Are human capital costs associated with bankruptcy large enough to be a disincentive for unlisted firms to use more debt? An Empirical Analysis

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Abstract

I empirically test the prediction of Berk, Stanton and Zechner (2010) model that human capital costs associated with bankruptcy are large enough to be disincentive for unlisted firms to use more debt. Leverage has a significantly positive impact on average employee pay. Firms do not act double as a risk-averse workers employer and as his/her insurer against the threat of dismissal. Employees are not willing to take a temporary pay cut to ensure that the financial state of the firm improves in order to avoid a default or bankruptcy of the firm.

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1. Introduction

The question of how capital structure impact employee pay policy has attracted attention at least since Titman (1984). A prevalent view in the existing literature is that the expected indirect bankruptcy costs could be large enough to be a disincentive for firms to use more debt. Examples of the most important indirect bankruptcy costs are the unexpected loss of market share (Opler and Titman (1994)); asset fire sales (Shleifer and Vishny 1992); undesired losses for stakeholders such as customers, employees and suppliers (Titman (1984)). Stakeholders such as customers, workers and suppliers of a firm that produce specialized or unique products are more likely to suffer from a firm's bankruptcy because claimants (such as debt- and shareholders) do not have enough incentives to negotiate around these indirect bankruptcy costs. While the literature has mainly attempted to quantify the direct bankruptcy costs, it has remained largely silent on the indirect costs which are believed to be more important but are difficult to quantify. The objective of this paper is to empirically examine whether human capital costs, an important type of indirect bankruptcy costs associated with using more debt, could be large enough to be a disincentive for unlisted Belgian firms to use more debt[2].

How important are these indirect human capital costs associated with financial distress and bankruptcy in influencing the firm's use of debt? Many studies have provided some mainly important theoretical insights and predictions of the interactions between capital structure and employee compensation that purport to explain the association between corporate capital structures and these human capital bankruptcy costs mainly from a theoretical perspective. Essential in all these theoretical models is whether employees in leveraged firms with a certain

[2] The human capital costs of bankruptcy are important and are often underestimated. For example, Graham, Kim, Li and Qui (2012) show that the human capital costs of bankruptcy to be 15 % - 22 % of pre-distress firm-value for US firms, which indicates that without considering these human costs of bankruptcy, bankruptcy costs of debt are more likely to be significantly under-estimated in the literature.

probability of bankruptcy can insure their own human capital risk. Recently Berk, Stanton, and Zechner (2010) formalize all these previous theoretical insights in one model,' which tries to understand the firm's capital structure decision as a response to market frictions such as bankruptcy costs and taxes by deriving the optimal contract compensation contract in a setting with bankruptcy debt and equity. The contribution of their model is that they are able to derive the implications of the optimal contract between a risk-averse employee and investors in a setting with bankruptcy debt and equity for the firm's capital structure. They find that human capital costs associated to financial distress and bankruptcy can be large enough to be disincentive for firms to hold more debt. Another stream of literature argues that firms use their capital structure as a bargaining tool to transfer more risk from investors and creditors to their employees by limiting rent transferring from investors to their employees (See Hanka (1998)).

An important facet of studies on the relationship between employment policies and firm's capital structure decisions is data availability. This paper does not want to be the first paper in the literature that examines whether human capital costs associated with financial distress and bankruptcy could be large enough to be a disincentive for unlisted firms to use more debt, but this paper wants to include the most essential workforce specific explanatory variables that may help to provide a nearly complete and precise picture on how these relations are defined by using a unique dataset about employee characteristics at firm level. For example, many previous studies focus on listed US firms. Often labor expenses are missing for a large number of listed firms in the COMPUSTAT Database, which may create a potential sample-selection bias when firms decide to whether or not to report labor expenses (Chemmanur, Cheng and Zhang (2013)). The disclosure of any valuable information about the firm's workforce is largely determined by both competitive and capital market concerns (Ballester, Livnat and Sinha (2002)). The findings

of these studies are unlikely to be generalized to all other firms and may subject to potential sample-selection bias if firms selectively decide whether or not to report this information on their workforce. By contrast Belgium consistently requires mandatory disclosure of not only the total labor costs, but also information on the composition of the workforce (for instance: blue-collar workers, white-collar workers, gender of employees, part-time vs. full-time employees, full-time equivalent employees, average number of employees, temporary workers, employee layoffs etc.). As a result Belgium provides an interesting test ground for financial or/and labor economists to examine whether human capital costs associated with bankruptcy are large enough to be a disincentive for unlisted firms to use more debt.

The main empirical result of this paper is that firm with higher debt levels are associated with higher average employee pay in the instrumental GMM regressions. Firms with higher leverage pay a higher wage to their employees to compensate them for the expected bankruptcy costs borne by them. An increase in book leverage by one standard deviation is associated with an increase of more than 5.40 % or 2,041.07 euros in average employee pay, a magnitude that is economically significant. My main result holds when alternative proxies for leverage are been used.

After documenting the robustness of the main result, I examine whether the effect of leverage on average employee pay differs when accounted for employee risk-aversion, employee entrenchment, the importance of employee layoff risk and financial distress. Employees with relatively high risk-aversion have a higher probability of losing their job in highly leveraged firms. I define blue-collar workers as employees with relatively high risk-aversion. It is a stylized fact that the employees with relatively high risk-aversion such as blue-collar workers experience higher rates of unemployment than the rest of society. These workers may lose their job, may

also significantly more likely to experience financial hardship and family problems (Broman, Hamilton, and Hoffman (1996)). As a result, employees with relatively high risk-aversion will seek more employment insurance. They are willing to pay for the provided employment insurance. Berk, Stanton and Zechner model predicts that when employees with relatively high-risk aversion value human capital insurance, then firms will optimally respond by reducing debt by even giving up the benefits of debt to enhance more risk-sharing between shareholders and employees. Employees with relatively high risk-aversion pay for the provided employment insurance by accepting lower wages. The evidence supporting this prediction is nonexistent.

Unemployment risk is an important element in the model of Berk, Stanton, and Zechner (2010). Unemployment risk is defined as the degree of inability of an employee to insure fully their own human capital risk. If employees are unable to insure fully their own human capital risk, employees will demand higher wages. It is extremely important and challenging to find an adequate proxy to test this prediction. The most adequate proxy for unemployment risk is often defined as the number of people actively looking for a job as a percentage of the labor force. I argue that the unemployment rate misses an important part that explains the importance of unemployment risk for an employee: the costs of reemployment in case of an employee layoff or the degree of worker's entrenchment. For instance, workers are not worried about their high dismissal risk when their costs of reemployment (proxied by the number of workers who left the firm voluntary) are negligible when they are dismissed. Workers may be able to insure their own human capital risk much better in another firm then their own firms. As a result, workers may move to another firm to insure their own human capital risk. I define the importance of unemployment risk as the difference of number of dismissed workers by the firm and workers that voluntary left the firm when they have better outside options scaled by number of

employees. This measure is standard normalized at sector level per year. I find that employees in firms with high unemployment risk earn between 1.6 and 1.9 % more than employees in firms with low unemployment risk. This result is quite surprising and interesting because Belgium has a very comprehensive social security system that potentially reduces employees expected costs of bankruptcy. However, employees in firms with higher leverage and higher unemployment risk do not receive a wage premium.

An important prediction of Berk, Stanton and Zechner (2010) model is that wages never fall and rise in response to good news about employee productivity, unless the firm cannot make interest payments at the contracted wage level. The employee will take a temporary pay cut to ensure full payment of the debt. I test this prediction by examining whether the relation between the interest coverage ratio and average employee pay is nonlinear. I do not find that employees take a temporary wage cut when the firm's risk of defaulting on their debt obligations increases. Perotti and Spier (1993) argue that labor unions would allow their employees to earn less to improve their financial health of highly leveraged firms. I test the importance of the degree of financial distress in influencing the effect of leverage on average employee pay by examining the joint effect of both leverage and the degree of financial distress on average employee pay. If financial distress attenuates the positive effect of leverage on average employee pay, then the interaction term between the financial distress and the proxy for leverage should have a positive coefficient, while the stand-alone proxy (i.e., the direct effect) for financial distress should have the typically observed negative coefficient. I also include the measure of leverage as a direct effect (stand-alone measure) to test the hypothesis that leverage increases liquidation or bankruptcy risk, which positively affects leverage. The results do not point out that employees will earn less to improve the financial health of the firm of highly leveraged firms.

This paper is related to the growing empirical literature that examines whether human bankruptcy costs associated with financial distress and bankruptcy could be large enough to be a disincentive for unlisted firms to hold more debt. Only a small number of papers that have been dedicated to human bankruptcy costs have touched upon the relationship between capital structure decisions and compensation of a collective employee for unlisted firms: see, e.g., Hovakimian and Li (2011), who documents that Chinese manufacturing firms with more debt pay lower wages; and Akyol and Verwijmeren (2013), who show that the average employee wage for Dutch firms is higher when firms hold more debt. Chemmanur, Cheng and Zhang (2013) also tests the prediction of Berk, Stanton, and Zechner (2010) model in the US and obtains conclusions that are consistent with respect to the relation between wages and leverage. The authors find a positive association between wages and leverage for US firms.

I add to the literature by showing the importance of workforce characteristics such as the importance of unemployment risk, degree of risk-aversion and employee entrenchment in influencing the relation between the observed capital structures of unlisted firms and the average wages of their workforces. Greater wages are not required to compensate employees for the potential loss of their human capital in highly leveraged firms when I account for the effect of risk-averse employees, employee entrenchment, and importance of employee layoff risk on the association between observed capital structures and the average employee pay in Belgium. These results can partly be explained by institutional factors. Belgium is known for their relatively high unemployment benefits. In a related study, Agrawal and Matsa (2013) show that US state unemployment benefits are positively associated to firm's debt levels, indicating that firms are able to use more debt when employees' cost of bankruptcy are reduced. This relation is stronger when unemployment benefits are more relevant.

My paper contributes to the literature by showing that leverage cannot always be used as a bargaining tool for firms against labor to negotiate wages downwards when firms faces a significant probability of financial distress. My empirical results do not confirm to what is been argued by Perotti and Spier (1993) that the disciplining effects of debt on labor is greater in highly leveraged firms with a higher degree of financial distress.

The rest of this paper is organized as follows. Section two reviews the relevant theory in more detail and develops testable hypotheses. Section three discuss relevant institutional features of the Belgian labor market. Section four describes the sample and variable selection. Section five presents the empirical results of the effect of capital structure on average employee pay. Section six provides the empirical evidence of the effect of employee entrenchment, importance of unemployment risk, employee risk-aversion and financial distress on the relation between the observed capital structures and the average employee pay. Section seven concludes.

2. Development of hypotheses

In a setting without bankruptcy, debt, or limited-liability equity, Harris and Holmström (1982) model shows that the optimal employment contract between a risk-averse worker and a risk-neutral equity holder guarantees job security, and pays employees a fixed wage that never goes down but rises in response to good news about employee ability. The employee is averse to bearing his own human capital risk. Their intuition is that while employees are averse to their own human capital risk. This is because the risk idiosyncratic. As a result, equity holders can costless diversify it away. Optimal risk sharing between shareholders and employees implies that the shareholders will bear all the risk by offering their employees a fixed-wage contract. However, employees cannot work under such contract because employees who turn out to be better than expected will threaten to quit unless they get a pay rise.

Titman (1984) and Berk, Stanton and Zechner (2010) extend the insights of the model of Harris and Holmström (1982)). Titman (1984) develops a model in which he argues that stakeholders such as customers, workers and suppliers of firms that produce specialized or unique products are more likely to suffer from a firm's bankruptcy. This is mainly because claimants (debt- and shareholders) do not have enough incentives to negotiate around these indirect bankruptcy costs. Employees bear significant costs such as significant reductions in consumption (Gruber (1997)), long delays before being again re-employed (Kats and Meyer (1990)); and possible wage cuts after returning to work (Gibbons and Katz (1991), Farber (2005)) in the event of liquidation. In general, bankruptcy can impose significantly costs on employees mainly through reducing the value of their human capital which can affect the firm's capital structure decision. Moreover, if these indirect human costs of bankruptcy are large enough then these costs can impose significant limits on the use of debt.

