 45 years old, single and with no dependents, and with a 20-year employment record[2]. With the aim of measuring each countries' generosity level in terms of unemployment benefits provided to a worker that became involuntarily unemployed, a new variable is introduced, the *log max total benefit*, which is the logarithm of the product of the maximum weekly UI benefit and the maximum number of weeks a country provides this benefit. Due to missing information on several countries, the total number of countries included in the study adds up to 20.

The relative variation in the maximum total UI benefits per country, from 2001 to 2016, is displayed in Fig. 1. As aforementioned, the maximum total UI benefit is computed as the product of the maximum weekly benefit and the maximum amount of time the UI benefit is provided to the worker. The figure is presenting the quartile of each country's variation in terms of its UI

[1] For instance, the two unemployment insurance variables differ for East and West Germany, and so, given that it would be nearly impossible to understand whether a firm is from one side or the other, it was assumed that the values for West Germany represent the values for Germany as a whole. Moreover, assumptions had to be made regarding some missing years: For 2002, the values for both variables were missing for Ireland and Italy and so it was assumed the same values as in the previous year, 2001. The same happened for the year 2016, for Ireland. Finally, Belgium presented no limit duration for the workers to receive UI benefits and therefore, it was assumed that this value was the same as Iceland, corresponding to the county with the highest maximum duration in weeks (261 weeks). Other less relevant assumptions were made. See Section 8 - "Appendices" to visualize the tables with all information.

[2] For Norway, it was also assumed that the income from work amounted for at least twice the basic amount (as opposed to less than twice, so as to be more in line with the countries that are not discriminating on this and for which the maximum was given).

generosity; a larger increase in the total UI benefits is shown in a darker shade and a smaller increase - or in some countries a negative variation – in a lighter shade. Portugal, Denmark, and Germany present a negative variation, however, it is worth mentioning that if in the picture (Figure 1) it was only depicted the maximum weekly benefit, the variation on all countries would be positive, as the negative variation in these countries comes from a decrease in the maximum duration and not a decrease in the weekly benefit – comparing 2016 values with 2001 values. The country that presented the largest increase in relative values was Switzerland, with a variation of over 276% from 2001 to 2016.

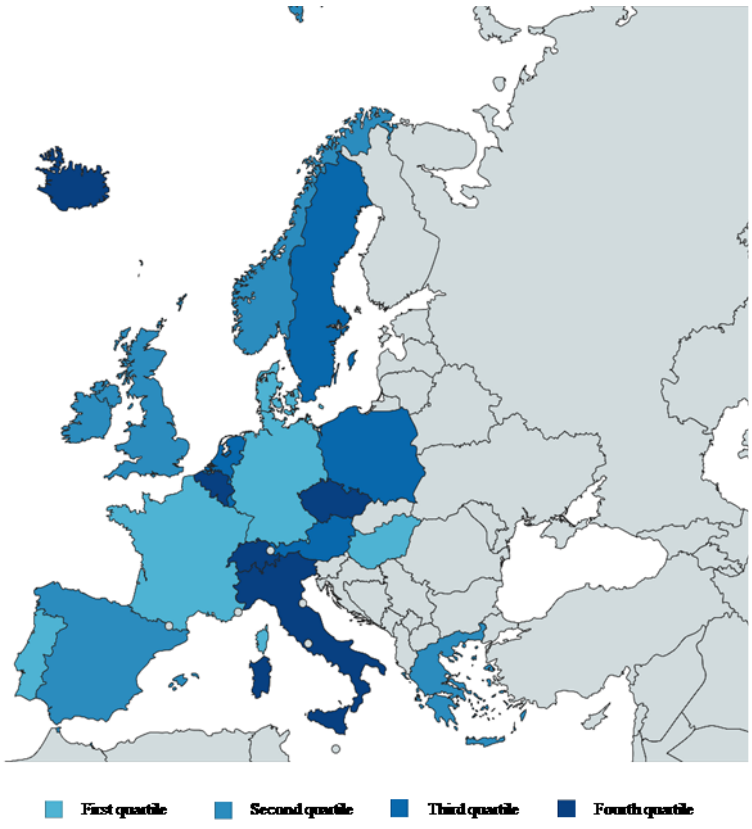
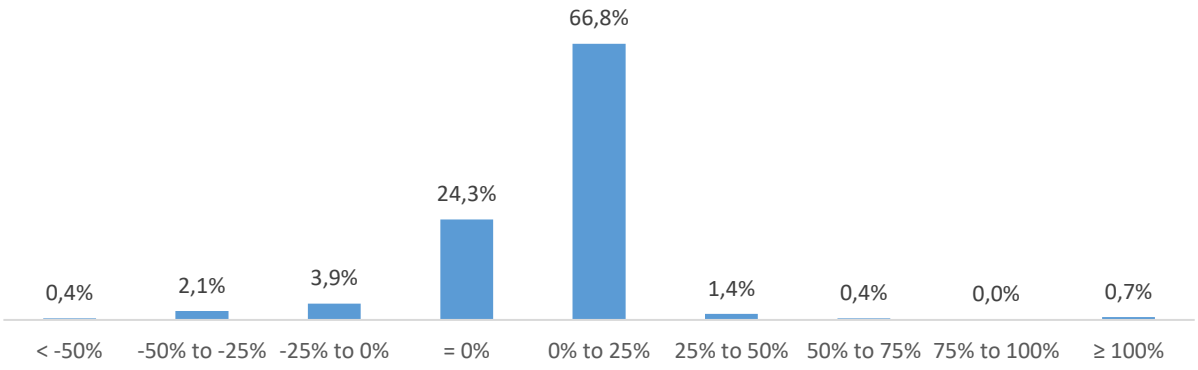


Figure 1 - Relative variation in each country's maximum total unemployment insurance benefit, 2001-2016. The maximum total UI benefit is computed as the product of the maximum weekly benefit and the maximum duration. The figure exhibits larger increases in UI benefits in darker shades. Information regarding these variables was extracted from the OECD "Benefits and Wages: Country policy descriptions".

