CEO-Employee Pay Ratio and Bond Yield Spreads

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Abstract

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***Key Words*:** CEO-Employee Pay Ratio, Yield Spreads, Bargaining Power

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1. Introduction

In recent years, the pay inequality between top executives and ordinary employees has been a highly addressed issue among both media and policy circles.[1] In particular, after 2008 financial crisis market participants and policy makers have paid more attention to the pay difference between company's CEO and its lower-rank ordinary employees. As mandated by the Dodd-Frank Act, the Securities and Exchange Commission (SEC) has adopted a new rule requiring companies to disclose the CEO-employee pay ratio (hereafter "pay ratio") effective as of January 1, 2017.

All of these concerns and public outcry over the relative pay difference between CEO and ordinary employees have led to vast literature focusing on the pay ratio and its effects on various characteristics of the firm, such as employees' work incentives, firm's performance, valuation, etc. (e.g., Faleye, Reis and Venkateswaran (2013), Crawford, Nelson, and Rountree (2014), Mueller, Ouimet and Simintz (2017) and Cheng, Ranasinghe and Zhao (2017)).

Another area of research focuses on the effect of the relative executive pay differences on a firm's financial risk. For example, Liu and Jiraporn (2010) examine the effect of pay slice, defined as the ratio between CEO's pay over pay of the other top executives, on the yield spreads of the bonds and find that higher pay slice leads to higher bond yield spreads. Their result suggests that bondholders may perceive CEO power over other top executives as a critical risk factor and thus incorporate it into bond yield. And, Kabir, Li and Veld-Merkoulova (2013) investigate different pay

[1] As reported in 2005 by United for a Fair Economy and the Institute for Policy Studies, and according to Faleye, Reis and Venkateswaran (2013), "the average CEO in the U.S. earned 431 times the average pay of a production (i.e., non-management) worker in 2004, up from 301 times in 2003 and 42 times in 1982" (Faleye, Reis and Venkateswaran (2013)).

components of the executive compensations on the cost of debt. Their findings indicate that different pay components, debt-like vs. equity-like, may have different effects on a firm's yield spreads.

Our study is most related to Liu and Jiraporn (2010) in that both studies examine the effect of the CEO relative pay on bond yield spreads. However, in our study we use pay ratio, instead of pay slice which is used by Liu and Jiraporn (2010), as the measure for CEO relative pay. Essentially, the difference between pay slice and pay ratio is that pay slice compares CEO's pay with the pay of other top executives, while pay ratio compares CEO's pay with the average worker or ordinary employee (i.e., non-management). And, the reasons why we use pay ratio instead of pay slice are three-folds and are explained as follows.

First of all, Since 2008 financial crisis, both popular press and policy makers have been focusing more on the pay difference between the top executives and the lower-rank ordinary employees, rather than that among the top executives, due to the public outcry over the rising pay of the top executives, in particular that of CEO. Consequently, as mentioned above, the Securities and Exchange Commission (SEC) has adopted a new rule implementing Dodd-Frank Act mandate, which requires companies to disclose the ratio of the compensation of its CEO to the median compensation of its employees, i.e., the pay ratio.

Secondly, in response to the attention garnered by the CEO relative pay issue in the media and among policy circles, the academia has started paying more attention to it and more researchers have been using *pay ratio*, instead of pay slice, in their studies addressing the CEO relative pay issue. For example, Faleye, Reis and Venkateswaran (2013) use pay ratio to examine both its determinants and its effects on a firm's productivity and find that ordinary employees seem to perceive higher pay ratio as opportunity for them in a series of sequential promotion tournaments. Mueller,

Ouimet and Simintz (2017) and Cheng, Ranasinghe and Zhao (2017) both use pay ratio to investigate its effect on firm value and performance and find that there exists a positive relation between higher pay ratios and better firm value and operating performance. Their results support the notion that higher pay ratios are a reflection of better managerial talent, instead of economically harmful to the firm. However, Crawford, Nelson, and Rountree (2014) find that firms with higher pay ratios are riskier and perform worse. No matter what the researchers have found regarding the effect of the relative CEO pay on the firm performance, etc., one thing in common is that most of them use the *pay ratio*, instead of pay slice, in their studies.

Thirdly, since pay slice only focuses on the pay differences among top executives, it fails to take into account the recent concern by the public and the policy makers regarding the rising pay difference between CEO and the ordinary employees, i.e., pay ratio.

Based on the above reasons, we believe that bondholders will be more concerned about pay ratio than pay slice when incorporating the relative CEO pay into risk consideration in bond yields. Therefore, pay ratio can better reflect bondholders' perception over the effect of relative CEO pay on bond yield spreads.

On examining the effect of CEO pay ratio on bond yield spreads, we find that higher CEO pay ratios tend to lead to higher yield spreads, which is consistent with the findings by Liu and Jiraporn (2010) by using pay slice. Our result suggests that bondholders perceive higher CEO pay ratio as a risk factor to the firm, thus require higher yield spreads when they incorporate it into bond's yield.

Liu and Jiraporn (2010) argue that relative CEO pay represents CEO's power. That is, a higher relative CEO pay signifies a more powerful CEO in the firm. And, explain the result of the relative CEO pay on bond yield spreads as " … bondholders perceive powerful CEOs as detrimental to their investments and consequently demand

higher yields from firms with powerful CEOs" (Liu and Jiraporn (2010), p. 757).

Following the line of logic by Liu and Jiraporn (2010), the positive relation between relative CEO pay and bond yield spreads in their study can be attributed to relative power between CEO and other top executives because they use pay slice as the variable for the relative CEO pay. Whereas in our study we use pay ratio for the relative CEO pay and our findings suggests that the positive relation between CEO pay ratio and bond yield spreads can be attributed to the relative bargaining power between the CEO and the ordinary employees. Therefore, similar to the logic of Liu and Jiraporn (2010), we argue that higher CEO pay ratio signifies a relative powerful CEO versus the ordinary employees. Thus, we next investigate how an increasing bargaining power from the ordinary employees would affect the relation between the CEO pay ratio and yield spreads. In other words, we try to find out if bondholders will not perceive the higher CEO pay ratio as much detrimental to their investments if employees are having more bargaining power.

The most intuitive way of measuring employees' bargaining is by using the degree of industry homogeneity and the intensity of labor unionization in a firm. Therefore, we use the degree of industry homogeneity and the unionization among workers in a firm as the proxy for employees' bargaining power, and examine the effect of the degree or level of unionization on the relation between CEO pay ratio and yield spreads. Our result shows that weaker homogeneous industries and higher level of unionization tends to mitigate the effect of CEO pay ratio on yield spreads. That is, higher CEO pay ratio does not affect yield spreads as much when the level of industry homogeneity is lower or the unionization level is higher. This result suggests that bondholders will perceive higher CEO pay ratio as less detrimental to their investments when the industry homogeneity is lower or level of unionization is higher, because the lower industry homogeneity and the higher level of unionization gives

workers more bargaining power and thus can alleviate the unbalance of power between CEO and the workers. And bondholders perceive it as a reduction of riskiness in their investments.

