Organizational complexity and bank loan spreads*

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Abstract

This study examines whether and how organizational complexity arising from the legal fragmentation of the firm into multiple entities affects the interest spread charged on bank loans and the design of loan contracts. The legal fragmentation of the firm is bound to be a consideration lenders make in determining the pricing of debt and design of contract terms because, for instance, lenders can only enter into legally enforceable agreements with specific legal entities. I document that organizational complexity is associated with higher loan spreads and the use of debt covenants and other loan terms. The relation between complexity and loan spreads is more pronounced for loan characteristics that reflects higher risk, but is attenuated by contracting mechanisms. Yet, contracts in the sample do not always include terms that mitigate contracting risks from organizational complexity. Subsequent tests are suggestive of potential channels related to credit quality and control rights.

Keywords: organizational complexity, subsidiaries, bank loans, minority interest

JEL Classifications: K40, G32, G33, M40

1 Introduction

Organizational complexity arising from the legal fragmentation of the firm into multiple entities dominates the modern corporate landscape. Prior literature documents that such organizational complexity provides benefits to the firm, including limited liability and savings from tax shelters (Leland, 2007; Altshuler and Grubert, 2001; Dyreng et al., 2015), but that it also creates significant risks and costs to the firm. For instance, Gibson et al. (2013) highlight that corporate governance failings often occur at the subsidiary level, and Black et al. (2014) and Fang et al. (2017) suggests that more subsidiaries cause greater agency costs.[1] In this paper, I examine whether and how organizational complexity arising from the firm's legal fragmentation into multiple entities affects interest spread charged on bank loans and design of loan contracts.

In determing the pricing and other terms in loan contracts, lenders are bound to consider organizational complexity arising from firms' legal fragmentation because, for instance, lenders can only enter into legally enforceable agreements with specific legal entities. The lenders may view organizational complexity as beneficial in that borrowing entities can benefit from affiliation with other entities but the resources in the borrowing entities cannot be used to satisfy liabilities related to risks in other separate entities. Conversely, lenders may view organizational complexity as a contracting risk because the borrowing entities can directly or indirectly use borrowed funds to support economic activities in other independent entities, and yet lenders do not have automatic access to resources in the separate entities.

The latter view, that organizational complexity can be a contracting risk, is likely more salient in debt contracting because of the natural tension between debt holders and shareholders (managers) of the firm (Gigler et al., 2009). The debt holder-shareholder tension arises from the asymmetric payoff to debt holders, who do not benefit from any upside in the business operations but are exposed to downside risk. Accordingly, as long as lenders

[1] Also, several studies in the audit literature use the number of subsidiaries (i.e., separate entities) as a measure of audit client complexity and find higher audit fees for firms with more subsidiaries (e.g., Palmrose, 1984; Craswell et al., 2002; Hay et al., 2006; Weber et al., 2008).

recognize the existence of risks, they will likely take them into account in deciding the pricing and non pricing terms of any given debt claim (Jensen and Meckling, 1976).

My empirical findings provide support for the proposition that organizational complexity based on the firms' legal fragmentation increases borrowing costs. Using subsidiary disclosures in Form 10-K Exhibit 21, I create a complexity measure based on the number of entities within the firm. The number of entities within the firm are the obvious guage of legal fragmentation of the firm into multiple entities, as the subsidiaries disclosed on Exhibit 10 are primarily separate legal entities and thus subject to the limited liability principle. The relation between the number of entities as a measure of complexity and the cost of debt (i.e., interest spread) is positive for a sample of bank loans issued by US parent companies for the period covering 1996 - 2010. My baseline results suggests that if a firm in the sample moves from the first quartile to the third quartile of the organizational complexity measure, the difference in the expected loan spreads can be as high as 41.69 basis points (i.e., roughly up to $5.7 million for the average total life of a loan in the sample).[2]

To provide further evidence, I perform a number of cross-sectional analyses to investigate the factors that attenuate the effects of organizational complexity on borrowing costs. I document that the effects of organizational complexity arising from firms' legal fragmentation into multiple entities are less pronounced for secured loans, loans with capital expenditure restrictions, or loans with dividend restrictions. Further, the findings are more pronounced for loans with longer maturities and for term loans. These findings suggest that contract design can mitigate the problems of legal fragmentation by requiring loan security, restricting capital expenditure or dividend payments, and approving short-term loans.

On this premise that lenders can mitigate the adverse effects of organizational complexity through contract design, I examine the associations between organizational complexity and non-price terms in debt agreements. I perform these tests using simultaneous estimation to

[2]The positive relation between organizational complexity and bank loan spread is robust to controlling for a number of loan and firm characteristics found in existing literature to be determinants of pricing of bank loans. I also perform robustness tests to address potential endogeneity concerns. I discuss the tests and results later in the paper.

account for the trade-off between price and non-price terms. The positive relation between organizational complexity and borrowing cost remains, suggesting that the potential simultaneity between price and non-price terms does not affect my findings. Further, the findings suggest that lenders are more likely to include restrictions in the form of financial covenants and performance pricing provisions. However, I document that organizational complexity is associated with longer loan maturities and lower likelihood of secured loans. These two loan characteristics are often used to mitigate loan risk by shortening loan maturity and securing the loans.

Next, I investigate potential mechanisms through which organizational complexity can affect debt pricing and non-pricing terms. In particular, I focus on control rights and credit quality. First, using the corporate long term ratings as a measure of credit quality, I document that on average organizational complexity is positively associated with credit quality. Nonetheless, prior literature shows that organizational complexity affects the ability of lenders to monitor the borrowers and to accurately assess the likelihood of default and other risks (i.e., monitoring costs).[3] Such findings suggest that although credit quality is not adversely affected, assessment of such quality is costly and can further explain why lenders would demand higher interests for complex borrowers.

Second, I examine the ability of lenders to exercise control rights in the firm due to non-controlling interests in the subsidiaries, represented by minority interests. Minority interests represent limits to the firms' control in the subsidiaries and a weakening in lenders' ability to exercise control rights to assets or resources in those entities. I find that the effects of organizational complexity on borrowing costs are more pronounced as minority interest increases. Further, I document that the association between organizational complexity and credit quality is also driven by the level of control in the subsidiaries. These findings suggest that organizational complexity affects borrowing costs by limiting the lenders' control rights

[3]For example, as noted earlier, existing evidence has shown that audit complexity as measured by the number of subsidiaries is associated with higher audit fees (e.g., Palmrose, 1984; Craswell et al., 2002; Hay et al., 2006; Weber et al., 2008).

in the assets held by separate entities.

My findings contribute to literature on the relation between organizational form and cost of debt. Existing studies show how cost of debt is influenced by different organizational forms, such as industrial diversification (i.e., business segments) (e.g., Hann et al., 2013), and geographic diversification (e.g., Mansi and Reeb, 2002; Li et al., 2011). Other studies examine stock ownership type (e.g., Lin et al., 2011), private versus public firms (e.g., Saunders and Steffen, 2011), founding family ownership (e.g., Anderson et al., 2003; Bagnoli et al., 2011), or shareholder rights Chava et al. (e.g., 2009). I extend these studies by examining the effects of a dominant corporate form, namely organizational complexity arising from legal fragmentation of the firm into multipe entities.

The findings also extend a nascent line of accounting research on corporate internal ownership of overseas subsidiaries (e..g, Dyreng et al., 2015). These studies suggest that internal ownership structures, defined as the way a firm's subsidiaries are connected through ownership links, are driven by distinct tax and non-tax factors, including expropriation risks. I extend these studies by examining the implications of internal ownership structures on borrowing costs. In this vein, I add to the findings in Black et al. (2014) that an enterprise's subsidiaries may represent high agency costs, which affects executive pay.

My study is closely related to Beaver et al. (2016) examination of bankruptcy models in corporate groups (i.e., firms with multiple entities) and Fang et al. (2017) examination of auditor choice and audit costs in corporate groups. Beaver et al. (2016) find that incorporating subsidiaries' financial information improves the parent companies' bankruptcy prediction models, and likewise, incorporating the parents' information improves the subsidiaries' bankruptcy prediction models. Fang et al. (2017) document that legal separation (referred to as corporate groups) affects auditor choice and increases audit costs. My study differs from, and thus complement, these studies in that I examine the direct effect of organizational complexity arising from entity legal fragmentation for US firms on borrowing costs and debt contract design.

Recent global regulatory developments around corporate governance at the subsidiary level emphasize the importance of my research question. As corporate governance failures often occur at subsidiaries, Gibson et al. (2013) note that regulators are shifting focus from business units to legal entities. For example, the International Accounting Standards Board (IASB) is currently evaluating financial reporting implications of separate legal entities.

The remainder of the paper proceeds as follows. I provide background and develop my hypotheses in section 2. I describe my research design in Section 3, primary and cross-sectional results in Section 5, and robustness tests in Section 5. I conclude in Section 6.

2 Organizational complexity and related research

The concept of organizational complexity has been explored in the literature, but little evidence relates to the effects of organizational complexity on borrowing costs. In this paper, I define organizational complexity as the legal fragmentation of the firm into multiple entities. That is, a complex organization consists of a parent company and separately incorporated subsidiaries or affiliated entities. For the purposes of this study, I capture organizational complexity using the firms' subsidiaries as disclosed in Exhibit 21 in the Form 10-K.

Cetorelli and Goldberg (2014) provides a comprehensive discussion of complexity. They note that complexity "is a thornier, less easily defined concept, although it is a natural subject of policy concern given the systemic implications of resolving failing institutions". They develop two broad measures of complexity, namely organizational complexity and business complexity. Although these measures in Cetorelli and Goldberg (2014) are developed specifically in the context of global banks, the principles apply generally to industrial corporations. In particular, they define 'organizational' complexity to indicate the extent to which firms are structured through separate affiliated entities. A related concept is geographic complexity, which captures the span of the firms' affiliated entities across different countries. The second broad measure is business complexity, which refers to the "type and variety of activities that

may be conducted within the walls of a given institution".

Existing literature explores geographic and business complexity but not organizational complexity in the context of borrowing costs. For example, emphasizing the co-insurance hypothesis Hann et al. (2013) documents the effects of business complexity (i.e., business or industrial diversification) on cost of capital. They document that diversification lowers costof debt when cash flows from separate segments are uncorrelated (i.e., co-insurance effect). Li et al. (2011) provide evidences that geographic compexity (i.e., corporate globalization) is beneficial to borrowers; lenders charge lower loan rates and demand less restrictive non-price contractual terms.[4] In this paper, I emphasize organizational complexity.

Organizational complexity arising from legal fragmentation of the firm into multiple entities is important in lending arrangements because, for example, lenders can only enter into legally enforceable agreements with specific legal entities. Accordingly, different legal organizations within a corporation introduce a source of complexity that is not necessarily captured by industrial or geographic diversification. In the event of financial distress, resolving debt claims may be more difficult because a large number of legal entities or legal systems are involved (Cetorelli and Goldberg, 2014).

There are studies that focus on organizational complexity, but they emphasize outcomes other than directs effects on borrowing costs. Studies in the audit research use the number of subsidiaries to capture audit client complexity (e.g., Palmrose, 1984; Craswell et al., 2002; Hay et al., 2006; Weber et al., 2008). Overall, the audit research shows that audit complexity, as captured by the number of subsidiaries, is positively associated with audit fees (for a review of the audit research see Hay et al., 2006). Further, Fang et al. (2017) suggest that organizational complexity (captured by corporate groups) affects firms' choice of auditors and thus audit costs. The findings in the audit research suggests that monitoring costs can be higher for firms with more subsidiaries. However, I am not aware of direct evidence on how complexity arising from legal fragmentation of the firm affects borrowing costs.

[4]There is mixed evidence on the benefits of geographic diversification in debt pricing (Mansi and Reeb, 2002).

The effects of organizational complexity on borrowing costs is the focus of this paper. I test the proposition that legal fragmentation of the firm into multiple entities create organizational complexities that increase borrowing costs. At the center of my hypothesis is the notion that a firm can borrow funds and use those funds across all afiliated entities, directly or indirectly through branding, but the lenders are not legally entitled to any resources generated or held in separate entities other than those that are party of debt contracts. In the normal course of business or through opportunistic activities, managers can transfer assets away from the lenders and thus increase the credit risk, which in turn would cause lenders to demand higher interest ex ante.

3 Research Design

3.1 Data

My initial sample consists of US firms that entered into bank loan contracts during the period 1996 – 2010.[5] I obtain loan contract data from Thomson Reuters LPC DealScan database, which contains detailed terms and conditions on private loan transactions made by bank and nonbank lenders to US and foreign corporations (for additional detail see Dichev and Skinner, 2002; Chava and Roberts, 2008). DealScan sources include regulatory filings, contacts within the credit industry, borrowers, lenders, and journalist contributions.

Loan details in DealScan pertain to two levels of observations: the deal (or package) and the loan (or facility). A package is a collection of facilities that are structured and contracted as one transaction. Each facility within a package has its own contractual terms, namely facility amount, maturity, interest rate spread, repayment schedules, collateral, and loan type or purpose. Generally, financial and general covenants are contracted at the package level (i.e., covenants apply to all facilities within a package), but performance pricing provisions

[5]The sample period is driven by exhibit 21 data availability starting in 1996 and collection of the data up to 2010.

as well as lender allocations of syndicated loan amounts may apply to specific facilities. The analysis in this paper is performed at the facility level because the cost of loans (i.e., loan spread) is at the facility level.

I require firms to have data in the COMPUSTAT annual files. I match each loan facility to the most recent fiscal year prior to the firm entering into a loan contract. This requirement yields 18,894 packages and 27,155 facilities to 5,315 parent companies, excluding financial and regulated firms, during the period 1996 – 2010. I identify parent companies in DealScan as firms whose borrower identification (borrower id) is the same as the ultimate parent company identification (parent id).[6] I then eliminate firm-years with missing data for the dependent variables, explanatory variable of interest, and control variables in the primary analyses as described below. This yields a final sample of 11,447 facilities extended to 2,902 unique entities with data for the measure of organizational complexity.

