**Internet Appendix for "Private Equity Firms' Reputational Concerns and the Costs of Debt Financing"**

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This internet appendix provides additional results for "Private Equity Firms' Reputational Concerns and the Costs of Debt Financing", which will be referred to as "the paper" throughout the appendix. In Section A of this appendix, we report some detailed information on the ownership of private equity (PE) sponsors for the initial public offering (IPO) companies that have issued bonds. Section B presents regression results on the effect of various ownership levels by the PE sponsors, measured immediately before the bond offering, on the yield spread of the bond offering. In Section C, we examine whether PE-backed companies use covenants differently, and if so, whether the differences drive our results. Section D examines the effect of venture capital (VC) sponsorship on credit ratings and yield spreads. In Section E, we study whether omitted variables, including earnings stability, future leverage changes, name recognition, and company age, are responsible for the difference in bond yield spreads between PE-backed and non-PE-backed companies. In this section, we also check to see if our results are robust to using the three-year averages of ROA, $ICR_0$-$ICR_{20}$, and Leverage instead of the one-year measures. We further compare the PE-sponsored issues with a sample of non-PE-sponsored issues identified using a propensity score matching procedure for the (IPO+1, IPO+50] sample.

*A. Ownership and Directorship for PE- and VC-Sponsored IPO companies*

We collect data from EDGAR for all buyout- and VC-backed IPO companies that did bond offerings and are thus in our (IPO+1, IPO+5] sample. We collect data on VC sponsors as well, for comparisons and robustness checks in our later analysis. The results are reported in

Panels A-C of Table A-1. We only include IPOs that have prospectuses in EDGAR so that we can use the prospectus to determine the names of the buyout or VC sponsors, resulting in a sample of 34 PE-backed and 12 VC-backed IPOs (about half of the PE- and VC-sponsored IPO companies in our sample). For these 46 IPOs, we read through their IPO prospectus and the first five years' proxy statements to collect the ownership and directorship information for their financial sponsors and other institutional investors.

Panel A of Table A-1 reports the information for the lead investor/sponsor for buyout-sponsored IPOs. We define a lead investor or a lead sponsor as the investor that has the largest equity ownership immediately after a firm's IPO. For PE-backed IPO companies in Panel A, the average equity ownership of the lead buyout sponsor remains above 15% for each of the first five years after the IPO. For over 88% of the sponsored companies, the lead buyout sponsor has one or more board seats during each of the first two years, and this percentage remains at about 59% at the fifth annual meeting. This ownership and directorship pattern validates the implicit assumption for our hypotheses that buyout firms remain important stakeholders for their sponsored companies after the IPO.

The continued ownership by buyout firms many years after the IPO might seem puzzling, given that one of the purposes of the IPO is to provide an exit for the buyout sponsor. There are several reasons why PE firms do not exit quickly. First, the general partners earn a management fee, typically 2%, on assets under management, and as long as the buyout firm has not distributed shares to the limited partners (LPs), the general partners continue to receive this source of income (Metrick and Yasuda (2010)). Second, buyout sponsors try to limit the downward price effect from selling pressure associated with distributing a large fraction of shares to LPs at one time, since many LPs immediately sell the shares that they receive. Third, if

the buyout firm is adding value to the portfolio company, continued ownership allows the buyout firm to capture some of the value added (Cao (2011)).

For VC-backed IPOs in Panel B of Table A-1, the lead VC sponsor starts with a much lower ownership at the IPO than the lead PE sponsor. The average and median lead VC ownership drops below 10% after the first year. However, 89% of the companies still have a VC-affiliated director on the board four years after the IPO.

For both PE- and VC-backed companies, institutional investors other than the lead sponsor can and do get involved. We define institutional investors, excluding the lead as defined above, that have reported equity ownership in the IPO prospectus as co-investors. We report the ownership and directorship information for the co-investors in Panel C of Table A-1. We set the ownership and directorships to zero if a firm does not have co-investors. Panel C also reports the information on how new institutional investors, defined as those that do not appear in the IPO prospectus, gradually increase their ownership after a company's IPO. For both PE- and VC-backed IPOs, co-investors have a significant ownership stake before and immediately after the IPO. For a majority of the companies that they invest in, the co-investors also have their affiliated directors on the board for the first few years after the IPO. These patterns are consistent with the existence of "club" deals in which several buyout firms jointly control a portfolio company (Demiroglu and James (2010) and Officer, Ozbas, and Sensoy (2010)). For new institutional investors, VC-backed companies seem to attract them at a faster pace.

We also collect private equity ownership data from the proxy statements of the PE-backed companies prior to the bond offerings, regardless of whether we can find the IPO prospectus and whether it is within five years since the IPO. Panel D of Table A-1 reports this information sorted by the number of years from the IPO to the bond offering date. Of the 95

bond offerings by 60 PE-backed companies within five years of the IPO (the focused sample), we have ownership data from EDGAR for 76 issues by 51 companies. Note that Panel D has ownership data for more companies than Panels A-C, because it does not require an IPO prospectus. Consistent with the patterns in Panels A and C, the mean PE ownership generally decreases as the time since the IPO increases. No issuer in our sample has 30% or more PE ownership prior to the bond issue when the bond issue date is more than nine years after the IPO.

*B. The Effect of PE Ownership on Yield Spreads*

In this section, we use hand-collected data on PE firms' ownership in their portfolio companies prior to bond issuance to shed light on the effect of PE ownership on the cost of debt for their portfolio companies. As discussed earlier, we are able to collect ownership data for 76 bonds issued by 51 PE-backed companies among the 95 bonds issued by 60 PE-backed companies in the (IPO+1, IPO+5] sample (see Panel D of Table A-1).

Each Panel of Table A-2 reports the results of four regression specifications similar to those in Table 3 in the paper. The dependent variable and the other independent variables in regressions (1)-(4) in each panel of Table A-2 are the same as those in regressions (1)-(4) in Table 3, respectively, except that we use several alternative variables to replace the PE Dummy.