Furthermore, we also try to find out if bondholders will perceive higher CEO pay ratio more threatening when the firm is in distress or has higher level of financial constraints, i.e., if financial constraints will make the relation between CEO pay ratio and yield spreads more pronounced.

Our result shows that the level of financial constraints does play a role in the relation between CEO pay ratio and yield spreads and they tend to reinforce that relation. In other words, higher CEO pay ratio will affect yield spreads more in a firm with higher level of financial constraints. This suggests that high CEO pay ratio can be even more detrimental to bondholders' investments when the firm is in distress or with more financial constraints.

The rest of the paper is organized as follows. In the next section, we describe the data and variables used in the empirical analysis. Section 3 specifies the methodologies and regression models. Section 4 reports our empirical results. And, section 5 contains concluding remarks.

2. Data and Variables

2.1 CEO pay ratio

The main variable of interest in this paper is the CEO-employee pay ratio, which is a ratio of CEO pay compensation over the average pay of the ordinary employees. Both CEO and employees pay compensations are obtained from Compustat, and specifically CEO pay compensation is collected from the ExecuComp sub-database of Compustat.

The CEO pay compensation includes CEO's salary, bonus, other annul pay, total

value of restricted stock in the granted year, long-term incentive payouts, and all other total compensation (the item TDC1 in ExecuComp). And, the average employee pay is measured by distracting total executive compensation from total labor expenses (the item XLR in Compustat), scaled by the number of employees (the item EMP in ExecuComp). Following Cheng, Ranasinghe, and Zhao (2017), we also use industry-adjusted CEO pay ratio to avoid industry effect. According to Cheng, Ranasinghe, and Zhao (2017), CEO pay ratio in one industry may be systematically different from another industry, which may reflect industry-level differences in the regression result.

Alternatively, for the CEO pay compensation, we also use CEO cash, CEO long-term pay, sum of CEO cash and CEO long-term pay, and the total compensation of non-CEO executives, in our robustness analyses. The CEO cash composes of salary and cash bonus and the long-term pay composes of stock and option grants and other long-term incentive payouts (the item LTIP in ExecuComp).

2.2 Bond Yield Spreads

Another main variable in our paper is the bond yield spreads. We obtain the bond yield spreads from the Datastream dataset. And, we employ the yield spread as a direct measure for the cost of bond financing, which is calculated as the difference in yields between corporate bonds and the U.S. Treasury bond with the same maturity. Both Chen, Liao, and Tsai (2011) and Liu and Jiraporn (2010) use yield spread as a proxy for the risk premium for both the default risk and liquidity risk of a firm. In our data sample, we exclude bonds issued by utility or financial firms (SIC codes 6000–6999 and 4900–4999), and bonds with embedded options (e.g., convertible, callable, or puttable bonds) and/or with a sinking fund provision. In addition, we also exclude bonds with floating rate coupons, security, government guarantee, and special clauses.

We next match the bond yield spreads data with the CEO compensation data from the Compustat's ExecuComp and to include only those that have the compensation data in ExecuComp. The remaining firms are then matched with Compustat, CRSP databases, and I/B/E/S database. As a result, our data includes 9378 firm-month observations from 230 unique firms, 948 bonds with periods from 1992 to 2013. Table 1 shows our data sample size, and the sample distribution by industry and time.

[Insert Table 1 here]

2.3 Control Variables

All of the firms' financial data items that we use as control variables in our empirical analysis are obtained from the Compustat database. And, the stock return volatility data is collected from the Center for Research in Security Prices (CRSP) database.

In specific, following Chen et al. (2011), we include the following financial data items in our regression analysis. *Leverage* is measured as the ratio of the book value of debt to the sum of the book value of debt and market value of equity. *Volatility* is calculated as the standard deviation of monthly stock returns over the preceding 360 months. It has been used to capture the volatility of a firm's value (e.g., Yu (2005), Chen et al. (2011)). *Coupon rate* is included as a determinant of bond yield based on the evidence that bonds with a higher coupon rate will be taxed more (Elton et al. (2001), Campbell and Taksler (2003)). *Term* is the remaining years to maturity of a bond. *LoanAmt* is the amount of the issue size of the bond, while *BondAge* is measured as the difference in time between the settlement date and the issuing date of a bond. Both of them measure the external liquidity of the bond.

Next, *Log (Sale)* is the natural logarithm of sales. *NAnalyst* is measured as the number of analysts following a stock, which is obtained from the I/B/E/S database.

Disper is calculated as the ratio of the standard deviation of analysts' earnings forecasts in a specific year to the absolute value of the mean earning forecast in that same year. *FirmAge* is calculated as the length in time the company has been publicly traded and the data is obtained from the CRSP database.

For the CEO bio data, *CEO age* is measured by the natural log of CEO's age. *CEO tenure* is measured by the number of years that CEO has been working in a firm. And, for the purpose of comparison, we also include other measures of the executive relative pay such as *CEO payslice* and *Log (paygap)*. *CEO payslice* is the ratio of pay compensation of CEO to that of the other top executives, while *Log (paygap)* is the natural logarithm of the difference between pay compensation of CEO and that of the other top executives. And, finally, *Rating* is a numerical score converted from Moody's bond rating data, as reported in the Datastream dataset. For example, *Rating* equals to 1, 2, 3 and 4, for the Moody's bond rating of Aaa, Aa1, Aa2 and Aa3, respectively.

Table 2 reports the summary statistics for the variables used in this paper. First of all, on average, the mean value for the yield spreads is 287.98 basis points, with a minimum and maximum value of 59.50 and 4874.60 basis points, respectively. And the mean CEO-employee pay ratio is 157.14, within a range between 4.17 and 3248.39. That is, on average compensation of CEO is about 163 times of that of employees, with a minimum of 4.17 times and a maximum of about 3248 times during our sample period. Other measures of CEO-employee relative pay, such as that in terms of cash pay, long term pay, show a relatively smaller numbers.

[Insert Table 2 here]

3. Model Specification

Since the main research question in this paper is to find out whether CEO pay ratio

has an effect on the bond yield spreads, we use the following regression model is conduct the empirical analysis on the relationship between CEO pay ratio and bond yield spreads. The model is an ordinary least squares (OLS) regression model with firm-clustered, heteroscedasticity-robust standard errors, and adjusted for both industry and time fixed effects.

$$YS_{it} = \alpha + \beta_1 CEO\ pay\ ratio + \beta_2 Leverage + \beta_3 Vol + \beta_4 Coupon + \beta_5 Term + \beta_6 LoanAmt + \beta_7 BondAge + \beta_8 Log(Sale) + \beta_9 Disper + \beta_{10} FirmAge + \beta_{11} RAT + \beta_{12} Log(CEO\ Age) + \beta_{13} Log(Tenure) + Year\ Dummies + Industry\ Dummies, \quad (1)$$

where bond yield spread (YS) is the dependent variable, and CEO pay ratio is the main variable capturing the effect of CEO pay ratio on the bond yield spread. The rest of the variables are control variables, which include leverage ratio (Leverage), annualized equity return volatility (Vol), annualized coupon rate (Coupon), term to maturity (Term), logarithmic loan amount (LoanAmt), bond age (BondAge), logarithmic sale (Sale), dispersion in analyst forecasts (Disper), firm age (FirmAge), credit rating (RAT), logarithmic CEOs age (CEO Age), logarithmic CEO tenure (Tenure). All of the values in explanatory variables are of lag-one period.