Berk, Stanton and Zechner (2010) derive the optimal compensation contract for a firm's capital structure with one risk-averse employee and risk-neutral investors which operates in competitive labor and capital markets. The employee is averse to bearing his own human capital risk. If the firm is financially constrained, the employee has to take a pay cut to fully ensure repayment of debt. This is because the employee could be terminated in an event of default. Employees face substantial human costs in the event of default and financial distress. Employees in highly leveraged firms are unable to insure fully their human capital risk in these events. As a result, highly leveraged firms have to pay, in equilibrium, a higher wage to their employees to compensate them for the expected human bankruptcy costs borne by them. In contrast, employees in less leveraged firms pay for the employment insurance provided by the labor contract by accepting lower wages. I have the following testable hypotheses.

Hypothesis 1. Firms with higher leverage will incur larger average employee pay.

An important prediction of both Perotti and Spier (1993) and Berk, Stanton, and Zechner (2010) models is that firms with higher debt levels will incur lower average employee pay when they are in financial distress. Perotti and Spier (1993) argue that firms use higher leverage to negotiate the workers' wages downward ex post, but they still will demand higher expected wages ex ante to compensate them for bearing this risk. However, firm are only able to use leverage as a bargaining tool to reduce employee wages when their profits from existing assets are small or when the firm has a significantly probability of financial distress. Moreover Berk, Stanton and Zechner (2010) argue that if the firm is in a state of financial distress than employees will take a temporary pay cut to ensure that the financial state of the firm improves in order that the firm is able to fulfill their debt payments and bankruptcy is avoided. In case the firm deteriorates further, than it is forced into bankruptcy. In bankruptcy, the employees will be dismissed. Employees' wages at moment of termination will typically be substantially greater than their competitive market wage because contracted wages never fall in response to bad news about the employee productivity. Consequently these employees face substantial costs resulting from a bankruptcy filing. They will be forced to take a wage cut and earn their market wage. If the financial health of the firm improves, wages return to their contracted level. This yields my second testable hypothesis.

Hypothesis 2. Firms with higher leverage will incur lower average employee pay when they have a higher degree of financial distress.

Another important implication of Berk, Stanton, and Zechner (2010) model is that the amount of risk sharing between investors and employees depends on the level of debt. Leverage is related to the employee's willingness to bear risk. In essence, firms with more risk-averse

employees will optimally choose to hold less debt. When employees with relatively high risk-aversion value human capital insurance more, firms will optimally respond by reducing debt by giving up debt benefits (such as tax shields) to enhance more risk-sharing between risk-averse employees and investors. All else equal, firms with more risk-averse employees should hold less debt. More employees with relatively high risk-aversion are better off working for firms with lower leverage, and employees with relatively low risk-aversion are better off working for firms with higher leverage. Firms with more risk-averse employees will provide more employment insurance, and, hence will choose to hold less debt. However, employees with relatively high risk-aversion pay for the employment insurance provided by the labor contract by accepting lower wages. Thus I have the following testable hypothesis.

Hypothesis 3. Firms with lower debt levels will incur lower average employee pay when they employ more risk-averse employees.

Another important element of the model of Berk, Stanton and Zechner (2010) is the degree of layoff risk. Job entrenchment in their model is defined as the degree to which employees are unable to insure their own human capital risk against dismissal. If employees in firms with high levels of debt are unable to insure their own human capital risk, then employees are entrenched and will demand a higher pay (premium) for a firm with higher debt levels. Previous evidence studied the impact of employee job entrenchment on the leverage-wage association by examining technology versus nontechnology firms (see Chemmanur, Cheng and Zhang (2013)). However to empirically examine the effect of job entrenchment on the leverage-wage association, I use yearly standard normalized firm's layoff risk rate adjusted by the number of employees that have voluntarily left the firm as a proxy for employment entrenchment. Employees receive more information whether they can insure their own human capital risk if they know the risk of being

unemployed and the costs of reemployment in case of a dismissal (Agrawal and Matsa (2013)). Employees in highly leveraged firms may not fully insure their own human capital risk when the firm's unemployment risk is high and the costs of reemployment are high. As a result, employees in highly leveraged firms may demand a higher pay (premium). I expect to observe a stronger effect of leverage on average employee pay when the employees have higher risk of being dismissed. This yields my final testable predictions.

Hypothesis 4. Firms with higher leverage will incur higher average employee pay when employees in these firms have higher expected human capital costs.

Hypothesis 5. Firms with more entrenched employees will incur lower average pay when firms holds less debt.

3. Institutional Features of the Belgian Labor Market[3]

This section briefly reviews some important features of the Belgian labor market that may be relevant for understanding wage formation. Important characteristics are existence of minimum wage, indexation, a cap on wage increases, and the importance of sectorial collective bargaining. First, the minimum wage applies to workers over 21 years old and with at least six months' tenure. The second important characteristic of the Belgian Labor market is full automatic indexation of nominal gross wages. Indexation is applied with respect to the health index, which is the consumer price index excluding alcoholic beverages, tobacco and motor fuels. Third, real wage increases in the private sector are also largely established by negotiation between the social partners. Since 1997, the wage norm provides a guideline for maximum nominal hourly labor costs increases. It is fixed for two years by an InterProfessional Agreement between employers and workers' representatives. Fourth, collective bargaining at the sector level has also a major

[3] The overview of the institutional features of the Belgian labor market is based on Fuss (2008). For references to the institutional features of the Belgian labor market in Belgium, please refer to Fuss (2008).

role in wage formation. Employers and union bargain with an equal weight to determine various aspects of wages, as well as other aspects of labor (such as training, mobility, etc.) These negotiations are often separate for white-collar and blue-collar workers. Sector-level collective agreements sets pay scales as well as real wage increases. Pay scales define a minimum wage by sector and occupation. These also depend on age or tenure for white-collar workers, and for a few blue-collar workers.

4. Data and variables description

In this section I describe the data and variables.

4.1. Data

I study a large unbalanced panel of unlisted firms that are covered by the BELFIRST database for 2001-2010. The BELFIRST database provides two main categories of variables: static and annual variables. Accounting data is primarily annual. The values are reported for each accounting year-end date. This paper also uses static variables such as sector codes. The static variables requires the disposition of the BELFIRST database per cross-section (2001, 2002, 2003 2004, 2005, 2005, 2006, 2007, 2008, 2009 and 2010).

The following filters are imposed. I exclude firm years with average employees below 5, average employee pay below or equal to the minimum annual gross wage of 18,712.56 euros4, with blue-collar workers greater than 1, with physical capital intensity below 0. The calculation of the dummy employee layoff rate, employee entrenchment, and human capital dummy require that sufficient number of firm years per NACE2008 sector. These dummy variables are constructed based on standard normalized variables. The calculation of these variables requires a

[4] This minimum wage level is applicable throughout the private sector. I do not have information about the minimum gross wage/salary of employed persons fixed by collective bargaining agreements. As a result, this paper uses the highest minimum gross wage determined at the inter-professional level, which is applicable throughout the private sector. More precisely, I use the monthly gross wage for workers aged 22 with twelve months seniority, which is 1559,38 euros. This monthly minimum gross wage is multiplied by 12, which results in a minimum annual gross wage of 18,712.56 euros. The information of the minimum gross wage/salary comes from the Federal Public Service Employment, Labour and Social Dialogue (http://www.employment.belgium.be).

minimum number of firms per 2-digit NACE2008 sector per year. The minimum required number of firms per 2-digit NACE2008 sector per year is 100, which results in 13 sectors. I lose one firm-year observations to calculate the dummy employee layoff rate. I further remove missing observations for all variables. The outliers are removed by winsorizing the extreme observations at the 1% left or right tail of the distribution. Imposing these filters I obtain a sample that consists of 4,070 firms corresponding to 35,499 firm-year observations with available data on all the variables.

4.2. Dependent variable: average employee pay

The dependent variable is the average employee pay. The average employee pay is the natural logarithm of the ratio of full-time-equivalent (FTE hereafter) labor costs to the average total FTE workers. Differently from previous studies, I am able to distinguish between the differences and importance of workload of employed part-time and full-time workers in total workforce in relation to the total labor costs of a firm. FTE employees equal the number of workers on full-time basis plus the number of workers on part-time basis converted to a full-time basis. Part-time workers are weighted in correspondence to the full-time work schedules.

4.3. Determinants of Average Employee Pay

4.3.1. Measures of Capital Structure

I measure leverage in five ways. The broadest definition of leverage is the ratio of total liabilities to total assets. This proxy can be seen what is left for shareholders in case of liquidation. The alternative broadest definition of leverage is also computed as (total debt)/ (total debt + book value of equity). I also use net leverage. Net leverage is defined as the ratio of the difference between total debt and cash holdings to the difference between the book value of total assets and cash holdings. The book value of assets is substituted in the denominator for book

value of equity and total debt for the alternative net leverage. The intuition for the use of net leverage is that cash holdings are often seen as negative debt and should be an integral part of the financing decision of the firm. For example: if a firm borrows more money and keeps the proceeds as cash within the firm then this transaction raises the firm's debt and leverage. However, firms are able to subsequently reverse this transaction by using the cash to pay off the debt. As such the firm's net debt and net leverage have not changed. As result, the amount of cash in the firm's balance sheet is been subtracted from the value of outstanding debt and from total assets to determine the firm's leverage (Lambrecht and Pawlina (2012)).

An important measure of the risk that equity holders will not be able to make fixed debt payments and will have to give up control in the interest coverage ratio, which is defined as the ratio of the firm's operating result after depreciation expenses to interest expenses. The use of the interest coverage ratio is important for firms that are expected to grow because it can lead to different conclusions when either leverage and interest coverage ratio are been used. Firms whose cash flows are expected to grow can have low debt levels when measured by leverage, but high debt levels when measured on an interest coverage basis. Debt is low relative to future expected cash flows but the required interest payments are large relative to current cash flows (Agrawal and Matsa (2013)).

4.3.2. Work-force specific control variables

Importance of Unemployment risk: Agrawal and Matsa (2013) argue that workers attach importance to both the risk of being unemployed (inability of the employee to insure his/her own human capital risk) and the costs of reemployment in case of a dismissal. Workers may attach more (less) value to unemployment risk in case they face higher (lower) costs of reemployment. An obvious firsthand measure is the ratio of dismissed FTE workers to the total workers.

However, this measure does not account for the costs of reemployment of dismissed workers. The workers are not worried about their high dismissal risk when their costs of reemployment are low when they are dismissed. This means that workers have better outside work opportunities compared to their own firm. Thus, it is essential to take into account the costs of reemployment (better outside work opportunities) in determining the importance of unemployment risk for workers. The number of FTE workers that voluntary have left the firm is been used as a proxy for the cost of reemployment for workers of the firm. The number of dismissed FTE workers (sum of forced dismissals and early retirements) is been used as a proxy for dismissal risk. As a result, I define the variable X_{itj} as the difference between the number of dismissed FTE workers and FTE workers that voluntary have left the firm scaled by the number of FTE employees of a firm i in year t-1 and in 2-digit NACE2008 sector j. I scale the difference between layoffs and voluntary departures by the total FTE workers to prevent that my measure is biased against capital intensive firms. An important strength of this ratio is that this ratio fully captures how many FTE workers are been dismissed during the year and the importance of costs of reemployment (better outside work opportunities). Then I convert the variable X_{itj} into a standardized normal distribution. If X_{itj} is normal with mean μ_{tj} and variance σ_{tj}^2 , than

$$Z_{itj} = \frac{X_{itj} - \mu_{tj}}{\sigma_{tj}} \quad (1)$$

has mean zero and unit variance. Z_{itj} has the standard normal distribution. This standard normal random variable captures the distance of the employee layoff risk of the firm from the sector mean. A positive (negative) z-value indicates that the risk of being dismissed is important to the firm compared to the sector's average risk of employee layoffs. This variable is calculated by taking into account the firms with missing values. I define a dummy variable layoff risk that equals to one when the z-value lays in the open interval]0; +∞[, else zero. A detailed overview

of the cross-sectional distribution of this standard normalized variable over the sample period 2001 to 2010 is provided in Table 1 of Appendix A. Employees are entrenched when they are unable to insure their own human capital risk in case they have a high unemployment risk. As a result, I expect that employees in firms with a high unemployment risk pay their employees more than firms with a low unemployment risk.