To better understand the magnitude of the variations over the years, Graph 2 shows the frequency each interval of variations happens from one year to the next one. By analyzing the data included in the graph, one can conclude that the vast majority of the variations in unemployment insurance benefits are from 0% to 25% (neither the value are included in the interval), each year. It is also worth noting that a variation of exactly 0% (i.e., no variation) from one year to the next one constitutes around 24% of the country-year observations. Overall, the number of countries increasing unemployment benefits was superior to those decreasing them.

With the purpose of exploring the relationship between the costs of unemployment in each country and a firm's corporate financing decisions, data and information on a firm's balance sheet as well as income statement were also employed and obtained from Thomson Reuters Datastream. The

sample used in this study includes firms from all industries, excluding financials and utilities, with non-missing observations.



Graph 2 – Frequency of the variation in the distribution of each country's maximum total unemployment insurance benefit, from 2001 to 2016. Information regarding these variables was extracted from the OECD "Benefits and Wages: Country policy descriptions".

Panel regression analysis is used to study the possible relation between financing policies at a firm level and the unemployment insurance benefits in each country. For this, the following regression (Eq. 3) was run:

$$\frac{DEBT_{ist}}{MARKET\ VALUE_{ist}} = \alpha_1 LN(MAX\ TOTAL\ BENEFIT)_{st-1} + X_{ist}\beta + \nu_i + \omega_t + \upsilon_i + \varepsilon_{ist} \quad (3)$$

Particularly, $DEBT_{ist}$ is a variable that represents the financial debt in a firm i, in a European country j, and in a given year t, and $MARKET\ VALUE_{ist}$ measures the market value of assets once again of the firm i, country j, and year t. Thus, the dependent variable, expressed as debt divided by a firm's total market value of assets is created as a function of the logarithm of the maximum total UI benefit in the preceding year, a set of control variables X_{it}, firm fixed effects ν_i, country fixed effects υ_i and finally, year fixed effects ω_t.

For the sake of comparison, the same regression will be run with other dependent variables. The debt-to-book value of assets will be used given that, even though market leverage is usually more in line with the theoretical hypothesis stating that firms aim for an ideal equilibrium among the tax shields from debt, the ex post costs of financial distress, and the ex ante costs that come from the extra compensation given to the employees by the firm due to unemployment risk. The other dependent variable that will be tested is the logarithm of interest coverage. The latter variable was chosen since measuring leverage using the interest coverage ratio as opposed to other leverage ratios such as debt-to-market or debt-to-assets, will introduce very different results if a firm is in an early stage of life or if it is likely to grow in the near future. For instance, if a firm is in its earliest stages of life, the cash flows will be expected to grow in the future. If one uses a debt-to-assets ratio, low levels of debt will be achieved as a result, since the debt will be low in relation to the future cash flows. However, when considering the interest coverage instead, one will get high levels of debt, as the interest payments required will be larger than the current cash flows. In this study, it is used this variable in logs in accordance with the paper of Faulkender and Petersen (2006), in order to take into consideration the relatively greater significance of equal variations in percentage at low levels of interest coverage.

The set of controls X_{ist} comprise several financial variables and ratios frequently used in leverage regressions, particularly, log of sales (which is used as a proxy for the size of the firm), market-to-book-ratio (proxy for investment opportunities), proportion of fixed assets (so as to account for potential collateral), return on assets (ROA; as a proxy for profitability) and lastly, the modified Altman Z-score (probability of bankruptcy)[3]. Furthermore, this term also includes controls for macroeconomic conditions, namely, each country's unemployment rate together with each country's GDP growth rate, both variables obtained from Thomson Reuters Datastream. Summary statistics for all the dependent and independent variables as well as the controls can be found in Table 1. In order to clear the data all financial variables – both the dependent variables and the firm financial controls – were winsorized at 1% tails.

[3] These variables were chosen based on the study of Harris and Raviv (1991). The modified Altman Z-score was computed as

$$3.3\frac{Earnings\ before\ interest\ and\ taxes}{Total\ assets} + 1.0\frac{Sales}{Total\ assets} + 1.4\frac{Retained\ earnings}{Total\ assets} + 1.2\frac{Working\ capital}{Total\ assets}$$

in accordance with Mackie-Mason (1990).

Table 1 – Summary statistics. The sample presented in the table comprises firm-year observations from 2001 to 2016, in 20 European countries. The unemployment insurance variables were extracted from the OECD "Benefits and Wages: Country policy descriptions". Dependent variables, firm financial controls and macroeconomic controls were taken from Thomson Reuters Datastream. This sample includes firms from all industries, excluding utilities and financials, with non-missing observations. All financial variables – dependent variables as well as controls – are winsorized at 1% tails.

	N	Mean	Standard deviation	Minimum	25th percentile	Median	75th percentile	Maximum
Panel A: Dependent variables								
Total debt/market value	44,359	0.177	0.177	0.000	0.023	0.132	0.276	0.741
Total debt/book value	49,725	0.216	0.204	0.000	0.036	0.177	0.329	0.969
Log interest coverage	35,214	2.567	1.573	-0.912	1.582	2.335	3.317	7.825
Panel B: UI variables								
Log max benefit	104,144	5.702	1.259	3.163	4.413	5.802	6.647	7.821
Log max duration	104,144	4.078	0.565	2.565	3.807	4.043	4.605	5.565
Log max total benefit	104,144	9.780	1.597	6.766	7.752	9.924	11.072	12.079
Panel C: Firm financial controls								
Proportion of fixed assets	49,196	0.247	0.241	0.000	0.044	0.176	0.377	0.942
Log sales	49,098	12.140	2.707	4.277	10.456	12.234	13.930	18.146
Return on assets (ROA)	50,463	-0.040	0.286	-1.817	-0.027	-0.028	0.068	0.335
Market-to-book ratio	45,463	2.383	3.334	-4.272	0.834	1.472	2.710	22.435
Z-score	38,960	1.102	2.518	-12.963	0.737	1.537	2.297	5.176
Panel D: Macroeconomic controls								
GDP growth	104,144	2.014	2.515	-9.130	0.950	2.080	3.600	25.560
Unemployment rate	102,648	7.863	4.203	1.000	5.100	7.400	8.900	27.480

Describing the generosity of each country, Panel B in Table 1 represents the UI benefit variables. It is important to bear in mind that the values presented in the table include the statistics for all the sample (firm-year observations) and as such, for instance the mean for the *log max benefit* - which is around 5.7 and corresponds to approximately 299.45 Eur per week[4] - does not represent the real average from 2001 to 2016 for all the countries, but instead the average of the entire sample and thus, it is biased due to the uneven number of firms used in each country. Given this, and for the

[4] All the presented values in Table 1 are unadjusted for inflation.

sake of transparency, Table 2 provides the real values for the descriptive statistics of the UI benefit variables, i.e., adjusted for inflation[5].