In Panel A, the PE Dummy is replaced with a high PE ownership dummy variable, PE30_DUM, which equals one if the bond is offered by a PE-backed IPO company with at least 30% ownership by the original PE sponsors immediately prior to the bond offering, and zero otherwise, and a second dummy variable, PE_OTHER_DUM, which equals one if the bond is offered by a PE-backed IPO company but the PE ownership prior to the bond offering is either missing or less than 30%, and zero otherwise. In all of the four regressions, the coefficients for

both PE30_DUM and PE_OTHER_DUM are reliably negative, and the point estimate for PE30_DUM is much greater than that on PE_OTHER_DUM. The results suggest that private equity firms are more helpful in lowering the cost of debt for their portfolio companies if their ownership is higher, consistent with the reputation acquisition hypothesis.

In Panel B, we replace the PE Dummy with PE10_DUM. The PE10_DUM dummy variable equals one if a bond is issued by a PE-backed IPO firm and the ownership by the original PE sponsors prior to the bond issuance is at least 10%. This variable is set to zero otherwise. The coefficients for PE10_DUM are negative and remain statistically significant for the focused sample. Note that the coefficients for PE10_DUM are smaller than the corresponding estimates for the PE Dummy in Table 3 in the paper, perhaps because bonds by PE-backed IPO companies with missing PE ownership or less than 10% ownership are pooled together with bonds by non-PE-backed companies. Our untabulated analysis shows that, if these bonds are simply excluded from Panel B, the coefficients for PE10_DUM would become larger than those in Table 3 in the paper. In Panel C, we replace the PE Dummy with PE30_DUM as defined in Panel A. The coefficients for PE30_DUM are smaller than those in Panel A because bonds by PE-backed IPO companies with missing PE ownership or less than 30% ownership are treated the same as bonds by non-PE-backed companies. The coefficients become larger if these bonds are excluded.

In summary, the results reported in Table A-2 support the reputation acquisition hypothesis. The lower yield spreads for bond offerings by PE-sponsored IPO companies are not merely due to the fact that the issuing companies had been involved in a buyout. A stronger

presence by the original PE sponsors at the time of the bond offering results in even lower yield spreads for the company.[1]

*C. Are Bond Covenants Responsible for the Lower Yield Spreads?*

The reputation acquisition hypothesis focuses on bond issuers' non-contractual commitments to protect bond investors. Alternatively, bond issuers can make explicit commitments by including covenants in the bond contracts. The literature suggests that the use of covenants can lower the cost of debt. In this section, we examine whether PE-backed companies use covenants differently than other companies, and if so, whether the differences drive our results.

The Fixed Income Securities Database (FISD) provides detailed covenant information for bond issues. Among the 1,320 bond issues in our full sample, 1,175 issues have data in FISD. There are two indicator variables in FISD for the availability of covenant information. The covenant record variable equals "yes" for bond issues for which the use of covenants is recorded, and equals "no" otherwise. The subsequent data variable equals "yes" if prospectuses, pricing supplements or other sources beyond the initial input phase have been checked for additional information, and equals "zero" otherwise. If the subsequent data variable is "yes" but no covenant information is recorded for a bond, then it is probably because no covenant is included in the bond contract. Therefore, following Billett, King, and Mauer (2007), we only include issues for which FISD has either recorded covenant information or has checked additional

[1] In untabulated analysis, we also examine whether bond issuers backed by more prestigious private equity firms are associated with even lower bond yield spreads. We try three sets of reputation measures: a PE firm's vintage year, a PE firm's market share, and the average change in the S&P long-term credit ratings of a PE firm's portfolio companies prior to the bond issuance. Due to statistical power issues from limited sample size and weakness in the reputation measures, we do not find a reliable relationship between these PE firm reputation measures and bond yield spreads.

sources beyond the initial input phase for covenant information, resulting in 1,093 issues. We also exclude 47 medium term notes and 1 retail note, because FISD does not have covenant information for them.[2] We further exclude one foreign currency debenture and 14 pass through certificates (including equipment trust certificates), resulting in 1,030 debentures (including 218 debentures during (IPO+1, IPO+5] and 523 debentures during (IPO+1, IPO+10]).[3] Among the 1,030 debentures, 461 are offered under Rule 144A.

We follow Mansi, Qi, and Wald (2013) to construct an overall covenant index using 37 covenant variables in FISD. Specifically, we first categorize the covenant variables into 22 relatively homogenous groups and create one indicator variable for each group. The group indicator variable equals one if at least one of the covenants in this group is included, and equals zero otherwise. We then sum the 22 group indicator variables to get the overall covenant index.

We use both public and 144A issues for our analysis. Since it is likely that FISD has incomplete covenant information for Rule 144A issues, we also perform our analysis using only public issues (Miller and Reisel (2011)). Panel A of Appendix Table A-3 reports the summary statistics for the overall covenant index. There is no conclusive evidence that debt issues by PE-backed companies use more covenants.

To control for the effects of firm and issue characteristics on the use of covenants, we estimate regressions using the overall covenant index (COV_INDEX) as the dependent variable. Since the dependent variable is categorical, we follow the literature and estimate Poisson regressions. The baseline regression has the following specification:

[2] FISD distinguishes between medium term notes and retail notes. A retail note is a medium-term, subordinated, unsecured debt obligation usually issued by a multinational corporation.
[3] We re-estimate the yield spread regressions as specified in Table 3 by excluding medium term notes, retail notes, pass through certificates, and foreign currency bonds. The results remain qualitatively the same.

(A1) COV_INDEX = $f$ (PE Dummy, DEFAULT_SPREAD, Ln(Proceeds), Ln(Maturity), SHELF_DUM, RULE_144A_DUM, SUBORD_DUM, FIRST_BOND_DUM, Ln(NUM_BONDS), Ln(Market Cap)$_{t-1}$, Ln(Age), DIV_PAYER_DUM$_{t-1}$, ROA$_{t-1}$, LOSS_DUM$_{t-1}$, ICR$_{i,\,t-1}$ (i=0,5,10,20), Leverage$_{t-1}$, BETA$_{t-1}$, STD_RETURN$_{t-1}$, RETURN$_{t-1}$, Market-to-book$_{t-1}$, Tangibility$_{t-1}$, UTILITY_DUM$_{t-1}$, BOND_YEAR_DUMMIES, IPO_PERIOD_DUMMIES, S&P Rating_RES, Moody's Rating_RES).