I capture organizational complexity using the number of entities within a firm obtained from Form 10-K Exhibit 21. The Securities Exchange Commission (SEC) requires firms to disclose all significant subsidiaries in this exhibit. I retrieve the Exhibit 21 from the SEC's Electronic Data Gathering, Analysis, and Retrieval system (EDGAR) using Perl programming language (PERL). A typical Exhibit 21 lists all its subsidiaries and/or affiliates by name and jurisdiction of incorporation (see Appendix B for an example). In limited cases, firms also list the percentage of their ownership in the subsidiary and the different ownership links between subsidiaries. I obtain the number of subsidiaries by counting the number of jurisdictions, which are a listing of all US and Canadian states/regions (abbreviated and full names) and all countries in the world. If a firm has multiple subsidiaries incorporated in one jurisdiction, I count each occurrence of the jurisdiction as a separate entity.[7]

There are challenges with this data retrieval. In some cases subsidiary names include the country or state of incorporation (e.g., Name: "Microsoft Ireland", Jurisdiction: "Ireland").

[6]Parent companies are also identified as firms with available data on subsidiaries.

[7]I do not simply count the subsidiaries (based on their names) due to the difficulty in retrieving the subsidiary names from exhibit 21, especially for the early years available on EDGAR.

In these case, the PERL for this study is structured to pick up the last mention of the country Ireland on each line in the list of subsidiaries, which is the jurisdiction, and thereby minimizes the potential for double counting subsidiaries. However, errors still occur due to inconsistencies in the underlying 10K text formats, some of which do not specify line or column breaks. While the SEC requires disclosure of significant subsidiaries only, I find that many firms list all their subsidiaries in exhibit 21. To identify disclosures of significant subsidiaries only, I use firms' statements that read: "The following is a list of subsidiaries of the company, omitting subsidiaries which, considered in the aggregate, would not constitute a significant subsidiary" (Form 10-K). [8]

3.2 Modeling cost of debt

I test the proposition that organizational complexity based on the firms' legal fragmentation increases borrowing costs. To test this proposition I estimate the relation between organizational complexity and bank loan spreads using ordinary least squares (OLS) regressions as follows:

$$\begin{aligned} Spread_{i,t} = \beta_0 + \beta_1 * OrgComplexity_{i,t-1} \\ + \sum \gamma * DebtControls_{i,t} + \sum \gamma * FirmControls_{i,t-1} + \varepsilon_{i,t} \end{aligned} \tag{1}$$

The dependent variable, *Spread*, is the interest spread over the London Interbank Offered Rate (LIBOR) or LIBOR equivalent on a loan plus associated loan origination fees. This is reported as the "All-in-Drawn-Spread" in DealScan.

The coefficient of interest is β_1 on *OrgComplexity*. I expect $\beta_1 > 0$ consistent with the hypothesis that borrowing costs are increasing in organizational complexity. The primary proxy for *OrgComplexity* is the number of entities within the firm. Consistent with existing

[8] I exclude firm-years with significant subsidiaries only in my primary analyses, but in robustness tests (not tabulated), I find that inclusion of these firm-years does not change my primary inferences.

literature (e.g., Palmrose, 1984), I use the number of subsidiaries in the natural logarithm form ($LogSubs$) to mitigate the effects of skewness in the data. Alternatively, I use the square root of the number of subsidiaries ($SqSubs$) as used in other studies (e.g., Craswell et al., 2002). Because the number of subsidiaries is highly corelated with firm size (Cetorelli and Goldberg, 2014), I scale the number of subsidiaries by total assets before transformations into the natural logarithm or square root form.

I include several control variables following prior literature (e.g., Ball et al., 2008; Graham et al., 2008; Costello and Wittenberg-Moerman, 2011; Valta; Hann et al., 2013; Hasan et al.). First, I control for loan characteristics, $DebtControls$, reported for each facility in DealScan. In general, loan characteristics that are indicative of high risk are associated with higher cost of debt. For example, larger loans are priced at lower interest rates, and longer maturity loans have higher default risk and thus are associated with higher cost of debt. Further, prior research finds that revolvers are priced at lower interest rates than term loans, and institutional term loans are more risky. Accordingly, I control for the following loan characteristics: facility amount ($LoanSize$), maturity of the loan ($LogMaturity$), whether the loan is secured ($SecuredLoan$), number of lenders participating in a loan deal ($NumLenders$), repeated lenders within the previous five years ($RepeatLenders$), whether a loan is a revolving facility ($Revolver$), and whether a loan is an institutional term loan ($InstInvestor$). I also control for whether a loan has performance pricing provisions ($PPIndicator$), the number of financial covenants ($FinCovenants$), the number of general covenants ($GenCovenants$), and whether the loan contains capital expenditure restrictions ($Capex$).

Second, I control for firm characteristics, $FirmControls$, measured at the end of the most recent fiscal year prior to the loan contract date. I control for firm size ($LogAssets$) as larger firms have easier access to external financing and have less information asymmetry. Accordingly, they are associated with smaller monitoring costs and are thus likely to access bank loans at a lower cost. Firms perceived to have promising growth prospects captured by market-to-book ratio ($MarketToBook$) are likely to have easier access to low cost bank debt.

Consistent with lenders being able to recover physical assets in the event of default, firms with more tangible assets ($AssetTangibility$) are likely to have lower borrowing costs. Leverage ($Leverage$) and profitability ($Profitability$) control for default risk, which is expected to be high for high leverage firms and low for high profitability firms. I also control for credit worthiness ($Z - Score$).

I control for time-invariant industry or firm effects and a time trend by, respectively, including industry or firm (α_i) and year dummies (δ_i). The stochastic error term is represented by ϵ_i. Estimates in the paper are based on standard errors adjusted for firm and year clustering. I adjust standard errors for within-firm and year clustering because I perform my analysis at the facility level and firms can obtain multiple facilities in the same loan package in a given contract year, and the loan terms obtained by the firm in the same year could be correlated. Complete definition and measurement of variables described above are presented in Appendix A.

3.3 Descriptive statistics

Table 1 shows summary statistics for firms in my primary sample of 11,447 loan observations and 7,206 firm-year observations for the period covering 1996 to 2010. The results suggest that an average publicly trade firm in the sample has over 43 entities (i.e., subsidiaries) during the sample period. The median number of entities is 18 and the maximum recorded number of entities in the sample is 1,873. The interquartile range for the number of entities is 40 (Q25 = 7 and Q75 = 47). The average firm size is $3,621 million in total assets, and the average firm has leverage of 29 percent over total assets and is profitable with average return on assets (EBITDA-to-Asset ratio) of 13 percent. The average and median interest rate spread over LIBOR (All-in-Drawn) are, respectively, 206.14 and 200 basis points. The other loan characteristics show that most loans are secured (65 percent), are revolving loan facilities (62 percent), include performance pricing provisions (70 percent), include repeate lenders (68 percent), and have dividend restrictions (79 percent). There are an average of

2.45 financial covenants and 9.15 lenders per syndicated loan facility. An average loan is issued for $341.68 million.

4 Regression results

4.1 The effect of organizational complexity on borrowing costs

Table 2 presents baseline results from regressions of cost of debt on the number of subsidiaries and control variables. The overall findings suggest that firms' borrowing costs are increasings in the firms' organizational complexity based on the number of separate entities, across the different transformations. Using the results for the natural log of subsidiaries, I document positive and significant coefficient on *LogSubsidiaries* before including control variables in Column 4 (coeff. = 19.297, t-stat = 14.319), with control variables and industry fixed effects in Column 5 (coeff. = 2.570, t-stat = 2.289), and with control variables and firm fixed effects in Column 6 (coeff. = 6.421, t-stat = 2.930).

The coefficient in column 4 suggests that for a one percent increase in organizational complexity measure (i.e., the ratio of the number of subsidiaries to total assets), the difference in the expected mean bank loan spreads is 0.083 (i.e., β_1x log[1.01] = 19.297 x log[1.01]).[9] I use the quartile statistics for an illustration of the economic magnitude. A typical sample firm in the first quartile (P25) has a subsidiaries-to-assets of 0.01 and third quartile (P75) has a ratio of 0.06. Therefore, if a firm moves from the first quartile to the third quartile (i.e., [0.06 - 0.01]/0.01 = 500%), the difference in the expected bank loan spread is 41.69 basis points (i.e., 0.083 x 500). An average loan in the sample carries 206.14 basis points over LIBOR and is in the amount of $341.68 million. The difference in the expected bank loan spread of 41.69 basis points for the interquartile change implies a difference in borrowing

[9]For interpretation of log transformed variables see Introduction to SAS. UCLA: Statistical Consulting Group, http://www.ats.ucla.edu/stat/sas/notes2/ as last accessed November 29, 2014 or Interpreting Coefficients in Regression with Log-Transformed Variables, https://www.cscu.cornell.edu/news/statnews/stnews83.pdf as last accessed May 14, 2015.

costs of \$1.425 million per year (i.e., 41.69 basis points x 341.68 = 0.4169% x 341.68),[10] or \$5.7 million for the average total life of a loan in the sample (i.e., \$1.425 million x 48.156 months).

Columns 5 and 6 show that, although the magnitude decreases, the coefficient is positive and significant after controlling for several loan and firm characteristics along with industry and firm fixed effects. Following the illustration above for economic magnitude, the results in column 6 (with firm fixed effects) suggests that for a one percent increase in organizational complexity measure (i.e., the ratio of the number of subsidiaries to total assets), the difference in the expected mean bank loan spreads is 0.028 (i.e., β_1x log[1.01] = 6.421 x log[1.01]). Therefore, if a firm moves from the first quartile to the third quartile, the difference in the expected bank loan spread is 13.87 basis points (i.e., 0.028 x 500). This translate to a difference in borrowing costs of \$0.474 million per year (i.e., 13.87 basis points x 341.68 = 0.1387% x 341.68), or \$1.902 million for the average total life of a loan in the sample (i.e., \$0.474 million x 48.156 months).

The control variables are mostly significant and the signs on firm characteristics are generally in line with prior findings. For instance, I document a positive association (i.e., higher interest spreads) for firms with high leverage and negative association for firms with more assets, valuable growth opportunities, high profitability, and higher modified z-score values. Overall, these results suggest that organizational complexity based on the legal fragmentation of the firm into multiple entities has a statistically and economically significant effect on the firm's borrowing costs after controlling for all other determinants of borrowing costs.

[10] 100 basis points = one percent

4.2 Factors attenuating the effect of organizational complexity on borrowing costs

Table 3 presents results for a variety of cross-sections, based on factors expected to attenuate the results on borrowing costs. Unsecured loans, loans without capital expenditure restrictions, and loans without asset sale sweeps can exacerbate the effects of organizational complexity in that they could facilitate ability of borrowers to transfer resources between entities without providing lenders with recourse. Accordingly, I expect borrowing costs to be lower for secured loans, loans with capital expenditure restrictions, loans with dividend restrictions, and loans with asset sweeps. I document empirical findings consistent with most of these expectations. I document negative and significant coefficient for secured loans in Column 1 (coeff. = -7.819, t-stat = -2.917), for capital expenditure restriction in Column 2 (coeff. = -10.336, t-stat = -3.199), and for dividend restrictions in Column 3 (coeff. = -4.947, t-stat = -2.107). I fail to find evidence for asset sweeps in column 4 (coeff. = -2.613, t-stat = -1.080).

Moreover, longer loan maturities increase risk to the lenders, such that longer maturities are likely to excerbate the effects of organizational complexity. Consistent with this, I document a positive and significant coefficient in Column 5 on the interaction between long maturity and organizational complexity (coeff. = 1.940, t-stat = 2.597). Long maturity is an indicator variable equal to one if the maturity of loan is equal to or greater than 60 months (5 years), and zero otherwise (for similar classification, see Lin et al., 2013). Additionally, term loans are generally more expensive, as indicated by a positive coefficient on the interaction between institutional investor and organizational complexity in Column 6 (coeff. = 6.226, t-stat = 1.793).

Overall, these findings suggest that lenders can mitigate the problems of legal fragmentation, which can limit legal access to the entities specified in the original contract, by demanding loan security, restricting capital expenditure, restricting distribution of resources in form of dividend to other investors (which could be distributions to separate, affiliated

entities), and reducing loan maturities to complex borrowers. Next, I examine whether loan contracts include such restrictions.

4.3 The effect of organizational complexity on non-price terms

Table 4 presents results on the simultaneous estimation of price and non-price terms in loan contracts. Panel A includes year fixed effects, Panel B includes year and 4-digit industry fixed effects, and Panel C includes 1-digit SIC Code industry fixed effects to allow for greater variation in the loan terms within broader industry classifications.[11] These results serve two purposes. First, the simultaneous estimation accounts for the notion that regressions using loan terms involve a variety of simultaneity problems because loan terms are simultaneously determined (see Melnik and Plaut, 1986; Dichev and Skinner, 2002; Graham et al., 2008; Costello and Wittenberg-Moerman, 2011). To address this issue, I re-estimate regressions for bank loan spread along with regressions for non-price terms as a system of equations using a seemingly unrelated post-estimation (SUEST) (similar to Costello and Wittenberg-Moerman, 2011). The effect of organizational complexity on borrowing costs continues to be positive and significant as shown by results in column 1 in Panel A (coeff. = 2.414, t-stat = 2.285), Panel B (coeff. = 2.570, t-stat = 2.329), and Panel C (coeff. = 2.316, t-stat = 2.178).

Second, on the premise that lenders can mitigate the adverse effects of organizational complexity through contract design, the results shed light on the association between organizational complexity and selected non-price terms. I include financial covenants, general covenants, loan maturity, loan security, capital expenditure restrictions, performance pricing provision, and asset sale sweeps. The findings in Panel A suggest that lenders are more likely to include restrictions in the form of financial covenants in Column 2 (coeff. = 0.037, t-stat = 3.660) and performance pricing provisions in Column 4 (coeff. = 0.044, t-stat = 2.691). However, I document that organizational complexity is negatively associated with

[11] I perform analyses across these different specifications because non-price terms tend to be sticky within firm and within industry and/or year. Accordingly, I do not include firm-fixed effects.

secured loans in Column 5 (coeff. = -0.034, z-stat = -1.986) and dividend restrictions in column 7 (coeff. = -0.009, z-stat = -2.046). Further, it is positively associated with loan maturity in Column 9 (coeff. = 0.026, z-stat = 1.849).[12] As shown in 3 above, securing loans, restricting dividend payouts, and shortening loan maturities can mitigate loan risk. The lower incurrences of some of these loan terms loan contracts thus excerbates lenders' risk when lending to complex organizations.