Table 2 – Summary statistics. The sample presented in the table comprises country-year observations from 2001 to 2016, in 20 European countries. The unemployment insurance variables were extracted from the OECD "Benefits and Wages: Country policy descriptions".

	N	Mean	Standard deviation	Minimum	25th percentile	Median	75th percentile	Maximum
UI variables (real)								
Maximum benefit (Eur/Week)	320	556.64	574.09	35.41	145.60	343.42	791.28	2539.46
Maximum duration (Weeks)	320	84.39	64.05	13.00	39.00	56.00	104.00	261.00
Maximum total benefit (Eur)	320	47,107.26	47,728.25	1,045.07	5,950.62	28,817.11	76,568.61	218,972.70

When looking at 320 observations corresponding to the country-year observations instead of the firm-year observations, the mean of the *maximum benefit* becomes 556.64 Eur per week instead. The minimum value for this variable corresponds to Poland in 2001 and the maximum UI benefit corresponds to Switzerland in 2016. For the *maximum duration* variable, the minimum value corresponds to Hungary, from 2012 to 2016, with a decrease of approximately 33.3%, from 39 weeks in 2011. The maximum value corresponds to Belgium where, as previously explained, there is no limit in its maximum duration. Lastly, regarding the last UI variable, the *maximum total benefit* reaches its lowest value in 2012 for Hungary, and its highest value in 2002, in France. Looking only at 2016 values (adjusted for 2018 prices), the highest value for the *maximum total benefit* corresponds, once again, to France with 182,807.93 Eur.

3.2 Unemployment insurance variables and the operating performance of a firm

The hypothesis in Section 3.1 proposed that variations in the generosity of a country in terms of its UI benefits affect the firms' corporate financing decisions. This impact in the firms' capital structure happens owing to the changes in the exposure to unemployment risk that the workers experience. As mentioned previously, workers anticipate they will have to bear significant unemployment costs and thus require a premium in their wages to compensate for the ex-ante costs.

[5] In Table 2, both the values included in the maximum benefit per week and the maximum total benefit for all the countries were adjusted for November 2018 inflation levels – except for Poland which was adjusted for October 2018 inflation values. Table 8 in Section 8 – "Appendices" presents both the inflation levels and the adjusted values for the country-year observations.

Hence, this compensation is higher the higher the debt of the firm, since higher debt increases the risk of financial distress of the firm and therefore the risk of unemployment for the employees.

Based on this, one could assume that an increase in the unemployment benefits of a country – through the decrease in the unemployment costs both for the employees and for the firm – will be associated with an increase in the profitability of a firm. Nonetheless, as previously mentioned, this may not be the case. One could also assume that the relationship is negative owing to either the indirect costs associated with an increase in the taxes paid by the firm and the households, or due to the decrease in the employees productivity owing to a decrease in the pressure to maintain their jobs.

Based on this idea, another question this paper tries to answer is whether or not the profitability of a firm is affected when there is a variation in the UI benefits. For this, Eq. 4 will be run, in which return on assets is used as a proxy for a firm's profitability.

$$RETURN\ ON\ ASSETS_{ist} = \alpha_1 LN(MAX\ TOTAL\ BENEFIT)_{st-1} + X_{ist}\beta + \nu_i + \omega_t + \varepsilon_{ist} \quad [6] \qquad (4)$$

Finally, the standard errors in all the presented regressions as well as for Section 3.1 will be adjusted for clustering at a country level. That is owing to the fact that the unemployment insurance benefits will vary in each country and as such, the residuals will most likely be correlated and the standard errors biased (Petersen, 2009). This method will, as a result, correct for possible correlations in unobserved conditions which vary across time and affect the firms within each country.

[6] The remaining variables are explained in section 3.1 – Data and Methodology: Unemployment insurance benefits and corporate borrowing.

4. Findings

4.1 Unemployment insurance benefits and corporate borrowing

In order to understand the relationship between the generosity of a country in terms of its unemployment insurance benefits and the corporate financing decisions a firm makes, several regressions were run. The results for the relation between two debt ratios - total debt divided by the market value of assets (Panel A) and total debt divided by the book value of assets (Panel B) – and the natural log of the maximum total unemployment insurance benefit entitled to a worker on the year before, are shown in Table 3. Starting by analyzing Column 1, Panel A, one can see that a 100 log point increase in the maximum unemployment insurance benefit will be associated with a 2.4 percentage point growth in the average debt-to-market value. These findings are in line with the hypothesis suggested above - that there is a positive relationship between the two variables. This column controls for both firm and year fixed effects, i.e., it guarantees that the regression will present the relationship between the generosity of a country's UI benefits and the average changes in capital structure of the firms, after taking into consideration simultaneous macroeconomic factors as well as leverage trends possibly influencing both variables. Nevertheless, this relation is not statistically significant.

After controlling for macroeconomic indicators (Column 2) as well as firm financial variables (Column 3), the results remain in line with the literature, showing a positive relation between the leverage ratio and the logarithm of maximum total benefit lagged one year. The coefficients in both cases became significantly lower. However, once again, the relation shown is not statistically significant at, at least, 10% level. Nonetheless, all control variables, both in Column 2 and Column 3, are statistically significant either at the 5% or 1% level, suggesting the variables chosen are effective in controlling for observed economic factors.