Panel B of Appendix Table A-3 reports the results. Consistent with Chava, Kumar, and Warga (2010), Rule 144A issues are less likely to have covenants. Riskier issues, such as subordinated issues, issues by firms with a lower interest coverage ratio ICR$_{0,\,t-1}$ and higher leverage ratios, and issues with lower S&P and Moody's credit ratings, are generally more likely to include covenants. The key variable, PE Dummy, has a coefficient that is not statistically different from zero. Both the summary statistics and the regression results suggest that PE-sponsored IPO companies do not use more covenants. Put differently, our results on bond yields and PE sponsorship reported in Table 3 are not driven by the use of bond covenants.

We do not report any regression results on bond yield spreads and covenants for our sample for two reasons. First, the evidence reported in Appendix Table A-3 suggests that, even if we find that the use of bond covenants helps lower yield spreads for our sample, this cannot explain the relations that we have identified in Tables 3 and A-2, since PE-sponsored companies do not use more covenants. Second, the use of bond covenants in a regression with yields on the left hand side suffers from an endogeneity bias, because riskier issues could use more covenants to facilitate the deal (see, e.g., Billett, King, and Mauer (2007)). In unreported analysis, we indeed find that, without controlling for the endogeneity of the use of bond covenants, the number of bond covenants has a positive impact on yield spreads, but the PE dummy still has a significantly negative impact on yields. Given our sample size, it is difficult to find good

instruments to deal with the endogeneity of covenant use. Because the relationship between bond yields and covenants *per se* is not a focus of this paper, we do not do further analysis.

*D. Are Buyout Groups and Venture Capitalists Different?*

Venture capitalists (VCs) do not access the bond markets as often as private equity firms. Therefore, VCs are less likely to have a track record with bond investors and care less about their bond market reputation than PE firms. In our focused sample, there are 47 bond issues by VC-backed IPOs. We did not distinguish between IPOs backed by VCs and IPOs backed by neither PE firms nor VCs in our earlier sections. To justify our decision, we re-estimate the credit rating and yield spread regressions by including a dummy variable that equals one for bonds offered after VC-backed IPOs and zero otherwise.

In results reported in Appendix Table A-4, we do not find any evidence that credit ratings or yield spreads are different for bonds after VC-backed IPOs and the omitted group of bonds after IPOs backed by neither PE firms nor VCs. The coefficient for the VC dummy variable is never statistically significant in either credit rating regressions or yield spread regressions. Therefore, our decision in earlier sections to pool VC-backed IPOs and IPOs backed by neither VCs nor PE firms is justified.

*E. Are Omitted Variables Responsible for Our Results?*

It is possible that the PE dummy captures unobservable and thus omitted differences between the PE-sponsored companies and the non-PE-sponsored ones. Although we cannot completely rule out all the possibilities, we perform various robustness checks. These robustness checks suggest that the omitted variable issue is unlikely to be responsible for our results.

It is likely that buyout groups use their expertise to select superior cash generators that are able to support more debt as targets of leveraged buyouts. Our lagged profitability measures such as return on assets, the dummy variable for posting a loss, and the interest coverage ratios help control for such superior cash generating power in our examination of bond offerings after the IPO. There is usually a gap of several years between the buyout and the post-IPO bond offering. It is reasonable to expect that, after several years, such superior cash generating power should show up in our profitability measures. However, it is still possible that our lagged profitability measures do not capture the superior earnings stability of PE-backed IPO companies. In our untabulated analysis, we include the standard deviation of ROA during the first five years after the IPO to control for the earnings stability. Our results remain essentially the same.

Financial ratios of IPO companies, especially ROA, interest coverage ratios, and debt ratios, could be unstable and noisy. Credit rating agencies state that they use historical average financial ratios to predict the default risk of bond issues and issuers. Requiring average financial ratios over several years reduces our sample size because some IPO companies do not have several years of data. In particular, this requirement excludes some bonds offered during the first several years after IPOs. Nevertheless, we re-estimate our regressions using three-year averages of return on assets, interest coverage ratios, and the leverage ratio (ROA, $ICR_0$-$ICR_{20}$, and Leverage) as independent variables. In unreported results, the coefficient for the PE Dummy remains essentially the same in both economic and statistical significance in the yield spread regressions.

PE-backed companies are often regarded as being much more highly levered than non-PE-backed companies at the IPO, and are thus more likely to reduce leverage after the IPO. Such expected leverage decreases could result in lower spreads for current bond issues. However, we

examine only companies that issue bonds after the IPO. As shown in Table 1, PE-backed and non-PE backed companies that issue bonds have similar leverage prior to bond issuance. It is not clear why PE-backed bond issuers would be more likely to reduce leverage after bond issuance than non-PE-backed issuers. Even if PE-backed issuers are expected to be more likely to reduce leverage in the future than non-PE-backed issuers, it is not necessarily inconsistent with the reputation acquisition hypothesis. Nevertheless, we show that future leverage changes do not drive our results for the variable. In regression (2) of Table 3, where we control for the net debt issuance in the bond offering year, the coefficient on the PE Dummy decreases only slightly. In unreported analysis, we also control for leverage changes during the next five years after the bond offering and pre-IPO leverage, and our results remain qualitatively similar.