Next, one of the factors that we would like to explore in terms of the effect of CEO pay ratio on the yield spreads is a firm's financial constraint. Therefore, we need to first adopt a proper measure for a firm's financial constraint. In this paper, we employ three financial constraint measures that have been used in the literature. They are, respectively, the new Kaplan-Zingales Index (New KZ index), the Size-age Index (SA Index), which are proposed by Hadlock and Pierce (2010), and the WW Index by Whited and Wu (2006).

First of all, the New KZ index is composed of five parts: dividend, leverage, cash holding, cash flow, and Tobin's Q. All of the variables are collected from Compustat and are normalized by capital expenditure. We calculate the New KZ index as follows:

$$New\ KZ_{i,t} = -0.009 \times \frac{Cash\ Flow_{i,t}}{K_{i,t-1}} + 0.031 \times Tobin\acute{}s\ Q_{i,t} + 2.643 \times \frac{Debt_{i,t}}{Total\ capital_{i,t-1}} + 0.024 \times \frac{Div_{i,t}}{K_{i,t-1}} + 0.017 \times \frac{Cash_{i,t}}{K_{i,t-1}}$$

The second measure for financial constraint is SA Index, which is defined as follows:

$$SA\ Index = -0.737 \times \text{Size} + 0.043 \times \text{Size}^2 - 0.04 \times \text{Age},$$

where Size is the log of book assets (Item AT in Compustat) adjusted by inflation.[2] And, Age is the age of a firm in terms of number of years reported in Compustat. The implication from the SA Index is that, in the earlier stage, when the younger and smaller firms become more mature and grow larger, their financial constraints decrease sharply. However, when the firm's size becomes larger to some extent, the possibility of facing more financial constraints becomes larger. In general, the SA Index is positively correlated with the level of financial constraint.

The third financial constraint measure, the WW Index, is first used by Whited and Wu (2006) and the index is estimated by using the generalized method of moments (GMM) on an investment Euler equation based on financial ratios. According to the Whited and Wu (2006), the WW Index improves the KZ index and better captures the level of financial constraint. The WW index is given as follows:

$$WW\ Index = -0.091 \times CF - 0.062 \times DIVPOS + 0.021 \times TLTD - 0.044 \times$$

[2] Information on inflation comes from the World Bank. http://www.worldbank.org/

$LNTA + 0.102 \times ISG - 0.035 \times SG,$

where CF is the cash flow scaled by total assets ((Item IB +Item DP)/ Item AT). *DIVPOS* is calculated as a dummy variable where the value is one if the firm pays cash dividends during the year ((Item DVC+ Item DVP) > 0). *TLTD* is measured as long-term debt scaled by total assets (Item DLTT/ Item AT). *LNTA* is the natural log of book value of total assets (Item AT). *ISG* is the industry sales growth based on the three-digit SIC level. And finally, *SG* is the sales growth of the firm. By construction, the value of each of the above three financial constraint indices would be higher when the firms are facing more financial constraints.

4. Empirical Results

4.1 The Effect of CEO Pay ratio on Bond Yield Spread

Table 3 reports the regression results of equation (1) above, i.e., the results of the effect of CEO pay ratio on bond yield spreads. First of all, it is shown in the first column of the table that the coefficient of CEO pay ratio is significantly positive, with a value of 0.062, which indicates that the bond yield spread is positively related with CEO pay ratio. In other words, the higher the CEO pay ratio is, the larger the bond yield spread will be. Since bond yield spread is a proxy for the riskiness of the bond, the result suggests that higher CEO pay ratio leads to higher financial risk of a firm. This is consistent with the findings by Liu and Jiraporn (2010). However, as we stated in the above section, Liu and Jiraporn (2010) do not use the CEO pay ratio in measuring the relative CEO pay, instead, they use the CEO pay slice. And, as we mentioned above, CEO pay slice only considers the pay difference between CEO and other top executives, while failing to include the vast majority of the employees, i.e., the ordinary employees who are not in the top executive level. And, we believe that

CEO pay ratio is able to better reflect bondholders' perception and concern regarding the pay inequality within a firm because CEO pay ratio specifically addresses the issue of the pay inequality between CEO and the vast majority of employees in a firm.

Next, we also conduct the analysis by controlling the other two CEO relative pay measures, i.e., CEO pay slice and CEO pay gap (Log (pay gap)), in our regression and the results are presented in columns (2) and (3) in Table 3. The log of CEO pay gap is measured as natural logarithm of the difference between CEO total pay and the median total pay among the other top executives. Essentially, the results are the same as that in column (1). That is, both CEO pay ratio coefficients in columns (2) and (3) are still positive and significant, after controlling for the other two CEO relative pay measures.

[Insert Table 3 here]

In Table 4, we use the industry-adjusted CEO pay ratio to re-examine the effect of CEO pay ratio on the yield spread. The industry-adjusted CEO pay ratio is measured as a firm's CEO pay ratio subtracting the industry average CEO pay ratio. As shown in the first row in Table 4, all of the coefficients of the CEO pay ratio remain significantly positive. This result confirms that the relation between CEO pay ratio and yield spread is not driven by the variations in pay ratio across industries.

[Insert Table 4 here]

In Table 5, we alternatively use the four measures to proxy CEO pay ratio, which are CEO cash pay ratio, CEO LTIP pay ratio, CEO cash LITP pay ratio, and Non-CEO pay ratio. CEO cash pay ratio is the sum of salary, bonus, and other annual payments divided by average pay of the ordinary employees. CEO LTIP pay ratio is the sum of restricted stock grants, options grants, and long-term incentive payouts

divided by average pay of the ordinary employees. CEO Cash LITP pay ratio is the sum of cash pay and long-term incentive payouts divided by average pay of the ordinary employees. Non-CEO total pay ratio is compensation of non-CEO top executives divided by average pay of the ordinary employees. As shown in the first row in Table 5, all of the coefficients of the alternative CEO pay ratio measures remain significantly positive.

[Insert Table 5 here]

4.2 Endogeneity Problem

Next, we address the potential endogeneity issue between CEO pay ratio and bond yield spread, i.e., the possible reverse causality effect from bond yield spread to CEO pay ratio. In both Table 3 and 4 we already used the lag-one period value of the CEO pay ratio as the explanatory variable. Here, we further account specifically for the endogeneity issue by employing the two-stage least squares regression and the propensity-score match (PSM) approaches.

First, for the two-stage least squares regression, we use *MedInd CEO pay ratio* and *CFOVP* as instrumental variables and CEO pay ratio as an endogenous variable to more explicitly control for the endogeneity.[3] In the first-stage estimation, we regress CEO pay ratio on both *MedInd CEO pay ratio* and *CFOVP* with the same control variables as in Table 3. *MedInd CEO pay ratio* is measured as the natural log of median value of CEO pay ratio in three-digit industry level. *CFOVP* is an indicator variable, which equals to one if CFO is listed in the proxy statement as the named

[3] Crawford, Nelson, and Rountree (2016) examine the relation between CEO pay ratio and firm value. For mitigating endogeneity problem, Crawford et al. (2014) take number of VPs and CFO is VP as instrumental variables and report these two variable could effectively mitigate the endogeneity problem.

officers.