4.4 Investigating economic channels: credit quality and control rights

In this section, I investigate some of the specific channels (i.e., mechanisms) through which organizational complexity causes lenders to demand higher interest spread on bank loans. I focus this analysis on the two ingredients to cost of debt, namely issuer credit quality and creditor control. The findings in this section suggest that organizational complexity may not affect borrowing costs through its effect on issuer credit quality but through its effect on lender control rights.

The first set of analysis sheds light on whether organizational complexity adversely affect the credit quality of the firm and thus increase borrowing costs. I capture credit quality using issuer long term credit ratings and specify an ordered probit model using the non-market based variables from Baghai et al. (2014). I specify the following ordered probit model:

$$\begin{aligned} Rating_{it} = \alpha_0 &+ \alpha_1 OrgComplexity + \alpha_2 IntCov_{it} + \alpha_3 Profit_{it} + \alpha_4 Leverage_{it} + \alpha_5 Size_{it} \\ &+ \alpha_6 DebtEBITDA_{it} + \alpha_7 NegDebtEBITDA_{it} + \alpha_8 EarnVol_{it} + \alpha_9 CashAssets_{it} \\ &+ \alpha_{10} ConvDebtAssets_{it} + \alpha_{11} RentAssets_{it} + \alpha_{12} PPEAssets_{it} \\ &+ \alpha_{13} CAPEXAssets_{it} + \sum_j \delta_j FixedEffects_j + u_{it} \end{aligned} \quad (2)$$

The dependent variable is a numerical value for Standard and Poor's Long Term Issuer

[12] I fail to document significant results for loan size, capital expenditure restrictions, and asset sweeps. The results for all non-price loan terms are consistent in Panel C with broader industry classification, but weak in Panel B with narrower industry fixed effects classification.

Rating obtained from Compustat, *Rating,* and is coded from 1 (SD/D) to 22 (Aaa). The firm characteristics are defined as follows:$IntCov$ is earnings before interest, taxes, depreciation, and amortization divided by interest expense; $Profit$ is earnings before interest, taxes, depreciation, and amortization divided by sales; $Leverage$ is the sum of long- and short-term debt divided by total assets; $Size$ is the natural logarithm of total assets; $DebtEBITDA$ is the sum of long- and short-term debt divided by earnings before interest, taxes, depreciation, and amortization, and is set equal to zero if $DebtEBITDA < 0$; $NegDebtEBITDA$ is an indicator variable equal to one if $DebtEBITDA < 0$, and zero otherwise; $EarnVol$ is the standard deviation of $Profit$ over the prior five fiscal years with a minimum of two years to be included in the sample; $CashAssets$ is cash and short-term investments divided by total assets; $ConvDebtAssets$ is convertible debt divided by total assets; $RentAssets$ is rent expense divided by total assets; $PPEAssets$ is net property, plant, and equipment divided by total assets; and $CAPEXAssets$ is capital expenditures divided by total assets. I include indicator variables for the year and, alternatively, issuer industry (Industry fixed effects) or firm fixed effects to control for any year, industry, or firm specific characteristics of credit ratings. Standard errors are corrected for clustering at the firm level.

Table 5 presents the findings. I document that organizational complexity is positively associated with credit ratings. Using the number of subsidiaries in the logarithm form, the results show a positive and significant coefficient for issuer ratings at three months after fiscal year end in Column 1 (coeff. = 0.050, z-stat = 2.736), at six months in Column 3 (coeff. = 0.049, z-stat = 2.660), or at nine months in Column 3 (coeff. = 0.047, z-stat = 2.565). These findings suggest that organizational complexity is positively associated with credit quality, and thus credit quality may not be a direct channel, through which lenders demand higher borrowing costs.[13] Nonetheless, prior literature shows that organizational complexity affects the ability of lenders to monitor the borrowers and to accurately assess

[13]However, in the next set of analysis I show that the relation between organizational complexity and credit quality is affected by control rights, and thus could be a potential channel.

the likelihood of default and other risks (i.e., monitoring costs).[14] Such findings suggest that although credit quality, captured by debt ratings, is not adversely affected, assessment of such quality is costly and may thus cause lenders to demand higher interests on loans to complex borrowers.

In the second set of analysis, I examine the lenders' ability to exercise control rights in the firm. Control rights allow lenders to establish ownership or access to resources available to the firm. Legal fragmentation of the firm into multiple entities may facilitate a transfer of resources between entities in the normal course of business or otherwise. Due to limited liability, lenders may not have legal recourse to resources transfered to entities that are not party to original debt agreements, and this is particularly salient when the separate entities have minority interest. Minority interest represent the borrowing firms's noncontrolling interests in the subsidiaries. The proportion of minority interest in the subsidiaries represents some extent of the firms' limited control in the subsidiaries and a weakening in lenders' ability to exercise control rights to assets or resources held in the separate entities.

To perform this second set of analysis, I re-estimate equations 1 and 2 adding interaction for measures of control. Table 7 presents results from re-estimating equation 1. The results show that the effects of organizational complexity on borrowing costs are more pronounced as minority interest increases. Further, re-estimating equation 2, the results in Table 6 show that the association between organizational complexity and issuer ratings is driven by the level of control in the subsidiaries as captured by minority interests. The presence of minority interest negatively affects the assessment of firm's credit quality.

Overall, these findings suggest that organizational complexity affects borrowing costs by limiting the lenders' control rights in the assets held by separate entities. That is, the borrower's access to and control of resources in the subsidiaries can be a significant driver of borrowing costs.

[14]For example, as noted earlier, existing evidence has shown that audit complexity as measured by the number of subsidiaries is associated with higher audit fees (e.g., Palmrose, 1984; Craswell et al., 2002; Hay et al., 2006; Weber et al., 2008).

5 Robustness tests

5.1 Endogeneity

Endogeneity concerns arising from omitted factors can make it difficult to draw a causal interpretation from my estimates. Omitted factors can induce bias because the number of subsidiaries could proxy for risk that I cannot observe as a researcher. Firms may then create subsidiaries to insulate that risk, and likewise lenders may charge higher interest because of that risk irrespective of organizational complexity. I address this problem in multiple ways.

5.1.1 Covariates and fixed effects

Larcker and Rusticus (2010) suggest that fixed effects regressions, along with inclusion of control variables, are alternative empirical approaches to mitigating endogeneity problems. Controlling for covariates can increase the likelihood of causal interpretation from regression estimates. Accordingly, I control for several observable factors (e.g., firm size, leverage, credit worthiness, credit ratings, default probability) that may drive the cost of bank loans. Additionally, I present estimates based on regressions with industry and firm fixed effects to mitigate bias from time invariant omitted factors.

5.1.2 Instrumented variables (IV) 2SLS estimation

Next, I estimate equation 1 using a two-stage least squares (2SLS) instrumental variable (IV) approach. IV is the most common approach to dealing with time variant omitted variable bias, but it is extremely difficult to identify factors that are both strong and valid instruments for the identified endogenous variable(s). In this paper, IV requires instrumental variables that are partially correlated with the number of subsidiaries but are uncorrelated with errors in the structural model for loan spreads.

First, I include in the set of instrumental variables the firms' prior subsidiaries to capture systematic differences in the number of subsidiaries. Prior Subsidiaries is measured two years

prior to the loan contract and one year prior to the measurement of the endogenous variable, the number of subsidiaries and transformed as a square root. The measurement ensures prior subsidiaries are not identical to and strongly explain the number of current subsidiaries without directly affecting the cost of debt. The square root of past subsidiaries is likely to strongly explain the current subsidiary structure of the firm, but it is unlikely that lenders will consider past subsidiary structure as opposed to current and future subsidiaries.[15]

Second, I include in the set of instrumental variables the number of the firm's employees. Labor economists suggest that workers of high ability are promoted (i.e., move up the ladder) to senior positions at new business units Gibbons and Waldman (e.g., 1999). Yet an increase in the number of employees within a firm limits the opportunities available to move up the ladder. Accordingly, firms with more employees are more likely to create subsidiaries to provide opportunities for their high ability workers to move up the ladder and thereby retain their talent (see Myers, 2002).[16] There is no obvious link between the number employees and the cost of debt.

I present the results in Table 8. The results show that, after controlling for all model covariates, the instruments have nonzero coefficients and, as expected, are positively related to the number of subsidiaries: Prior Subsidiaries (coeff. = 0.245, t-stat = 38.027) and Employees (coeff. = 0.100, t-stat = 7.452) with industry fixed effects in Column 1; Prior Subsidiaries (coeff. =0.155, t-stat = 10.700) and Employees (coeff. = 0.231, t-stat = 4.248) with firm fixed effects in Column 3. The high partial R-squared (54.6 percent) and partial F-test (F = 894.4, p = <0.001) in Column 1 and partial R-squared (25.2 percent) and partial F-test (F = 73.63, p = <0.001) in Column 3 suggest that the instruments are strong. Moreover, further diagnostics tests suggests that instruments may be appropriate: the overidentifying restrictions test, which can be used to determine whether additional instruments are valid

[15]This is consistent with Armstrong et al. (2010) assertion that contract terms are likely to be designed around borrowers' current attributes and anticipated future attributes at the time the firm enters into the contract.

[16]Myers (2002) provides a quote by Janet Moran, [...] of Deloitte & Touche LLP: "I even had a company—and this is probably not so uncommon—that just wanted to give somebody a new title [...] Management said, 'We've got to make him president of something,' so they created a new subsidiary".

(Larcker and Rusticus, 2010), reports an insignificant test statistic (Hansen J statistic = 0.587, p = 0.444) with industry fixed effects and (Hansen J statistic = 0.010, p = 0.920) with firm fixed effects.

The second stage results show a positive and significant effect of organizational complexity on borrowing cost with industry effects in Column 2 (coeff. = 2.441, t-stat = 1.921) and with firm effects in Column 4 (coeff. = 13.635, t-stat = 2.479). However, the endogeneity tests are insignficant for both industry and firm fixed effects specifications, with industry fixed effects ($\chi 2$ = 0.00459, p = 0.946) and firm fixed effects ($\chi 2$ = 0.00459, p = 0.946). These findings suggests that OLS estimates in the primary tests may be preferred to the 2SLS estimates.

Overall, the inferences that organizational complexity is associated with greater borrowing costs remain unchanged, and the empirical design as well as the IV method provide greater confidence on the causal relation between organizational complexity and cost of debt.

5.2 Other robustness tests

5.2.1 Impact of economic downturns on the findings

The supply of lending money is constrained during economic downturns and as such economic downturns can drive borrowing costs. To determine whether the effects of organizational complexity on borrowing costs is not driven by economic crises, I perform additional robustness tests to address economic crises. An an economic crisis is defined as an indicator variable equal to one if the fiscal year falls within a recessionary period as defined by the National Bureau of Economic Research.[17] First, I include in the set of covariates an indicator variable equal to one if the loan was issued following a fiscal year end that coincide with an economic crisis. Second, following Lin et al. (2013) I exclude all firm years falling in an economic crisis. The results are qualitatively similar and the inferences that organizational

[17]The recessionary cycles (business contractions) during my sample period are March 2001 to November 2001, and December 2007 to June 2009 (http://www.nber.org/cycles.html).

complexity increase borrowing costs remain unchanged.

Table 9 Panel A presents the re-estimated results of equation 1 including in the set of covariates an indicator variable equal to one if the loan was issued following a fiscal year end that coincide with an economic crisis. As expected, recessionary firm-years are associated with higher borrowing costs. For example, results show positive and significant coefficient on indicator variable for recessionary firm-years (coeff. = 84.630, t-stat = 10.852) in Column 1, (coeff. = 12.746, t-stat = 1.731) in Column 2 with industry fixed effects, and (coeff. = 16.696, t-stat = 2.632) in column 3 with firm-fixed effects. Similar findings are documents for Columns 4 to 6, where organizational complexity is measured by the square root of subsidiaries.

The coefficients on the variable of interest, organizational complexity, remain positive and significant. I document positive and significant coefficient on organizational complexity, measured by the natural logarithm of number of subsidiaries, (coeff. = 19.674, t-stat = 15.146) in Column 1, (coeff. = 2.560, t-stat = 2.280) in Column 2 with industry fixed effects, and (coeff. = 6.374, t-stat = 2.911) in column 3 with firm-fixed effects. Similar results obtain for organizational complexity measured by the square root of subsidiaries in columns 4 to 6. Moreover, results in Panel B show that the inferences on the relation between organizational complexity and borrowing costs remain unchanged when recessionary firm-years are excluded from the sample in the analyses. The results show positive and significant coefficient on organizational complexity, measured by the natural logarithm of number of subsidiaries, (coeff. = 20.542, t-stat = 15.648) in Column 1, (coeff. = 1.817, t-stat = 1.616) in Column 2 with industry fixed effects, and (coeff. = 6.153, t-stat = 2.829) in column 3 with firm-fixed effects.

5.2.2 Firm and year clustering

My primary estimates are based on standard errors corrected for clustering at the firm and year. This approach accounts for multiple facilities per firm, per year. However, while the

vast majority of firms have multiple loan observations during the sample period, not all firms have multiple loan observations within a given year. Accordingly, I re-estimate my baseline equation with only clustering at the firm level. The inferences remain unchanged. I present the re-estimated baseline results in Table 10 Panel A, and the re-estimated cross-sectional tests in Panel B.

6 Conclusion

In this paper, I focus on organizational complexity arising from the legal fragmentation of the firm into multiple entities and test the proposition that such complexity increases borrowing costs. Using the number of entities within a firm to capture complexity, I document evidence that borrowing costs are increasing in organizational complexity and that the findings are more pronounced for unsecured loans, acquisition loans and other loan terms associated with high lender risk.