Given the greater exposure of reverse LBOs in the literature and in the press, one might argue that the portfolio company's being public in the past, due to possible name recognition, is responsible for the PE dummy's impact on the yield spread. The PE-sponsored companies in our sample include both RLBOs that had been previously public and those that had not been previously public. We check CRSP, merger and acquisition announcements, press releases, and company websites to identify whether a PE-sponsored bond issuer is a first-time public company or a returning public company. We then include two different dummies to represent separately the two types of PE-sponsored issuers in a regression for the 329 bond issues in years (IPO+1, IPO+5] (including 51 bonds issued by PE-backed first-time public companies and 44 by RLBOs), with the non-PE backed bond issuers being the base category. In untabulated results, the dummy for the PE-backed returning public companies has a coefficient of -88 bp, while the coefficient on the dummy for the PE-sponsored first-time public companies is -56 bp. Both coefficients are statistically significant at the 1% level.

It is also possible that old companies receive more capital market recognition. In another specification, we also interact the PE dummy with dummies for whether the bond issuing company is younger or older than the median PE-backed issuer at the time of the bond offering and find statistically significant coefficients of -58 bp for PE-backed young issuers and -87 bp for PE-backed old issuers, with the two coefficients not reliably different from each other. The both statistically and economically significant coefficients for even the PE-sponsored first-time public companies and young companies suggest that the name recognition effect cannot replace the PE sponsor reputation effect.

To further evaluate whether the effect of the PE dummy on yield spreads is driven by the differences in other characteristics (e.g., credit ratings, issuer age, profitability, leverage, and industry) between PE-backed and non-PE-backed issuers, we also use a propensity score matching procedure for the (IPO+1, IPO+5] sample in untabulated analysis. We estimate a probit model to compute a propensity score and match each PE-backed bond issue with a non-PE-backed issue by the propensity score. We require that the balancing property is satisfied in our matching process (i.e., there are no statistically significant differences between the PE-backed issues and the matched issues in the independent variables in the probit model). Depending on the probit model specification and the matching method (Nearest-Neighbor or Kernel matching), the difference in the average yield spread between the 95 PE-backed issues and the matched issues ranges from -54 to -99 basis points, with statistical significances at either the 1% or the 5% level.

To summarize, the fact that the PE and the non-PE-sponsored IPO companies in our sample have issued bonds makes them much more comparable to each other than they are to the

other IPO companies that do not issue bonds within a few years after the IPO.[4] The impact of PE presence on bond yield spreads varies with both time (number of years since the IPO) and PE ownership. These and other results such as the PE impact on corporate investments and dividend policies are much easier to be reconciled with a PE reputation effect rather than omitted variables.

[4] In the (IPO+1, IPO+5] sample, non-PE-backed bond issuers include well-known companies such as UPS, Kraft Foods, and Hertz, and PE-backed bond issuers include well-known companies such as Northwest Airlines and Kohl's.

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**Table A-1. Ownership and Directorship for Buyout- and VC-Sponsored IPO companies**

Of the 204 issuing companies and their 329 bond offerings in the (IPO+1, IPO+5] sample, 60 IPO companies (for 95 bond offerings) are sponsored by private equity (PE) firms and 30 IPO companies (for 47 bond offerings) are sponsored by venture capital (VC) firms. Among the 90 sponsored companies, 34 PE-backed and 12 VC-backed IPO companies have an IPO prospectus available through EDGAR (all have an IPO offer date of May 16, 1996 or later). Panels A, B, and C report the information on equity ownership and directorships before and after the IPO for the 46 sponsored companies, regardless of the bond offering year. We report the information for the lead investor in Panels A and B: Panel A is for PE-sponsored IPO companies, and Panel B is for VC-sponsored IPO companies. We report additional information on the involvement of co-investors and new institutional investors for both buyout- and VC-sponsored IPO companies in Panel C. We define a lead investor as the investor that has the largest ownership before and right after the IPO, and co-investors as the other institutional investors that have reported ownership in the IPO prospectus (SEC filing 424B). New institutional investors are the institutional investors, including mutual funds and other types of non-individual investors, that have reported ownership in the proxy statements (SEC filing DEF 14A) after the IPO but not in the IPO prospectus. Year -1 in all three panels refers to the ownership information before the IPO, and Year 0 is right after the IPO. The information source for both years is the IPO prospectus, and the actual calendar time between Year -1 and Year 0 can be less than a year. Year 1 through Year 5 refer to the first thorough the fifth annual meetings (and the proxy statements) after the IPO. The ownership information in both the prospectuses and the proxy statements generally has a reporting threshold of at least 5% equity ownership. The number of directors for a lead investor or co-investors only includes the ones that have a current affiliation with the particular lead or co-investors based on the bios reported in the respective SEC filings. For each group of descriptive statistics, N is the number of observations without missing values. We report the average of the ownership or the affiliated directors (Mean), its standard deviation (Std), the 25$^{th}$ percentile (P25), the 75$^{th}$ percentile (P75), and/or the median (Median) for different groups of investors. For directorship information, the percentage of the firms that have at least one affiliated director (% Yes) is also reported. For the 46 companies in the table, most of the missing values are due to the fact that a company does not have a particular filing for a year (such as the Year 5 proxy statement for a 2007 IPO). Two companies do not report the ownership information before the IPO and another firm does not report ownership information in the first year proxy statement, so we only have 32 observations for Year -1 and 33 observations for Year 1. Two companies, one in Year 1 and one in Year 5, report only the information on directors but not ownership, which causes one observation difference for the two years between ownership and directorship for PE-backed companies.

Of the 283 bonds issued by 117 PE-backed companies in our full sample, we are able to collect ownership data from the proxy statements immediately before the bond offering on EDGAR for 211 bonds by 88 PE-backed companies. Of the 95 bonds by 60 PE-backed companies in the focused sample, ownership data are available for 76 issues by 51 companies. Panel D reports the ownership by the PE sponsors right before the bond offering, sorted by the number of years after the IPO. We only classify a reported institutional ownership in DEF 14A as a PE ownership if we can use either the IPO prospectus or some other source to positively identify the institution as a financial sponsor at the IPO. PE ownership is recorded as missing when either proxy statements from EDGAR or information about the sponsors at the IPO is missing. Note that Panel D has ownership data for more companies than Panels A-C, because it is possible that we have the proxy statement for a PE-sponsored company even if we do not have its IPO prospectus. Also note that institutional investors that are not on the board and that own less than 5% of the equity do not have to be disclosed in the proxy statements. Thus, the reported numbers in Panels A-D are lower bound estimates of the true PE ownership.

