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Evidence on the Tradeoff between Risk and Return for IPO and SEO Firms♣

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Abstract

Do the low long-run average returns of equity issuers reflect underperformance due to mispricing or the risk characteristics of the issuing firms? We shed new light on this question by examining how institutional lenders price loans of equity-issuing firms. We find that equity- issuing firms' expected debt return is equivalent to the expected debt return of non-issuing firms with similar characteristics, implying that institutional lenders perceive equity issuers to be as risky as similar non-issuing firms. We also find that institutional lenders perceive small and high book-to-market borrowers as systematically riskier than larger borrowers with low book-to-market ratios, consistent with the asset pricing approach in Fama and French (1993). Finally, we find that firms' expected debt returns decline after equity offerings, consistent with recent theoretical arguments suggesting that firm risk should decline following an equity offering if equity is issued to exercise a real option. Overall, our analysis provides novel evidence consistent with risk-based explanations for the observed equity returns following IPOs and SEOs.

Firms conducting initial and seasoned equity offerings have historically experienced relatively low long-run equity returns (Ritter (1991), and Loughran and Ritter (1995)). Additionally, these returns covary with firm characteristics such as size and book-to-market (Brav and Gompers (1997) and Brav, Geczy, and Gompers (2000)). Two explanations for these phenomena have been offered. The first is predicated on rational investor behavior and argues that the low average returns are commensurate with the issuing firms' risk characteristics, as captured, for example, by size and book-to-market. The second argues that firms are able to time their equity offerings and raise capital by selling overvalued equity. Thus, the poor long-term performance of the equity issues reflects the gradual correction of asset prices to their true fundamental value and any correlation with firm characteristics is more indicative of security mispricing, as opposed to additional dimensions of systematic risk.

We shed light on this debate by examining the initial pricing of loans to firms that have recently issued equity. Our goal is twofold. First, we identify whether lenders demand, *ex-ante*, lower returns for equity issuers relative to similar non-issuers. Second, we test whether lenders view key firm characteristics, such as firm size and book-to-market, in a manner that is consistent with that observed in the equity market. For example, we examine whether small, growth firms that issue equity have low expected debt returns, similar to their equity returns. By focusing on private debt markets, we are able to provide novel results consistent with a rational view of the long-run returns of equity issues.

In particular, our focus on the private debt market is intentional. First, private debt is held primarily by large financial institutions rather than individuals. For example, in our sample, institutions hold over 90% of the debt issued.[1] Because of the size of their investments and the frequency with which those investors evaluate and transact in securities, they are presumed to be more rational than individuals.[2] Second, institutions are more likely to mitigate informational asymmetries arising between firms and investors (e.g., Shleifer and Vishny (1986); Allen,

[1] Depository institutions (mainly commercial banks) hold 85% of the loans, non-depository institutions (mainly credit institutions) hold 5% of the loans; Insurance companies hold 3% and the reminder (7%) is being held by security dealers, real estate agents and other investment officers.

[2] A potential disadvantage of the private debt market is the lack of liquidity of its secondary market. While we do not have access to data on secondary market liquidity of the loans in our sample, Altman, Gande and Saunders (2003) indicate that the market for most secondary loans is highly illiquid. However, the first order effect of

Bernardo, and Welch (2000)). Private lenders specialize in monitoring and gathering information about borrowers.[3] In conjunction with the repeated interactions between borrowers and lending institutions, the functions served by private lenders suggest that loan prices are less likely to be subject to behavioral biases relative to equity prices.[4]

We begin by showing that conditional on firm characteristics and features of the loan contract (e.g., firm size, profitability, loan maturity, loan amount), the pricing of loans to issuing firms - both IPOs and SEOs - does not differ from that of non-issuing firms. Institutional lenders view issuing and non-issuing firms in a similar light with regard to *total* risk (i.e., systematic plus idiosyncratic).

We next examine whether this finding is robust to a comparison of expected loan returns, as opposed to total loan yields. That is, after removing the effects of expected default risk and recovery rates, how do the expected returns on the loans of issuers and non-issuers compare? We find that our inferences regarding the relative risk of issuing firms is unchanged from above: IPO and SEO firms' expected loan returns are indistinguishable from those of similar non-issuing firms. This result is robust to numerous specification tests including: alternative expected loan return estimates corresponding to changes in the assumed recovery rates and estimated default probabilities, alternative model specifications for the expected loan return, and endogeneity of the expected loan return with other loan contract features, such as covenants and maturity.