The findings are robust to endogeneity and other checks. I control for many observables factors that have been found in prior literature to affect the cost of debt. I also perform regressions with fixed effects to mitigate bias from omitted factors that do not vary over time, and instrumental variable regressions to mitigate bias from time variant omitted factors. Additionally, I employ seemingly unrelated regressions to mitigate simultaneity problems that arise because loan contract terms are simultaneously determined. Overall, these analyses increase the likelihood that my estimates have a causal interpretation.

References

Altman, E. I. (1968). Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy. *The Journal of Finance*, 23(4):589–609.

Altshuler, R. and Grubert, H. (2001). Repatriation taxes, repatriation strategies and multinational financial policy. DOI: 10.3386/w8144.

Anderson, R. C., Mansi, S. A., and Reeb, D. M. (2003). Founding family ownership and the agency cost of debt. 68(2):263–285.

Armstrong, C. S., Guay, W. R., and Weber, J. P. (2010). The role of information and financial reporting in corporate governance and debt contracting. 50(2):179–234.

Baghai, R. P., Servaes, H., and Tamayo, A. (2014). Have Rating Agencies Become More Conservative? Implications for Capital Structure and Debt Pricing. *The Journal of Finance*, 69(5):1961–2005.

Bagnoli, M., Liu, H.-T., and Watts, S. G. (2011). Family firms, debtholderâshareholder agency costs and the use of covenants in private debt. 7(4):477–509.

Ball, R., Bushman, R. M., and Vasvari, F. P. (2008). The debt-contracting value of accounting information and loan syndicate structure. 46(2):247–287.

Beaver, W. H., Cascino, S., Correia, M. M., and McNichols, M. F. (2016). Bankruptcy in groups. *Stanford University Graduate School of Business Research Paper No. 15-48. Available at SSRN: https://ssrn.com/abstract=2646916.*

Black, D. E., Dikolli, S. S., and Dyreng, S. D. (2014). CEO pay-for-complexity and the risk of managerial diversion from multinational diversification. 31(1):103–135.

Cetorelli, N. and Goldberg, L. S. (2014). Measures of global bank complexity. *Economic Policy Review*, pages 107–126.

Chava, S., Livdan, D., and Purnanandam, A. (2009). Do shareholder rights affect the cost of bank loans? 22(8):2973–3004.

Chava, S. and Roberts, M. R. (2008). How does financing impact investment? the role of debt covenants. 63(5):2085–2121.

Costello, A. M. and Wittenberg-Moerman, R. (2011). The impact of financial reporting quality on debt contracting: Evidence from internal control weakness reports. 49(1):97–136.

Craswell, A., Stokes, D. J., and Laughton, J. (2002). Auditor independence and fee dependence. 33(2):253–275.

Dichev, I. D. and Skinner, D. J. (2002). Largeâsample evidence on the debt covenant hypothesis. 40(4):1091–1123.

Dyreng, S. D., Lindsey, B. P., Markle, K. S., and Shackelford, D. A. (2015). The effect of tax and nontax country characteristics on the global equity supply chains of u.s. multinationals. 59(2):182–202.

Fang, J., Pittman, J., Zhang, Y., and Zhao, Y. (2017). Auditor choice and its implications for group-affiliated firms. 34(1):39–82.

Gibbons, R. and Waldman, M. (1999). Chapter 36 careers in organizations: Theory and evidence. 3:2373–2437.

Gibson, J., Elsdon, K., and Johnson, L. (2013). Subsidiary governance: an unappreciated risk. *PricewaterhouseCoopers LLP*.

Gigler, F., Kanodia, C., Sapra, H., and Venugopalan, R. (2009). Accounting Conservatism and the Efficiency of Debt Contracts. *Journal of Accounting Research*, 47(3):767–797.

Graham, J. R., Li, S., and Qiu, J. (2008). Corporate misreporting and bank loan contracting. 89(1):44–61.

Hann, R. N., Ogneva, M., and Ozbas, O. (2013). Corporate diversification and the cost of capital. 68(5):1961–1999.

Hasan, I., Hoi, C. K. S., Wu, Q., and Zhang, H. Beauty is in the eye of the beholder: The effect of corporate tax avoidance on the cost of bank loans. 113(1):109–130.

Hay, D. C., Knechel, W. R., and Wong, N. (2006). Audit fees: A meta-analysis of the effect of supply and demand attributes*. 23(1):141–191.

Jensen, M. C. and Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4):305–360.

Larcker, D. F. and Rusticus, T. O. (2010). On the use of instrumental variables in accounting research. 49(3):186–205.

Leland, H. E. (2007). Financial synergies and the optimal scope of the firm: Implications for mergers, spinoffs, and structured finance. 62(2):765–807.

Li, S., Qiu, J., and Wan, C. (2011). Corporate globalization and bank lending. *Journal of International Business Studies*, 42(8):1016–1042.

Lin, C., Ma, Y., Malatesta, P., and Xuan, Y. (2011). Ownership structure and the cost of corporate borrowing. 100(1):1–23.

Lin, C., Officer, M. S., Wang, R., and Zou, H. (2013). Directors' and officers' liability insurance and loan spreads. 110(1):37–60.

Mansi, S. A. and Reeb, D. M. (2002). Corporate international activity and debt financing. 33(1):129–147.

Melnik, A. and Plaut, S. (1986). Loan commitment contracts, terms of lending, and credit allocation. 41(2):425–435.

Myers, R. (2002). Is a subsidiary in your future? *Journal of Accountancy*.

Palmrose, Z.-V. (1984). The demand for quality-differentiated audit services in an agency-cost setting: An empirical investigation. *Auditing Research Symposium, Edited by Abdel-Khalik, A Rashad and Solomon, Ira*.

Saunders, A. and Steffen, S. (2011). The costs of being private: Evidence from the loan market. 24(12):4091–4122.

Valta, P. Competition and the cost of debt. 105(3):661–682.

Weber, J., Willenborg, M., and Zhang, J. (2008). Does auditor reputation matter? the case of KPMG germany and ComROAD AG. 46(4):941–972.

Appendix A - Variable Definitions and Measurement

Subsidiaries data is obtained from Form 10-K Exhibit 21. Data on loan pricing and loan contract terms obtained from Thomson Reuters LPC's DealScan database. Accounting data is obtained from Compustat - Capital IQ from Standard & Poor's.

(A) Primary variables

subs = The number of subsidiaries and/or affiliates disclosed on Form 10-K, Exhibit 21.

asubs = The ratio of the number of subsidiaries (subs) to total assets (at)

logsubs = The natural logarithm of the number of subsidiaries (log(asubs))

sqsubs = The square root of the number of subsidiaries (sqrt(asubs))

allindrawn = The interest spread over LIBOR measured as the All-in-Drawn-Spread measure reported in DealScan. All-in-Drawn-Spread is the amount the borrower pays in basis points over LIBOR for each dollar drawn down. (DealScan)

revolver = Indicator variable equal to one if the loan's type is revolver, and zero otherwise. (DealScan)

instinvestor = Indicator variable equal to one if the loan's type is term loan B, C, or D (institutional term loans), and zero otherwise. (DealScan)

logmaturity = The natural logarithm of number of months between the loan's issue date and the date when the loan matures. (DealScan)

loanamt = The facility (or loan) amount in US dollars (millions). (DealScan)

loansize = The natural logarithm of the loan amount scaled by total assets. (DealScan)

$numberlenders$ = The number of banks and other lenders (e.g., insurance companies, institutional investors) participating in the loan syndicate. (DealScan)

$repeatlenders$ = Indicator variable equal to one if at least one of the lenders for the current loan is a lender to the same borrower/firm in the prior five years, and zero otherwise. (DealScan)

$pp\_indicator$ = Indicator variable equal to one if the loan contract has performance pricing provisions, and zero otherwise. (DealScan)

$securedloan$ = Indicator variable equal to one if the loan is secured (has collateral), and zero otherwise. (DealScan)

$fcovenants$ = The number of debt covenants included in the loan contract that are based on financial ratios from both the income statement and balance sheet. (DealScan)

$Dividend$ = Indicator variable equal to one if the loan contract has dividend restrictions, and zero otherwise. (DealScan)

$capex$ = Indicator variable equal to one if the loan contract has capital expenditure restrictions, and zero otherwise. (DealScan)

$sweepsdummy$ = Indicator variable equal to one if the loan contract has equity issuance sweeps, debt issuance sweeps, asset sales sweeps, and insurance proceeds sweeps, and zero otherwise. (DealScan)

at = Total assets (AT) in US dollars (millions). (Compustat)

$logassets$ = The natural logarithm of total assets. (Compustat)

$tangibility$ = Net property, plant and equipment (PPENT) scaled by total assets. (Compustat)

profitability = Earnings before interest and depreciation (EBITDA), scaled by total assets.(Compustat)

leveragetotal = Total long-term debt (DLTT + DLC) scaled by total assets. (Compustat)

market_to_book = The ratio of the market value of assets (market value of equity plus book value of debt) to the book value of assets. ([PRCC_F * CSHO + (AT – CEQ)] / AT). (Compustat)

zscore = The Modified Altman (1968) Z-score (Graham et al., 2008) z-score = (1.2*WCAP + 1.4*RE + 3.3*PI + 0.999* SALE) / AT, where WCAP is working capital, RE is retained earnings, PI is pretax income, SALE is total sales, and AT is total assets. (Compustat)

Prior_Subsidiaries = The number of prior subsidiaries, measured as the square root of the number of subsidiaries two years prior to loan contract and one year prior to measure of Log Subsidiaries. (Exhibit 21)

Employees = The natural logarithm of the number of employees (EMP), measured in the most recent fiscal year prior to the loan contract and in the same year as Log Subsidiaries. (Compustat)

(B) Ratings variables

Rating = Standard and Poors Long Term Issuer Credit Rating (SPLTICRM) mapped to natural numbers such that higher numbers indicate higher rating quality, i.e., SD/D = 1, ..., Aaa = 22 (www.standardandpoors.com).

IntCov = Earnings before interest, taxes, depreciation, and amortization divided by interest expense (EBITDA / XINT, Compustat).

Profit = Earnings before interest, taxes, depreciation, and amortization divided by sales (EBITDA / REVT, Compustat).

$Leverage$ = The sum of long- and short-term debt divided by total assets ((DLTT + DLC) / AT, Compustat).

$Size$ = Natural logarithm of total assets (AT, Compustat).

$DebtEBITDA$ = The sum of long- and short-term debt divided by earnings before interest, taxes, depreciation, and amortization; set equal to zero if negative ((DLTT + DLC) / EBITDA, Compustat).

$NegDebtEBITDA$ = Indicator variable equal to one if $DebtEBITDA < 0$, and zero otherwise.

$EarnVol$ = Standard deviation of $Profit$ over the prior five fiscal years; a minimum of two years required.

$CashAssets$ = Cash and short-term investments divided by total assets (CHE / AT, Compustat).

$ConvDebtAssets$ = Convertible debt divided by total assets (DCVT / AT, Compustat).

$RentAssets$ = Rent expense divided by total assets (XRENT / AT, Compustat).

$PPEAssets$ = Net property, plant, and equipment divided by total assets (PPENT / AT, Compustat).

$CAPEXAssets$ = Capital expenditures divided by total assets (CAPX / AT, Compustat).

Table 1: Summary statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) p25	(5) p50	(6) p75	(7) p90	(8) max
subs	7,206.00	43.14	83.72	7.00	18.00	47.00	106.00	1,873.00
asubs	7,206.00	0.05	0.09	0.01	0.02	0.06	0.11	3.42
logsubs	7,206.00	-3.84	1.42	-4.63	-3.70	-2.87	-2.22	1.23
sqsubs	7,206.00	0.18	0.12	0.10	0.16	0.24	0.33	1.85
allindrawn	11,447.00	206.14	137.93	100.00	200.00	275.00	355.00	1,325.00
revolver	11,447.00	0.62	0.48	0.00	1.00	1.00	1.00	1.00
instinvestor	11,447.00	0.11	0.31	0.00	0.00	0.00	1.00	1.00
logmaturity	11,447.00	3.72	0.64	3.58	4.06	4.09	4.28	5.53
loanamt	11,447.00	341.68	719.21	50.00	150.00	350.00	800.00	25,000.00
loansize	11,447.00	-1.91	1.01	-2.52	-1.84	-1.23	-0.71	2.17
numberlenders	11,447.00	9.15	9.61	3.00	7.00	12.00	20.00	290.00
repeatlenders	11,447.00	0.68	0.47	0.00	1.00	1.00	1.00	1.00
pp_indicator	11,447.00	0.70	0.46	0.00	1.00	1.00	1.00	1.00
fcovenants	11,447.00	2.45	1.01	2.00	2.00	3.00	4.00	7.00
securedloan	11,447.00	0.65	0.48	0.00	1.00	1.00	1.00	1.00
capex	11,447.00	0.29	0.45	0.00	0.00	1.00	1.00	1.00
ddividendrestrictions	11,447.00	0.79	0.41	1.00	1.00	1.00	1.00	1.00
sweepsdummy	11,447.00	0.48	0.50	0.00	0.00	1.00	1.00	1.00
at	7,206.00	3,621.07	18,550.44	268.26	766.88	2,376.74	7,091.02	781,818.00
logassets	7,206.00	6.70	1.65	5.59	6.64	7.77	8.87	13.57
tangibility	7,206.00	0.43	0.24	0.24	0.42	0.61	0.78	0.97
profitability	7,206.00	0.13	0.12	0.09	0.13	0.18	0.23	0.94
leveragetotal	7,206.00	0.29	0.24	0.12	0.26	0.40	0.57	3.74
market_to_book	7,206.00	1.77	1.79	1.12	1.44	1.98	2.84	96.40
zscore	7,206.00	1.62	2.20	0.92	1.74	2.52	3.36	16.65

Table 1 presents descriptive statistics for primary variables. Observations are presented at the firm-year for firm characteristics and loan facility for the loan characteristics. Each firm-year can have multiple loan facilities. In the syndicated loan market, a loan is referred to as a "facility" and a number of facilities with different maturities, interest rate spreads, and repayment schedules are structured and syndicated as one transaction ("package" or "deal") within a common contract. The sample covers the period 1996 to 2010. All variables are as described in Appendix A.