**Panel A: Lead PE Ownership and Directorships**

| | Ownership | | | | | | Directorships | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | N | Mean | Std | P25 | Median | P75 | N | Mean | Std | Median | % Yes |
| -1 | 32 | 53.07% | 27.12% | 31.45% | 47.65% | 79.90% | | | | | |
| 0 | 34 | 34.57% | 18.66% | 23.00% | 34.55% | 47.50% | 34 | 2.26 | 1.54 | 2.00 | 94.12% |
| 1 | 33 | 32.50% | 18.17% | 18.20% | 32.00% | 46.50% | 34 | 2.12 | 1.68 | 1.00 | 91.18% |
| 2 | 34 | 26.34% | 20.71% | 6.50% | 27.45% | 42.30% | 34 | 2.12 | 1.68 | 1.50 | 88.24% |
| 3 | 34 | 22.95% | 21.38% | 0.00% | 18.25% | 42.60% | 34 | 1.97 | 1.71 | 1.00 | 82.35% |
| 4 | 31 | 18.58% | 22.87% | 0.00% | 6.00% | 36.50% | 31 | 1.87 | 1.84 | 1.00 | 70.97% |
| 5 | 28 | 15.57% | 22.13% | 0.00% | 0.00% | 37.80% | 29 | 1.45 | 1.76 | 1.00 | 58.62% |

**Panel B: Lead VC Ownership and Directorships**

| | Ownership | | | | | | Directorships | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | N | Mean | Std | P25 | Median | P75 | N | Mean | Std | Median | % Yes |
| -1 | 12 | 24.78% | 9.30% | 18.65% | 25.59% | 30.50% | | | | | |
| 0 | 12 | 16.73% | 7.78% | 11.89% | 17.26% | 23.30% | 12 | 1.50 | 1.24 | 1.00 | 91.67% |
| 1 | 12 | 13.52% | 8.05% | 8.31% | 14.03% | 20.55% | 12 | 1.42 | 1.24 | 1.00 | 91.67% |
| 2 | 12 | 9.76% | 8.29% | 3.45% | 7.81% | 16.23% | 12 | 1.42 | 1.24 | 1.00 | 91.67% |
| 3 | 10 | 8.31% | 8.28% | 0.00% | 7.20% | 13.60% | 10 | 1.30 | 1.06 | 1.00 | 90.00% |
| 4 | 9 | 2.39% | 4.74% | 0.00% | 0.00% | 0.00% | 9 | 1.11 | 0.78 | 1.00 | 88.89% |
| 5 | 7 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 7 | 0.57 | 0.53 | 1.00 | 57.14% |

**Panel C: Co-Investors and New Institutional Investors**

| | Co-Investor Ownership | | | | Co-Investor Directorships | | | | | | New Institutional Ownership | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PE | | VC | | PE | | | VC | | | PE | | VC | |
| Year | N | Mean | N | Mean | N | Mean | % Yes | N | Mean | % Yes | N | Mean | N | Mean |
| -1 | 32 | 25.63% | 12 | 30.22% | | | | | | | | | | |
| 0 | 34 | 15.35% | 12 | 23.06% | 34 | 1.06 | 61.76% | 12 | 1.33 | 66.67% | | | | |
| 1 | 33 | 14.61% | 12 | 10.43% | 34 | 0.88 | 55.88% | 12 | 1.17 | 66.67% | 33 | 4.84% | 12 | 6.87% |
| 2 | 34 | 9.73% | 12 | 4.95% | 34 | 0.79 | 52.94% | 12 | 1.08 | 66.67% | 34 | 9.88% | 12 | 11.81% |
| 3 | 34 | 7.46% | 10 | 3.22% | 34 | 0.62 | 44.12% | 10 | 1.00 | 70.00% | 34 | 12.31% | 10 | 15.55% |
| 4 | 31 | 6.42% | 9 | 1.52% | 31 | 0.58 | 38.71% | 9 | 1.00 | 66.67% | 31 | 16.04% | 9 | 21.49% |
| 5 | 28 | 4.83% | 7 | 0.00% | 29 | 0.55 | 34.48% | 7 | 0.57 | 57.14% | 28 | 20.16% | 7 | 35.50% |

**Panel D: PE Ownership before Bond Offering Sorted by Number of Years after the IPO**

| Number of Years after the IPO | All Bonds | Bonds by PE-Backed Companies | Number of Bonds with PE Ownership Information | | | | | Average PE Ownership (%) |
|---|---|---|---|---|---|---|---|---|
| | | | [30%,100%] | [10%, 30%) | (0%, 10%) | 0% | Missing | |
| (1,2] | 86 | 29 | 11 | 1 | 1 | 3 | 13 | 34.21 |
| (2,3] | 67 | 24 | 10 | 1 | 3 | 8 | 2 | 25.80 |
| (3,4] | 90 | 24 | 8 | 7 | 2 | 3 | 4 | 25.04 |
| (4,5] | 86 | 18 | 6 | 5 | 0 | 7 | 0 | 25.18 |
| ***(1,5] Sub-Total*** | ***329*** | ***95*** | ***35*** | ***14*** | ***6*** | ***21*** | ***19*** | ***27.22*** |
| (5,6] | 75 | 28 | 3 | 3 | 3 | 12 | 7 | 10.44 |
| (6,7] | 88 | 30 | 0 | 1 | 1 | 13 | 15 | 1.81 |
| (7,8] | 75 | 19 | 6 | 0 | 0 | 8 | 5 | 20.38 |
| (8,9] | 66 | 20 | 4 | 5 | 1 | 8 | 2 | 18.66 |
| (9,10] | 91 | 15 | 0 | 0 | 3 | 4 | 8 | 3.77 |
| (10,11] | 79 | 10 | 0 | 0 | 4 | 2 | 4 | 4.72 |
| (11,12] | 68 | 17 | 0 | 0 | 0 | 12 | 5 | 0 |
| (12,13] | 66 | 20 | 0 | 0 | 0 | 18 | 2 | 0 |
| (13,14] | 55 | 9 | 0 | 0 | 0 | 8 | 1 | 0 |
| (14,15] | 49 | 2 | 0 | 0 | 0 | 2 | 0 | 0 |
| (15,16] | 47 | 5 | 0 | 0 | 0 | 3 | 2 | 0 |
| (16,17] | 36 | 5 | 0 | 0 | 0 | 5 | 0 | 0 |
| (17,18] | 34 | 4 | 0 | 0 | 0 | 4 | 0 | 0 |
| (18,19] | 25 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| (19,∞) | 137 | 3 | 0 | 0 | 0 | 2 | 1 | 0 |
| ***Total*** | ***1,320*** | ***283*** | ***48*** | ***23*** | ***18*** | ***122*** | ***72*** | ***14.18*** |