Finally, when accounting for country fixed effects - that is, ensuring the relationship presented by the regression is between the unemployment insurance benefits of a given country and the average changes in the capital structure of a firm in that same country – the results are very similar to the ones obtained in the previous column, Column 3.

Table 3 – Capital structure of the firm and unemployment insurance benefits. The table provides a summary of the results obtained from firm-panel regressions of total debt-to-total market value of assets on the natural log of the maximum total potential unemployment insurance benefit available in a given country 1-year lagged. Year fixed effects are included in all regressions. The standard errors in all regressions are provided in parenthesis and are corrected for clustering at the country level. ***, ** and * represent the statistical significance of the variables at the 1%, 5%, and 10% level, respectively. The estimation method is OLS, that is, ordinary least squares.

	(1)	(2)	(3)	(4)
Dependent variable: Total debt/market value				
Log max total benefit $_{t-1}$	0.024	0.010	0.008	0.008
	(0.025)	(0.016)	(0.020)	(0.020)
Proportion of fixed assets			0.148***	0.183***
Log sales			0.021***	0.017***
Market-to-book ratio			-0.005***	-0.005***
Return on assets			-0.025**	-0.021**
Modified altman Z-score			-0.011***	-0.011***
GDP growth		-0.006***	-0.006***	-0.006***
Unemployment rate		0.004**	0.003**	0.003**
Constant	-0.052	0.044	-0.198	-0.095
Number of observations	42,129	42,002	32,406	32,406
R-squared (within)	0.04	0.06	0.15	0.15
Control variables				
Macroeconomic indicators	No	Yes	Yes	Yes
Firm financial controls	No	No	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes[7]
Country fixed effects	No	No	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Estimation method	OLS	OLS	OLS	OLS

For Table 4 – using total debt-to-book value as a dependent variable instead – the results are once again positive, though the coefficients shown are not statistically significant for none of the columns and the values are quite small. Most of the control variables are statistically significant at the 10%, 5% and 1% level. When including all controls, Column 3, and adding country fixed effects as well, Column 4, the results became even smaller, with values close to zero. Hence, one can conclude that there is no significant relationship between the variables nor they are economically meaningful.

[7] When using country fixed effects, it is not possible to use firm fixed effects. This happens because firm fixed effects explore within firm identification and the firms' countries do not vary over time. Hence, in reality it was used firm random effects.

Table 4 - Capital structure of the firm and unemployment insurance benefits. The table provides a summary of the results obtained from firm-panel regressions of total debt-to-total book value of assets on the natural log of the maximum total potential unemployment insurance benefit available in a given country 1-year lagged. Year fixed effects are included in all regressions. The standard errors in all regressions are provided in parenthesis and are corrected for clustering at the country level. ***, ** and * represent the statistical significance of the variables at the 1%, 5%, and 10% level, respectively. The estimation method is OLS, that is, ordinary least squares.

	(1)	(2)	(3)	(4)
Dependent variable: Total debt/book value				
Log max total benefit $_{t-1}$	0.012	0.003	0.000	0.000
	(0.015)	(0.014)	(0.014)	(0.015)
Proportion of fixed assets			0.161***	0.187***
Log sales			0.021***	0.021***
Market-to-book ratio			-0.001	-0.001
Return on assets			-0.009	-0.005
Modified altman Z-score			-0.025***	-0.025***
GDP growth		-0.003***	-0.025***	-0.003***
Unemployment rate		0.003*	0.003**	-0.003**
Constant	0.118	0.159	-0.087	-0.039
Number of observations	47,334	47,204	32,406	32,406
R-squared (within)	0.00	0.01	0.12	0.12
Control variables				
Macroeconomic indicators	No	Yes	Yes	Yes
Firm financial controls	No	No	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes[7]
Country fixed effects	No	No	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Estimation method	OLS	OLS	OLS	OLS

Finally, even though a considerable part of the literature on this subject focuses on market leverage, if a worker is worried about the firm he or she works in becoming financially stressed, another essential variable to consider is the firm's interest coverage. Calculated by dividing the operating earnings before depreciation by the interest expense of a firm, this ratio will measure the ability the firm has to honor its payments on its outstanding debt. In Table 5, we can look at the relationship of the logarithm of interest coverage and the generosity of the countries in terms of UI benefits. Controlling for year and firm fixed effects for all regressions, this relationship between interest coverage and the generosity of a country in terms of UI benefits is negative. These results are once again consistent with the literature in the sense that an increase in the *log max total benefit* in one

year will be associated with a decrease in the *log interest coverage* in the following year, although, not statistically significant for the OLS regressions.

On the whole, by analyzing all specifications both in Table 3 and 4, one can conclude that, even though the firms seem to increase their levels of debt as a fraction of assets as well as to decrease their levels of interest coverage when there is an adoption of more generous laws by countries, the relationship shown is not statistically significant for neither of the regressions run. In other words, no significant associations can be found between the two variables. Hence, the empirical findings are not consistent with the conclusions obtained by Agrawal and Matsa (2013) – which established a statistically significant relationship between the two variables, nonetheless for US firms instead.

Table 5 - Capital structure of the firm and unemployment insurance benefits. The table provides a summary of the results obtained from firm-panel regressions of the logarithm of interest coverage on the natural log of the maximum total potential unemployment insurance benefit available in a given country 1-year lagged. Year fixed effects are included in all regressions. The standard errors in all regressions are provided in parenthesis and are corrected for clustering at the country level. ***, ** and * represent the statistical significance of the variables at the 1%, 5%, and 10% level, respectively. The estimation method is OLS, that is, ordinary least squares.