In untabulated Table, we reports the first-stage regression results. The coefficients on *MedInd CEO pay ratio* and *CFOVP* are significantly positively related to CEO pay ratio, which is consistent with Crawford, Nelson, and Rountree (2016). The Hansen J-statistic at the bottom of the Table is to examine whether the instrumental variables are valid. The p-value of Hansen J-statistics is 0.210, which is insignificant, thus indicates that we cannot reject the hypothesis that the instrumental variables are valid. We also report Sargan statistics to examine whether all instruments are over-identified. The p-value of chi-square is 0.298, which is not significant, suggesting that there is no over-identification problem among the instrumental variables.

In column (1) of Table 6 reports the results of the second-stage regression. We regress bond yield spread on the CEO pay ratio. Similar to that in the previous three tables, as we can see that the coefficient of the CEO pay ratio is 0.0604, which is positive and statistically significant. Therefore, the result shows that the positive impact of CEO pay ratio on bond yield spread is robust after controlling for the endogeneity issue.

Secondly, we use the propensity-score matched (PSM) approach to control for the endogeneity problem. In this approach, we match two types of firms: the treatment firms with high rent-sharing incentive, and the control firms with low rent-sharing incentive (Lawrence, Minutti-Meza, and Zhang, 2011). First, we use Probit regression that includes high pay ratio as dependent variable and all explanatory variables as independent variables to generate a predicted probability for high pay ratio. The high pay ratio is an indicator that equal to one if the value of pay ratio is over the 70^{th} percentile, and zero if the value is below the 30^{th} percentile. Next, by using a caliper method to match treatment firms and matching firms so that the difference between

these two types of firms equal to 1%.

The result by using the PSM approach is presented in the second column of Table 6. From the coefficient of CEO pay ratio, it is clear that the value of the coefficient is 0.0088, which is still positive and significant. Again, the result indicates that our previous result regarding the effect of CEO pay ratio on the yield spread is not due to the endogeneity problem.

[Insert Table 6 here]

4.3 The Effect of CEO Bargaining Power: Industry Homogeneity and Labor Unionization

In this section, we try to find out if the degree of CEO bargaining power would affect the relation that we find in the previous sections between CEO pay ratio and bond yield spread. To capture the power of CEO, we use homogeneous industry and labor union based on Faleye et al. (2013) argument that the similarity of firms in homogenous industries indicates that CEO has greater bargaining power because CEO has more opportunities for outside employment and takes the power to replace workers. In addition, the labor unionization to some degree represents the employees' bargaining power against the top mangers (e.g., Frandsen, 2012), in particular the CEO.

We argue that the degree of industry homogeneity and level of labor unionization may affect the perception by the bondholders toward the pay inequality issue between CEO and the employees. We hypothesize that CEO in a firm with a weaker degree of industry homogeneity and a higher degree of labor unionization will tend to respond to her employees in a less opaque way because of the higher bargaining power from the employees. Thus, the pay inequality problem tends to be less severe in such firms. That, in turn, will mitigate the effect of the CEO pay ratio on bond yield spread.

Following Parrino (1997), we calculate the industry homogeneity based on the correlation between common stock return within two-digit SIC industries. The measure capture the perspective that the firms may encounter similar shock (e.g., economic conditions or technological innovations) which would affect their cash flow, and further stock price because the firms in an industry launch similar production technologies and compete in similar product markets. We calculate this measure by three steps. First, we use monthly returns to estimate the equally weighted return index for each industry. Next, we regress monthly return for each firm on an equally weighted market return index and the industry return index. Finally, we average partial correlation coefficient for the industry return index across all firms in each industry to get the mean partial correlation proxy. If the value of the mean partial correlation proxy is higher, the level of homogeneous industries is larger.[4] We then divide the samples into two subsamples by the median of the value of industry homogeneity. A firm is assigned to highly homogeneous industry if the value of industry homogeneity is above the median over the samples.

The labor unionization data is from Union Membership and Coverage Database, which is constructed and maintained by Barry Hirsch and David Macpherson.[5] The measure for labor unionization is captured by *LSTR*, *which is* calculated as unionization rate multiplied by labor intensity. The unionization rate is percentage of employed labors who are the member of union. The labor intensity is the number of employees scaled by its total assets. We next divide the samples into two subsamples by the median of the value of LSTR. A firm is assigned to highly labor union intensity

[4] Following Parrino (1997), if returns are reported for fewer than 35 firms in an industry, we delete the samples from all analyses, while if observations from industries more than 50 firms in an industry, we select a random sample of 50.

[5] We download and collect union-related data at www.unoinstat.com.

if the value of LSTR is above the median over the samples.[6]

Table 7 reports the results of regressions of yield spreads on pay ratio for subsamples. In column (1) and (2) presents the effect of homogeneous industry, which show that coefficients of the CEO pay ratio are significantly more positive for firms within higher (above-median) level of homogeneous industry than firms within lower (below median) level of homogeneous industry. For example, we find that the coefficients of CEO pay ratio are respectively 0.0559 and 0.0285 for firms with above- and below- median homogeneous industry. The results support the argument by Faleye et al. (2013) that the homogenous industries help CEOs raise their bargaining power.

In column (3) and (4) of Table 7 presents the effect of labor union, show that coefficients of the CEO pay ratio are significantly less positive for firms with higher (above-median) intensity of labor union than firms with lower (below median) level of intensity of labor union. For example, we find that the coefficients of CEO pay ratio are respectively 0.0383 and 0.0480 for firms with above- and below- median intensity of labor union. That is, the results suggest that homogenous industries and labor unionization does play a mitigating role in the relation between CEO pay ratio and bond yield spread. In other words, the effect of CEO pay ratio on bond yield spread becomes weaker in firms with lower degree of industry homogeneity or higher degree of labor unionization, because the lower degree of industry homogeneity or the higher degree of unionization represents a stronger employee bargaining power and thus can mitigate the risk perceived by the bondholders toward the pay inequality between its CEO and employees.

[Insert Table 7 here]

[6] Faleye et al. (2013) include labor union in the regression as control variable to control the potential effects of labor unions on productivity.

4.4 The Effect of Financial Constraint

In this section, we further investigate whether the relation between CEO pay ratio and bond yield spread will be affected by the level of financial constraints. Chen et al. (2011) propose that internal liquidity of firm is an indicator of a firm's ability to fulfill the obligatory payments, which indicates that the firm has poor corporate government. Therefore, we predict that the internal illiquidity would enhance the positive relationship between CEO pay ratio and bond yield spread. In this paper, we use financial constraint to capture the firm's internal illiquidity. To measure the financial constraint, we employ three different proxies as described in the Model Specification section above, i.e., the New KZ Index, the SA Index, and the WW Index. And the results of the effect of financial constraints are reported in Table 8.

In order to examine the effect from the financial constraints, we firstly employ the New KZ index to measure financial constrain. The value of the New KZ index is positively related to the level of financial constraint. Next, we divide the sample firms into two subgroups by the median of financial constraints, measured by the New KZ index, in each year. A firm is assigned to the high financial-constraint group if its New KZ index is above the median, and assigned to the low financial-constraint group if its New KZ index is below the median.