**Table A-2. OLS Regressions Explaining Yield Spreads: The Effect of PE Ownership**

The dependent variable is the percentage yield spread on the bond (YIELD_SPREAD(%)) at the time of issuance. PE30_DUM is a dummy variable that equals one for bonds issued by PE-backed IPO companies with ⩾30% PE ownership at the time of bond issuance and zero otherwise. PE_OTHER_DUM is a dummy variable that equals one for bonds issued by PE-backed IPO companies with missing or <30% PE ownership at the time of bond issuance and zero otherwise. PE10_DUM is a dummy variable that equals one for bonds issued by PE-backed IPO companies with ⩾10% PE ownership at the time of bond issuance and zero otherwise. The independent variables in regressions (1)-(4) of the three panels in this table are the same as those in regressions (1)-(4) of Table 3, respectively, except that PE Dummy in Table 3 is replaced by PE30_DUM and PE_OTHER_DUM in Panel A of this table and replaced by PE10_DUM or PE30_DUM in Panels B and C, respectively. For brevity, the coefficients on the other independent variables and their corresponding t-statistics are not reported. See Tables 1 and 3 for the definitions of the other independent variables. The t-statistics are calculated using robust standard errors corrected for heteroskedasticity (White (1980)) and clustering at the company level (Rogers (1993)). ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively, in a two-tailed test.

**Panel A. High and Low PE Ownership**

| | (IPO+1, IPO+5] | | | | | | (IPO+1, IPO+10] | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| Independent Variable | Coeff. | t-stat. | Coeff. | t-stat. | Coeff. | t-stat. | Coeff. | t-stat. |
| PE30_DUM | -0.99*** | -3.48 | -0.94*** | -3.33 | -0.77*** | -2.84 | -0.49*** | -2.59 |
| PE_OTHER_DUM | -0.55*** | -2.92 | -0.52*** | -2.83 | -0.45** | -2.42 | -0.24** | -1.99 |
| N | 329 | | 329 | | 329 | | 724 | |
| Adjusted $R^2$ | 0.739 | | 0.739 | | 0.734 | | 0.729 | |

**Panel B. PE Ownership ⩾10%**

| | (IPO+1, IPO+5] | | | | | | (IPO+1, IPO+10] | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| Independent Variable | Coeff. | t-stat. | Coeff. | t-stat. | Coeff. | t-stat. | Coeff. | t-stat. |
| PE10_DUM | -0.53*** | -2.74 | -0.51*** | -2.64 | -0.44** | -2.26 | -0.22 | -1.27 |
| N | 329 | | 329 | | 329 | | 724 | |
| Adjusted $R^2$ | 0.731 | | 0.724 | | 0.729 | | 0.725 | |

**Panel C. PE Ownership ⩾30%**

| | (IPO+1, IPO+5] | | | | | | (IPO+1, IPO+10] | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| Independent Variable | Coeff. | t-stat. | Coeff. | t-stat. | Coeff. | t-stat. | Coeff. | t-stat. |
| PE30_DUM | -0.82*** | -3.02 | -0.78*** | -2.86 | -0.66** | -2.50 | -0.39** | -2.13 |
| N | 329 | | 329 | | 329 | | 724 | |
| Adjusted $R^2$ | 0.734 | | 0.736 | | 0.731 | | 0.726 | |

**Table A-3. Robustness Checks – Use of Covenants**

We report summary statistics for the overall covenant index in Panel A. Following Mansi, Qi, and Wald (2013), we group relative homogeneous covenants into 22 types and create one indicator variable for each type of covenants. The indicator variable for each type of covenants is set to one if at least one such covenant exists, and equals zero otherwise. The overall covenant index is the sum of the 22 indicator variables. We report the Poisson regression results for the use of covenants in Panel B. The dependent variable, COV_INDEX, is the overall covenant index. See Tables 1 and 3 for the definitions of the independent variables. For brevity, the coefficients on the year dummies and their corresponding z-statistics are not reported. At the bottom of Panel B, we report the means of the dependent variables, as reported in Panel A. To give an economic interpretation to a slope coefficient in a Poisson regression, the slope must be multiplied by the mean of the dependent variable. For example, in regression (1), the effect of the PE Dummy on the covenant index is -0.02×3. 01=-0.06, i.e., the covenant index for PE-backed bond issuers is 0.06 less than for non-PE-backed bond issues, everything else the same.