	(1)	(2)	(3)	(4)
Dependent variable: Log interest coverage				
Log max total benefit $_{t-1}$	-0.145	-0.052	-0.004	-0.008
	(0.159)	(0.118)	(0.093)	(0.094)
Proportion of fixed assets			-0.514***	-0.568***
Log sales			-0.119***	-0.101***
Market-to-book ratio			-0.002	-0.004
Return on assets			7.479***	7.784***
Modified altman Z-score			0.272***	0.252***
GDP growth		0.060***	0.030***	0.029***
Unemployment rate		-0.020	-0.021**	-0.019**
Constant	3.585**	3.191***	3.669***	3.704***
Number of observations	33,492	33,411	25,781	25,781
R-squared (within)	0.03	0.04	0.31	0.31
Control variables				
Macroeconomic indicators	No	Yes	Yes	Yes
Firm financial controls	No	No	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes[7]
Country fixed effects	No	No	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Estimation method	OLS	OLS	OLS	OLS

The results obtained may be due to several reasons. There may be, de facto, no causality in the relation between the two variables. Alternatively, assuming there is a causal relationship between a change in a firm's levels of debt and a variation in the UI benefits of a country, the results achieved might be due to bias in the data. Owing to the assumptions made, the bias may come especially from the unemployment insurance variables[8]. In addition, another issue these results may have comes from the fact that, in this study, firms are considered in the country where its headquarters are located. In the (most likely) case that a firm is actually present in several different countries other than where it is headquartered, that firm will not just be subject to the laws of the country in which its headquarters are located but also to the laws of the countries where its other plants are. These issues may attenuate the estimates obtained. Finally, the controls used in the regressions may also fail to be exogenous, which is a possibility given that these variables consist on potentially endogenous features of the companies (Wooldridge, 2002).

4.2 Unemployment insurance benefits and the operating performance of a firm

With the aim of understanding the relationship between a variation in UI benefits and the operating performance of a firm, a regression - with the return on assets of a firm as a dependent variable and the *log max total benefit* 1-year lagged - was run. The estimates for the regression are represented in Table 6. As opposed to the conclusions reached by Agrawal and Matsa (2012) – who found no evidence that a firm will show poor operating performance following an increase in the UI benefits – the results achieved show that there is a negative relationship between the two variables, i.e., a 100 log point increase in the maximum UI benefit will be associated with a 3.2 percentage point decay in the ROA. The results shown are statistically significant at the 10% level, for Column 1 and Column 2, and statistically significant at the 5% level for Column 3, with all the controls. Firm and year fixed effects are present in all the regressions of Table 6.

[8] Some of the assumptions were already mention in Section 3.1. The UI variables might include bias given that, when extracted, for the sake of homogenization, it was assumed for both variables that the employee in question was 45 years old, single and with no dependents, and with a 20-year employment record. Unfortunately, it was not possible to make sure the data collected for the two variables in all countries followed these constraints, as for instance, some of the countries did not show discrimination in terms of age, and just provided a maximum number for both variables.

Table 6 – Profitability of a firm and unemployment insurance benefits. The table provides a summary of the results obtained from firm-panel regressions of the return on assets of a firm (ROA) on the natural log of the maximum total potential unemployment insurance benefit available in a given country 1-year lagged. Year and firm fixed effects are included in all regressions. The standard errors in all regressions are provided in parenthesis and are corrected for clustering at the country level. ***, ** and * represent the statistical significance of the variables at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)
Return on assets (ROA)			
Log max total benefit $_{t-1}$	-0.032*	-0.027*	-0.019**
	(0.017)	(0.014)	(0.008)
Proportion of fixed assets			-0.016
Log sales			-0.004
Market-to-book ratio			-0.0004
Modified altman Z-score			0.089***
GDP growth		0.004***	0.002***
Unemployment rate		0.000	0.001
Constant	0.230	0.231*	0.104
Number of observations	48,048	47,920	32,814
R-squared (within)	0.01	0.01	0.49
Macroeconomic indicators	No	Yes	Yes
Firm financial controls	No	No	Yes
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes

The results obtained are perhaps somewhat surprising. Even though, when there is an increase in UI benefits the firm has a potential increase in its costs due to the extra taxes paid, this is an utterly indirect channel. Moreover, as specified above, the results could also have to do with a decrease in the productivity of the employees owing to an increase in their security in terms of unemployment costs. Conversely, it would be only logical to assume that despite this possible increase in costs as well as decrease in productivity, an increase in the UI benefits is ultimately good both for the work environment and for the company as a whole, thereby leading to a firm being in a more advantageous position instead of worse off. Furthermore, in the case there is an increase in UI benefits, the employees will actually be demanding lower compensations for the risk of unemployment thus questioning the results obtained in Table 6.

The results achieved could be due to several reasons. The sample used includes data on 20 European countries from 2001 to 2016. This sample therefore included several years of crisis,

which may be tampering the results significantly, leading one to believe that an increase in the unemployment benefits of a country may have lead a decay in the profitability of its firms, although this may not be causal. One could solve this problem by adding country-year fixed effects simultaneously to a regression that way considering national trends. Though, this is not conceivable as it would be impossible to estimate the unemployment insurance benefits.

5. Limitations and possible future research

As it would be expected, this paper presents several limitations and room for improvement. Some limitations have already been mentioned in previous sections. For instance, some of these restrictions include the fact that some assumptions had to be made regarding the unemployment insurance variables due to missing information, consequently leading to possible bias in the data. Additionally, another issue already mentioned had to do with the idea that the firms are linked to a country based where the company's headquarters are located and, probably the vast majority of the firms under analysis, actually have plants in several different countries and not just where the company is headquartered. This creates bias since these firms will be subject to the laws of more than one country and this study is not be able to account for this. A possible solution for this issue would be for example to try to exclude from the sample firms that have a more dispersed workforce, geographically speaking. Although, this may not be a feasible solution, one way to try to minimize the error could be to only exclude certain industries known to have a more dispersed workforce, for example, the industry of transportation, as well as wholesale and retail.

Furthermore, another possible problem comes from the fact that it was assumed that the unemployment insurance benefits provided to a worker in case of unemployment were a precise measure for the worker's exposure to unemployment risk. Even though this variable may be a good measurement proxy, it is not foolproof.

Moreover, an important limitation has to do with the fact that unobserved variables, other than the ones controlled for in this study, could affect the capital structure and financing decisions of the firm. An example of a variable that most likely affects corporate financing decisions and that it is not included in the controls would be the amount of taxes paid by each firm. This variable is not incorporated in the control variables as it not only varies from country to country but also within each country.