Table 2: Organizational complexity and borrowing costs

VARIABLES	(1) allindrawn	(2) allindrawn	(3) allindrawn	(4) allindrawn	(5) allindrawn	(6) allindrawn
logsubs	19.297***	2.570**	6.421***			
	(14.319)	(2.289)	(2.930)			
sqsubs				218.392***	40.931***	83.599***
				(14.076)	(3.122)	(3.217)
logassets		-18.924***	-19.900***		-18.413***	-19.227***
		(-13.369)	(-5.807)		(-13.098)	(-5.575)
tangibility		-6.537	43.620**		-6.066	43.590**
		(-0.718)	(2.379)		(-0.670)	(2.381)
profitability		-106.042***	-115.694***		-106.161***	-116.747***
		(-6.226)	(-4.441)		(-6.222)	(-4.458)
leveragetotal		61.582***	37.504***		62.042***	38.069***
		(9.715)	(3.575)		(9.779)	(3.617)
market_to_book		-7.183***	-10.033***		-7.142***	-9.983***
		(-10.073)	(-7.395)		(-9.994)	(-7.361)
zscore		-5.232***	-6.607***		-5.119***	-6.393***
		(-5.360)	(-3.477)		(-5.287)	(-3.330)
revolver		-13.777***	-16.056***		-13.611***	-16.050***
		(-5.702)	(-6.934)		(-5.638)	(-6.935)
instinvestor		35.902***	24.947***		36.151***	25.065***
		(6.912)	(4.662)		(6.955)	(4.685)
logmaturity		0.451	4.001*		0.498	3.999*
		(0.210)	(1.698)		(0.232)	(1.696)
loansize		-12.274***	-11.458***		-12.193***	-11.492***
		(-9.248)	(-7.909)		(-9.190)	(-7.926)
numberlenders		-0.455***	-0.264*		-0.464***	-0.260*
		(-3.292)	(-1.883)		(-3.356)	(-1.855)
repeatlenders		-3.978	-3.605		-3.831	-3.512
		(-1.445)	(-1.076)		(-1.392)	(-1.047)
pp_indicator		-50.452***	-46.084***		-50.443***	-46.078***
		(-16.228)	(-12.167)		(-16.259)	(-12.164)
fcovenants		0.157	1.562		0.313	1.561
		(0.111)	(0.826)		(0.220)	(0.825)
securedloan		43.030***	24.331***		43.155***	24.531***
		(14.557)	(5.961)		(14.611)	(6.008)
capex		40.675***	39.151***		40.679***	38.953***
		(12.581)	(9.052)		(12.586)	(8.990)
ddividendrestrictions		8.091***	3.875		8.301***	4.042
		(2.925)	(1.111)		(3.006)	(1.161)
sweepsdummy		41.590***	38.233***		41.758***	38.387***
		(14.472)	(10.348)		(14.523)	(10.389)
Observations	11,447	11,447	11,447	11,447	11,447	11,447
Adjusted R-squared	0.039	0.572	0.668	0.039	0.572	0.668
Year FE	No	Yes	Yes	No	Yes	Yes
Industry FE	No	Yes	No	No	Yes	No
Firm FE	No	No	Yes	No	No	Yes

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2 presents the baseline results on the relation between organizational complexity and borrowing costs. The sample period is between 1996 and 2010 and each observation represents a loan facility. Industry fixed effects are defined according to four-digit Standard Industrial Classification (SIC) Code. The t-statistics, reported in parentheses, are based on standard errors adjusted for clustering at the firm and year. All variables are as described in Appendix A.

Table 3: Attenuating factors for Organizational complexity and borrowing costs

VARIABLES	(1) allindrawn	(2) allindrawn	(3) allindrawn	(4) allindrawn	(5) allindrawn	(6) allindrawn
logsubs	11.072***	9.124***	10.060***	7.569***	5.438**	5.756***
	(4.585)	(4.094)	(3.634)	(3.385)	(2.452)	(2.614)
logsubs_securedloan	-7.819***					
	(-2.917)					
logsubs_capex		-10.336***				
		(-3.199)				
logsubs_ddividendrestrictions			-4.947**			
			(-2.107)			
logsubs_sweepsdummy				-2.613		
				(-1.080)		
logsubs_longmaturity					1.940***	
					(2.597)	
logsubs_instinvestor						6.226*
						(1.793)
logassets	-20.387***	-20.285***	-19.847***	-19.938***	-19.847***	-19.924***
	(-5.931)	(-5.908)	(-5.791)	(-5.813)	(-5.802)	(-5.815)
tangibility	42.921**	44.502**	43.503**	43.852**	44.324**	43.219**
	(2.328)	(2.424)	(2.371)	(2.388)	(2.421)	(2.357)
profitability	-117.220***	-117.730***	-116.367***	-116.352***	-114.840***	-115.345***
	(-4.521)	(-4.550)	(-4.455)	(-4.475)	(-4.414)	(-4.423)
leveragetotal	37.283***	35.926***	37.374***	37.674***	37.106***	37.663***
	(3.552)	(3.437)	(3.570)	(3.593)	(3.537)	(3.587)
market_to_book	-10.087***	-10.331***	-10.055***	-9.974***	-9.996***	-10.048***
	(-7.531)	(-7.668)	(-7.426)	(-7.400)	(-7.323)	(-7.368)
zscore	-6.763***	-6.657***	-6.704***	-6.578***	-6.552***	-6.603***
	(-3.586)	(-3.541)	(-3.524)	(-3.471)	(-3.450)	(-3.478)
revolver	-16.229***	-16.258***	-16.139***	-16.037***	-16.134***	-16.004***
	(-6.995)	(-7.036)	(-6.967)	(-6.930)	(-6.964)	(-6.903)
instinvestor	24.640***	24.754***	24.938***	24.892***	25.149***	48.921***
	(4.605)	(4.638)	(4.663)	(4.655)	(4.696)	(3.154)
logmaturity	4.145*	4.231*	4.031*	4.158*	7.956***	4.034*
	(1.764)	(1.803)	(1.714)	(1.764)	(2.833)	(1.711)
loansize	-11.428***	-11.415***	-11.435***	-11.494***	-11.396***	-11.440***
	(-7.911)	(-7.894)	(-7.895)	(-7.925)	(-7.870)	(-7.895)
numberlenders	-0.253*	-0.268*	-0.263*	-0.260*	-0.250*	-0.269*
	(-1.812)	(-1.951)	(-1.878)	(-1.858)	(-1.786)	(-1.886)
repeatlenders	-3.615	-3.326	-3.555	-3.430	-3.614	-3.615
	(-1.080)	(-0.995)	(-1.061)	(-1.024)	(-1.079)	(-1.080)
pp_indicator	-46.009***	-45.720***	-45.935***	-46.108***	-46.119***	-46.238***
	(-12.171)	(-12.118)	(-12.143)	(-12.184)	(-12.173)	(-12.198)
fcovenants	1.726	1.653	1.529	1.632	1.369	1.557
	(0.914)	(0.873)	(0.808)	(0.861)	(0.725)	(0.823)
securedloan	-6.234	23.536***	24.259***	24.280***	24.370***	24.486***
	(-0.526)	(5.769)	(5.960)	(5.954)	(5.976)	(5.994)
capex	39.169***	1.901	39.427***	39.151***	38.895***	39.108***
	(9.074)	(0.154)	(9.152)	(9.058)	(9.003)	(9.035)
ddividendrestrictions	3.403	3.490	-16.404	3.781	3.822	3.833
	(0.979)	(1.005)	(-1.518)	(1.086)	(1.098)	(1.096)
sweepsdummy	38.209***	37.601***	38.236***	28.069***	38.169***	38.210***
	(10.369)	(10.203)	(10.366)	(2.644)	(10.337)	(10.324)
Constant	306.548***	296.369***	299.607***	287.653***	268.776***	281.641***
	(11.078)	(10.990)	(10.621)	(10.736)	(9.937)	(10.664)
Observations	11,447	11,447	11,447	11,447	11,447	11,447
Adjusted R-squared	0.669	0.669	0.668	0.668	0.669	0.668
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3 presents the results from the cross-sectional tests on the relation between organizational complexity and borrowing costs. The sample period is between 1996 and 2010 and each observation represents a loan facility. Industry fixed effects are defined according to four-digit Standard Industrial Classification (SIC) Code. The t-statistics, reported in parentheses, are based on standard errors adjusted for clustering at the firm and year. All variables are as described in Appendix A.

Table 4: Simultaneous estimation of pricing and non-pricing loan terms

Panel A: Within year

VARIABLES	(1) allindrawn	(2) fcovenants	(3) loansize	(4) pp_indicator	(5) securedloan	(6) capex	(7) dividend	(8) sweepsdummy	(9) logmaturity
logsubs	2.414**	0.037***	-0.010	0.044***	-0.034**	0.012	-0.009**	0.011	0.026*
	(2.285)	(3.660)	(-1.134)	(2.691)	(-1.986)	(0.607)	(-2.046)	(0.645)	(1.849)
revolver	-13.071***	-0.049***	0.332***	0.187***	0.188***	0.172***	0.035***	-0.612***	0.156***
	(-5.178)	(-2.607)	(15.419)	(5.716)	(5.113)	(5.490)	(4.336)	(-17.987)	(4.969)
instinvestor	37.492***	0.113***	0.549***	-1.117***	0.356***	0.347***	0.006	0.269***	1.101***
	(7.030)	(3.244)	(14.835)	(-17.797)	(4.045)	(6.442)	(0.455)	(3.908)	(18.964)
logmaturity	-1.589	0.162***	0.129***	0.412***	0.265***	0.027	0.028***	0.211***	
	(-0.732)	(8.629)	(7.701)	(14.699)	(8.133)	(0.809)	(3.597)	(6.654)	
loansize	-12.244***	-0.017		0.174***	-0.078***	-0.101***	0.016***	0.201***	0.137***
	(-9.059)	(-1.231)		(8.579)	(-3.377)	(-4.604)	(3.130)	(9.299)	(7.129)
numberlenders	-0.622***	0.003**	0.022***	0.008***	0.011***	-0.000	0.000	-0.000	0.014***
	(-4.445)	(2.091)	(7.855)	(3.318)	(3.339)	(-0.180)	(0.101)	(-0.187)	(4.702)
repeatlenders	-5.406*	0.158***	0.218***	0.157***	-0.090*	-0.117**	0.036***	0.167***	-0.115***
	(-1.892)	(5.740)	(8.921)	(3.835)	(-1.874)	(-2.403)	(3.333)	(3.796)	(-3.009)
pp_indicator	-53.723***	0.171***	0.216***		-0.042	-0.022	0.054***	0.296***	0.328***
	(-16.971)	(6.326)	(9.230)		(-0.866)	(-0.493)	(4.806)	(6.652)	(8.440)
fcovenants	1.674		-0.014	0.108***	0.041*	0.011	0.046***	0.154***	0.012
	(1.216)		(-1.236)	(5.488)	(1.711)	(0.479)	(9.719)	(7.483)	(0.667)
securedloan	51.711***	0.090***	-0.100***	-0.106**		0.486***	0.123***	0.765***	0.163***
	(17.409)	(3.198)	(-4.180)	(-2.187)		(8.746)	(9.859)	(16.643)	(4.067)
capex	40.469***	-0.024	-0.106***	-0.004	0.334***		0.073***	0.594***	0.012
	(12.455)	(-0.733)	(-4.147)	(-0.080)	(5.954)		(7.241)	(12.610)	(0.265)
ddividendrestrictions	11.289***	0.267***	0.077***	0.231***	0.410***	0.548***		0.642***	0.020
	(3.961)	(9.716)	(3.181)	(4.736)	(8.539)	(8.315)		(11.689)	(0.485)
sweepsdummy	39.129***	0.219***	0.192***	0.276***	0.680***	0.595***	0.143***		0.307***
	(13.836)	(7.818)	(8.278)	(6.388)	(15.126)	(12.842)	(12.621)		(8.069)
logassets	-15.538***	-0.141***	-0.398***	0.109***	-0.333***	-0.133***	-0.027***	0.168***	0.127***
	(-11.635)	(-11.140)	(-29.531)	(5.506)	(-12.546)	(-5.699)	(-5.220)	(7.681)	(6.399)
tangibility	7.687	-0.122**	0.252***	-0.029	0.105	-0.046	0.035*	-0.617***	-0.178**
	(1.398)	(-2.310)	(6.162)	(-0.362)	(1.201)	(-0.484)	(1.692)	(-7.549)	(-2.419)
profitability	-100.228***	0.277*	0.942***	0.550**	-1.208***	-0.010	-0.142***	0.965***	0.936***
	(-5.990)	(1.803)	(7.479)	(2.462)	(-4.057)	(-0.043)	(-2.988)	(4.214)	(3.885)
leveragetotal	55.674***	0.003	0.047	-0.138	0.435***	0.457***	-0.011	0.550***	0.272***
	(7.665)	(0.048)	(1.037)	(-1.613)	(3.385)	(4.880)	(-0.554)	(5.372)	(3.340)
market_to_book	-6.651***	-0.007	0.040***	-0.048***	-0.038**	-0.022	-0.002	-0.000	-0.030*
	(-11.174)	(-0.522)	(5.472)	(-2.981)	(-2.109)	(-0.940)	(-0.604)	(-0.007)	(-1.687)
zscore	-6.623***	0.028***	-0.008	0.002	-0.051***	0.047***	0.005*	-0.017	-0.001
	(-7.163)	(3.711)	(-1.168)	(0.168)	(-3.174)	(3.811)	(1.880)	(-1.348)	(-0.060)
allindrawn		0.000	-0.001***	-0.003***	0.004***	0.002***	0.000***	0.003***	-0.001***
		(1.211)	(-8.884)	(-15.680)	(9.339)	(10.117)	(4.009)	(10.267)	(-4.082)
Constant	251.319***	2.696***	-0.734***	-1.482***	-0.422*	-3.795***	0.430***	-3.460***	-1.198***
	(19.856)	(21.528)	(-6.026)	(-7.872)	(-1.775)	(-7.809)	(8.211)	(-16.858)	(-7.245)
Observations	11,447	11,447	11,447	11,447	11,447	11,447	11,447	11,447	11,447
Adjusted R-squared	0.543	0.250	0.373						
Pseudo R-squared				0.232	0.402	0.300	0.215	0.337	0.192
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No	No	No	No
Firm FE	No	No	No	No	No	No	No	No	No