The results are presented from columns (1) to (6), respectively, in Table 8. The results show that coefficients of CEO pay ratio are significantly more positive for firms with high (above-median) financial constraint than firms with low (below median) financial constraint. For example, we find that the coefficients of CEO pay ratios are respectively 0.0320 and -0.0856 for firms with above- and below- median financial constraint. The results suggest that higher financial constraints can lead to higher impact of the CEO pay ratio on bond yield spread. We alternatively use SA Index and

WW Index to measure a firm's financial constraints. The results are consistent with the results of the New KZ Index, which finds that the association between CEO pay ratio and yield spread is more positive for the firms with large financial constraint. This makes sense because bondholders tend to perceive pay inequality between CEO and employees as riskier when the firm is facing higher financial tension.

[Insert Table 8 here]

5. Conclusion

In this paper, we explore the relation between CEO pay ratio and bond yield spreads. That is, we examine how the pay inequality between CEO and non-executive, or ordinary employees affect bondholders' perception regarding a firm's financial riskiness. We use the CEO pay ratio, defined as the ratio between pay compensation of CEO and that of an average ordinary employee, as the measure for the pay inequality. Our empirical results show that there exists a positive relation between the CEO pay ratio and bond yield spread, which suggests that bonds issued by a firm with higher CEO pay ratio tend to have higher bond yield spreads. In other words, bondholders tend to perceive the pay inequality as a risk factor when they incorporate it into the yield that they require from investing in the bonds.

In addition, we investigate whether the degree of labor unionization would affect the relation between CEO pay ratio and bond yield spread and our findings show that labor unionization does play a role in mitigating the effect of CEO pay ratio on the bond yield spread. That is, higher degree of labor unionization tends to reduce the effect of the pay inequality between CEO and ordinary employees on bond yield spread. Since the degree of labor unionization can be seen as a bargaining power of the employees against the top executives, in particular the CEO, the role of industry homogeneity and labor unionization in the relation between pay inequality and bond

yield spread seems to suggest that bondholders perceive higher employees bargaining power as a mitigating factor reducing the riskiness coming from the pay inequality.

Furthermore, we also examine the effect of a firm's financial constraints on the relation between CEO pay ratio and bond yield spread. What we find is that higher level of financial constraint tends to reinforce the positive effect of the pay inequality on bond yield spread.

Appendix A. Variables Description

Variable	Description
Main Variables	
CEO pay ratio (total)	CEO pay ratio, measured as the sum of salary, bonus, and other annual payments divided by average pay of the ordinary employees.
CEO cash pay ratio	The sum of salary, bonus, and other annual payments divided by average pay of the ordinary employees.
CEO LTIP pay ratio	The sum of restricted stock grants, options grants, and long-term incentive payouts divided by average pay of the ordinary employees.
CEO cash LITP pay ratio	The sum of cash pay and long-term incentive payouts divided by average pay of the ordinary employees.
Non-CEO total pay ratio	The compensation of non-CEO top executives divided by average pay of the ordinary employees.
Control Variables	
CEO payslice	CEO pay slice, measured as a CEO's total pay (Execucomp item TDC1) divided by the sum of the total pays of the top five executives.
Log (paygap)	Natural log of the difference between the total pay of the CEO and the median total pay among the other top four executives.
Leverage	Leverage is defined as the ratio of the book value of debt to the book value of debt plus market value of equity
Vol	Standard deviation of monthly stock returns over the preceding 36 months
Coupon	Coupon rate of bond in a given year.
Term	Years to maturity
LoanAmt	The logarithm of the dollar amount of the bond issue.
BondAge	The difference (in years) between the settlement date and the issuing date
Log (Sale)	Natural log of sale.
Disper	The standard deviation in analysts' fiscal year 1 earnings per share forecasts made one month prior to fiscal year end, and is scaled by the absolute value of the mean forecast.
FirmAge	The period of time a firm appears in the CRSP.
RAT	The Moody's ratings are converted into a numerical score : 1 is Aaa, 2 is Aa1, 3 is Aa2, 4 is Aa3,5 is A1, and so on
Log (CEO Age)	The natural log of CEO's age as of the sample year
Log (Tenure)	The natural log of number of years that CEO has worked for the firm

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Table 1 Sample Size

The table reports the distribution of all bonds between 1993 and 2006 and with one-digit industry over one to nine. The sample includes 230 firms, 948 bonds for a total of 9378 monthly bonds observations during the sample periods. Panel A reports number of CEO, number of bonds and the number of pooled observations sorted by Moody's credit ratings in the given year. Panel B and Panel C separately reports total executives' revenue, CEOs' revenue including cash pay and long-term incentive pay, and revenue for per employee. All variables are defined in Appendix A.

Panel A

	#CEO	#Bond	#Observations					
			A1	A2	A3	Baa	Below Baa	Total
2001	20	76	14	175	143	269	33	634
2002	19	70	24	275	156	204	60	719
2003	19	74	24	311	162	216	60	773
2004	20	78	48	334	175	216	60	833
2005	18	79	48	347	180	175	36	786
2006	21	86	48	377	184	192	50	851
2007	21	80	48	240	210	204	76	778
2008	19	74	24	240	125	216	108	713
2009	20	86	25	240	214	229	123	831
2010	21	91	37	240	238	240	138	893
2011	16	73	48	144	252	171	144	759
2012	16	81	48	118	264	190	188	808
Total	230	948	436	3041	2303	2522	1076	9378

Panel B

	(1)	(2)	(3)	(4)	(5)	(6)
Year	Total executives pay	CEO pay	CEO total cash	CEO long-term pay	Employee pay each person	Pay ratio ((2)/(5))
2001	20798.90	8869.56	2580.48	1241.74	65.92	134.56
2002	20934.92	8268.19	2492.45	1816.36	70.06	118.01
2003	21965.13	8989.50	2725.99	1786.96	76.10	118.13
2004	25010.99	9466.67	3147.27	2471.04	78.57	120.49
2005	31175.51	9908.29	2898.71	3587.26	84.41	117.38
2006	29250.83	10803.85	2323.80	3471.42	87.04	124.12
2007	30974.04	11200.01	1865.19	3936.27	87.40	128.14
2008	31569.94	12354.78	1981.99	4229.53	84.47	146.26
2009	24209.94	9659.92	2390.93	2534.62	86.73	111.38
2010	29745.10	11003.13	2330.37	2922.31	91.35	120.46
2011	25482.50	10545.22	2380.27	2841.12	86.63	121.72
2012	27955.36	9384.06	1960.15	2706.90	88.89	105.57

Panel C

	(1)	(2)	(3)	(4)	(5)	(6)
SIC1	Total executives pay	CEO pay	CEO total cash	CEO long-term pay	Employee pay each person	Pay ratio ((2)/(5))
1	30555.00	13757.23	3053.49	3355.20	78.15	176.04
2	30468.82	11549.07	3118.32	2165.91	84.34	136.93
3	32897.56	11165.68	2566.04	4197.05	84.61	131.97
4	22472.23	8725.89	2064.92	2444.61	86.03	101.43
5	35026.88	13940.00	1705.61	5050.02	5.92	2354.73
7	14381.61	2870.68	1590.71	185.75	63.91	44.92
8	17371.66	8512.55	1883.80	2086.62	58.32	145.96