So as to improve the paper, several additional researches could be conducted. For instance, one could try to focus on firms with tight financial constraints, since, in those companies, the workers have to face a higher risk of unemployment, and thus, variations in the unemployment insurance benefits of a country ought to have a greater influence on the decisions in corporate financing. Agrawal and Matsa (2013) tested this for US firms, using as a measure the size of the firm, the

level of operating cash flows and the absence or not of payments in dividends, and found strong evidence that an increase in UI benefits leads to an increase in debt in these firms.

Additionally, another research question one could add could be related to whether or not bordering countries have any influence on the relationship between a country's UI benefits and the decisions on corporate financing.

One could also focus on several other situations in which the workers have to face greater unemployment risk, examples for this include industries in which the employees face greater labor intensity - which is also related with higher layoff propensity - as well as industries known to pay lower wages to its employees. Both these situations could change significantly the estimates in the relation between the two tested variables.

6. Conclusions

The purpose of this study was to provide new empirical evidence in the field of corporate finance. The relationship between corporate financing decisions and unemployment risk is still a topic quite underexplored, especially in the European context. The main research question this paper tries to answer is whether or not there is a relationship between the capital structure of a firm in a given country, and the unemployment costs for the employees in each firm. More precisely, by exploiting changes in the unemployment insurance benefits of a country as shocks to the unemployment costs the workers have to bear, the hypothesis explored is that, firms will increase their levels of debt when they observe an increase in the generosity of the UI benefits, provided by a country.

Included in the study are firms from all the industries, excluding financials and utilities, from the year 2001 to 2016. The sample includes 20 European firms, including firms from the European Union (EU) and the European Free Trade Association (EFTA).

The conclusions taken do not support the hypothesis that there is a positive impact in the levels of debt in a given firm, when there is a positive shock in the UI benefits of a country. The estimates indicate that the relationship between the variables is positive, although, not significant at, at least, the 10% level. More specifically, the relationship between the debt-to-market value of assets and the UI benefits lagged one year of a country, as well as the relationship between the debt-to-book value of assets and the UI benefits lagged one year, were both shown positive, though, both not significant, and the latter relationship presented utterly small values. Additionally, the estimates indicated that the relationship between the natural logarithm of interest coverage and the generosity of a country in terms of its UI benefits the year before is negative, which is expected and in line with the literature, nonetheless, once again, showing no significant causality between the two variables. The conclusions drawn are similar for all the regressions both with no control variables, using macroeconomic controls, and using financial controls, as well as firm, year, and country fixed effects.

Another research question was explored in this study. The aim was to understand what the relationship was, if any, between the unemployment insurance benefits and the operating performance of a firm. The idea was that, an increase in the UI benefits could lead to either a decrease in the profitability of a firm - indirectly through an increase in the taxes paid by firms and households in order to support the extra benefits, or through a decrease in the productivity of the

employees – or it could lead to an increase in the profitability of a firm - due to the decrease in the compensation firms have to pay as well as owing to the general extra motivation the workers gain when they observe an increase on benefits.

Based on the results, one can conclude that there is a negative relationship between the two abovementioned variables, that is, when there is a positive variation in the unemployment insurance benefits of a country in one year, the return on assets of a firm (ROA) the next year – used as a proxy for the profitability of a firm – will decrease. The relationship proved significant at the 10% level, both without using control variables and using macroeconomic controls, and significant at 5% level when using both financial and macroeconomic control variables. The illustrated conclusions are not, once again, in line with previous literature. Agrawal and Matsa (2013) found that increases in the unemployment insurance benefits have no significant relation with a firm's operating performance in the following year.

Broadly speaking, the empirical findings suggest that there is no causal relationship between the unemployment insurance benefits on one year and the levels of debt the forward year. Furthermore, regarding the second question, the evidence suggests that there is a negative relationship between the two variables, that is, an increase in the UI benefits of a country are associated with decreases in the operating performance of the firms the next year.

Throughout the last decades, the human resources of a firm have been suffering substantial changes in terms of their importance to a company. Progressively the idea spreads that, when treated properly and with fairness, the human capital will constitute a crucially important competitive advantage for the organization. In spite of this, there have been several studies on how unemployment costs and unemployment risk are affected by the corporate structure and corporate financing decisions of a firm, although, the inverse relationship is still, to a certain extent, somewhat uncharted.

The findings of this study come with several limitations already mentioned in previous sections, as well as room for future research in order to improve and to expand the topic of unemployment risk on corporate finance. Notwithstanding, this paper alone provides relevant new insights for the European context as well as to the - not so explored - effect a variation in the unemployment costs has on the corporate financing decisions of a firm and on its operating performance.

7. References

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8. Appendices

Table 7 – Maximum unemployment insurance (UI) benefit per week, in Euros, 2001-2016. The values presented in the table are not adjusted for inflation. The information was manually extracted from the OECD "Benefits and Wages: Country policy descriptions" website. Some relevant assumptions were made and already mentioned in Section 3.1 – "Data and empirical framework - unemployment insurance benefits and corporate borrowing", as well as throughout the paper.