Temporary employment: As proxy for temporary employment, I define a dummy variable that equal to one for firms rely on 10 % more on seasonal workers that are registered at the temporary employment agency (Hanka (1998)). Seasonal workers are scaled by FTE average workers in the firm. Seasonal or temporary workers are paid smaller wages than permanent workers (Nienhüser and Matiaske (2006)). Firms that use seasonal workers are expected to have lower average employee pay than firms that do not use seasonal workers.

Employee risk-aversion: I use the share of FTE blue-collar workers in total workforce. Literature has shown that blue-collar workers are employees with a relatively high risk-aversion that face significant barriers to enter new position when they are dismissed because of the very competitive nature of the labor market (Taubman and Wales (1978); Harris and Holmström (1982) and Berk, Stanton and Zechner (2010)). Moreover, the wage dispersion between blue-collar and white-collar workers is substantial. It is also shown that employees with a relatively high risk-aversion have lower reservation wages, and conditional on productivity they receive lower wages. Thus, employees with a relatively high risk-aversion receive lower wages than equally productive but less risk-averse workers. A difference in risk aversion will cause a wage gap to arise between the two types of workers for at least two reasons: First, employees with a relatively high risk-aversion have less bargaining power, and therefore receive a lower wage for any matched job. The second and final reason is that employees with a relatively high risk-

aversion have a lower reservation wage and therefore accept less productive matches than those accepted by the less-risk adverse worker (Nachman (1975), Vesterlund (1997)). In addition, the Belgian legislation has introduced the system of temporary unemployment to protect blue-collar workers against dismissal when the firm's financial state deteriorates, bad weather, strikes or other economic reasons. The temporary unemployed blue-collar workers are granted unemployment benefits. This can be an important source of support for the employer, as it relieves them of the obligations to bear all of the costs of the temporary unemployment benefit conferred. I expect that the share of highly risk-averse workers affects average employee pay negatively.

Employee or job entrenchment: The proxy for employee entrenchment is calculated as follow: first, I define the ratio of voluntary left FTE employees of a firm in year t to the total number of FTE employees in previous year. Next, this ratio is standard normalized at sectorial level and per year. Finally, I define dummy variable employee entrenchment equal to one for firms with employee entrenchment in the annual sector employee entrenchment interval $]-\infty; 0[$, and zero otherwise[5]. Table 2 in Appendix A provides an overview of the distribution of the standard normalized variable employee entrenchment. Firms pay their entrenched employees. Several types of private benefits to firms can arise from paying entrenched workers more. For example, higher wages can make relationship with the employer and their workers more pleasant, and higher compensation may also produce more loyalty. Moreover, higher pay can also reduce the employer's effort in wage bargaining , particularly when employers face aggressive and conflict-inclined workers' unions (Cronqvist, Heyman, Nilson, Svaleryd and

[5] The data does not allow me to identify individual employees with firm-specific human capital.

Vlachos (2009)). I expect that firms with more entrenched employees pay more than firms with less entrenched employees.

Labor productivity: As a proxy for labor productivity, I use the gross added value productivity measure as a proxy for employee productivity. This proxy is defined as the ratio of the added value to total average number of FTE workers in the firm. Added value is defined as the difference between operating income and charges and the sum of the costs of purchases of goods; and services and other goods. Wages will always rise in response to good news about their productivity (Harris and Holmström (1982); Mincer (1991); Berk, Stanton and Zechner's (2010)). However, it is possible that a rise in employee productivity is caused by lowering total labor costs through a downsizing of the firm's workforce (Cashell (2004)). I expect that firms with highly productive employees will pay their employees more.

Workplace representation: Workplace representation in Belgian firms runs through three separate channels: the works council; the trade union delegation; and health and safety committee. I have no information available about trade union delegation. As a result, I am unable to control for the effect of trade union delegation on average employee pay.

Works council acts as a body of control of collective agreements on the firm level. They have formally no impact on wage bargaining with the management. However, works council may have an indirect influence on wages by making use of their codetermination rights. For example, works councils may introduce new payment methods or new employee performance monitoring technologies. Two possibilities do exist: First, works councils may participate in wage agreements above the collectively bargained levels. Second, they can negotiate about the allocation of employees in higher wage groups. (Grund and Schmitt (2011)). In case works

councils and the management fail to reach an agreement, than they can threaten to be uncooperative at issues with considerable codetermination rights.

The works council represents the whole workforce and it is only elected in firms when the number of workers employed on average is at least 100. Unions nominate the candidates of the works council. Hence, all the members of the works council are all union members. I define a dummy variable works council equal to one when the firm employs at least 100 workers, else zero. I expect that average employee wage is increased by works councils.

The final workplace representation occurs through a health and safety committee. This committee has some information and consultation rights on economic and social issues. This committee enables employees to express their dissatisfaction with certain working conditions instead of quitting their jobs. The employer is interested in such decentralized information and thus in adjusting the working conditions with respect to employees' preferences. This may lead to higher job satisfaction and lower turnover because it increases trust between the employer and the workforce. Respect and appreciation by the employer influence employee's productively positively and increases their pay (Berk, Stanton and Zechner (2010), Grund and Schmitt (2011)). The health and safety committee is installed when the firm employs on average at least 50 employees. As a result, I define a dummy variable health and safety committee equal to one when the firm employs at least 50 workers, else zero. I expect that average employee pay is increased by health and safety councils.

4.3.3. Firm-specific control variables

Firm size: I use the natural logarithm of total assets as proxy for the firm-size effect on wages. It is well-known stylized fact that larger firms pay higher wages. Previous research provides a mix of reasons why larger firms tend to pay higher wages. For example, larger firms

pay higher wages because they employ more quality (highly skilled) workers (Brown and Medoff (1989)). Employees tend to be more productive in larger firms and therefore may ask higher wages (Oi and Idson (1996)). Workers in organization hierarchies with more upper layers of employees require higher pay (Strand (1987)).

Firm age: I proxy firm-age effect as the natural logarithm of firm age (in years). Employee's quality, work-experience and work tenure with firm is positively correlated to firm age. Established firms are more likely to offer fringe benefits such as pension plans and health insurance (Hall (1982); Brown and Medoff (2003); Farber (2005)). As a result, more mature firms will pay higher wages. However, workers in older firm that have a strong reputation may receive lower wages because of the long-term employment prospect. I expect that firms that have been longer in business pay their employees more.

Financial distress: As a proxy for financial distress, I use the Z"-score (Altman (1993)). The formula for the Z"-score is 6.56 *(working capital/total assets) + 3.26 * (retained earnings /total assets) + 6.72*(EBIT/total assets) + 1.05*(capital/debt). A lower Z"-score corresponds to a greater probability of bankruptcy. Employees in financially constrained firms face a higher exposure to unemployment. As a result, firms may have to compensate their workers for bearing greater unemployment risk induced by an increase of the firm's bankruptcy risk (Ofek (1993); Atanassov and Kim (2009); and Agrawal and Matsa (2013)). I expect that financially constrained firms will pay their employees more.

Profitability: Profitability is defined as a ratio of earnings before interests, taxes, depreciation and amortization (EBITDA) to book value of total assets. Previous research has shown that firm performance is positively associated with wages (See Blanchflower, Oswald, and Garret (1990); Christofides and Oswald (1992); Blanchflower, and Oswald, and Sanfey

(1996. The main argument is that when firms generate profits than they should share their profits also with their employees through an increase in wages. Employees may threat to leave the firm or withdraw their co-operation in certain projects when profitable firms are not willing to share their rent with their employees (Krueger and Summers (1988)). I predict that profitable firms pay their employees more.

Physical capital intensity: Consistent with Chemmanur, Cheng and Zhang (2013), physical capital intensity of the firm is defined as gross property, plant, and equipment scaled by book value of total assets. Firms that highly value their human capital are labor-intensive firms. These firms tend to have less physical capital intensity and have less debt capacity (Qian (2003)). However, labor-intensive sectors have a higher chance of bankruptcy, firms in these sectors pay their employees more. These firms endogenously respond by using less debt or even holding only cash which decreases the probability of bankruptcy. As a result, the effect is reversed, hence, capital-intensive firms pay higher wages (Berk, Stanton, and Zechner (2010)). I expect that firms with more physical capital intensity pay their employees more.

5. Empirical results of the effect of capital structure on average employee pay

5.1. Summary Statistics

Summary statistics for the full sample are presented in Table 1. According to the first definition of leverage (debt to total assets) the average (median) sample firm leverage is 0.62 (0.65). The average (median) net leverage of a firm is 0.54 (0.61). The mean value of average employee pay is 37.797.57 euros. I provide an overview of the heterogeneity across sectors in Table 3 in Appendix A. The sample displays considerable cross-section heterogeneity: the highest average employee pay is more than 3.49 times the size of the lowest average employee pay. Employees in an average firm have 65 % more risk of being dismissed than employees in

low layoff risk firms. 67% of the sample firms are firms with entrenched employees. The mean (median) labor productivity is 58.66 (52.46). On average, 67% of the workforce consists of blue-collar workers. An average (median) sample firm employs 39 (16) full-time equivalent employees.

The sample firms are quite large in terms of firm size, which ranges from 198789.15 euros to 183.92 million euros. Large number of firms of my sample are financially strong and profitable firms. 75% of the firms have a physical capital intensity of 40%.

Previous research has shown that the firm's sector may influence the outcome of the associations between the firm's capital structure and average employee pay (Perrotti and Spier (1993); Qian (2003)). As a result, I expect that a large degree of heterogeneity should exist between the capital structure (net leverage) and average employee pay across 2-digit NACE2008 sectors. Figure 1 provides interesting initial insights of the cross-sector heterogeneity in the association between net leverage and average employee pay. The results of this conditional correlation analysis suggest that sector heterogeneity is important in determining the empirical relation between net leverage and average employee pay. In addition I also present the pairwise correlation between net leverage and employee entrenchment (Figure 2) and employee layoff risk (Figure 3) across 13 2-digit NACE2008 sectors.

5.2. Levels of average employee pay

Leverage may be correlated with almost every aspect of corporate financial and real policies. Consider for example the concern that an omitted variable that might be linked to higher pay is also correlated with leverage capacity. A fixed effects estimator may partly alleviate the concerns of endogeneity of the leverage variable by preventing that an omitted factor will be related to both average employee pay and net leverage.

To address the ensuing endogeneity, I threat the leverage proxies as endogenous in an instrumental generalized method of moments (GMM) estimation framework. The instrumental GMM method relies on instrumental variables for the leverage proxies. The GMM approach accounts for the fact that the regression residuals are heteroskedastic and serially correlated across both firm-level observations (Fan, Titman, and Twite (2012)).