**Panel A. Summary Statistics for the Overall Covenant Index**

| | Public and 144A Issues | | | | Public Issues | | | |
|---|---|---|---|---|---|---|---|---|
| | N | Mean | Median | Std. Dev. | N | Mean | Median | Std. Dev. |
| *(IPO+1, IPO+5] Sample:* | | | | | | | | |
| Buyout-Backed IPO | 62 | 2.23 | 0.00 | 3.64 | 19 | 6.32 | 6.00 | 3.42 |
| Other IPO | 156 | 3.33 | 4.00 | 3.87 | 78 | 5.92 | 5.00 | 2.96 |
| All | 218 | 3.01 | 0.00 | 3.83 | 97 | 6.00 | 5.00 | 3.04 |
| *(IPO+1, IPO+10] Sample:* | | | | | | | | |
| Buyout-Backed IPO | 155 | 2.44 | 0.00 | 3.40 | 60 | 5.88 | 5.00 | 2.71 |
| Other IPO | 368 | 3.10 | 3.00 | 3.63 | 182 | 5.56 | 5.00 | 2.76 |
| All | 523 | 2.90 | 0.00 | 3.58 | 242 | 5.64 | 5.00 | 2.74 |

**Panel B. Covenant Regression Results**

| | Public and 144A Issues | | | | Public Issues | | | |
|---|---|---|---|---|---|---|---|---|
| | (IPO+1, IPO+5] | | (IPO+1, IPO+10] | | (IPO+1, IPO+5] | | (IPO+1, IPO+10] | |
| | (1) | | (2) | | (3) | | (4) | |
| Independent Variable | Coeff. | z-stat. | Coeff. | z-stat. | Coeff. | z-stat. | Coeff. | z-stat. |
| PE Dummy | -0.02 | -0.13 | -0.03 | -0.36 | -0.10 | -0.62 | 0.04 | 0.50 |
| DEFAULT_SPREAD(%) | 0.28 | 0.43 | 0.66* | 1.92 | 0.16 | 0.17 | 0.02 | 0.05 |
| Ln(Proceeds) | 0.06 | 0.58 | 0.12** | 2.33 | -0.04 | -0.33 | 0.09* | 1.72 |
| LN(Maturity) | -0.18 | -1.37 | -0.04 | -0.70 | 0.08 | 0.55 | 0.06 | 0.91 |
| SHELF_DUM | -0.24 | -1.41 | -0.09 | -1.04 | -0.45** | -2.20 | -0.21** | -2.29 |
| RULE_144A_DUM | -2.51*** | -13.34 | -2.56*** | -21.24 | | | | |
| SUBORD_DUM | 0.35** | 2.19 | 0.27*** | 3.15 | | | | |
| FIRST_BOND_DUM | -0.57*** | -3.36 | -0.25** | -2.56 | 0.03 | 0.16 | -0.08 | -0.75 |
| LN(NUM_BONDS) | -0.40*** | -3.76 | -0.18*** | -3.52 | 0.02 | 0.16 | -0.02 | -0.30 |
| $Ln(Market\ Cap)_{t-1}$ | 0.15** | 2.04 | -0.05 | -1.21 | -0.04 | -0.44 | -0.13*** | -3.18 |
| $Ln(Age)_{t-1}$ | -0.01 | -0.10 | -0.00 | -0.09 | 0.04 | 0.60 | -0.02 | -0.38 |
| $DIV\_PAYER\_DUM_{t-1}$ | -0.02 | -0.16 | -0.12 | -1.60 | -0.10 | -0.59 | -0.21*** | -2.60 |
| $ROA_{t-1}$ | 0.31 | 0.47 | -0.40 | -1.00 | -0.09 | -0.09 | -0.14 | -0.24 |
| $LOSS\_DUM_{t-1}$ | 0.15 | 0.69 | -0.07 | -0.64 | -0.19 | -0.67 | 0.01 | 0.09 |
| $ICR_{0,\ t-1}$ | -0.12** | -2.07 | -0.13*** | -4.35 | -0.11 | -1.50 | -0.06* | -1.68 |
| $ICR_{5,\ t-1}$ | -0.03 | -0.63 | 0.02 | 0.78 | 0.00 | 0.02 | 0.01 | 0.29 |
| $ICR_{10,\ t-1}$ | 0.01 | 0.26 | -0.00 | -0.04 | -0.03 | -0.68 | -0.00 | -0.08 |
| $ICR_{20,\ t-1}$ | 0.00 | 0.69 | 0.00 | 1.29 | 0.00 | 0.38 | -0.00 | -0.56 |
| $Leverage_{t-1}$ | 0.56* | 1.66 | 0.12 | 0.88 | -0.60 | -1.30 | 0.05 | 0.31 |
| $BETA_{t-1}$ | -0.01 | -0.12 | 0.04 | 0.75 | 0.03 | 0.21 | 0.01 | 0.22 |
| $STD\_RETURN(\%)_{t-1}$ | 0.02 | 0.13 | -0.11** | -2.14 | 0.19 | 1.19 | -0.03 | -0.52 |
| $RETURN_{t-1}$ | -0.14* | -1.95 | 0.03 | 0.76 | -0.01 | -0.14 | 0.10* | 1.87 |
| $Market\text{-}to\text{-}book_{t-1}$ | -0.11* | -1.76 | -0.06* | -1.95 | 0.05 | 0.62 | -0.00 | -0.13 |
| $Tangibility_{t-1}$ | 0.29 | 1.22 | 0.09 | 0.77 | -0.16 | -0.50 | -0.12 | -0.93 |
| $UTILITY\_DUM_{t-1}$ | 0.06 | 0.13 | -0.48** | -2.37 | -0.26 | -0.59 | -0.23 | -1.10 |
| S&P Rating_RES | -0.15*** | -4.07 | -0.07*** | -4.24 | -0.07* | -1.67 | -0.08*** | -4.33 |
| Moody's Rating_RES | 0.04 | 0.58 | -0.08*** | -3.04 | -0.00 | -0.02 | -0.05* | -1.73 |
| Intercept | 3.17*** | 3.49 | 2.57*** | 5.85 | 2.84** | 2.34 | 2.88*** | 5.94 |
| N | 218 | | 523 | | 97 | | 242 | |
| Pseudo $R^2$ | 0.487 | | 0.458 | | 0.230 | | 0.182 | |
| Means of the Dependent Variable | 3.01 | | 2.90 | | 6.00 | | 5.64 | |