Countries	2001	2002	2003	2004	2005	2006	2007	2008
Austria	249,55	255,08	257,18	262,64	269,43	275,17	282,87	292,39
Belgium	176,40	223,07	227,53	232,07	236,72	241,46	248,75	253,72
Czech Republic	39,60	39,60	39,60	39,60	43,15	44,93	107,82	117,25
Denmark	394,11	404,84	417,57	429,64	438,35	447,06	457,79	471,19
France	1209,69	1248,37	1290,83	1314,19	1314,19	1314,19	1471,82	1471,82
Germany	615,91	650,77	650,77	713,08	720,00	726,92	726,92	733,85
Greece	61,44	64,56	64,56	64,56	75,98	75,98	84,75	96,46
Hungary	23,65	25,96	28,16	29,97	31,89	53,82	56,40	59,42
Iceland	113,58	123,25	129,41	148,31	152,76	185,49	190,89	197,19
Ireland	108,56	108,56	124,80	134,80	148,80	165,80	185,80	197,80
Italy	175,35	175,35	182,59	186,18	189,14	191,72	194,78	198,13
Luxembourg	726,20	755,21	797,88	814,46	846,21	867,36	905,93	928,58
Netherlands	765,35	795,00	825,00	838,50	838,50	851,65	873,20	899,50
Norway	388,25	409,24	430,23	443,87	458,56	475,13	504,74	504,74
Poland	25,65	26,81	27,08	27,13	28,08	28,67	28,96	29,70
Portugal	231,36	240,93	246,88	253,11	259,41	267,16	275,44	282,05
Spain	200,63	204,68	208,85	185,97	189,73	193,48	201,60	243,54
Sweden	300,88	340,38	340,38	340,38	340,38	340,38	331,02	331,02
Switzerland	1797,00	1797,00	1797,00	1797,00	1797,00	1797,00	1797,00	2119,80
United Kingdom (UK)	60,52	61,54	62,33	63,47	64,10	65,53	67,47	69,00
Countries	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Austria	306,67	312,90	318,71	324,52	330,33	336,56	338,10	367,64
Belgium	305,51	305,51	311,63	328,26	369,99	369,99	369,99	382,11
Czech Republic	121,22	123,56	126,86	129,20	128,49	134,21	136,72	141,95
Denmark	485,94	504,03	513,42	528,16	536,88	546,26	536,88	560,34
France	1517,47	1517,47	1517,47	1608,76	1608,76	1667,91	1667,91	1693,16
Germany	747,69	747,69	761,54	775,38	775,38	823,85	837,69	837,69
Greece	104,83	104,83	106,50	83,08	83,08	83,08	83,08	83,08
Hungary	61,57	63,29	67,17	66,74	70,32	72,83	75,35	79,65
Iceland	249,83	249,83	269,76	279,29	288,37	298,75	307,71	337,56
Ireland	204,30	196,00	188,00	188,00	188,00	188,00	188,00	188,00
Italy	204,53	206,07	206,07	214,91	266,05	268,98	269,52	269,52
Luxembourg	970,82	995,08	1013,98	1045,81	1088,03	1108,29	1109,40	1109,40
Netherlands	915,75	933,25	951,60	965,45	979,80	991,40	991,40	1019,25
Norway	550,60	571,45	598,53	620,48	620,48	667,68	680,49	699,48
Poland	30,94	39,92	40,96	42,73	44,32	44,72	44,72	44,72
Portugal	290,23	290,23	290,23	290,23	241,86	241,86	241,86	241,86
Spain	248,41	250,89	250,89	250,89	250,89	250,89	250,89	250,89
Sweden	331,02	331,02	331,02	331,02	331,02	331,02	331,02	442,80
Switzerland	2119,80	2119,80	2119,80	2119,80	2119,80	2119,80	2119,80	2493,37
United Kingdom (UK)	73,34	74,64	76,93	80,92	81,71	82,50	83,31	83,31

Table 8 - Maximum unemployment insurance (UI) benefit per week, in Euros, 2001-2016. The values presented in the table are adjusted for November 2018 inflation levels. The information was manually extracted from the OECD "Benefits and Wages: Country policy descriptions" website. Some relevant assumptions were made and already mentioned in Section 3.1 – "Data and empirical framework - unemployment insurance benefits and corporate borrowing", as well as throughout the paper.

Countries	Inflation Nov 2018	2001	2002	2003	2004	2005	2006	2007	2008
Austria	2,21	361,86	361,89	356,98	356,67	357,98	357,70	359,76	363,83
Belgium	2,78	281,15	345,92	343,29	340,68	338,11	335,55	336,32	333,77
Czech Republic	2,02	55,63	54,53	53,45	52,39	55,96	57,12	134,35	143,21
Denmark	0,79	450,52	459,16	469,88	479,68	485,57	491,33	499,18	509,77
France	1,89	1663,06	1684,41	1709,39	1708,04	1676,36	1645,26	1808,43	1774,89
Germany	2,27	902,06	931,96	911,28	976,36	963,96	951,63	930,51	918,52
Greece	0,99	72,64	75,58	74,84	74,10	86,36	85,52	94,46	106,45
Hungary	3,15	40,07	42,64	44,84	46,27	47,73	78,09	79,33	81,03
Iceland	3,74	212,03	221,78	224,47	247,98	246,21	288,19	285,89	284,67
Ireland	0,6	120,18	119,46	136,52	146,58	160,83	178,14	198,44	209,99
Italy	1,59	229,28	225,69	231,33	232,19	232,20	231,67	231,69	231,99
Luxembourg	2,26	1061,83	1079,84	1115,64	1113,66	1131,50	1134,15	1158,40	1161,12
Netherlands	2,03	1077,05	1096,51	1115,25	1110,95	1088,84	1083,92	1089,23	1099,71
Norway	3,49	695,64	708,52	719,74	717,52	716,27	717,12	736,12	711,30
Poland	1,92	35,44	36,35	36,02	35,41	35,96	36,02	35,70	35,92
Portugal	0,86	267,62	276,31	280,71	285,35	289,95	296,07	302,65	307,27
Spain	1,69	266,77	267,63	268,53	235,15	235,91	236,58	242,41	287,97
Sweden	1,96	418,50	464,35	455,42	446,66	438,08	429,66	409,81	401,93
Switzerland	0,92	2099,72	2080,58	2061,61	2042,82	2024,19	2005,74	1987,46	2323,10
United Kingdom	2,1	86,17	85,82	85,13	84,90	83,98	84,09	84,80	84,94
Countries	**Inflation Nov 2018**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Austria	2,21	373,35	372,69	371,41	370,00	368,48	367,31	361,02	384,07
Belgium	2,78	391,02	380,45	377,57	386,96	424,36	412,88	401,71	403,65
Czech Republic	2,02	145,12	145,00	145,92	145,67	142,00	145,39	145,17	147,74
Denmark	0,79	521,60	536,78	542,49	553,69	558,42	563,73	549,70	569,23
France	1,89	1795,99	1762,68	1729,98	1800,04	1766,65	1797,62	1764,27	1757,77
Germany	2,27	915,08	894,76	891,11	887,17	867,48	901,24	896,04	876,16
Greece	0,99	114,55	113,42	114,10	88,14	87,27	86,42	85,57	84,73
Hungary	3,15	81,39	81,11	83,46	80,39	82,12	82,45	82,70	84,75
Iceland	3,74	347,66	335,13	348,82	348,12	346,48	346,01	343,54	363,28
Ireland	0,6	215,60	205,61	196,04	194,87	193,71	192,55	191,40	190,26
Italy	1,59	235,73	233,79	230,13	236,25	287,89	286,50	282,58	278,16
Luxembourg	2,26	1187,11	1189,88	1185,69	1195,88	1216,66	1211,93	1186,33	1160,11
Netherlands	2,03	1097,31	1096,03	1095,34	1089,17	1083,37	1074,39	1053,01	1061,05
Norway	3,49	749,76	751,91	760,98	762,29	736,58	765,88	754,25	749,16
Poland	1,92	36,72	46,48	46,79	47,89	48,74	48,25	47,35	46,45
Portugal	0,86	313,48	310,81	308,16	305,53	252,44	250,29	248,15	246,04
Spain	1,69	288,85	286,89	282,12	277,43	272,82	268,29	263,83	259,45
Sweden	1,96	394,21	386,63	379,20	371,91	364,76	357,74	350,87	460,33
Switzerland	0,92	2301,92	2280,93	2260,14	2239,54	2219,12	2198,89	2178,85	2539,46
United Kingdom	2,1	88,42	88,14	88,98	91,67	90,66	89,65	88,67	86,85