We also find that firm characteristics, such as size and book-to-market, are related to private debt expected returns in a manner similar to public equity expected returns. Specifically, small value firms are deemed riskier, thus requiring higher expected rates of return, *ex-ante*. This evidence is important as it provides a new test corroborating the interpretation of these firm characteristics as proxies for systematic risk (Fama and French (1993)). Put differently, using private debt rather than public equity and focusing on pricing by institutions, we are able to provide evidence that is consistent with the notion that size and book-to-market capture exposure to systematic risk that is compensated in expected returns.

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illiquidity is on the pricing level of all loans. Since our focus is on differential pricing of loans, this issue is not likely to affect our results.

[3] See, for example, theoretical studies by Diamond (1984, 1991), Rajan (1992), and Rajan and Winton (1995)) and corresponding empirical evidence in Fama (1985), James (1987), James and Weir (1992), and Puri (1995).

[4] For evidence on the impact of relationships on borrowing terms, see studies by Petersen and Rajan (1994) Berger and Udell (1995), Schenone (2004), Barry and Mihov (2005), and Gonzales and James (2005).

Finally, we examine recent theoretical claims suggesting that raising and subsequently investing capital is tantamount to the exercise of a call option that results in a reduction of the firm's overall risk (Benninga, Helmantel and Sarig (2005), and Carlson, Fisher and Giammarino (2004)). It is difficult to assess the validity of this claim in the equity market since changes in the underlying firm risk characteristics are difficult to detect in the short sample period around equity offerings. Using the loan market we show that the expected debt return for issuing firms changes around the offerings in a manner consistent with the above models: both the total yield and the expected return show a significant decline around the time firms raise additional equity capital. Thus, our analysis yields cross-sectional and within-firm results which are consistent with risk-based explanations of the long-run returns of equity issues.

The rest of the paper is organized as follows. In section I, we discuss the data and sample selection. In Section II, we examine the determinants of loan yields, asking whether IPO and SEO loan yields are determined by the same factors as those determining non-issuing firms' yields. In Section III, we describe our decomposition of loan yields into expected returns and default risk premia. We then examine whether IPO and SEO loan expected returns are different from those of similar non-issuing firms. Section IV presents several robustness checks of our findings followed by an examination of how loan yields and expected loan returns change around the time of equity issuances in Section V. Section VI concludes.

I. Data

For our analysis, we employ four databases containing information on corporate loans (Loan Pricing Corporation's DealScan), stock prices and accounting data (CRSP-Compustat), IPOs and SEOs (SDC Global New Issues), and bankruptcy filings (Bankruptcy.com). To merge these databases, we assign PERMNOs and GVKEYs to firms in each database using the CRSP historical header file. Specifically, we match firms by company name, event date (e.g., loan inception, quarterly filing, issuance, bankruptcy filing), and, when available, cusip and stock ticker. This matching approach provides a unique key(s) among the databases and ensures that we avoid matching on "stale" information.

We restrict our analysis to loans whose borrowers are not in the farming (SIC codes less than 1000), financial (SIC codes between 6000 and 6999), or utility (SIC codes between 4900 and 4999) sectors. We further narrow our sample to include only loans whose borrowers have common shares (share code 10 or 11 in CRSP). In addition, we include only loans whose borrowers can be found in the merged CRSP/Compustat database and which have a strictly positive yield, maturity and loan amount. Our final sample of loans consists of 22,048 loans taken out by 5,337 firms. The remainder of this section discusses the data in more detail, providing summary statistics and a segue into our primary analysis.