Table 2 Summary Statistics

This table presents the summary statistics of major variables, including mean, median, standard deviation, minimum and maximum. Yield spread (YS) is the difference in yield to maturity between a corporate bond and a US Treasury bond with the same maturity. CEO pay ratio is the total CEO compensation (TDC1 in ExecuComp) divided by average pay of the ordinary employees. CEO cash pay ratio is the sum of salary, bonus, and other annual payments divided by average pay of the ordinary employees. CEO LTIP pay ratio is the sum of restricted stock grants, options grants, and long-term incentive payouts divided by average pay of the ordinary employees. CEO cash LITP pay ratio is the sum of cash pay and long-term incentive payouts divided by average pay of the ordinary employees. Non-CEO total pay ratio is compensation of non-CEO top executives divided by average pay of the ordinary employees. Ordinary employee pay is average labor expenses less CEO compensation divided by the number of employees. CEO payslice is the ratio of CEO's total pay (Execucomp item TDC1) divided by the sum of the total pays of the top five executives. Log of paygap is the natural logarithm of the difference between the total pay of the CEO and the median total pay among the other top four executives. Leverage is the firm's leverage ratio. Equity volatility (Vol) measures volatility using the returns of previous 36 months. Coupon, Term, and LoanAmt are respectively coupon rate, time to maturity, and the natural log of amount issued. Bond age (BondAge) is defined as the difference between the settlement date and the issuing date. Log of sale is the natural logarithm of sale. The dispersion in analysts' forecasts (Disper) is calculated as the standard deviation of the analysts' fiscal year 1 earnings per share forecasts scaled by the absolute value of the mean forecast. FirmAge is number of years that a corporate appears on CRSP. Bond rating (RAT) is the numerical bond rating from Datastream, where Aaa has a value of 1, Aa1 2, Aa2 3, etc. CEO age is natural log of CEO's age as of the sample year. CEO tenure (Tenure) is the number of years that CEO works in the firm. All variables are winsorized at the 1% level.

Variable	Mean	Median	Std. Dev	Min.	Max.
Panel A: dependent variable					
YS	287.98	171.55	437.77	59.50	4874.60
Panel B: independent variable					
CEO pay ratio (total)	157.14	120.63	297.60	4.17	3248.39
CEO cash pay ratio	34.62	26.21	40.34	2.50	372.06
CEO LTIP pay ratio	48.36	23.42	120.14	0.00	1137.98
CEO cash LITP pay ratio	82.98	57.24	155.30	4.17	1510.04
Non-CEO total pay ratio	159.07	121.02	303.64	4.17	3281.21
Ordinary employee pay	82.90	85.99	20.55	4.99	148.40
Panel C: control variable					
CEO payslice	0.39	0.41	0.11	0.06	0.76
Log (paygap)	8.49	8.84	1.07	2.49	9.88
Leverage	0.31	0.26	0.19	0.01	0.98
Vol	0.09	0.08	0.04	0.03	0.38
Coupon	7.52	7.38	1.24	2.90	10.38
Term	23.61	19.28	19.67	3.36	99.94
LoanAmt	12.16	12.43	1.15	5.52	14.36
BondAge	9.30	8.82	5.90	0.01	26.60
Log (Sale)	9.77	9.73	0.89	6.38	12.00
Disper	0.08	0.03	0.24	0.00	3.48
FirmAge	35.11	38.48	10.93	0.08	49.95
RAT	7.74	7.00	2.49	5.00	18.00
Log (CEO Age)	4.04	4.06	0.11	3.74	4.30
Log (Tenure)	1.59	1.61	0.65	0.00	3.58

Table 3 CEO Total Pay Ratio and Bond Yield Spread

This table reports the regression results of yield spread (YS) on CEO pay ratio. Other control variables include the commonly used factors (Leverage, Volatility, Coupon, Term, LoanAmt, BondAge, FirmAge, RAT, respectively), the information uncertainty proxies (Disper), and two CEO characteristics (CEO Age, Tenure). Column (1) reports the result from the baseline OLS regression, Column (2) and Column (3) separately controls for the CEO payslice effect and paygap effect. All regressions control for the two-digit SIC industry effect and year effect. The t-statistics are in parentheses based on robust standard errors clustered at the firm level. All variables are winsorized at the 1% level. ***, **, and *, reported below are significant at 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)
CEO pay ratio (total)	0.0619***	0.0591***	0.0463***
	(3.54)	(3.94)	(3.45)
CEO payslice		138.797	
		(1.31)	
Log (paygap)			0.0047*
			(1.76)
Leverage	241.457***	241.470***	256.740***
	(3.05)	(3.09)	(3.08)
Vol	-192.18	-197.18	-234.56
	(-0.98)	(-0.61)	(-1.12)
Coupon	10.7422*	9.4777	10.6590*
	(1.67)	(1.47)	(1.66)
Term	-0.0889	-0.1016	-0.1507
	(-0.20)	(-0.23)	(-0.34)
LoanAmt	-2.4803	-3.5669	-2.5077
	(-1.01)	(-1.27)	(-0.90)
BondAge	0.7493	0.7846	0.7939
	(0.59)	(0.59)	(0.61)
Log (Sale)	-5.4768	-6.6388	-10.767
	(-0.57)	(-0.54)	(-1.22)
Disper	-36.953*	-30.117*	-29.043*
	(-1.89)	(-1.68)	(-1.75)
FirmAge	1.1894	1.3109	1.4081
	(1.28)	(1.40)	(1.47)
RAT	-0.9498	-0.0846	0.9696
	(-0.29)	(-0.03)	(0.33)
Log (CEO Age)	-17.963	-23.990	-16.086
	(-0.50)	(-0.53)	(-0.46)
Log (Tenure)	-15.588	-20.633	-17.638
	(-1.05)	(-1.44)	(-1.27)
SIC FE	Y	Y	Y
Year FE	Y	Y	Y
N	7736	7690	7736
Adj. R2	0.11	0.11	0.12

Table 4 Industry-Adjusted CEO Total Pay Ratio and Bond Yield Spread

This table reports the regression results of yield spread (YS) on industry-adjusted CEO pay ratio (Ind_payratio). Ind_payratio is measured as a firm's CEO pay ratio subtracting the industry average CEO pay ratio. Other control variables include the commonly used factors (Leverage, Volatility, Coupon, Term, LoanAmt, BondAge, FirmAge, RAT, respectively), the information uncertainty proxies (Disper), and two CEO characteristics (CEO Age, Tenure). Column (1) reports the result from the baseline OLS regression, Column (2) and Column (3) separately controls for the CEO payslice effect and paygap effect. All regressions control for the two-digit SIC industry effect and year effect. The t-statistics are in parentheses based on robust standard errors clustered at the firm level. All variables are winsorized at the 1% level. ***, **, and *, reported below are significant at 1%, 5%, and 10% level, respectively.