Table 9 - Maximum unemployment insurance (UI) benefit duration, in weeks, 2001-2016. The information was manually extracted from the OECD "Benefits and Wages: Country policy descriptions" website. Some relevant assumptions were made and already mentioned in Section 3.1 – "Data and empirical framework - unemployment insurance benefits and corporate borrowing", as well as throughout the paper. It was already mentioned previously, but it is worth noting again, the values for the maximum UI benefit duration for Belgium were assumed to be equal to the highest value in the table since in fact, Belgium has no limit in this variable.

Countries	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Austria	39	39	39	39	39	39	39	39
Belgium	261	261	261	261	261	261	261	261
Czech Republic	26	26	26	26	26	26	26	26
Denmark	209	209	209	209	209	209	209	209
France	130	130	100	100	100	100	100	100
Germany	78	78	78	78	78	52	52	52
Greece	52	52	52	52	52	52	52	52
Hungary	39	39	39	39	39	39	39	39
Iceland	261	261	261	261	261	156	156	156
Ireland	56	56	56	56	56	56	56	56
Italy	26	26	26	26	26	26	26	35
Luxembourg	52	52	52	52	52	52	52	52
Netherlands	78	78	78	78	78	78	87	87
Norway	156	156	104	104	104	104	104	104
Poland	52	52	52	52	52	52	52	52
Portugal	165	165	165	165	165	165	163	163
Spain	104	104	104	103	103	103	103	103
Sweden	60	60	60	60	60	60	60	60
Switzerland	21	21	57	57	57	57	57	57
United Kingdom	26	26	26	26	26	26	26	26
Countries	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Austria	39	39	39	39	39	39	39	39
Belgium	261	261	261	261	261	261	261	261
Czech Republic	22	22	22	22	22	22	22	22
Denmark	209	104	104	104	104	104	104	104
France	104	104	104	104	104	104	104	104
Germany	52	52	52	52	52	52	52	52
Greece	52	52	52	52	52	52	52	52
Hungary	39	39	39	13	13	13	13	13
Iceland	156	156	156	156	156	156	156	156
Ireland	56	56	56	45	45	45	45	45
Italy	35	35	35	35	35	35	43	43
Luxembourg	52	52	52	52	52	52	52	52
Netherlands	87	87	87	87	87	87	87	87
Norway	104	104	104	104	104	104	104	104
Poland	52	52	52	52	52	52	52	52
Portugal	163	163	163	103	103	103	103	103
Spain	103	103	103	103	103	103	103	103
Sweden	60	60	60	60	60	60	60	60
Switzerland	57	57	37	37	37	37	37	57
United Kingdom	26	26	26	26	26	26	26	26

Table 10 – Correlation matrix with all variables used in the regressions. In Table 11 one can see the corresponding names for the codes presented below.

	LMaxTot	DebtMkt	DebtBook	LogIntCov	PropFAss	LogSales	MktBook	ROA	Zscore	GDPgr	UnempR
LMaxTot	1.000										
DebtMkt	0.111	1.000									
DebtBook	0.083	0.873	1.000								
LogIntCov	-0.014	-0.645	-0.629	1.000							
PropFAss	-0.069	0.376	0.330	-0.196	1.000						
LogSales	0.237	0.088	0.137	-0.051	0.035	1.000					
MktBook	-0.068	-0.279	-0.061	0.214	-0.131	0.032	1.000				
ROA	-0.056	-0.388	-0.293	0.570	-0.119	0.055	0.344	1.000			
Zscore	-0.006	-0.352	-0.367	0.401	-0.177	0.195	0.153	0.434	1.000		
GDPgr	-0.385	-0.201	-0.125	0.116	-0.014	-0.070	0.130	0.120	0.062	1.000	
UnempR	-0.232	0.103	0.050	-0.114	0.050	-0.131	-0.079	-0.077	-0.080	-0.160	1.000

Table 11 – Codes of the all the variables used in the regressions and their respective names.

Codes	Variables
LMaxTot	Natural logarithm of the maximum total benefit lagged 1-year
DebtMkt	Total debt-to-total market value of assets
DebtBook	Total debt-to-total market value of assets
LogIntCov	Natural logarithm of interest coverage
PropFAss	Proportion of fixed assets
LogSales	Natural logarithm of sales
MktBook	Total market-to-total book value
ROA	Return on assets
ZScore	Modified altman Z-score
GDPgr	Gross domestic product growth
UnempR	Unemployment Rate