In search for valid instruments I aim to find exogenous variables that are economically related to leverage but are uncorrelated with the error term of the second-stage regressions, explaining average pay levels. I instrument the leverage proxies by using a proxy for shareholder risk-aversion of unlisted firms. Shareholder risk-aversion is defined as the sum of the ratio of book value of total assets to book value of equity and the ratio of profit/loss of the year before taxes plus income taxes to the sum of profit/loss of the year before taxes, income taxes, debt charges, interest subsidies and discounts on for negotiations on debt. Higher values of this ratio indicate higher financial risk that the firm will default on their debt payments, and hence more risk for shareholders (Ooghe, and Van Wymeersch (2006))[6]. All firm-level variables are lagged 1 period to allow for the noncontemporaneous nature of the interactions between firm-level characteristic and average employee pay. I include year and sector fixed effects[7]. I further cluster-adjust the regression standard errors at the firm level. Finally, note that I do not report the R^2s for my GMM regressions, since as Goldberger (1991) highlights, there is no guarantee that the R^2s reported in instrumental variable regression models lie between zero and one. Unfortunately, there is no widely accepted goodness of fit measure for instrumental variable

[6] It is impossible for unlisted firms to calculate the traditional beta or systematic risk measure from the market model that relates firm rates of return to the market rate of return.

[7] I include sector fixed effects as opposed to firm fixed effects for two main reasons. First, the results of Figure 1 shows that the association between average employee pay and leverage significantly differ across sectors. Second, including firm fixed effects requires variation within firms across time in the key variables leverage, importance of employee layoff risk, and employee entrenchment. Firm fixed effects would defeat the purpose of including these key variables in my regression analysis. Year fixed effects control for aggregate variation in employee pay (Chemmanur, Cheng, and Zhang (2013)).

regression estimation techniques. Table 2 contains the results of the average employee pay regressions.

Firms with higher levels of debt higher incur, all else equal, larger average employee pay. Leverage has a positive effect on average employee pay. The coefficients on all the five leverage ratios are positive and significant at the 1% level. This result supports Hypothesis 1. Higher debt levels implies an increased probability of bankruptcy and employees are unable to insure fully their human capital risk, firms with higher debt levels pay, in equilibrium, a higher wage to the employees to compensate them for the expected bankruptcy costs borne by them (Berk, Stanton and Zechner (2010); Chemmanur, Cheng and Zhang (2013)). The effect of a one-standard deviation increase in leverage implies a meaningful increase of average employee pay that ranges between 21 % (7,937.49 euros) and 37 % (14,022.90 euros) depending on the proxy of leverage. The relative important of the first hypothesis vary with the level of leverage. In order to capture the trade-off between the different roles of leverage more adequately, I specific a quadratic functional form to allow to the relationship between leverage and average employee pay to be non-monotonic. For instance leverage can serve different purposes such as reducing agency costs, a buffer to shocks, etc. (Baele, De Jonghe and Vander Vennet (2007)). I do not find a non-linear relationship between leverage and average employee pay. The results reported of the interest coverage ratio and its quadratic term in the final model of Table 2 are of particular interest, because interest coverage ratio measures also the number of times a company could make the interest payments on its debt with the earnings before interest and taxes. The lower the interest coverage ratio, the higher the company's debt burden and the greater the possibility of bankruptcy. As a result, I am able to test an important prediction from Berk, Stanton and Zechner (2010) model that when firms cannot make interest payments at the contracted wage level, the

employees will take a temporary pay cut to ensure full debt payment. If firms are able to fulfill their debt payments than wages return to their contracted level. I can conclude by noting that there appears to be no evidence to support this important prediction of Berk, Stanton, and Zechner (2010), to the extent to which my proxy for debt default is an unbiased one. Moreover, the results of the first stage GMM regression confirm that the instrumental variable shareholder risk aversion is very strong instrument for the endogenous variable leverage. The first-stage F-statistic is far above the benchmark of the F-statistic when only one instrumental variable is included. The benchmark of the F-statistic for one instrument is 8.96 (Stock, Wright, and Yogo (2002)). The first-stage F-statistic of the instrumental variable in the first stage ranges between 44.76 and 325.35. I include both the shareholders risk aversion, its quadratic and shareholder risk aversion to the third power as instruments when I specify a quadratic functional form to allow the relationship between leverage and average employee pay to be non-monotonic. My instruments appear to be valid as indicated by the F-test of joint significance of the excluded instruments, and the test of overidentification.

Prior empirical studies have shown that firms with a high unemployment risk tend to pay higher wages to their employees than firms with a lower unemployment risk, so I expect that the coefficient of unemployment risk to be positive. Employees in firms with high unemployment risk earn 1.8 % (680.36 euros) more than employees in firms with low unemployment risk in Model 1 of Table 2**,** which is very substantial taken into account the very generous system of high unemployment benefits in Belgium. This result is in line what other typical studies do find. For example, Akyol and Verwijmeren (2013) find that a one point increase in unemployment risk is related to an increase of the average wage by 3.7 % in the United States. Firms with more

entrenched workforce pay 2.7 % or 1020.53 euros more than firms with less entrenched workforce.

Employees in firms with a works council receive 3.50 % or 1,322.92 euros more pay than employees in firms without a works council in Model 1 of Table 2, consistent with the theoretical considerations and empirical evidence that show that the presence of works councils affects both the allocation and the distribution of economic rent in favor of the employees. Works councils' opportunities for a wage premium include allocating workers into higher defined occupational wage groups or working towards wages above the collective wage agreements (Freeman and Lazear (1995); Grund and Smitt (2011)). The installation of a health and safety committees improves the well-being of the employees. Employees in firms with a health and safety committee earn 4.2% or 1,587.50 euros more than firms without a health and safety committee in the same model of Table 2.

I discover that the coefficient (-0.091) on the share of employees with a relatively high risk-aversion reveals that an increasing reliance on highly risk-averse employees decreases the average employee pay. To illustrate the economic impact of employees with a relatively high risk-aversion on average employee pay; an increase in the share of highly risk-averse employees from the first sample quartile (0.53) to the second sample quartile (0.78) decreases the mean average employee pay by 2.28 percentage points. Hence, while the relationship is statistically significant, the economic impact on average employee pay seems rather small. Labor productivity affects average employee pay positively, consistent with my expectations.

Financially constrained firms pay their employees less in Model 1 of Table 2. This finding is consistent with the literature which argues that firms are more likely to pay their employees more due to the increased default risk of the firm. When the Z"-score changes from the 25th

percentile to the 50th percentile, the firm's mean average employee pay increases by 2.11 percentage points.

For the other remaining firm-specific control variables I find that both firms are positively related to average employee pay. This effect is predicted. Inconsistent with Cronqvist, Heyman, Nilsson, Svaleryd, and Vlachos (2009), physical capital intensity has a significant negative effect on average employee pay (Model 1 in Table 2). It seems that less capital intensive firms are less productive. With respect to firm profitability, profitable firms pay their employee less, inconsistent with the argument put forward by labor economists that rent sharing between firms and employees is highly desirable when employees co-operate in profitable projects (Hanka (1998); Akyol and Verwijmeren (2013)). The economic effect is nontrivial: a one-standard-deviation increase in firm profitability results in a decrease of average employee pay of more than 1800 euros. The firm size coefficient is positive and significant, as expected.

6. Extensions

6.1. Capital structure, financial distress and average employee pay

My second hypothesis emphasizes how financial distress may affect employee pay policy through the firm's financial policy. Employees could be more willing to take pay cuts if highly leveraged firms run a greater risk of bankruptcy (Perotti and Spier (1993)); Berk, Stanton and Zechner (2010)). To test the second hypothesis, I repeat my basic test from Table 2 allowing for the interaction of leverage with the proxy for financial distress.

Recall from previous section that leverage is endogenous. I include the endogenous variable leverage in a two-way interaction term leverage x financial distress in the regression model. When I only take account of the endogenous variable leverage and ignore the endogeneity of leverage in the two-way interaction term than the traditional linear single-equation instrumental

variable regression model may produce inconsistent estimates. As a result, the single equation regression model is estimated by using a nonlinear generalized method of moments (hereafter NGMM), which takes account that any product of variables involving endogenous variables are themselves endogenous functions of exogenous variables (Green (2002); Billet, King and Mauer (2007)). I estimate the nonlinear GMM, using the exogenous variables as instruments in the moment conditions. In addition, I include besides the shareholder risk aversion and (shareholder risk aversion) ² also the dividend ratio, defined as dividends to book value of total assets, as exogenous variable. The standard errors of the nonlinear GMM are heteroskedasticity and autocorrelation consistent. Weak instrumentation and over-identification may lead to biased estimators of the NGMM. The instruments appear to be valid as indicated by the Hansen J-test of overidentification. The null hypothesis of the Hansen J-test is that all instruments are valid. The results of this test are presented in Table 3.

The interaction of the financial distress proxy with leverage has the expected positive sign however this coefficient is not significant. Inconsistent with Perotti and Spier (1993), this result shows that firms do not compensate employees for their human capital risk for higher leverage due to the statistically insignificant positive interaction coefficient effect of the interaction term. Firms with a higher degree of financial distress do not have a higher ability to use leverage as a bargaining tool with employees than firms with lower degree of financial distress. Perotti and Spier (1993) point out those labor unions will bargain less aggressively and may be more willing to take pay cuts when highly leveraged firms have a higher probability of default or financial distress.

Overall, I do not find support for my second Hypothesis. The interactions of the financial distress proxy with the different leverage proxies have positive coefficients, as expected.

However, these are not statistically significant. I also note that leverage and Z”-score have a positive and significant coefficient in all my regressions, except for interest coverage ratio. The coefficient on interest coverage ratio is positive but not statistically significant, while the coefficient on Z”-score is negative and significant at 5%.

6.2. Capital structure, employee risk-aversion and average employee pay

A third hypothesis involves the interaction effect of the level of debt and the share of employees with a relatively high risk-aversion. I test whether firms with lower debt levels and have more employees with relatively high risk-aversion will incur lower average employee pay. To test the third hypothesis, I repeat my basic test from Table 2 allowing for the interaction of leverage with the employee risk-aversion proxy. With regards to the empirical approach, I mimick the approach in Table 3. The results of these tests by using the nonlinear GMM are presented in Table 4.

The share of blue-collar workers has a negative interaction coefficient with leverage however this coefficient is not statistically significant. I also highlight that only leverage has a positive coefficient and is highly significant at either 5% or 10%, except for interest coverage ratio. The coefficient on share of blue-collar workers is negative but statistically insignificant.

Overall, I conclude that sub-section that my evidence for the validity of the third hypothesis is nonexistent. This indicates that highly leveraged firms with more employees with relatively high risk-aversion will not incur a higher pay because of the inability of the employees with relatively high risk-aversion to insure their own human capital risk. Firms do not act double as risk-averse workers employer and as his/her insurer against fluctuations in the workers’ opportunities (Haltiwanger (1983)). The presence of employees with relatively high risk-

aversion is not important in influencing the observed association between capital structure and average employee pay.

6.3. Capital Structure, employee layoff risk, and average employee pay

My fourth hypothesis emphasizes how employee's layoff risk may affect firm's pay policy through the financing policy of the firm. To test this empirical prediction, I again repeat my basic test from Table 2 allowing for the interaction of leverage with employee layoff risk rate. The main variable of interest is the interaction term net leverage x dummy employee layoff risk. The partial derivative of average employee pay with respect to net leverage contains two terms, the coefficient on leverage measure and the coefficient on the interaction term times the measure of employee entrenchment. The first term measures the effect of leverage on average employee pay assuming that the firm's employee layoff risk is zero, and thus, the employees are able to insure their own human capital risk. The effect of the first term should be positive. Firms with higher debt levels incur larger average employee pay (Berk, Stanton and Zechner (2010)). The second term measures the restorative effect of the positive effect of leverage on average employee pay for a firm with a higher employee layoff risk or when the firm's employees are unable to insure their own human capital risk. The effect of the interaction term should always be positive for firms with higher debt levels. Firms with high debt levels will pay their employees more when their employees are unable to insure their own human capital risk.