A. Loan Information: DealScan

Our loan data is an extract of the Loan Pricing Corporation (LPC) DealScan database. The basic unit of observation in DealScan is a loan. The data consists of dollar denominated private loans made by bank (e.g., commercial and investment) and non-bank (e.g., insurance companies and pension funds) lenders to U.S. corporations during the period 1987-2003. According to Carey and Hrycray (1999), the database contains between 50% and 75% of the value of all commercial loans in the U.S. during the early 1990s. From 1995 onward, Dealscan coverage increases to include an even greater fraction of commercial loans. According to LPC, approximately half of the loan data are from SEC filings (13Ds, 14Ds, 13Es, 10Ks, 10Qs, 8Ks, and registration statements). The other half is obtained from LPC's contacts in the credit industry.

Table I presents a longitudinal view of our sample of loans. In Panel A, we report the number of borrowers, loans and packages in our sample by year. A package is a bundle of loans issued to a borrowing firm at the same time. Between 1987 and 1996, the number of loans and borrowers in our sample increases dramatically. This is largely due to the fact that LPC's coverage improved over time, particularly after 1995. To ensure that our empirical findings are not driven by this increase in loan coverage, we include year fixed effects in our regressions.

Panel B summarizes the most common types of loans in our sample.[5] Revolving loans enable borrowers to draw down capital over time. They comprise the majority (61%) of loans in our sample. Term loans, requiring a complete withdrawal of funds at inception, represent roughly 25% of the loans. Finally, 364-day facilities – short-term, revolving credit used to avoid the capital allocation banks are required to make on un-funded commitments of a year or more – are

[5] There are 23 different types of loans represented in our sample, which differ in the basic details of the loan (e.g., maturity, repayment schedules, etc.).

the third major loan type in our sample comprising 8% of the sample. These short-term loans have grown increasingly popular over time. However, revolving and term loans continue to make up the majority of loans throughout the sample period.

Panel C summarizes the most common loan purpose categories for our sample of loans. Corporate purposes, debt repayment, takeovers and working capital comprise just fewer than 80% of the loans in our sample. General-purpose loans (i.e. corporate purposes and working capital) represent 24% of our sample, whereas debt repayment is the single most popular loan purpose in our sample (26%). Examination of time-variation in loan purpose reveals that debt repayments are pro-cyclical and general-purpose loans are counter-cyclical. In our regression analysis below, we control for both loan type and deal purpose with fixed effects.

Panel D summarizes loan promised yield, amount and maturity over our sample period. Promised yields, measured in basis points above the six-month LIBOR at the time the loan is issued, range from a low of 188 in 1995 to a high of 264 in 1989.[6] LPC computes this figure, known as All-in-Drawn Spread (AIS), as the sum of the coupon spread and any recurring fees (e.g. annual fee). For loans not based on LIBOR, LPC converts the coupon spread into LIBOR terms by adding or subtracting a constant differential reflecting the historical averages of the relevant spreads.[7] The AIS enables comparisons across multiple facilities, independent of the underlying fee and rate structure. In the empirical analysis we use AIS as the promised yield of the debt. Loan maturities are, on average, approximately 3.5 years long and vary relatively little over the duration of our sample (the maturities are reported in Panel D in months). Average loan size (Amount), all deflated to year 2000 dollars, range from \$99 million in 1991 to \$241 million on 2001, with an average over all years of \$171 million.

Panel E presents information on loan covenants, which are available for a subsample of loans in DealScan. Since covenants are potentially important determinants of loan yields, we describe these features here and incorporate this information into robustness checks of our results

[6] Dealscan refers to this measure as the All-in-Drawn Spread (AIS), which represents the cost to the borrower for each dollar withdrawn from the lender. LPC also reports a measure All-in-Spread Un-drawn, which represents the cost to the borrower for each dollar available under commitment from the lender but not withdrawn. Since this measure primarily reflects an opportunity cost for the bank, we use the AIS measure in our analysis.

[7] As of 12/31/2003, the differentials used in the calculation of AIS reported by LPC are: +255 basis points (BP) for the prime rate, +3 BP for the commercial paper rate, -34 BP for the T-bill rate, -18 BP for bankers' acceptance rate, –6 BP for the rate on CDs, and 0 BP for the federal funds rate, cost of funds rate and money market rate. Hubbard,

below. In our analysis, we focus on seven specific covenants: secured, dividend restricted, financial ratio restrictions, net worth, and three sweep provisions (asset, debt, and equity). Secured debt provides collateral for the loan, usually in the form of the physical assets of the firm. Dividend restrictions limit the ability of the firm to distribute cash to its shareholders by requiring that certain conditions (e.g., minimum earnings or working capital) are met before paying dividends. These two covenants are measured by indicator variables representing their presence in the contract. Panel E shows that 82% (86%) of loans with covenant information contain a security provision (dividend restriction).