Robust z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Panel B: Within industry and year

VARIABLES	(1) allindrawn	(2) fcovenants	(3) loansize	(4) pp_indicator	(5) securedloan	(6) capex	(7) dividend	(8) sweepsdummy	(9) logmaturity
logsubs	2.570**	0.004	-0.005	0.060***	-0.002	0.002	-0.007	0.019	0.010
	(2.329)	(0.416)	(-0.503)	(3.322)	(-0.083)	(0.092)	(-1.536)	(0.957)	(0.610)
revolver	-13.777***	-0.053***	0.304***	0.192***	0.178***	0.174***	0.025***	-0.611***	0.189***
	(-5.803)	(-3.042)	(15.002)	(5.735)	(4.656)	(5.357)	(3.320)	(-17.823)	(5.787)
instinvestor	35.902***	0.105***	0.556***	-1.196***	0.338***	0.275***	0.005	0.216***	1.083***
	(7.034)	(3.334)	(15.746)	(-18.788)	(3.848)	(4.951)	(0.416)	(3.070)	(17.789)
logmaturity	0.451	0.146***	0.129***	0.433***	0.306***	0.024	0.032***	0.158***	
	(0.214)	(8.281)	(7.910)	(14.746)	(8.875)	(0.682)	(4.317)	(4.765)	
loansize	-12.274***	-0.025*		0.190***	-0.090***	-0.066***	0.012**	0.237***	0.148***
	(-9.411)	(-1.952)		(9.164)	(-3.712)	(-2.841)	(2.418)	(10.581)	(7.260)
numberlenders	-0.455***	0.002*	0.021***	0.010***	0.011***	0.000	0.000	0.000	0.015***
	(-3.350)	(1.780)	(7.323)	(3.836)	(3.095)	(0.058)	(0.137)	(0.078)	(4.918)
repeatlenders	-3.978	0.170***	0.181***	0.113***	-0.074	-0.141***	0.036***	0.130***	-0.115***
	(-1.471)	(6.333)	(8.252)	(2.687)	(-1.420)	(-2.711)	(3.420)	(2.791)	(-2.884)
pp_indicator	-50.452***	0.175***	0.213***		-0.016	-0.043	0.050***	0.289***	0.312***
	(-16.514)	(6.807)	(9.702)		(-0.307)	(-0.887)	(4.722)	(6.083)	(7.670)
fcovenants	0.157		-0.021**	0.127***	0.007	0.076***	0.042***	0.175***	0.025
	(0.113)		(-1.964)	(5.991)	(0.238)	(2.971)	(8.671)	(7.668)	(1.268)
securedloan	43.030***	0.055**	-0.102***	-0.090*		0.560***	0.103***	0.853***	0.213***
	(14.813)	(1.967)	(-4.565)	(-1.779)		(9.096)	(8.325)	(17.271)	(5.031)
capex	40.675***	0.033	-0.055**	-0.027	0.397***		0.081***	0.601***	0.005
	(12.803)	(1.048)	(-2.243)	(-0.557)	(6.580)		(7.884)	(11.785)	(0.111)
ddividendrestrictions	8.091***	0.233***	0.056**	0.233***	0.369***	0.632***		0.688***	0.045
	(2.977)	(8.671)	(2.447)	(4.743)	(7.111)	(9.018)		(11.910)	(1.023)
sweepsdummy	41.590***	0.220***	0.205***	0.268***	0.766***	0.611***	0.143***		0.237***
	(14.727)	(7.882)	(9.459)	(5.868)	(15.667)	(11.900)	(12.668)		(5.919)
logassets	-18.924***	-0.168***	-0.393***	0.142***	-0.401***	-0.106***	-0.029***	0.204***	0.134***
	(-13.604)	(-12.467)	(-29.718)	(6.726)	(-14.135)	(-4.035)	(-5.397)	(8.424)	(6.118)
tangibility	-6.537	-0.042	0.199***	0.022	-0.228	0.023	0.032	-0.642***	-0.140
	(-0.731)	(-0.519)	(2.824)	(0.168)	(-1.528)	(0.146)	(1.004)	(-4.679)	(-1.166)
profitability	-106.042***	0.406**	0.960***	0.412*	-1.358***	0.056	-0.122**	0.911***	0.882***
	(-6.336)	(2.550)	(6.800)	(1.777)	(-4.205)	(0.208)	(-2.357)	(3.521)	(3.361)
leveragetotal	61.582***	-0.091	-0.021	-0.064	0.597***	0.608***	0.014	0.419***	0.130
	(9.887)	(-1.550)	(-0.456)	(-0.694)	(4.405)	(5.610)	(0.642)	(3.867)	(1.429)
market_to_book	-7.183***	0.003	0.041***	-0.041***	-0.044**	-0.018	-0.000	0.009	-0.012
	(-10.251)	(0.186)	(5.484)	(-2.753)	(-2.363)	(-0.743)	(-0.055)	(0.677)	(-0.711)
zscore	-5.232***	0.032***	-0.011	-0.004	-0.046**	0.021	0.006**	-0.016	0.012
	(-5.454)	(3.731)	(-1.494)	(-0.262)	(-2.138)	(1.519)	(1.968)	(-1.112)	(0.746)
allindrawn		0.000	-0.001***	-0.004***	0.004***	0.003***	0.000***	0.003***	-0.001***
		(0.113)	(-9.185)	(-15.850)	(8.627)	(10.295)	(2.985)	(10.417)	(-3.442)
Constant	273.296***	2.992***	-0.897***	-1.750***	0.402	-3.796***	0.308***	-2.430***	-1.486***
	(11.562)	(11.251)	(-5.148)	(-5.269)	(1.037)	(-6.930)	(3.179)	(-6.260)	(-3.416)
Observations	11,447	11,447	11,447	11,447	11,447	11,447	11,447	11,447	11,447
Adjusted R-squared	0.572	0.331	0.416						
Pseudo R-squared				0.276	0.451	0.371	0.273	0.393	0.249
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	No	No	No	No	No	No	No	No

Robust z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Panel C: Within year and industry (broader industry classification)

VARIABLES	(1) allindrawn	(3) fcovenants	(5) loansize	(7) pp_indicator	(8) securedloan	(9) capex	(10) dividend	(12) sweepsdummy	(13) logmaturity
logsubs	2.316**	0.034***	-0.011	0.044***	-0.035**	0.010	-0.009**	0.015	0.024*
	(2.178)	(3.331)	(-1.213)	(2.673)	(-1.990)	(0.502)	(-2.111)	(0.857)	(1.684)
revolver	-13.605***	-0.051***	0.324***	0.185***	0.182***	0.175***	0.034***	-0.599***	0.170***
	(-5.391)	(-2.708)	(15.120)	(5.633)	(4.931)	(5.560)	(4.190)	(-17.476)	(5.390)
instinvestor	37.610***	0.123***	0.550***	-1.126***	0.365***	0.322***	0.008	0.257***	1.088***
	(7.044)	(3.562)	(14.986)	(-17.973)	(4.140)	(5.979)	(0.657)	(3.697)	(18.584)
logmaturity	-0.857	0.160***	0.131***	0.416***	0.275***	0.023	0.028***	0.191***	
	(-0.391)	(8.671)	(7.843)	(14.766)	(8.455)	(0.692)	(3.678)	(5.968)	
loansize	-12.536***	-0.024*		0.177***	-0.088***	-0.082***	0.014***	0.215***	0.146***
	(-9.225)	(-1.768)		(8.713)	(-3.772)	(-3.655)	(2.796)	(9.838)	(7.462)
numberlenders	-0.617***	0.002*	0.022***	0.008***	0.011***	-0.000	-0.000	0.000	0.014***
	(-4.452)	(1.935)	(7.793)	(3.311)	(3.283)	(-0.184)	(-0.010)	(0.052)	(4.644)
repeatlenders	-5.166*	0.162***	0.212***	0.151***	-0.092*	-0.123**	0.035***	0.173***	-0.104***
	(-1.810)	(5.895)	(8.947)	(3.701)	(-1.917)	(-2.508)	(3.315)	(3.891)	(-2.718)
pp_indicator	-53.068***	0.180***	0.216***		-0.035	-0.033	0.055***	0.293***	0.323***
	(-16.866)	(6.678)	(9.314)		(-0.701)	(-0.720)	(4.878)	(6.513)	(8.243)
fcovenants	1.022		-0.020*	0.117***	0.029	0.039	0.043***	0.165***	0.019
	(0.732)		(-1.780)	(5.885)	(1.233)	(1.627)	(9.071)	(7.922)	(1.036)
securedloan	50.301***	0.072**	-0.111***	-0.099**		0.510***	0.120***	0.785***	0.180***
	(16.937)	(2.548)	(-4.709)	(-2.032)		(9.000)	(9.595)	(16.893)	(4.504)
capex	41.903***	0.005	-0.085***	-0.020	0.353***		0.078***	0.566***	-0.003
	(12.834)	(0.144)	(-3.335)	(-0.439)	(6.236)		(7.647)	(11.815)	(-0.066)
ddividendrestrictions	10.460***	0.251***	0.067***	0.236***	0.399***	0.568***		0.659***	0.032
	(3.669)	(9.044)	(2.838)	(4.818)	(8.286)	(8.616)		(11.864)	(0.765)
sweepsdummy	40.283***	0.229***	0.205***	0.275***	0.700***	0.565***	0.147***		0.272***
	(14.114)	(8.154)	(8.925)	(6.314)	(15.349)	(11.919)	(12.842)		(7.094)
logassets	-15.894***	-0.150***	-0.400***	0.116***	-0.340***	-0.115***	-0.028***	0.168***	0.128***
	(-12.024)	(-11.776)	(-29.969)	(5.824)	(-12.748)	(-4.881)	(-5.385)	(7.588)	(6.416)
tangibility	9.725	-0.126**	0.193***	-0.029	0.045	0.022	0.019	-0.492***	0.041
	(1.551)	(-2.085)	(3.977)	(-0.317)	(0.435)	(0.201)	(0.809)	(-5.157)	(0.493)
profitability	-107.113***	0.155	0.813***	0.594***	-1.307***	0.179	-0.149***	1.124***	0.966***
	(-6.373)	(1.006)	(6.278)	(2.728)	(-4.406)	(0.752)	(-3.051)	(4.741)	(3.836)
leveragetotal	57.427***	0.027	0.059	-0.146*	0.468***	0.439***	-0.008	0.463***	0.206**
	(7.986)	(0.483)	(1.266)	(-1.738)	(3.642)	(4.569)	(-0.369)	(4.404)	(2.522)
market_to_book	-6.551***	-0.003	0.043***	-0.049***	-0.040**	-0.022	-0.001	-0.005	-0.031*
	(-11.053)	(-0.208)	(5.546)	(-3.114)	(-2.215)	(-0.935)	(-0.521)	(-0.369)	(-1.713)
zscore	-5.933***	0.042***	0.002	-0.007	-0.037**	0.022*	0.006**	-0.028**	-0.001
	(-6.049)	(5.256)	(0.231)	(-0.544)	(-2.118)	(1.794)	(2.000)	(-2.075)	(-0.075)
allindrawn		0.000	-0.001***	-0.003***	0.004***	0.002***	0.000***	0.003***	-0.001***
		(0.730)	(-9.046)	(-15.665)	(9.189)	(10.339)	(3.710)	(10.367)	(-3.708)
Constant	227.895***	2.931***	-0.860***	-1.851***	0.021	-3.461***	0.362***	-2.172***	-1.600***
	(10.878)	(12.663)	(-5.148)	(-5.852)	(0.060)	(-6.404)	(4.245)	(-6.538)	(-4.176)
Observations	11,447	11,447	11,447	11,447	11,447	11,447	11,447	11,447	11,447
Adjusted R-squared	0.546	0.260	0.381						
Pseudo R-squared				0.233	0.405	0.313	0.218	0.346	0.202
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	No	No	No	No	No	No	No	No

Robust z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4 Panel A to Panel C present results from seemingly unrelated post-estimations of price and nonprice loan terms. Panel A include year indicators. Panel B includes year and industry indicators; Industry defined according to 4-digit Standard Industrial Classification (SIC) Code. Panel C includes year and industry indicators; Industry defined according to 1-digit SIC Code to allow for great variation in non-price terms. The sample period is between 1996 and 2010 and each observation represents a loan facility. The z-statistics, reported in parentheses, are based on standard errors adjusted for clustering at the firm and year level. All variables are as described in Appendix A.