I mimick again my empirical approach in Table 3. Before I interpret the test results it is important to mention that the nonlinear GMM only provides a solution for interactions between endogenous continuous variable and an exogenous continuous variable. As a consequence, I have to transform the importance of employee layoff dummy variable into a continuous variable by calculating the predicted probabilities that employees of firms have high layoff rate. First, I

estimate a logistic regression with the dummy importance of employee layoff rate as dependent variable. The independent variables are the one-period lagged dummy variable importance of employee layoff rate, sector and year fixed effects. Sector and year fixed effects are not lagged one period. The standard errors are calculated using the bootstrap method. I perform 100 bootstrap replications. Mooney and Duval (1993) argue that a total of 50-200 replications are generally adequate for estimates of standard errors and thus are adequate for normal-approximation confidence interval. However, estimates of confidence intervals using the bias-corrected methods typically require 1,000 or more replications. Finally, I calculate the predicted likelihood of a positive outcome.

Table 5 presents the results. The nonlinear GMM regressions produce a negative but statistically significant estimate for the interaction term leverage x importance of employee layoff risk, except for the interaction with interest coverage ratio as proxy for leverage. This result is not supportive for hypothesis 4. The evidence is inconsistent with conjectures that companies with more debt pay higher wages when the unemployment risk increases. Moreover, this result can be explained by the presence of a relatively high unemployment benefits system in Belgium. Unemployment benefits affects the relevance of my prediction on the joint effect of leverage and unemployment rates on wages, as employers may be aware that employees are not needed to be compensated when their unemployment risk increases in an environment with relatively high unemployment benefits.

6.4. Capital Structure, employee entrenchment, and average employee pay

I examine the relation between wages and the interaction term of employee entrenchment and firm leverage, which can provide evidence whether firms with different debt levels take into account that the employee entrenchment when determining the employee's pay levels

(Hypothesis 5). If employee entrenchment is important, then the predicted positive relation between wages and leverage will be stronger when employees are less entrenched. To test this hypothesis, I again repeat the basic test from Table 2 allowing for the interaction of leverage with employment entrenchment.

Before I interpret the test results it is important to mention that the nonlinear GMM only provides a solution for interactions between endogenous continuous variable and an exogenous continuous variable. As a consequence, I have to transform the employment entrenchment dummy variable into a continuous variable by calculating the predicted probabilities that firms have entrenched employees. I set forth to test the fifth prediction by first estimating the likelihood that a firm has entrenched employees in a logit model. I estimate a logistic regression with the dummy employment entrenchment as dependent variable. The independent variables are the one-period lagged dummy variable employment entrenchment, sector and year fixed effects. Sector and year fixed effects are not lagged one period. The standard errors are calculated using the bootstrap method. I perform 100 bootstrap replications. Mooney and Duval (1993) argue that a total of 50-200 replications are generally adequate for estimates of standard errors and thus are adequate for normal-approximation confidence interval. However, estimates of confidence intervals using the bias-corrected methods typically require 1,000 or more replications. I calculate the predicted likelihood of a positive outcome.

Table 6 shows the results of the estimating my nonlinear GMM regression models. The effect of the leverage ratio on average employee pay is not affect by the degree of job entrenchment. The interaction of employment entrenchment with leverage does not have the expected positive sign and is not statistically significant. These results contradict my fifth hypothesis.

7. Conclusion

In this paper, I empirically examine whether human capital costs associated with bankruptcy are large enough to be a disincentive for unlisted firms to use more debt. I also examine whether employee entrenchment, unemployment risk, risk-aversion of employees and the degree of financial distress significantly influence the association between the observed capital structures and employee compensation.

This paper finds that human bankruptcy costs are large enough to offset the use of more debt when determining the employee's pay. I show that the effect of leverage on average employee pay is positively and statistically significant. However, the degree of financial distress, the risk of defaulting on their debt payments, employee risk-aversion, and importance of unemployment risk has no significant effect on the association between the observed capital structures and average employee pay. The results thus provide surprising new evidence on the direction and the importance of the linkage between corporate financing decisions and terms of employment.

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Appendix A

Table 1: Unemployment risk sector heterogeneity

This Appendix presents the cross-sectional distribution of the standardized normal dismissal risk rate for firms by sectors per year. The sample period covers the 2001 to 2010 period. The sector breakdown is based on two-digit NACE2008 codes. The discussion of the calculation of the unemployment risk is provided in Section four.

Nace2 description	nace2	Interval	2002	2003	2004	2005	2006	2007	2008	2009	2010
Manufacture of food products	10	]-∞;0[	34,39%	36,65%	28,96%	32,41%	34,12%	32,23%	37,62%	32,38%	32,86%
		]0;+∞[	65,61%	63,35%	71,04%	67,59%	65,88%	67,77%	62,38%	67,62%	67,14%
Printing and reproduction of recorded media	18	]-∞;0[	16,24%	29,06%	35,90%	2,63%	34,26%	38,89%	36,45%	31,78%	29,91%
		]0;+∞[	83,76%	70,94%	64,10%	97,37%	65,74%	61,11%	63,55%	68,22%	70,09%
Manufacture of other non-metallic mineral products	23	]-∞;0[	39,37%	40,94%	39,37%	41,94%	40,50%	29,06%	33,91%	36,52%	33,91%
		]0;+∞[	60,63%	59,06%	60,63%	58,06%	59,50%	70,94%	66,09%	63,48%	66,09%
Manufacture of fabricated metal products, except machinery and equipment	25	]-∞;0[	25,45%	31,21%	31,52%	26,15%	28,34%	29,13%	30,90%	35,88%	33,55%
		]0;+∞[	74,55%	68,79%	68,48%	73,85%	71,66%	70,87%	69,10%	64,12%	66,45%
Manufacture of machinery and equipment	28	]-∞;0[	35,53%	38,82%	32,89%	40,97%	37,50%	34,51%	39,57%	38,85%	35,25%
		]0;+∞[	64,47%	61,18%	67,11%	59,03%	62,50%	65,49%	60,43%	61,15%	64,75%
Construction of buildings	41	]-∞;0[	38,63%	40,27%	38,90%	40,44%	41,48%	39,94%	45,06%	40,12%	40,99%
		]0;+∞[	61,37%	59,73%	61,10%	59,56%	58,52%	60,06%	54,94%	59,88%	59,01%
Civil engineering	42	]-∞;0[	34,75%	39,72%	42,55%	40,88%	38,06%	39,39%	40,77%	33,85%	35,38%
		]0;+∞[	65,25%	60,28%	57,45%	59,12%	61,94%	60,61%	59,23%	66,15%	64,62%
Specialized construction activities	43	]-∞;0[	39,05%	38,70%	40,36%	39,71%	37,18%	39,65%	42,55%	40,40%	39,90%
		]0;+∞[	60,95%	61,30%	59,64%	60,29%	62,82%	60,35%	57,45%	59,60%	60,10%
Wholesale and retail trade and repair of motor vehicles and motorcycles	45	]-∞;0[	40,20%	39,41%	41,37%	41,87%	42,32%	43,69%	43,38%	41,14%	40,53%
		]0;+∞[	59,80%	60,59%	58,63%	58,13%	57,68%	56,31%	56,62%	58,86%	59,47%
Retail trade, except of motor vehicles and motorcycles	47	]-∞;0[	39,47%	36,68%	36,18%	32,77%	28,91%	33,90%	35,70%	34,14%	32,58%
		]0;+∞[	60,53%	63,32%	63,82%	67,23%	71,09%	66,10%	64,30%	65,86%	67,42%
Land transport and transport via pipelines	49	]-∞;0[	27,53%	25,65%	17,41%	16,75%	17,35%	15,63%	15,87%	16,88%	14,11%
		]0;+∞[	72,47%	74,35%	82,59%	83,25%	82,65%	84,37%	84,13%	83,12%	85,89%
Warehousing and support activities for transportation	52	]-∞;0[	41,07%	41,07%	37,50%	29,09%	34,55%	35,78%	36,11%	38,89%	33,33%
		]0;+∞[	58,93%	58,93%	62,50%	70,91%	65,45%	64,22%	63,89%	61,11%	66,67%
Food and beverage service activities	56	]-∞;0[	35,04%	17,09%	13,68%	12,07%	11,30%	13,16%	10,53%	9,65%	10,53%
		]0;+∞[	64,96%	82,91%	86,32%	87,93%	88,70%	86,84%	89,47%	90,35%	89,47%

Table 2: Employee entrenchment sector heterogeneity

This Appendix presents the cross-sectional distribution of the standardized employee entrenchment rate for firms by sectors per year. The sample period covers the 2001 to 2010 period. The sector breakdown is based on two-digit NACE2008 codes. The discussion of the calculation of the unemployment risk is provided in Section four.

Nace2 description	nace2	Interval	2002	2003	2004	2005	2006	2007	2008	2009	2010
Manufacture of food products	10	]-∞;0[	64,71%	65,16%	72,40%	69,44%	67,30%	67,77%	61,90%	69,52%	69,52%
		]0;+∞[	35,29%	34,84%	27,60%	30,56%	32,70%	32,23%	38,10%	30,48%	30,48%
Printing and reproduction of recorded media	18	]-∞;0[	88,03%	70,94%	62,39%	97,37%	63,89%	60,19%	63,55%	66,36%	69,16%
		]0;+∞[	11,97%	29,06%	37,61%	2,63%	36,11%	39,81%	36,45%	33,64%	30,84%
Manufacture of other non-metallic mineral products	23	]-∞;0[	62,99%	63,78%	62,99%	62,10%	64,46%	73,50%	66,96%	64,35%	70,43%
		]0;+∞[	37,01%	36,22%	37,01%	37,90%	35,54%	26,50%	33,04%	35,65%	29,57%
Manufacture of fabricated metal products, except machinery and equipment	25	]-∞;0[	74,85%	70,30%	71,21%	72,62%	72,29%	70,55%	69,44%	65,45%	68,44%
		]0;+∞[	25,15%	29,70%	28,79%	27,38%	27,71%	29,45%	30,56%	34,55%	31,56%
Manufacture of machinery and equipment	28	]-∞;0[	64,47%	62,50%	71,05%	61,81%	65,28%	64,79%	65,47%	63,31%	65,47%
		]0;+∞[	35,53%	37,50%	28,95%	38,19%	34,72%	35,21%	34,53%	36,69%	34,53%
Construction of buildings	41	]-∞;0[	63,01%	61,37%	61,64%	62,33%	60,23%	62,93%	56,98%	63,66%	61,92%
		]0;+∞[	36,99%	38,63%	38,36%	37,67%	39,77%	37,07%	43,02%	36,34%	38,08%
Civil engineering	42	]-∞;0[	66,67%	62,41%	64,54%	61,31%	61,94%	65,15%	61,54%	67,69%	66,15%
		]0;+∞[	33,33%	37,59%	35,46%	38,69%	38,06%	34,85%	38,46%	32,31%	33,85%
Specialized construction activities	43	]-∞;0[	61,07%	61,18%	59,76%	61,73%	63,06%	61,21%	59,97%	62,63%	62,37%
		]0;+∞[	38,93%	38,82%	40,24%	38,27%	36,94%	38,79%	40,03%	37,37%	37,63%
Wholesale and retail trade and repair of motor vehicles and motorcycles	45	]-∞;0[	62,16%	59,61%	60,20%	58,93%	61,08%	58,52%	57,03%	59,88%	60,29%
		]0;+∞[	37,84%	40,39%	39,80%	41,07%	38,92%	41,48%	42,97%	40,12%	39,71%
Retail trade, except of motor vehicles and motorcycles	47	]-∞;0[	63,16%	63,82%	62,99%	66,55%	70,75%	66,27%	65,34%	65,86%	68,28%
		]0;+∞[	36,84%	36,18%	37,01%	33,45%	29,25%	33,73%	34,66%	34,14%	31,72%
Land transport and transport via pipelines	49	]-∞;0[	73,88%	75,06%	82,59%	83,01%	83,13%	84,12%	84,13%	82,87%	85,64%
		]0;+∞[	26,12%	24,94%	17,41%	16,99%	16,87%	15,88%	15,87%	17,13%	14,36%
Warehousing and support activities for transportation	52	]-∞;0[	65,18%	64,29%	66,96%	71,82%	70,00%	64,22%	63,89%	69,44%	68,52%
		]0;+∞[	34,82%	35,71%	33,04%	28,18%	30,00%	35,78%	36,11%	30,56%	31,48%
Food and beverage service activities	56	]-∞;0[	64,96%	82,91%	86,32%	87,93%	88,70%	86,84%	89,47%	90,35%	89,47%
		]0;+∞[	35,04%	17,09%	13,68%	12,07%	11,30%	13,16%	10,53%	9,65%	10,53%

Table 3: Average wage per employee sector heterogeneity

This Appendix presents the cross-sectional distribution of the standardized average wage per employee for firms by sectors per year. The sample period covers the 2001 to 2010 period. The sector breakdown is based on two-digit NACE2008 codes. The discussion of the calculation of the unemployment risk is provided in Section four.