Financial ratio restrictions impose bounds or ranges on certain accounting ratios. For example, a firm may be required to keep its leverage ratio less than 30% for the duration of the loan. Or, a firm may be forced to keep its interest coverage ratio above 5%. In many instances firms have more than one ratio restricted at time, as indicated by the average number of ratios restricted in our subsample of loans: 2.56. Net worth covenants impose a floor on the net worth of the company, often measured in terms of tangible assets or both tangible and intangible assets. Approximately 25% of loans with covenant information contain net worth covenants.

Finally, sweep covenants are effectively prepayment provisions that mandate early retirement of all, or a portion, of the loan conditional on an event, such as a security issuance or asset sale. Asset sweeps impose restrictions on asset sales, while debt and equity sweeps restrict debt and equity issuances and repurchases, respectively. Sweeps are stated as percentages, which correspond to the fraction of the loan that must be repaid in the event of a violation of the covenant. For example, a contract containing a 50% asset sweep may specify that if the firm sells more than a certain dollar amount of its assets, it must repay 50% of the principal value of the loan. For ease of interpretation and consistency with the analysis below, Panel E presents the fraction of loans containing a particular sweep, independent of the fraction of the loan covered by the sweep. We see that asset sweeps are the most common prepayment provisions (66% of loans) followed by equity (49%) and debt (48%).

B. Borrower Information: CRSP/Compustat and SDC

We obtain accounting data and equity market data for our sample of DealScan borrowers

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Kuttner, and Palia (2002) show that replacing these constants with time-varying differentials based on year-specific average spreads has a minimal effect on any pricing implications.

from the merged CRSP/Compustat database. All borrower information, when available, is lagged one quarter from the inception of the loan to ensure that this information was known to the lender prior to the structuring of the loan. Matching IPO/SEO data from SDC to CRSP/Compustat produces a final sample of 4,446 IPOs and 5,182 SEOs between 1987 and 2003 after excluding unit offerings and firms whose share codes on CRSP differ from 10 or 11 (as well as imposing the previous existing screen on financial firms and utilities). We then identify the subset of these issuers that take on a loan in Dealscan any time between the issuance day and two years after the issuance. While the choice of two years is admittedly arbitrary, we also examine alternative window lengths (2.5 years, 1.5 years, 1 year) with little effect on our results.[8] We are able to identify 1,166 firms that entered into a loan agreement in the two years after their IPO and 1,158 firms in the two years after their follow-on equity offerings corresponding to a total of 2,152 IPO loans, 2,911 SEO loans, and 16,985 Non-Issuer loans.

Panel A of Table II summarizes loan characteristics across the subsamples of IPO, SEO and non-issuer loans in our Dealscan sample. The average (median) IPO loan yield is 232 (225) basis points above Libor; the average (median) SEO loan yield is 180 (163) basis points above Libor. For non-issuer loans the average (median) yield is 225 (225) basis points above Libor. The average loan size is $91 million for IPOs, $199 million for SEOs, and $177 million for non-issuing firms. IPO firms tend to take out large loans (relative to book value of assets) of approximately the same maturity as non-issuing firms, while SEO firms take out smaller loans (relative to their book value of assets) of a slightly longer maturity than non-issuing firms.

Panel B of Table II summarizes covenant types for the subsamples of loans with covenant information. We see that IPO and SEO loans contain slightly more financial covenants than non-issuer loans, suggestive of greater risk and potential agency problems. Overall, the information presented in Panels A and B of Table II suggests that, unconditionally, our sample of IPO loans is on average as risky as our sample of non-issuer loans, and that SEO loans might be in fact on average slightly less risky than non-issuer loans. One might conjecture then that institutional lenders view the total risk of a typical equity issuing firm to be similar to that of a typical non-issuing firm. We explore these conjectures more formally below.