	(1)	(1)	(3)
Ind_payratio (total pay)	0.0556***	0.0546***	0.0415***
	(3.35)	(3.68)	(3.09)
CEO payslice		149.736	
		(1.39)	
Log (paygap)			0.0052*
			(1.91)
Leverage	228.792***	230.452***	250.008***
	(3.04)	(3.09)	(3.09)
Vol	-196.76	-209.62	-241.62
	(-0.99)	(-0.64)	(-1.15)
Coupon	10.3697	9.1401	10.4133
	(1.64)	(1.44)	(1.64)
Term	-0.1164	-0.1263	-0.1751
	(-0.25)	(-0.28)	(-0.39)
LoanAmt	-2.0810	-3.3016	-2.2413
	(-0.86)	(-1.18)	(-0.80)
BondAge	0.7959	0.8045	0.8268
	(0.64)	(0.61)	(0.64)
Log (Sale)	-3.9467	-5.1593	-10.347
	(-0.42)	(-0.42)	(-1.19)
Disper	-40.945**	-32.838*	-30.850*
	(-1.98)	(-1.77)	(-1.82)
FirmAge	1.0002	1.1604	1.3121
	(1.14)	(1.30)	(1.43)
RAT	-0.7522	0.1191	1.2675
	(-0.24)	(0.04)	(0.45)
Log (CEO Age)	-17.971	-24.848	-15.713
	(-0.50)	(-0.55)	(-0.45)
Log (Tenure)	-15.353	-20.756	-17.752
	(-1.02)	(-1.43)	(-1.27)
SIC FE	Y	Y	Y
Year FE	Y	Y	Y
N	7736	7690	7736
Adj. R2	0.10	0.11	0.11

Table 5 Alternative Measures of CEO Total Pay Ratio

This table reports the regression results based on four alternative measures of CEO cash pay ratio, CEO LTIP pay ratio, CEO cash LITP pay ratio, and Non-CEO total pay ratio. The dependent variable is the bond yield spread (YS). CEO cash pay ratio is the sum of salary, bonus, and other annual payments divided by average pay of the ordinary employees. CEO LTIP pay ratio is the sum of restricted stock grants, options grants, and long-term incentive payouts divided by average pay of the ordinary employees. CEO Cash LITP pay ratio is the sum of cash pay and long-term incentive payouts divided by average pay of the ordinary employees. Non-CEO total pay ratio is compensation of non-CEO top executives divided by average pay of the ordinary employees. Other control variables include the commonly used factors (Leverage, Volatility, Coupon, Term, LoanAmt, BondAge, FirmAge, RAT, respectively), the information uncertainty proxies (Disper), and two CEO characteristics (CEO Age, Tenure). Column (1) reports the result from the baseline OLS regression, Column (2) and Column (3) separately controls for the CEO payslice effect and paygap effect. All regressions control for the two-digit SIC industry effect and year effect. The t-statistics are in parentheses based on robust standard errors clustered at the firm level. All variables are winsorized at the 1% level. ***, **, and *, reported below are significant at 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)
CEO cash pay ratio	0.3112**			
	(2.13)			
CEO LTIP pay ratio		0.1121***		
		(2.90)		
CEO cash LTIP pay ratio			0.0869***	
			(3.05)	
Non-CEO pay ratio (total pay)				0.0587***
				(3.95)
CEO payslice	144.477	142.907	142.588	137.843
	(1.39)	(1.33)	(1.34)	(1.30)
Leverage	235.549***	223.832***	228.626***	242.121***
	(2.97)	(2.93)	(2.95)	(3.10)
Vol	-223.81	-215.88	-214.63	-195.42
	(-0.70)	(-0.66)	(-0.66)	(-0.60)
Coupon	9.0026	8.8049	8.9010	9.4461
	(1.39)	(1.38)	(1.39)	(1.47)
Term	-0.1219	-0.1282	-0.1221	-0.0982
	(-0.26)	(-0.29)	(-0.27)	(-0.22)
LoanAmt	-2.4992	-3.5049	-3.2762	-3.5458
	(-0.89)	(-1.24)	(-1.16)	(-1.26)
BondAge	1.0242	0.8746	0.9125	0.8100
	(0.78)	(0.66)	(0.69)	(0.61)
Log (Sale)	-3.6429	-5.2481	-5.1726	-6.7314
	(-0.33)	(-0.41)	(-0.42)	(-0.54)
Disper	-35.768*	-32.200*	-32.670*	-29.890*
	(-1.87)	(-1.75)	(-1.77)	(-1.67)
FirmAge	0.8859	0.9445	0.9579	1.3088
	(1.02)	(1.04)	(1.06)	(1.40)
RAT	0.7835	0.0972	0.1768	-0.2072
	(0.29)	(0.03)	(0.06)	(-0.07)
Log (CEO Age)	-32.261	-21.099	-23.426	-23.568
	(-0.72)	(-0.46)	(-0.52)	(-0.52)
Log (Tenure)	-20.658	-20.062	-20.367	-20.664
	(-1.52)	(-1.38)	(-1.42)	(-1.44)
SIC FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
N	7690	7690	7690	7690
Adj. R2	0.11	0.11	0.11	0.11

Table 6 Endogeneity problem using two-stage regression and PSM model (propensity-score matched model)

This table reports the results of the two-stage regression and propensity-score matched sample. Column (1) presents the second-stage regressions. We first treat the pay ratio measure as the endogenous variable, we then use the industry median value of CEO pay ratio and indicator variable that CFO is VP as the instrument. This table also reports *Sargan*-statistic p-value. Column (2) presents the PSM model regressions. We first use Probit regression that includes high pay ratio as dependent variable and all explanatory variables as independent variables to generate a predicted probability for high pay ratio. The high pay ratio is an indicator that equal to one if the value of pay ratio is over the 70^{th} percentile, and zero if the value is below the 30^{th} percentile. Next, by using a caliper method to match treatment firms and matching firms so that the difference between these two types of firms equal to 1%. All regressions control for the two-digit SIC industry effect and year effect. The t-statistics are in parentheses based on robust standard errors clustered at the firm level. All variables are winsorized at the 1% level. ***, **, and *, reported below are significant at 1%, 5%, and 10% level, respectively.

	(1)	(2)
	2SLS Regression	PSM
CEO pay ratio (total)	0.0604***	0.0088***
(High CEO total pay ratio)	(10.57)	(2.69)
CEO payslice		-2.304
		(-1.50)
Leverage	240.3***	-2.590***
	(16.38)	(-2.98)
Vol	-193.0***	2.119
	(-3.61)	(0.53)
Coupon	10.70***	0.107
	(4.67)	(0.72)
Term	-0.0915	0.00352
	(-1.11)	(0.53)
LoanAmt	-2.452	0.123
	(-1.42)	(0.82)
BondAge	0.756	0.0421
	(1.39)	(1.07)
Log (Sale)	-5.308**	0.388*
	(-2.13)	(1.95)
Disper	-37.30***	1.851
	(-3.39)	(1.02)
FirmAge	1.167***	-0.0430**
	(4.39)	(-1.97)
RAT	-0.899	0.128
	(-1.01)	(1.50)
Log (CEO Age)	-18.15**	-3.050
	(-2.01)	(-1.28)
Log (Tenure)	-15.51***	0.168
	(-5.35)	(0.75)
SIC FE	Y	Y
Year FE	Y	Y
N	7736	5051
Adj. R2 (Pseudo R2)	0.10	0.17
Sargan statistic chi-sq p-val	0.298	