Nace2 description	nace2	Interval	2002	2003	2004	2005	2006	2007	2008	2009	2010
Manufacture of food products	10	]-∞;0[	54,30%	52,94%	56,56%	56,02%	57,35%	55,45%	54,76%	54,29%	54,29%
		]0;+∞[	45,70%	47,06%	43,44%	43,98%	42,65%	44,55%	45,24%	45,71%	45,71%
Printing and reproduction of recorded media	18	]-∞;0[	51,28%	52,99%	48,72%	50,88%	50,93%	50,93%	50,47%	53,27%	51,40%
		]0;+∞[	48,72%	47,01%	51,28%	49,12%	49,07%	49,07%	49,53%	46,73%	48,60%
Manufacture of other non-metallic mineral products	23	]-∞;0[	49,61%	55,91%	50,39%	53,23%	57,02%	58,97%	57,39%	54,78%	52,17%
		]0;+∞[	50,39%	44,09%	49,61%	46,77%	42,98%	41,03%	42,61%	45,22%	47,83%
Manufacture of fabricated metal products, except machinery and equipment	25	]-∞;0[	51,21%	53,33%	52,12%	50,46%	50,64%	49,19%	49,50%	47,51%	45,51%
		]0;+∞[	48,79%	46,67%	47,88%	49,54%	49,36%	50,81%	50,50%	52,49%	54,49%
Manufacture of machinery and equipment	28	]-∞;0[	53,95%	50,00%	49,34%	50,69%	49,31%	48,59%	50,36%	51,08%	47,48%
		]0;+∞[	46,05%	50,00%	50,66%	49,31%	50,69%	51,41%	49,64%	48,92%	52,52%
Construction of buildings	41	]-∞;0[	45,75%	46,03%	47,12%	48,75%	47,16%	48,56%	45,64%	47,97%	50,29%
		]0;+∞[	54,25%	53,97%	52,88%	51,25%	52,84%	51,44%	54,36%	52,03%	49,71%
Civil engineering	42	]-∞;0[	50,35%	50,35%	48,94%	48,18%	50,75%	50,00%	48,46%	45,38%	46,92%
		]0;+∞[	49,65%	49,65%	51,06%	51,82%	49,25%	50,00%	51,54%	54,62%	53,08%
Specialized construction activities	43	]-∞;0[	47,46%	47,34%	48,28%	48,13%	47,75%	46,72%	48,36%	47,35%	46,21%
		]0;+∞[	52,54%	52,66%	51,72%	51,87%	52,25%	53,28%	51,64%	52,65%	53,79%
Wholesale and retail trade and repair of motor vehicles and motorcycles	45	]-∞;0[	50,78%	48,43%	51,18%	52,18%	51,30%	51,10%	50,10%	52,55%	49,49%
		]0;+∞[	49,22%	51,57%	48,82%	47,82%	48,70%	48,90%	49,90%	47,45%	50,51%
Retail trade, except of motor vehicles and motorcycles	47	]-∞;0[	56,58%	57,07%	56,25%	57,48%	56,29%	56,68%	56,67%	55,81%	54,07%
		]0;+∞[	43,42%	42,93%	43,75%	42,52%	43,71%	43,32%	43,33%	44,19%	45,93%
Land transport and transport via pipelines	49	]-∞;0[	44,94%	44,47%	44,47%	44,74%	45,30%	46,65%	45,84%	46,10%	44,58%
		]0;+∞[	55,06%	55,53%	55,53%	55,26%	54,70%	53,35%	54,16%	53,90%	55,42%
Warehousing and support activities for transportation	52	]-∞;0[	50,89%	51,79%	50,89%	46,36%	51,82%	50,46%	50,00%	47,22%	47,22%
		]0;+∞[	49,11%	48,21%	49,11%	53,64%	48,18%	49,54%	50,00%	52,78%	52,78%
Food and beverage service activities	56	]-∞;0[	56,41%	59,83%	54,70%	50,00%	56,52%	57,89%	52,63%	54,39%	51,75%
		]0;+∞[	43,59%	40,17%	45,30%	50,00%	43,48%	42,11%	47,37%	45,61%	48,25%

Table 1: Descriptive Statistics

The Table reports descriptive statistics. Panel A reports descriptive statistics of variables over the period 2002 to 2010.. All variables are defined in Section four.

	Nobs	Mean	Std. Dev.	Min.	25%	50%	75%	Max.
Leverage TA	35,499	0.62	0.21	0.09	0.48	0.65	0.79	0.96
Leverage EV	35,499	0.63	0.22	0.09	0.49	0.66	0.80	0.97
Net leverage	35,499	0.54	0.31	-0.67	0.39	0.61	0.77	0.96
Alternative Net leverage	35,499	0.55	0.31	-0.69	0.40	0.63	0.78	0.97
Interest coverage ratio	35,499	12.91	37.10	-22.66	0.92	2.65	8.47	259.45
Average employee pay	35,499	10.54	0.25	9.98	10.38	10.54	10.69	11.23
Human capital value of firm dummy	35,499	0.50	0.50	0	0	0	1	1
Labor productivity	35,499	58.66	25.86	25.02	42.53	52.46	66.64	17.98
Highly risk-averse FTE workers	35,499	0.67	0.31	0.00	0.53	0.78	0.90	0
Dummy Temporary employment	35,499	0.04	0.20	0	0	0	0	1
Dummy layoff risk	35,499	0.65	0.48	0	0	1	1	1
Dummy employee risk aversion	35,499	0.67	0.47	0	0	1	1	1
Works council	35,499	0.07	0.25	0	0	0	0	1
Health and safety committee	35,499	0.14	0.34	0	0	0	0	1
Average number of FTE workers	35,499	39	80	5	10	16	33	568
Share of blue-collar workers	35,499	0.67	0.31	0.00	0.53	0.78	0.90	1.00
Firm age	35,499	3.04	0.57	1.39	2.71	3.04	3.43	4.30
Firm size	35,499	14.71	1.32	12.20	13.81	14.55	15.40	19.03
Z"-score	35,499	3.23	3.46	-2.67	0.96	2.47	4.72	17.21
Profitability	35,499	0.06	0.09	-0.17	0.01	0.04	0.10	0.37
Physical capital intensity	35,499	0.27	0.20	0.01	0.11	0.24	0.40	0.82
Dividend	35,499	0.02	0.05	0.00	0.00	0.00	0.00	0.28

Figure 1: Pairwise correlation of leverage and average employee pay

This figure contains information on the relationship between book leverage and average employee pay for all sample firms per NACE2008 2-digit sectors in the sample over the period 2001 and 2010. The height of the bars shows the pairwise correlation between capital structure and average employee pay. Average employee pay is defined in Section four. Book leverage is defined as ratio of total debt to book value of assets. The bars are sorted from low to high. The NACE2008 2-digit sector labels are mentioned on the X-axis. The pairwise correlations have a blue-color shade if they are significantly different from zero ($p \leq 0.05$).

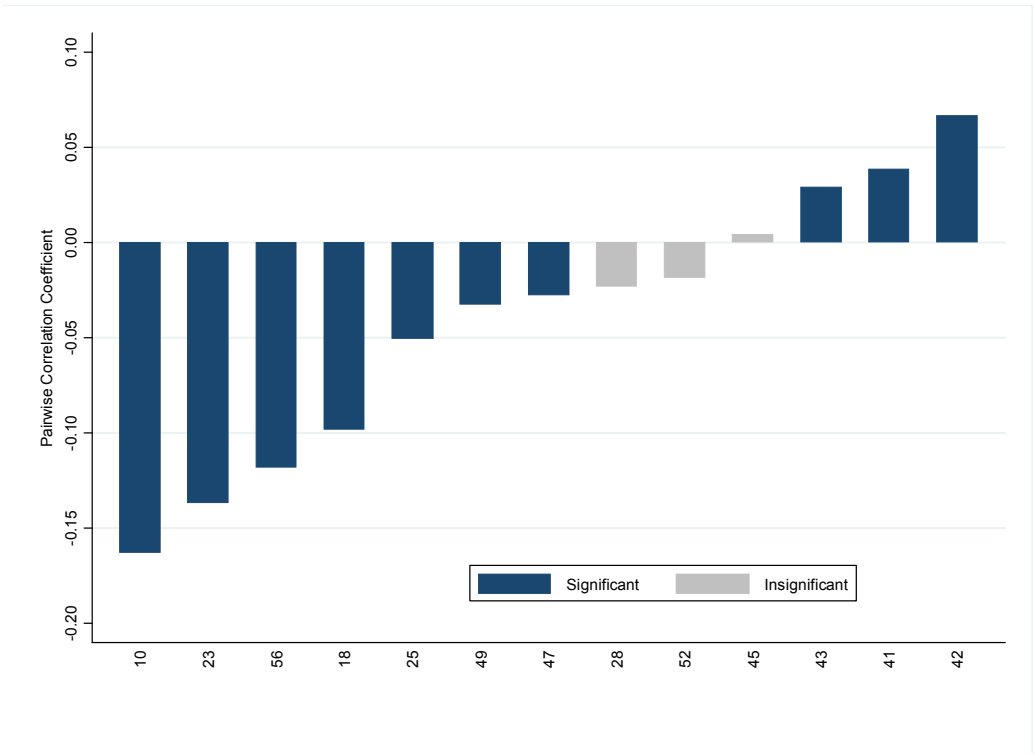

Figure 2: Pairwise correlation of leverage and employees with a relatively high risk-aversion

This figure contains information on the relationship between book leverage and employees with a relatively high risk-aversion for all sample firms per NACE2008 2-digit sectors in the sample over the period 2001 and 2010. The height of the bars shows the pairwise correlation between capital structure and employees with a relatively high risk-aversion. The variable employees with a relatively high risk-aversion is defined in Section four. Book leverage is defined as ratio of total debt to book value of assets. The bars are sorted from low to high. The NACE2008 2-digit sector labels are mentioned on the X-axis. The pairwise correlations have a blue-color shade if they are significantly different from zero ($p \leq 0.05$).