[8] Using private loan transactions prior to the IPO/SEO is problematic as it introduces a selection bias (at the time the loan is taken the market does not know that the firm is about to raise equity capital). Nevertheless, we also repeat the

Panel C of Table II provides information about borrower characteristics across our subsamples of issuer and non-issuer loans. The columns labeled Dealscan, Dealscan IPOs, Dealscan SEOs, and Dealscan Non-Issuers correspond to the Dealscan samples described in Panel A. The column labeled Compustat provides both average and median firm characteristics for all nonfinancial, nonutility firms in the merged CRSP/Compustat database during the period 1987 to 2003.

A comparison of columns titled Dealscan IPOs, Dealscan SEOs and Dealscan Non-Issuers provide information about the differences between issuing and non-issuing firms that use the private debt. IPO borrowers are smaller, have lower book-to-market ratios, and have fewer tangible assets than non-issuers. SEO firms' characteristics are more similar to non-issuers than to the IPO firms.

Focusing on the Compustat and Dealscan columns in Panel C enables a comparison of the firms in the Dealscan database with those in the merged CRSP/Compustat database. The median firm included in the Dealscan database tends to be slightly more levered (total debt / total assets) than the median firm on Compustat, an unsurprising result given that our sample conditions on a debt issuance. Dealscan firms tend to be somewhat larger than the average or median Compustat firm and their mean book-to-market ratio is lower. This latter finding is due to a long right tail in the Compustat book-to-market distribution since the median book to market ratio of the Compustat and Dealscan samples are quite similar. A comparison of the medians also indicates that with respect to tangible assets, profitability, and cash flow volatility, Dealscan and Compustat firms are not qualitatively different. An examination of the distribution across industries (not reported) also does not reveal substantial differences. However, all of our regression analysis below incorporates industry fixed effects for the 38 Fama and French industries.

Next, focusing on the Dealscan IPOs and non-Dealscan IPOs enables a comparison of IPOs that appear in the Dealscan database and those that do not. IPO firms which take out loans within two years after the IPO represent approximately one quarter of all IPOs during 1987 and 2003, although the proceeds raised by our sample of IPOs represent almost half of the total

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experiment with loans taken in the year prior to the equity issuances, and there is no significant impact on the results we report.

proceeds generated. Thus, our IPOs represent a significant economic share of IPO activity. IPO firms in our sample are larger, more profitable, have higher book-to-market ratios, and have a higher fraction of tangible assets and lower cashflow volatility. These differences are consistent with the notion that the more speculative IPOs are less likely to tap the private debt market. A comparison of our samples of Dealscan SEOs and non-Dealscan SEOs yields similar differences. Our analysis, which is conditioned on equity issuing firms' access to the private debt market, is therefore indicative of the pricing behavior of slightly larger issuers.

Finally, it is well known that issuing firms, both IPOs and SEOs, tend to underperform against market wide indices (Ritter (1991)). Since our goal is to shed light on the pricing of equity by IPO and SEO firms, it is important to establish that the long-term average return of the Dealscan IPO and SEO sample is similar to that of the overall set of equity issuers. To this end, we conduct two tests. In the first, we compute event time, five-year, buy-and-hold abnormal returns against a value weighted market portfolio. We find that DealScan (full sample) IPOs' average abnormal returns is -25.5% (-13%) while DealScan (full sample) SEO firms' abnormal return is –15.6% (-24.1%). These comparisons suggest that equity issuers on DealScan exhibit underperformance against the market portfolio that is common with the full sample of issuers over our sample period.

In a second test, designed to examine equity return characteristics of firms issuing equity on DealScan, we estimate calendar-time portfolio regressions as in Loughran and Ritter (1995). We find that the standard size and book-to-market factors proposed by Fama and French (1993) explain return comovement of these issuers as in earlier studies (e.g., Brav and Gompers (1997)). For example, DealScan issuers with low book-to-market ratios share a common negative exposure to the Fama and French book-to-market factor and issuers with low market capitalizations share a common positive loading on the Fama and French size factor. Overall, we conclude that the issuers studied in this paper exhibit similar equity return characteristics as the larger sample of equity issuers.