Table 7 The Effect of CEO Bargaining Power: Industry Homogeneity and Labor Unionization

This table reports the results of the regressions of yield spreads (YS) on pay ratio for subsamples of high (low) homogeneous Industry and high (low) intensity of labor union. Industry homogeneity is calculated as the mean partial correlation between firm's returns for all firms in the same industry. We then have an equally weighted industry index by using the above returns and remain market return constant. We further divide the samples into two subsamples by the median of the value of industry homogeneity. A firm is assigned to highly homogeneous industry if the value of industry homogeneity is above the median over the samples. The organized labor is captured by *LSTR*. LSTR is measured as unionization rate multiplied by labor intensity. The unionization rate is percentage of employed labors who are the member of union. The labor intensity is the number of employees scaled by its total assets. We divide the samples into two subsamples by the median of the value of LSTR. A firm is assigned to highly labor union intensity if the value of LSTR is above the median over the samples. All regressions control for the two-digit SIC industry effect and year effect. The t-statistics are in parentheses based on robust standard errors clustered at the firm level. All variables are winsorized at the 1% level. ***, **, and *, reported below are significant at 1%, 5%, and 10% level, respectively.

	Homogeneous Industry		Labor Union	
	(1)	(2)	(3)	(4)
	High	Low	High	Low
CEO pay ratio (total)	0.0559***	0.0285**	0.0383**	0.0480
	(3.43)	(2.87)	(2.87)	(0.74)
CEO payslice	120.579***	69.8021**	-122.53***	165.809**
	(3.62)	(2.82)	(-3.30)	(2.57)
Leverage	-112.57	101.121	436.913***	534.446***
	(-1.22)	(0.98)	(4.39)	(4.85)
Vol	-114.21	-167.60	-66.662	-105.27
	(-0.56)	(-1.01)	(-0.10)	(-0.31)
Coupon	-3.9795	-1.9343	11.8141	-1.7430
	(-1.48)	(-0.26)	(1.21)	(-0.34)
Term	0.7986***	0.7027***	0.6150***	0.6783***
	(15.00)	(4.55)	(4.33)	(11.98)
LoanAmt	4.4548***	4.2469	-3.4442	3.6402
	(3.00)	(1.38)	(-1.17)	(1.65)
BondAge	3.1598***	1.8696	0.6821	2.2741*
	(4.82)	(0.93)	(0.31)	(1.84)
Log (Sale)	-14.906	-24.459*	-0.0197	-28.502
	(-1.25)	(-1.93)	(-0.00)	(-1.04)
Disper	-25.260	-37.612***	-6.9793	-43.075**
	(-1.55)	(-3.37)	(-0.91)	(-2.35)
FirmAge	-3.3908*	-0.0374	1.0368	-2.7709
	(-2.02)	(-0.02)	(0.59)	(-1.04)
RAT	15.0323**	18.1421***	8.7286	5.1832
	(2.60)	(3.40)	(0.41)	(0.41)
Log (CEO Age)	-65.678	-74.396	-41.638	-49.764
	(-0.91)	(-1.21)	(-0.29)	(-0.67)
Log (Tenure)	0.8473	-11.516	-21.650***	-37.145**
	(0.16)	(-1.37)	(-3.07)	(-2.81)
SIC FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
N	2172	2302	3873	3817
Adj. R2	0.23	0.21	0.90	0.90

Table 8 The Effect of Financial Constraint

This table reports the results of the regressions of yield spreads (YS) on CEO pay ratio for subsamples of high (low) financial constraint. The financial constraint proxies include *NewKZ, SA Index* and WW Index. We divide the samples into two subsamples by the median of the value of financial constraint. A firm is assigned to highly financial constrain if the value of New KZ (SA Index, WW Index) is above the median over the samples. All regressions control for the two-digit SIC industry effect and year effect. The t-statistics are in parentheses based on robust standard errors clustered at the firm level. All variables are winsorized at the 1% level. ***, **, and *, reported below are significant at 1%, 5%, and 10% level, respectively.

	FC=New KZ		FC= SA Index		FC= WW Index	
	High	Low	High	Low	High	Low
CEO pay ratio (total)	0.0320*	-0.0856	0.1797***	-0.0629	0.0967**	-0.3157*
	(1.68)	(-0.22)	(4.14)	(-1.53)	(2.30)	(-1.70)
CEO payslice	97.0835***	-223.29	285.581	18.3432	418.472	34.8994
	(2.71)	(-1.37)	(1.65)	(0.78)	(1.42)	(0.80)
Leverage	-67.682	891.316**	619.641***	-45.302*	453.883*	242.932***
	(-1.31)	(2.18)	(3.02)	(-1.95)	(1.76)	(3.91)
Vol	32.0499	-1844.4*	-1130.5*	33.9396	-253.50	-461.99
	(0.34)	(-1.80)	(-1.94)	(0.22)	(-0.56)	(-1.28)
Coupon	10.3821	7.3842	18.5920	12.1451**	22.3276**	-6.9008**
	(1.28)	(1.37)	(1.24)	(2.05)	(2.22)	(-2.52)
Term	0.7670***	0.3729	-0.1976	0.5300***	-0.6848	0.3102*
	(5.95)	(0.93)	(-0.22)	(6.23)	(-0.61)	(1.73)
LoanAmt	-7.7288*	2.3360	4.3016	-0.5264	-6.0094	2.5024
	(-1.73)	(0.89)	(0.40)	(-0.38)	(-0.68)	(1.28)
BondAge	-0.4421	2.9380*	5.6497**	0.4295	-3.1074	6.3317***
	(-0.20)	(1.96)	(2.26)	(0.33)	(-0.79)	(8.94)
Log (Sale)	-17.868	65.2395	-14.250	11.5857*	8.7639	-40.406**

	(-1.17)	(0.55)	(-0.44)	(1.74)	(0.44)	(-2.33)
Disper	-31.376**	24.2016	-33.397	-20.994	-4.7468	-14.145
	(-2.09)	(0.78)	(-0.95)	(-1.52)	(-0.19)	(-0.58)
FirmAge	-1.6757	-2.1957	12.2507***	-1.4622**	3.6709	3.7676**
	(-0.77)	(-0.38)	(3.48)	(-2.46)	(1.22)	(2.45)
RAT	34.8531***	-36.277	16.6633*	3.5379*	-2.2650	0.5809
	(4.81)	(-1.13)	(1.88)	(1.69)	(-0.52)	(0.11)
Log (CEO Age)	-109.81*	374.254	-368.62*	-40.383	138.457	-145.26
	(-1.84)	(0.91)	(-1.70)	(-0.71)	(0.64)	(-1.05)
Log (Tenure)	4.1114	0.7235	7.9080	-2.9217	-8.9290	-14.399
	(0.65)	(0.02)	(0.24)	(-0.53)	(-0.33)	(-1.28)
SIC FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
N	3420	3678	2943	4737	3383	4297
Adj. R2	0.33	0.41	0.35	0.19	0.33	0.15