Pairwise correlation of book leverage and employees with a relatively high risk-aversion:
Heterogeneity across 13 Sectors

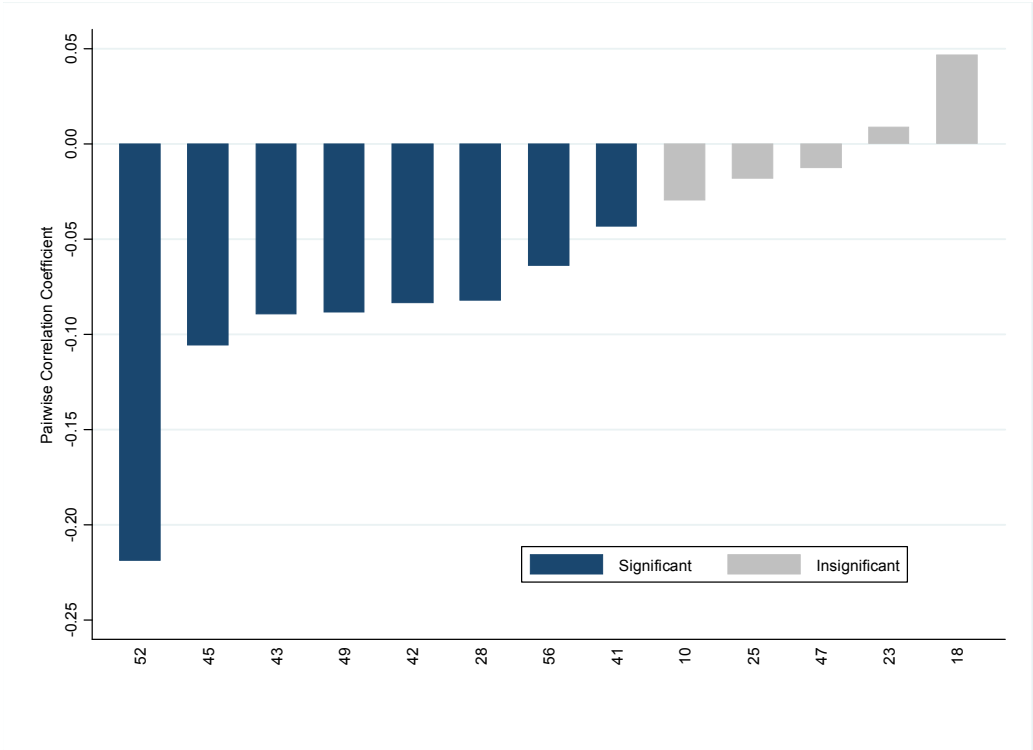

Figure 3: Pairwise correlation of book leverage and employee entrenchment

This figure contains information on the relationship between book leverage and employee entrenchment for all sample firms per NACE2008 2-digit sectors in the sample over the period 2001 and 2010. The height of the bars shows the pairwise correlation between capital structure and employee entrenchment. Employee entrenchment is calculated as follows: First, I estimate a logistic regression model with as dependent variable dummy employee entrenchment and as independent variables one-year lagged dummy employee entrenchment, sector and year fixed effects. Sector and year fixed effects are not lagged one period. The standard errors are calculated using the bootstrap method. I perform 100 bootstrap replications. Mooney and Duval (1993) argue that a total of 50-200 replications are generally adequate for estimates of standard errors and thus are adequate for normal-approximation confidence interval. However, estimates of confidence intervals using the bias-corrected methods typically require 1,000 or more replications. Book leverage is defined as ratio of total debt to book value of assets. The bars are sorted from low to high. The NACE2008 2-digit sector labels are mentioned on the X-axis. The pairwise correlations have a blue-color shade if they are significantly different from zero ($p \leq 0.05$). Variables are defined in Section four.

Pairwise correlation of book leverage and employee entrenchment:
Heterogeneity across 13 Sectors

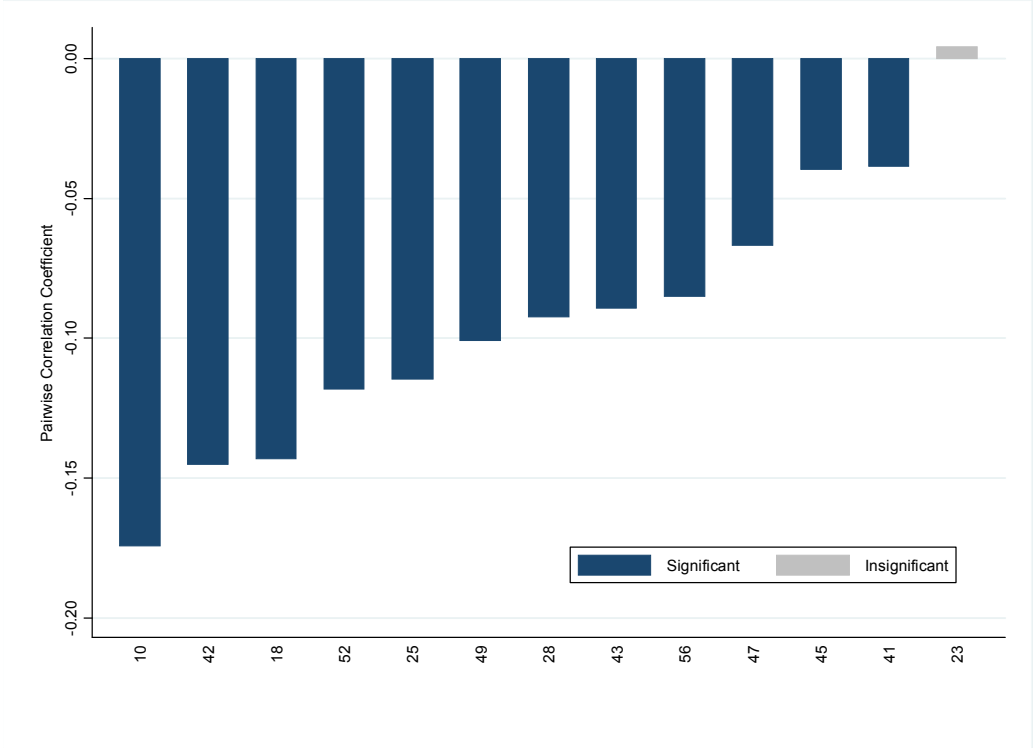

Figure 4: Pairwise correlation of book leverage and layoff risk

This figure contains information on the relationship between net leverage and layoff risk for all sample firms per NACE2008 2-digit sectors in the sample over the period 2001 and 2010. The height of the bars shows the pairwise correlation between capital structure and layoff risk. Layoff risk is calculated as follows: First, I estimate a logistic regression model with as dependent variable dummy employee layoff risk and as independent variables one-year lagged dummy employee layoff risk, sector and year fixed effects. Sector and year fixed effects are not lagged one period. The standard errors are calculated using the bootstrap method. I perform 100 bootstrap replications. Mooney and Duval (1993) argue that a total of 50-200 replications are generally adequate for estimates of standard errors and thus are adequate for normal-approximation confidence interval. However, estimates of confidence intervals using the bias-corrected methods typically require 1,000 or more replications. Book leverage is defined as ratio of total debt to book value of assets. The bars are sorted from low to high. The NACE2008 2-digit sector labels are mentioned on the X-axis. The pairwise correlations have a blue-color shade if they are significantly different from zero ($p \leq 0.05$). The variables are defined in section four.

Pairwise correlation of book leverage and layoff risk:
Heterogeneity across 13 Sectors

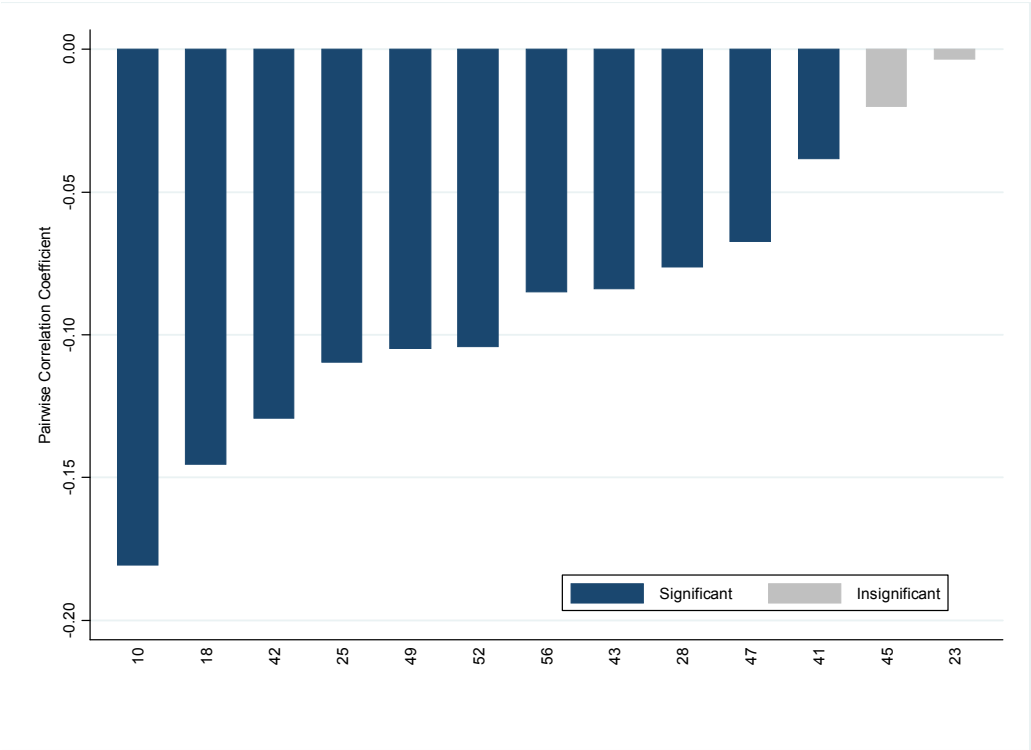

Table 2: Instrumental variable regressions of the relation between the average employee pay and leverage

This table presents the results of the GMM regressions of the average employee pay. The sample covers the 2001 to 2010 period. The dependent variable is the natural logarithm of the average employee pay. All models include year and 2 digit NACE2008 sector dummy variables. For brevity, the parameter estimations of the year and 2-digit NACE2008 sector dummy variables are not reported. Standard errors are clustered at the firm level. t-statistics are reported in parentheses below the parameter estimates. All variables are defined in Section four. I use ***, **, and * to denote significance at the 1 % level, 5 % level, and 10 % level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Debt to assets	0.257***	-0.087								
	(3.09)	(-0.18)								
(Debt to assets)²		0.144								
		(0.52)								
Debt to equity			0.239***	-0.105						
			(3.10)	(-0.23)						
(Debt to equity)²				0.150						
				(0.60)						
Net leverage					0.295***	0.002				
					(3.05)	(0.01)				
(Net leverage)²						0.083				
						(0.77)				
Alternative Net leverage							0.271***	-0.008		
							(3.07)	(-0.04)		
(Alternative Net leverage)²								0.084		
								(0.85)		
Interest coverage ratio									0.003***	0.025
									(2.81)	(1.09)
(Interest coverage ratio)²										-0.000
										(-1.02)
Works council	0.035***	0.028**	0.033***	0.027**	0.042***	0.029**	0.039***	0.028**	0.016	0.061
	(3.14)	(2.31)	(3.04)	(2.32)	(3.46)	(2.15)	(3.37)	(2.17)	(1.32)	(1.29)
Health and safety commission	0.042***	0.039***	0.040***	0.038***	0.046***	0.039***	0.044***	0.038***	0.028***	0.021
	(4.70)	(4.37)	(4.58)	(4.41)	(4.88)	(4.02)	(4.79)	(4.12)	(2.97)	(1.12)
Temporary employment	-0.042***	-0.042***	-0.041***	-0.042***	-0.042***	-0.043***	-0.042***	-0.042***	-0.051***	-0.057**
	(-4.07)	(-4.19)	(-4.04)	(-4.17)	(-4.04)	(-4.19)	(-4.01)	(-4.17)	(-4.60)	(-2.55)
Employment entrenchment	0.027***	0.027***	0.027***	0.026***	0.025***	0.026***	0.025***	0.026***	0.025***	0.035**
	(3.89)	(3.85)	(3.87)	(3.85)	(3.55)	(3.78)	(3.53)	(3.77)	(3.32)	(2.11)
Layoff risk	0.018**	0.017**	0.018***	0.017**	0.019***	0.017**	0.019***	0.017**	0.016**	0.002
	(2.55)	(2.41)	(2.58)	(2.42)	(2.69)	(2.45)	(2.70)	(2.46)	(2.12)	(0.13)
Profitability	-0.533***	-0.457***	-0.527***	-0.453***	-0.524***	-0.455***	-0.519***	-0.453***	-0.796***	-1.864
	(-14.95)	(-4.59)	(-15.32)	(-4.93)	(-15.39)	(-7.22)	(-15.78)	(-7.59)	(-6.53)	(-1.58)