Table 5: Investigating channels: Organizational complexity and credit quality

VARIABLES	(1) Rating(3)	(2) Rating(3)	(3) Rating(6)	(4) Rating(6)	(5) Rating(9)	(6) Rating(9)
logsubs	0.050***		0.049***		0.047**	
	(2.736)		(2.660)		(2.565)	
sqsubs		0.684***		0.693***		0.677**
		(2.618)		(2.630)		(2.534)
invintcov	-1.974***	-1.973***	-2.050***	-2.049***	-2.102***	-2.101***
	(-22.366)	(-22.332)	(-22.426)	(-22.394)	(-22.257)	(-22.229)
profit	0.001	0.001	0.002	0.002	0.001	0.001
	(0.458)	(0.465)	(0.841)	(0.859)	(0.771)	(0.786)
leverage	-0.924***	-0.933***	-1.065***	-1.075***	-1.044***	-1.052***
	(-6.851)	(-6.858)	(-7.465)	(-7.463)	(-7.056)	(-7.058)
size	0.572***	0.563***	0.552***	0.544***	0.547***	0.539***
	(20.903)	(21.027)	(20.227)	(20.373)	(20.092)	(20.176)
debtebitda	0.001	0.001	0.001	0.001	0.001	0.001
	(1.570)	(1.562)	(1.559)	(1.553)	(1.494)	(1.488)
negdebtebitda	1.714***	1.707***	1.790***	1.785***	1.851***	1.845***
	(10.893)	(10.837)	(11.071)	(11.020)	(11.188)	(11.142)
convdebtassets	-0.734***	-0.740***	-1.309***	-1.310***	-1.277***	-1.280***
	(-2.792)	(-2.808)	(-4.669)	(-4.656)	(-4.434)	(-4.424)
rentassets	-0.719	-0.735	-3.484***	-3.515***	-3.694***	-3.719***
	(-0.637)	(-0.646)	(-5.556)	(-5.593)	(-5.806)	(-5.827)
ppeassets	-0.153	-0.164	-0.125	-0.134	-0.127	-0.136
	(-1.309)	(-1.401)	(-1.074)	(-1.152)	(-1.087)	(-1.165)
capexassets	0.341	0.338	0.328	0.326	0.362	0.358
	(0.913)	(0.908)	(0.862)	(0.859)	(0.986)	(0.978)
Observations	12,517	12,517	12,305	12,305	12,040	12,040
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	No	No	No	No	No
r2_p	0.203	0.203	0.209	0.209	0.208	0.208

Robust z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5 presents the results on the association between between organizational complexity and firm credit quality, captured by Standard & Poor's long-term issuer ratings. The issuer ratings are obtained from Compustat and measured at 3-, 6-, and 9-months following the fiscal year end. Organizational complexity is measured at the fiscal year end. The sample period is between 1996 and 2010 and each observation represents a firm-year. Industry fixed effects are defined according to four-digit Standard Industrial Classification (SIC) Code. The z-statistics, reported in parentheses, are based on standard errors adjusted for clustering at the firm and year. All variables are as described in Appendix A.

Table 6: Investigating channels: Organizational complexity and likelihood of default

Panel A: Impact of high vs low minority interest (relative to mean)

VARIABLES	(1) Rating(3)	(2) Rating(3)	(3) Rating(3)	(4) Rating(3)
logsubs	0.057***	0.017		
	(3.027)	(0.388)		
sqsubs			0.703**	0.406
			(2.531)	(0.720)
invintcov	-1.946***	-1.990***	-1.946***	-1.989***
	(-21.065)	(-9.126)	(-21.059)	(-9.091)
profit	0.001	0.939	0.001	0.943
	(0.359)	(1.529)	(0.371)	(1.532)
leverage	-0.889***	-1.928***	-0.899***	-1.913***
	(-6.556)	(-5.271)	(-6.559)	(-5.158)
size	0.581***	0.515***	0.568***	0.518***
	(20.533)	(9.880)	(20.745)	(10.475)
debtebitda	0.001	0.002	0.001	0.002
	(1.472)	(1.494)	(1.461)	(1.496)
negdebtebitda	1.633***	2.690***	1.626***	2.696***
	(9.958)	(5.856)	(9.908)	(5.873)
convdebtassets	-0.672***	-1.656**	-0.679***	-1.661**
	(-2.614)	(-1.977)	(-2.633)	(-1.997)
rentassets	-0.678	-1.558	-0.694	-1.564
	(-0.615)	(-1.251)	(-0.623)	(-1.255)
ppeassets	-0.227*	0.221	-0.244**	0.231
	(-1.952)	(0.689)	(-2.099)	(0.712)
capexassets	0.355	0.031	0.350	0.039
	(0.932)	(0.026)	(0.922)	(0.033)
Observations	10,747	1,770	10,747	1,770
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Firm FE	No	No	No	No
Sample	LowMIB	HighMIB	LowMIB	HighMIB
r2_p	0.200	0.215	0.200	0.215

Robust z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Panel B: Impact of high vs low minority interest (below or zero and above zero)

VARIABLES	(1) Rating(3)	(2) Rating(3)	(3) Rating(3)	(4) Rating(3)
logsubs	0.050**	0.043		
	(2.547)	(1.271)		
sqsubs			0.587**	0.699
			(2.058)	(1.491)
invintcov	-1.979***	-1.873***	-1.979***	-1.872***
	(-20.485)	(-11.383)	(-20.499)	(-11.381)
profit	0.000	0.028	0.000	0.028
	(0.300)	(1.592)	(0.312)	(1.580)
leverage	-0.818***	-2.094***	-0.825***	-2.082***
	(-6.127)	(-7.584)	(-6.119)	(-7.499)
size	0.578***	0.541***	0.566***	0.536***
	(19.617)	(13.342)	(19.955)	(13.857)
debtebitda	0.000	0.002***	0.000	0.002***
	(1.321)	(2.859)	(1.308)	(2.893)
negdebtebitda	1.642***	2.066***	1.637***	2.061***
	(9.663)	(6.277)	(9.634)	(6.266)
convdebtassets	-0.626**	-1.495***	-0.632**	-1.511***
	(-2.451)	(-2.578)	(-2.469)	(-2.627)
rentassets	-0.713	-2.039**	-0.724	-2.043**
	(-0.646)	(-2.132)	(-0.652)	(-2.148)
ppeassets	-0.271**	0.276	-0.285**	0.270
	(-2.270)	(1.135)	(-2.395)	(1.107)
capexassets	0.447	0.078	0.440	0.079
	(1.182)	(0.095)	(1.167)	(0.097)
Observations	9,493	3,024	9,493	3,024
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Firm FE	No	No	No	No
Sample	MIBCEQ<=0	MIBCEQ>0	MIBCEQ<=0	MIBCEQ>0
r2_p	0.202	0.204	0.202	0.204

Robust z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6 Panel A and B present the results on the moderating effect of minority interest on the association between between organizational complexity and firm credit quality, captured by Standard & Poor's long-term issuer ratings. The issuer ratings are obtained from Compustat and measured at 3-months following the fiscal year end. Minority interest captures the degree of control a parent company has in the subsidiaries. Organizational complexity and minority interest are measured at the fiscal year end. The sample period is between 1996 and 2010 and each observation represents a firm-year. Industry fixed effects are defined according to four-digit Standard Industrial Classification (SIC) Code. The z-statistics, reported in parentheses, are based on standard errors adjusted for clustering at the firm and year. All variables are as described in Appendix A.

Table 7: Investigating channels: Minority interest on borrowing costs

VARIABLES	(1) allindrawn	(2) allindrawn	(3) allindrawn	(4) allindrawn
logsubs	2.571**	6.269***		
	(2.289)	(2.861)		
logsubs_mibceq	0.350	3.004***		
	(0.736)	(4.236)		
sqsubs			41.036***	82.059***
			(3.129)	(3.159)
sqsubs_mibceq			4.164	45.593***
			(1.197)	(3.873)
logassets	-18.920***	-20.092***	-18.407***	-19.411***
	(-13.364)	(-5.864)	(-13.089)	(-5.630)
tangibility	-6.569	43.801**	-6.091	43.722**
	(-0.722)	(2.387)	(-0.673)	(2.387)
profitability	-106.146***	-115.823***	-106.283***	-116.845***
	(-6.231)	(-4.448)	(-6.228)	(-4.465)
leveragetotal	61.654***	37.095***	62.134***	37.627***
	(9.719)	(3.537)	(9.785)	(3.576)
market_to_book	-7.187***	-10.063***	-7.148***	-10.012***
	(-10.082)	(-7.428)	(-10.004)	(-7.392)
zscore	-5.226***	-6.619***	-5.112***	-6.404***
	(-5.353)	(-3.485)	(-5.279)	(-3.337)
revolver	-13.816***	-16.194***	-13.656***	-16.182***
	(-5.716)	(-6.991)	(-5.653)	(-6.989)
instinvestor	35.873***	24.853***	36.109***	24.971***
	(6.905)	(4.643)	(6.945)	(4.666)
logmaturity	0.451	3.988*	0.502	3.985*
	(0.210)	(1.693)	(0.234)	(1.691)
loansize	-12.274***	-11.452***	-12.190***	-11.481***
	(-9.249)	(-7.905)	(-9.188)	(-7.919)
numberlenders	-0.456***	-0.261*	-0.465***	-0.257*
	(-3.296)	(-1.864)	(-3.362)	(-1.835)
repeatlenders	-4.028	-3.680	-3.883	-3.575
	(-1.461)	(-1.098)	(-1.409)	(-1.066)
pp_indicator	-50.421***	-46.022***	-50.408***	-46.033***
	(-16.216)	(-12.147)	(-16.248)	(-12.149)
fcovenants	0.187	1.507	0.346	1.509
	(0.131)	(0.796)	(0.243)	(0.796)
securedloan	43.029***	24.238***	43.157***	24.446***
	(14.556)	(5.938)	(14.612)	(5.987)
capex	40.656***	39.327***	40.656***	39.134***
	(12.567)	(9.095)	(12.570)	(9.035)
ddividendrestrictions	8.077***	3.854	8.289***	4.012
	(2.919)	(1.106)	(3.001)	(1.153)
sweepsdummy	41.609***	38.332***	41.782***	38.493***
	(14.480)	(10.375)	(14.530)	(10.417)
Constant	277.372***	285.092***	255.278***	240.817***
	(19.605)	(10.739)	(16.511)	(8.214)
Observations	11,447	11,447	11,447	11,447
Adjusted R-squared	0.572	0.668	0.572	0.668
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	No	Yes	No
Firm FE	No	Yes	No	Yes

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7 presents the results on the moderating effect of minority interest on the association between between organizational complexity and borrowing costs. Minority interest captures the degree of control a parent company has in the subsidiaries and is measured at the fiscal year end. The sample period is between 1996 and 2010 and each observation represents a loan facility. Industry fixed effects are defined according to four-digit Standard Industrial Classification (SIC) Code. The t-statistics, reported in parentheses, are based on standard errors adjusted for clustering at the firm and year. All variables are as described in Appendix A.

Table 8: Robustness: Instrumented variable analyses

	(1)		(2)		(3)		(4)	
	1st Stage		2nd Stage		1st Stage		2nd Stage	
VARIABLES	logsubs	tstat	allindrawn	tstat	logsubs	tstat	allindrawn	tstat
logsubs			2.441*	(1.921)			13.635**	(2.479)
sqrtlsubs	0.245***	(38.027)			0.155***	(10.700)		
employees	0.100***	(7.452)			0.231***	(4.248)		
revolver	-0.007	(-0.403)	-13.483***	(-4.894)	-0.005	(-0.620)	-16.715***	(-6.417)
instinvestor	0.038	(1.363)	38.352***	(6.685)	-0.008	(-0.469)	24.383***	(3.867)
logmaturity	0.038***	(2.874)	1.190	(0.540)	-0.001	(-0.116)	5.534**	(2.025)
loansize	0.005	(0.581)	-11.361***	(-7.850)	-0.001	(-0.109)	-11.387***	(-6.799)
numberlenders	0.001	(1.250)	-0.507***	(-3.949)	0.000	(0.233)	-0.178	(-1.004)
repeatlenders	0.079***	(4.388)	-3.592	(-1.361)	0.027	(1.163)	-2.406	(-0.600)
pp_indicator	0.061***	(3.388)	-52.624***	(-17.639)	0.007	(0.368)	-49.333***	(-11.117)
fcovenants	0.026***	(2.869)	-0.156	(-0.116)	-0.001	(-0.129)	2.884	(1.275)
securedloan	0.014	(0.698)	40.879***	(14.271)	0.028	(1.100)	21.878***	(4.536)
capex	-0.047**	(-2.391)	38.538***	(13.193)	0.001	(0.017)	38.422***	(7.203)
ddividendrestrictions	0.013	(0.657)	10.624***	(4.220)	-0.038	(-1.487)	7.270*	(1.737)
sweepsdummy	0.019	(0.988)	42.579***	(15.622)	0.020	(0.972)	38.275***	(9.197)
logassets	-0.928***	(-65.100)	-17.493***	(-13.000)	-0.886***	(-17.706)	-14.874***	(-2.885)
tangibility	-0.276***	(-4.865)	-1.565	(-0.174)	-0.271	(-1.630)	31.922	(1.359)
profitability	-0.421***	(-3.456)	-104.386***	(-5.350)	-0.324*	(-1.798)	-129.660***	(-3.691)
leveragetotal	0.034	(0.861)	61.714***	(9.810)	0.087	(0.992)	39.260***	(3.003)
market_to_book	0.012	(1.618)	-8.282***	(-6.043)	-0.024	(-1.210)	-5.139**	(-2.123)
zscore	0.011*	(1.810)	-7.072***	(-6.799)	-0.001	(-0.063)	-9.385***	(-3.494)
Observations	9,156		9,156		8,534		8,534	
Year FE	Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		No		No	
Firm FE	No		No		Yes		Yes	
Partial R-squared	0.546				0.252			
Partial F-test	894.4				73.63			
p-value of Partial F-test	0				0			
Adjusted R-squared			0.492				0.225	
Hansen J statistic			0.587				0.0100	
p-value of Hansen J statistic			0.444				0.920	
Endogeneity test Chi-sq			0.00459				1.769	
p-value of Endogeneity test Chi-sq			0.946				0.183	

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8 presents the results from the instrumented variable analyses. The sample period is between 1996 and 2010 and each observation represents a loan facility. Industry fixed effects are defined according to four-digit Standard Industrial Classification (SIC) Code. The t-statistics, reported in parentheses, are based on standard errors adjusted for clustering at the firm level. The set of instruments and all other variables are as described in Appendix A.