## Table A-4. Robustness Checks – Are PEs and VCs Different?

The dependent variable in ordered logit regressions (1) and (3) is the S&P rating score (S&P Rating) at the time of issuance. The dependent variable in OLS regressions (2) and (4) is the percentage yield spread on the bond (YIELD_SPREAD(%)) at the time of issuance. *VC Dummy* is a dummy variable that equals one for bonds by VC-backed IPO companies and zero otherwise. In the (IPO+1, IPO+5] sample and the (IPO+1, IPO+10] sample, there are 47 and 107 bonds, respectively, that are issued by VC-backed IPO companies. See Tables 1 and 3 for the definitions of the other independent variables. Pseudo $R^2$ and adjusted $R^2$ are reported for ordered logit and OLS regressions, respectively. The z-statistics and the t-statistics are calculated using robust standard errors corrected for heteroskedasticity (White (1980)) and clustering at the company level (Rogers (1993)). ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively, in a two-tailed test. All regressions include bond offering year and IPO period dummies, and the ordered logit regressions also include intercepts. For brevity, the intercepts and the coefficients on the bond offering year dummies and the IPO period dummies and their corresponding z-statistics or t-statistics are not reported.

| | (IPO+1, IPO+5] | | | | (IPO+1, IPO+10] | | | |
|---|---|---|---|---|---|---|---|---|
| | S&P Rating | | Yield Spread | | S&P Rating | | Yield Spread | |
| | (1) | | (2) | | (3) | | (4) | |
| Independent Variable | Coeff. | z-stat. | Coeff. | t-stat. | Coeff. | z-stat. | Coeff. | t-stat. |
| PE Dummy | 0.72* | 1.69 | -0.70*** | -3.58 | -0.28 | -1.01 | -0.28** | -2.27 |
| VC Dummy | -0.22 | -0.40 | -0.02 | -0.09 | -0.41 | -1.23 | 0.01 | 0.08 |
| DEFAULT_SPREAD(%) | 0.50 | 0.34 | 1.08* | 1.68 | 0.99 | 1.01 | 1.44*** | 3.84 |
| Ln(Proceeds) | -0.18 | -0.94 | -0.06 | -0.58 | -0.07 | -0.48 | 0.00 | 0.03 |
| Ln(Maturity) | -0.14 | -0.50 | 0.07 | 0.50 | 0.18 | 1.08 | -0.05 | -0.53 |
| SHELF_DUM | -0.29 | -0.39 | -0.44** | -2.25 | 0.16 | 0.24 | -0.37** | -2.35 |
| RULE_144A_DUM | -1.29* | -1.69 | 0.21 | 0.86 | -0.71 | -1.02 | 0.05 | 0.29 |
| SUBORD_DUM | -2.28*** | -5.84 | 0.29* | 1.65 | -2.08*** | -8.15 | 0.36*** | 2.95 |
| FIRST_BOND_DUM | 0.22 | 0.56 | 0.11 | 0.60 | 0.07 | 0.20 | 0.21 | 1.42 |
| LN(NUM_BONDS) | 0.17 | 0.61 | 0.00 | 0.03 | 0.09 | 0.41 | 0.06 | 0.77 |
| $Ln(Market\ Cap)_{t-1}$ | 0.79*** | 3.79 | -0.37*** | -5.35 | 0.69*** | 4.76 | -0.44*** | -7.77 |
| $Ln(Age)_{t-1}$ | 0.04 | 0.21 | 0.08 | 1.00 | 0.08 | 0.61 | -0.01 | -0.26 |
| $DIV\_PAYER\_DUM_{t-1}$ | 0.79* | 1.95 | -0.56*** | -3.02 | 1.01*** | 3.55 | -0.46*** | -4.10 |
| $ROA_{t-1}$ | 1.54* | 1.83 | -1.26* | -1.87 | 1.01 | 1.46 | -1.20** | -2.50 |
| $LOSS\_DUM_{t-1}$ | -0.60 | -1.35 | 0.02 | 0.07 | 0.09 | 0.23 | 0.04 | 0.24 |
| $ICR_{0,\ t-1}$ | 0.27** | 2.02 | -0.14** | -2.14 | 0.28*** | 2.88 | -0.07 | -1.64 |
| $ICR_{5,\ t-1}$ | 0.03 | 0.22 | 0.04 | 0.75 | 0.05 | 0.53 | -0.01 | -0.34 |
| $ICR_{10,\ t-1}$ | 0.07 | 0.67 | 0.01 | 0.25 | 0.01 | 0.15 | 0.02 | 0.56 |
| $ICR_{20,\ t-1}$ | -0.02 | -1.57 | 0.01 | 0.79 | -0.01 | -0.74 | 0.00 | 0.97 |
| $Leverage_{t-1}$ | 0.20 | 0.23 | 0.88 | 1.65 | -1.02* | -1.85 | 0.40* | 1.67 |
| $BETA_{t-1}$ | -0.42** | -2.17 | 0.35** | 2.03 | -0.01 | -0.05 | 0.04 | 0.28 |
| $STD\_RETURN(\%)_{t-1}$ | -0.57*** | -2.71 | 0.27*** | 3.60 | -0.62*** | -4.66 | 0.36*** | 4.53 |
| $RETURN_{t-1}$ | -0.13 | -0.94 | -0.17 | -1.57 | -0.17 | -1.62 | -0.11* | -1.66 |
| $Market\text{-}to\text{-}book_{t-1}$ | -0.18 | -1.09 | -0.01 | -0.18 | -0.11 | -1.35 | 0.00 | 0.04 |
| $Tangibility_{t-1}$ | -0.44 | -0.78 | -0.18 | -0.59 | -0.60 | -1.34 | 0.16 | 0.72 |
| $UTILITY\_DUM_{t-1}$ | 0.06 | 0.10 | -0.19 | -0.75 | -0.10 | -0.18 | -0.20 | -0.75 |
| S&P Rating_RES | | | -0.30*** | -8.33 | | | -0.30*** | -12.02 |
| Moody's Rating_RES | | | -0.22** | -2.47 | | | -0.11** | -2.26 |
| Intercept | | | -0.50 | -0.44 | | | 5.08*** | 3.42 |
| N | 329 | | 329 | | 724 | | 724 | |
| Pseudo / Adjusted $R^2$ | 0.286 | | 0.738 | | 0.267 | | 0.728 | |