Firm size	0.024*** (6.78)	0.026*** (7.58)	0.024*** (6.76)	0.026*** (7.52)	0.018*** (3.61)	0.025*** (4.32)	0.018*** (3.80)	0.026*** (4.51)	0.026*** (7.36)	0.023*** (3.87)
Asset tangibility	-0.119*** (-5.84)	-0.155*** (-3.81)	-0.121*** (-6.17)	-0.156*** (-4.16)	-0.118*** (-5.73)	-0.153*** (-5.97)	-0.121*** (-6.11)	-0.154*** (-6.35)	-0.152*** (-10.49)	-0.092 (-1.38)
Highly risk-averse workers	-0.091*** (-7.47)	-0.089*** (-7.26)	-0.090*** (-7.46)	-0.088*** (-7.25)	-0.090*** (-7.43)	-0.090*** (-7.40)	-0.090*** (-7.40)	-0.090*** (-7.37)	-0.087*** (-6.86)	-0.087*** (-5.10)
Labor productivity	0.005*** (28.14)	0.005*** (27.79)	0.005*** (28.18)	0.005*** (27.91)	0.005*** (28.01)	0.005*** (27.29)	0.005*** (28.17)	0.005*** (27.42)	0.005*** (24.59)	0.005*** (11.82)
Financial distress	0.014*** (2.70)	0.002 (0.14)	0.013*** (2.69)	0.001 (0.11)	0.022*** (2.81)	0.003 (0.22)	0.020*** (2.81)	0.002 (0.19)	-0.007*** (-3.34)	-0.008** (-2.05)
Firm age	0.011** (2.19)	0.007 (1.25)	0.010** (2.08)	0.006 (1.23)	0.011** (2.20)	0.007 (1.50)	0.010** (2.08)	0.007 (1.47)	0.002 (0.53)	0.003 (0.40)
Constant	9.788*** (131.83)	9.967*** (43.16)	9.805*** (140.14)	9.979*** (47.42)	9.862*** (167.55)	9.948*** (129.52)	9.875*** (175.71)	9.953*** (138.58)	10.015*** (188.03)	10.006*** (132.48)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-year observations	31,429	31,429	31,429	31,429	31,429	31,429	31,429	31,429	31,429	31,429
Number of firms	4,070	4,070	4,070	4,070	4,070	4,070	4,070	4,070	4,070	4,070
Wald Chi²-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hansen J-statistic p-value		0.1766		0.2034		0.1484		0.1719		0.7250
Test of endogeneity	0.0003	0.0000	0.0003	0.0000	0.0027	0.0000	0.0034	0.0000	0.0017	0.0025
F-stat	274.742		325.346		150.549		180.013		44.7596	

Table 3: Interaction between capital structure, financial distress and average employee pay

This table presents the results of the non-linear GMM regression estimations of the average employee pay on one year lagged explanatory variables. The sample covers the period 2001 to 2010. The dependent variable is average employee pay. The results of the first stage regressions are omitted. All regressions include workforce-specific and other firm-control variables from Table 2, but coefficients are not reported. The instrumental variables are the financial hedging multiplier, (financial hedging multiplier)², dividend , but coefficients are not reported. All models include year and 2 digit NACE2008 sector dummy variables. For brevity, the parameter estimations of the year and sector dummy variables are not reported. Heteroskedasticity and autocorrelation consistent t-statistics for the NGMM regression models are reported in parentheses below the parameter estimates. I report the results of overidentifying restrictions provided by the Hansen J statistic (p-value) for the NGMM in the final row of this table. All variables are defined in Section four. I use ***, **, and * to denote significance at the 1 % level, 5 % level, and 10 % level, respectively.

	1	**2**	**3**	**4**	**5**
Debt to assets	0.404** (2.39)				
Debt to equity		0.334** (2.48)			
Net Leverage			0.397** (2.04)		
Alternative Net Leverage				0.335** (2.19)	
Interest coverage ratio					0.001 (1.46)
Z"-score	0.019** (2.52)	0.016*** (2.63)	0.031* (1.82)	0.026* (1.92)	-0.006** (-2.55)
Z"-score x capital structure	0.021 (1.07)	0.014 (0.85)	0.009 (0.70)	0.005 (0.51)	0.000 (0.99)
Constant	9.662*** (62.81)	9.728*** (79.66)	9.833*** (115.16)	9.862*** (143.38)	10.005*** (249.74)
Work-specific variables	X	X	X	X	X
Firm-control variables	X	X	X	X	X
Year indicator variables	X	X	X	X	X
Sector indicator variables	X	X	X	X	X
Firm-year observations	31,429	31,429	31,429	31,429	31,429
Test of overidentifying restrictions: H0: all instruments are valid (p-value)	0.27	0.28	0.14	0.16	0.07

Table 4: Interactions between capital structure, highly risk-averse employees, average employee pay

This table presents the results of the non-linear GMM regression estimations of the average employee pay on one year lagged explanatory variables. The sample covers the period 2001 to 2010. The dependent variable is average employee pay. The results of the first stage regressions are omitted. All regressions include workforce-specific and other firm-control variables from Table 2, but coefficients are not reported. The instrumental variables are the financial hedging multiplier, (financial hedging multiplier)², dividend, but coefficients are not reported. All models include year and 2 digit NACE2008 sector dummy variables. For brevity, the parameter estimations of the year and sector dummy variables are not reported. Heteroskedasticity and autocorrelation consistent t-statistics for the NGMM regression models are reported in parentheses below the parameter estimates. I report the results of overidentifying restrictions provided by the Hansen J statistic (p-value) for the NGMM in the final row of this table. All variables are defined in Section four. I use ***, **, and * to denote significance at the 1 % level, 5 % level, and 10 % level, respectively.

	(1)	(2)	(3)	(4)	(5)
Debt to assets	0.718** (1.99)				
Debt to equity		0.722* (1.75)			
Net Leverage			0.614** (2.32)		
Alternative Net Leverage				0.623** (2.02)	
Interest coverage ratio					-0.000 (-0.10)
Highly risk-averse workers	0.598 (1.19)	0.629 (1.05)	0.524 (1.19)	0.566 (1.06)	-0.125 (-1.28)
Highly risk-averse workers x capital structure	-1.109 (-1.37)	-1.144 (-1.21)	-1.128 (-1.40)	-1.187 (-1.23)	0.003 (0.37)
Constant	9.508*** (40.68)	9.498*** (34.46)	9.595*** (44.81)	9.570*** (35.98)	10.025*** (129.69)
Work-specific variables	X	X	X	X	X
Firm-control variables	X	X	X	X	X
Year indicator variables	X	X	X	X	X
Sector indicator variables	X	X	X	X	X
Firm-year observations	31,429	31,429	31,429	31,429	31,429
Test of overidentifying restrictions: H0: all instruments are valid (p-value)	0.74	0.77	0.86	0.97	0.06

Table 5: Interactions between capital structure, layoff risk, and average employee pay

This table presents the results of the non-linear GMM regression estimations of the average employee pay on one year lagged explanatory variables. The sample covers the period 2001 to 2010. The dependent variable is average employee pay. The results of the first stage regressions are omitted. All regressions include workforce-specific and other firm-control variables from Table 2, but coefficients are not reported. The instrumental variables are the financial hedging multiplier, (financial hedging multiplier)², variable dividend, but coefficients are not reported. All models include year and 2 digit NACE2008 sector dummy variables. For brevity, the parameter estimations of the year and sector dummy variables are not reported. Heteroskedasticity and autocorrelation consistent t-statistics for the NGMM regression models are reported in parentheses below the parameter estimates. I report the results of overidentifying restrictions provided by the Hansen J statistic (p-value) for the NGMM in the final row of this table. All variables are defined in Section four. I use ***, **, and * to denote significance at the 1 % level, 5 % level, and 10 % level, respectively.

	(1)	(2)	(3)	(4)	(5)
Debt to assets	2.644 (1.11))				
Debt to equity		2.061 (1.18)			
Net Leverage			2.166 (1.20)		
Alternative Net Leverage				1.902 (1.23)	
Interest coverage ratio					-0.053 (-0.74)
Employee layoff risk	2.436 (1.02)	1.876 (1.06)	1.760 (1.07)	1.535 (1.08)	-0.898 (-0.74)
Employee layoff risk x capital structure	-3.825 (-1.01)	-2.889 (-1.05)	-3.054 (-1.05)	-2.614 (-1.06)	0.078 (0.76)
Constant	8.360*** (5.85)	8.696*** (8.16)	8.843*** (9.04)	8.981*** (10.59)	10.607*** (13.33)
Work-specific variables	X	X	X	X	X
Firm-control variables	X	X	X	X	X
Year indicator variables	X	X	X	X	X
Sector indicator variables	X	X	X	X	X
Firm-year observations	31,429	31,429	31,429	31,429	31,429
Test of overidentifying restrictions: H0: all instruments are valid (p-value)	0.54	0.58	0.55	0.64	0.70

Table 6: Interactions between capital structure, employment entrenchment, and average employee pay

This table presents the results of the non-linear GMM regression estimations of the average employee pay on one year lagged explanatory variables. The sample covers the period 2001 to 2010. The dependent variable is average employee pay. The results of the first stage regressions are omitted. All regressions include workforce-specific and other firm-control variables from Table 2, but coefficients are not reported. The instrumental variables are the financial hedging multiplier, (financial hedging multiplier)², variable dividend, but coefficients are not reported. All models include year and 2 digit NACE2008 sector dummy variables. For brevity, the parameter estimations of the year and sector dummy variables are not reported. Heteroskedasticity and autocorrelation consistent t-statistics for the NGMM regression models are reported in parentheses below the parameter estimates. I report the results of overidentifying restrictions provided by the Hansen J statistic (p-value) for the NGMM in the final row of this table. All variables are defined in Section four. I use ***, **, and * to denote significance at the 1 % level, 5 % level, and 10 % level, respectively.

	(1)	(2)	(3)	(4)	(5)
Debt to assets	2.941 (1.17)				
Debt to equity		2.495 (1.16)			
Net Leverage			2.597 (1.13)		
Alternative Net Leverage				2.401 (1.08)	
Interest coverage ratio					-0.029 (-0.40)
Employee entrenchment	2.804 (1.10)	2.380 (1.08)	2.248 (1.04)	2.086 (0.98)	-0.443 (-0.37)
Employee entrenchment x capital structure	-4.261 (-1.08)	-3.549 (-1.05)	-3.736 (-1.01)	-3.405 (-0.96)	0.042 (0.42)
Constant	8.175*** (5.44)	8.424*** (6.45)	8.595*** (6.86)	8.693*** (7.10)	10.313*** (12.93)
Work-specific variables	X	X	X	X	X
Firm-control variables	X	X	X	X	X
Year indicator variables	X	X	X	X	X
Sector indicator variables	X	X	X	X	X
Firm-year observations	31,429	31,429	31,429	31,429	31,429
Test of overidentifying restrictions: H0: all instruments are valid (p-value)	0.71	0.74	0.67	0.72	0.10