Table 9: Robustness: Impact of economic recessionary firm-years

Panel B: Controlling for recessionary firm-years)

VARIABLES	(1) allindrawn	(2) allindrawn	(3) allindrawn	(4) allindrawn	(5) allindrawn	(6) allindrawn
logsubs	19.674***	2.560**	6.374***			
	(15.146)	(2.280)	(2.911)			
sqsubs				223.210***	40.797***	83.219***
				(14.768)	(3.112)	(3.206)
recession	84.630***	12.746*	16.696***	84.898***	12.685*	16.761***
	(10.852)	(1.731)	(2.632)	(10.990)	(1.724)	(2.649)
logassets		-18.886***	-19.756***		-18.377***	-19.077***
		(-13.355)	(-5.792)		(-13.079)	(-5.559)
tangibility		-6.192	44.704**		-5.722	44.682**
		(-0.680)	(2.439)		(-0.631)	(2.442)
profitability		-106.071***	-115.751***		-106.189***	-116.795***
		(-6.230)	(-4.453)		(-6.226)	(-4.471)
leveragetotal		61.710***	37.709***		62.168***	38.272***
		(9.737)	(3.597)		(9.800)	(3.638)
market_to_book		-7.158***	-9.982***		-7.118***	-9.932***
		(-10.036)	(-7.307)		(-9.957)	(-7.274)
zscore		-5.231***	-6.598***		-5.119***	-6.384***
		(-5.375)	(-3.474)		(-5.301)	(-3.326)
revolver		-13.755***	-16.013***		-13.589***	-16.007***
		(-5.693)	(-6.913)		(-5.629)	(-6.914)
instinvestor		35.951***	25.007***		36.199***	25.125***
		(6.919)	(4.671)		(6.962)	(4.694)
logmaturity		0.537	4.036*		0.583	4.034*
		(0.250)	(1.715)		(0.272)	(1.714)
loansize		-12.296***	-11.446***		-12.215***	-11.479***
		(-9.266)	(-7.901)		(-9.208)	(-7.918)
numberlenders		-0.459***	-0.265*		-0.467***	-0.260*
		(-3.315)	(-1.885)		(-3.378)	(-1.857)
repeatlenders		-4.021	-3.627		-3.874	-3.535
		(-1.462)	(-1.084)		(-1.409)	(-1.056)
pp_indicator		-50.415***	-46.015***		-50.406***	-46.009***
		(-16.212)	(-12.147)		(-16.244)	(-12.143)
fcovenants		0.189	1.550		0.344	1.549
		(0.133)	(0.820)		(0.242)	(0.819)
securedloan		43.058***	24.360***		43.182***	24.559***
		(14.582)	(5.968)		(14.636)	(6.015)
capex		40.663***	39.006***		40.667***	38.808***
		(12.577)	(9.024)		(12.582)	(8.962)
ddividendrestrictions		8.098***	3.873		8.307***	4.041
		(2.930)	(1.112)		(3.010)	(1.162)
sweepsdummy		41.542***	38.224***		41.710***	38.377***
		(14.450)	(10.351)		(14.501)	(10.391)
Observations	11,447	11,447	11,447	11,447	11,447	11,447
Adjusted R-squared	0.068	0.572	0.668	0.068	0.572	0.669
Year FE	No	Yes	Yes	No	Yes	Yes
Industry FE	No	Yes	No	No	Yes	No
Firm FE	No	No	Yes	No	No	Yes

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Panel B: Exclude recession firm-years

VARIABLES	(1) allindrawn	(2) allindrawn	(3) allindrawn	(4) allindrawn	(5) allindrawn	(6) allindrawn
logsubs	20.542***	1.817	6.153***			
	(15.648)	(1.616)	(2.829)			
sqsubs				227.870***	31.014**	86.972***
				(14.684)	(2.341)	(3.386)
logassets		-21.428***	-18.942***		-20.958***	-17.818***
		(-15.538)	(-5.440)		(-15.243)	(-5.069)
tangibility		-12.497	50.501***		-12.098	50.577***
		(-1.361)	(2.734)		(-1.323)	(2.751)
profitability		-122.186***	-145.197***		-121.985***	-146.271***
		(-7.179)	(-5.426)		(-7.154)	(-5.432)
leveragetotal		63.557***	41.430***		63.861***	42.029***
		(9.846)	(3.769)		(9.873)	(3.810)
market_to_book		-6.582***	-9.750***		-6.558***	-9.665***
		(-10.007)	(-7.573)		(-9.920)	(-7.500)
zscore		-3.577***	-4.908***		-3.511***	-4.639**
		(-3.813)	(-2.578)		(-3.752)	(-2.405)
revolver		-11.174***	-15.309***		-11.041***	-15.274***
		(-4.579)	(-6.336)		(-4.524)	(-6.324)
instinvestor		37.682***	25.983***		37.873***	26.112***
		(7.150)	(4.675)		(7.176)	(4.699)
logmaturity		0.745	5.550**		0.784	5.562**
		(0.349)	(2.344)		(0.368)	(2.348)
loansize		-12.034***	-10.761***		-11.967***	-10.809***
		(-9.029)	(-7.314)		(-8.977)	(-7.339)
numberlenders		-0.360***	-0.167		-0.366***	-0.161
		(-2.693)	(-1.246)		(-2.743)	(-1.203)
repeatlenders		-7.182***	-6.537*		-7.060**	-6.413*
		(-2.591)	(-1.902)		(-2.549)	(-1.864)
pp_indicator		-48.991***	-41.788***		-48.983***	-41.811***
		(-15.499)	(-10.583)		(-15.537)	(-10.585)
fcovenants		0.790	1.778		0.907	1.776
		(0.550)	(0.911)		(0.632)	(0.910)
securedloan		42.794***	24.603***		42.890***	24.767***
		(14.344)	(6.070)		(14.389)	(6.113)
capex		41.023***	38.639***		41.055***	38.474***
		(12.520)	(8.490)		(12.532)	(8.442)
ddividendrestrictions		7.299***	2.676		7.448***	2.854
		(2.701)	(0.760)		(2.757)	(0.812)
sweepsdummy		40.212***	36.599***		40.338***	36.749***
		(13.593)	(9.273)		(13.628)	(9.306)
Constant	277.492***	287.978***	268.260***	156.972***	271.231***	220.369***
	(51.672)	(20.288)	(9.901)	(47.398)	(17.701)	(7.474)
Observations	10,469	10,469	10,469	10,469	10,469	10,469
Adjusted R-squared	0.047	0.577	0.675	0.045	0.578	0.675
Year FE	No	Yes	Yes	Yes	Yes	Yes
Industry FE	No	Yes	No	Yes	Yes	No
Firm FE	No	No	Yes	No	No	Yes

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9 Panel A and B presents the re-estimated baseline results on the relation between organizational complexity and borrowing costs with control for recessionary firm-years in Panel A and excluding recessionary firm-years in Panel B. The sample period is between 1996 and 2010 and each observation represents a loan facility. Industry fixed effects are defined according to four-digit Standard Industrial Classification (SIC) Code. All variables are as described in Appendix A.

Table 10: Robustness: clustering at the firm level only

Panel A: Re-estimating baseline results in Table 2

VARIABLES	(1) allindrawn	(2) allindrawn	(3) allindrawn	(4) allindrawn	(5) allindrawn	(6) allindrawn
logsubs	19.297***	2.570**	6.421**			
	(11.313)	(2.188)	(2.262)			
sqsubs				218.392***	40.931***	83.599**
				(11.999)	(3.023)	(2.546)
logassets		-18.924***	-19.900***		-18.413***	-19.227***
		(-13.067)	(-4.818)		(-12.787)	(-4.636)
tangibility		-6.537	43.620*		-6.066	43.590*
		(-0.692)	(1.850)		(-0.647)	(1.852)
profitability		-106.042***	-115.694***		-106.161***	-116.747***
		(-5.953)	(-3.593)		(-5.947)	(-3.602)
leveragetotal		61.582***	37.504***		62.042***	38.069***
		(9.304)	(2.893)		(9.364)	(2.927)
market_to_book		-7.183***	-10.033***		-7.142***	-9.983***
		(-9.705)	(-5.683)		(-9.630)	(-5.665)
zscore		-5.232***	-6.607***		-5.119***	-6.393***
		(-5.217)	(-2.799)		(-5.140)	(-2.680)
revolver		-13.777***	-16.056***		-13.611***	-16.050***
		(-5.573)	(-5.965)		(-5.513)	(-5.972)
instinvestor		35.902***	24.947***		36.151***	25.065***
		(6.476)	(4.006)		(6.515)	(4.024)
logmaturity		0.451	4.001		0.498	3.999
		(0.199)	(1.432)		(0.220)	(1.431)
loansize		-12.274***	-11.458***		-12.193***	-11.492***
		(-8.856)	(-6.685)		(-8.808)	(-6.694)
numberlenders		-0.455***	-0.264		-0.464***	-0.260
		(-3.093)	(-1.554)		(-3.151)	(-1.533)
repeatlenders		-3.978	-3.605		-3.831	-3.512
		(-1.419)	(-0.904)		(-1.366)	(-0.880)
pp_indicator		-50.452***	-46.084***		-50.443***	-46.078***
		(-15.236)	(-10.173)		(-15.262)	(-10.162)
fcovenants		0.157	1.562		0.313	1.561
		(0.109)	(0.680)		(0.216)	(0.678)
securedloan		43.030***	24.331***		43.155***	24.531***
		(13.836)	(5.119)		(13.891)	(5.150)
capex		40.675***	39.151***		40.679***	38.953***
		(11.890)	(7.215)		(11.884)	(7.158)
ddividendrestrictions		8.091***	3.875		8.301***	4.042
		(2.800)	(0.918)		(2.875)	(0.958)
sweepsdummy		41.590***	38.233***		41.758***	38.387***
		(13.641)	(8.848)		(13.684)	(8.864)
Observations	11,447	11,447	11,447	11,447	11,447	11,447
Adjusted R-squared	0.039	0.572	0.668	0.039	0.572	0.668
Year FE	No	Yes	Yes	No	Yes	Yes
Industry FE	No	Yes	No	No	Yes	No
Firm FE	No	No	Yes	No	No	Yes

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Panel B: Re-estimating attenuation results in Table 3

VARIABLES	(1) allindrawn	(2) allindrawn	(3) allindrawn	(4) allindrawn	(5) allindrawn	(6) allindrawn
logsubs	11.072***	9.124***	10.060***	7.569***	5.438*	5.756**
	(3.747)	(3.133)	(2.827)	(2.701)	(1.891)	(2.018)
logsubs_securedloan	-7.819**					
	(-2.449)					
logsubs_capex		-10.336**				
		(-2.518)				
logsubs_ddividendrestrictions			-4.947			
			(-1.629)			
logsubs_sweepsdummy				-2.613		
				(-0.867)		
logsubs_longmaturity					1.940**	
					(2.248)	
logsubs_instinvestor						6.226
						(1.561)
logassets	-20.387***	-20.285***	-19.847***	-19.938***	-19.847***	-19.924***
	(-4.896)	(-4.889)	(-4.794)	(-4.824)	(-4.826)	(-4.818)
tangibility	42.921*	44.502*	43.503*	43.852*	44.324*	43.219*
	(1.802)	(1.876)	(1.838)	(1.854)	(1.883)	(1.836)
profitability	-117.220***	-117.730***	-116.367***	-116.352***	-114.840***	-115.345***
	(-3.652)	(-3.667)	(-3.605)	(-3.620)	(-3.570)	(-3.577)
leveragetotal	37.283***	35.926***	37.374***	37.674***	37.106***	37.663***
	(2.875)	(2.768)	(2.893)	(2.910)	(2.862)	(2.897)
market_to_book	-10.087***	-10.331***	-10.055***	-9.974***	-9.996***	-10.048***
	(-5.801)	(-5.894)	(-5.711)	(-5.698)	(-5.620)	(-5.657)
zscore	-6.763***	-6.657***	-6.704***	-6.578***	-6.552***	-6.603***
	(-2.889)	(-2.844)	(-2.838)	(-2.794)	(-2.772)	(-2.796)
revolver	-16.229***	-16.258***	-16.139***	-16.037***	-16.134***	-16.004***
	(-6.005)	(-6.042)	(-5.982)	(-5.963)	(-5.988)	(-5.940)
instinvestor	24.640***	24.754***	24.938***	24.892***	25.149***	48.921***
	(3.958)	(3.984)	(4.006)	(4.000)	(4.030)	(2.705)
logmaturity	4.145	4.231	4.031	4.158	7.956**	4.034
	(1.485)	(1.512)	(1.445)	(1.487)	(2.403)	(1.443)
loansize	-11.428***	-11.415***	-11.435***	-11.494***	-11.396***	-11.440***
	(-6.689)	(-6.679)	(-6.671)	(-6.702)	(-6.647)	(-6.669)
numberlenders	-0.253	-0.268	-0.263	-0.260	-0.250	-0.269
	(-1.497)	(-1.610)	(-1.552)	(-1.536)	(-1.471)	(-1.556)
repeatlenders	-3.615	-3.326	-3.555	-3.430	-3.614	-3.615
	(-0.908)	(-0.836)	(-0.893)	(-0.863)	(-0.906)	(-0.907)
pp_indicator	-46.009***	-45.720***	-45.935***	-46.108***	-46.119***	-46.238***
	(-10.192)	(-10.190)	(-10.168)	(-10.194)	(-10.177)	(-10.207)
fcovenants	1.726	1.653	1.529	1.632	1.369	1.557
	(0.753)	(0.718)	(0.665)	(0.708)	(0.597)	(0.677)
securedloan	-6.234	23.536***	24.259***	24.280***	24.370***	24.486***
	(-0.435)	(4.954)	(5.131)	(5.113)	(5.125)	(5.151)
capex	39.169***	1.901	39.427***	39.151***	38.895***	39.108***
	(7.237)	(0.123)	(7.297)	(7.217)	(7.184)	(7.198)
ddividendrestrictions	3.403	3.490	-16.404	3.781	3.822	3.833
	(0.812)	(0.832)	(-1.198)	(0.897)	(0.907)	(0.905)
sweepsdummy	38.209***	37.601***	38.236***	28.069**	38.169***	38.210***
	(8.876)	(8.759)	(8.871)	(2.198)	(8.837)	(8.809)
Constant	306.548***	296.369***	299.607***	287.653***	268.776***	281.641***
	(9.244)	(9.223)	(8.984)	(9.100)	(8.312)	(8.961)
Observations	11,447	11,447	11,447	11,447	11,447	11,447
Adjusted R-squared	0.669	0.669	0.668	0.668	0.669	0.668
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10 presents the re-estimated results on the relation between organizational complexity and borrowing costs with the t-statistics, reported in parentheses, based on standard errors adjusted for clustering at the firm level. Panel A presents the baseline results and Panel B presents the cross-sectional results. The sample period is between 1996 and 2010 and each observation represents a loan facility. Industry fixed effects are defined according to four-digit Standard Industrial Classification (SIC) Code. All variables are as described in Appendix A.