II. Loan Yields

A. Two-Way Sorts on Size and Book-to-Market

While the above summary statistics are suggestive, they fail to account for the differences between the characteristics of the issuer and non-issuer samples. Thus, we begin our examination of the loan pricing differential between IPO, SEO and non-issuing firms with a non-parametric analysis. We sort all borrowers into size (total assets) and book-to-market quintiles each year.[9] For each of the resulting 25 portfolios of loans, we separate the IPO and SEO loans from the non-issuer loans and compute the average yield, which is presented in Table III, along with the number of loans in parentheses. Several aspects of the results are worth highlighting.

First, there is a large "size effect" in loan yield spreads. For almost every book-to-market quintile, yield spreads decline significantly and monotonically with firm size. For example, non-issuing (IPO) firms in the lowest book-to-market and smallest size quintile pay, 347 (256) basis points above LIBOR whereas large non-issuing (IPO) firms in the low book-to-market pay 103 (157) basis points above Libor. When we average across book-to-market quintiles (unreported), small non-issuing (IPO) firms pay, on average, 310 (275) basis points above LIBOR. Non-IPO (IPO) firms in the largest size quintile pay, on average, 99 (147) basis points above LIBOR. A similar pattern is found for SEO loans.

Second, the association between book-to-market and loan yield spreads appears to be positive, but is less distinct than the relation between size and yield spreads. For small non-issuing firms, yield spreads are mostly flat across the book-to-market quintiles. As we move to larger-quintile firms, a positive association between book-to-market and yields begins to emerge, becoming stronger with each successive size quintile. While the relation between book-to-market and yield seems to be positive for issuing firms as well, the relation is weaker and depends upon the particular size quintile.

In drawing comparisons of these two-way sorts with similar sorts for equity returns, it is important to remember that the yield on a loan is the sum of both an expected return and a default risk premium. To the extent that book-to-market ratios reflect collateral values, with high book-to-market firms having higher collateral values and recovery rates, we might expect book-to-market to be negatively related to the default premium on loans. However, if value firms are more likely to enter financial distress and default on their loans, then book-to-market may be

[9] Book value of equity to market value of equity is calculated as book equity plus deferred taxes and investment tax credit, when available, all divided by market capitalization. We use total assets as a measure of size to maintain consistency with the banking literature (e.g., Drucker and Puri (2005)) and because of near zero correlation with

positively associated with the default premium. Hence, book-to-market may have opposing effects on the systematic and default premium components of loan yields, which might explain the weak relation between book-to-market and loan yield spreads observed in our two-way sorts. (We investigate this possibility below.)

Finally, holding fixed size and book-to-market quintiles, the difference in IPO and non-issuer loan yield spreads is not always positive. In the first two size quintiles, IPO loans have slightly lower yield spreads than non-issuer loans and SEO loans have the lowest spreads. In the middle size quintile, IPO and non-issuer loan yield spreads are roughly similar. In the top two size quintiles, IPO loan yield spreads are larger than non-issuer loan yield spreads. Thus, spread differentials across issuers and non-issuers fail to reveal an obvious relation, consistent with our earlier conjecture based on the sample summary statistics.

B. The Determinants of Loan Yield Spreads

A shortcoming of the previous analysis is that it fails to control for other differences between issuers and non-issuers that were identified in the summary statistics (e.g., loan maturity). Therefore, we now examine whether there is a difference in the loan yields of issuing and non-issuing firms after controlling for firm characteristics and other features of the loan contracts in a regression framework. This analysis enables us to re-examine the differences in yield spreads across IPO, SEO and non-issuing firms in a setting that accounts for the confounding effects of multiple factors, beyond size and book-to-market examined above.

We first regress the loan yield spread on various proxies for risk and additional control factors using the largest sample of loans, which we call our base regressions. The first column of Table IV provides estimated coefficients and robust t-statistics for the base regression.[10] The inclusion of size and book-to-market are motivated by asset pricing specifications (Fama and French (1992)) and can be interpreted in this framework as capturing systematic risk factors. Similarly, equity beta is a standard measure of systematic risk which we use as a proxy for assets' systematic risk. We also control for the leverage effect by including book leverage in the

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book-to-market. We also examine a measure of market capitalization, orthogonalized to book-to-market by a univariate regression, in our analysis and find very similar results.

regression. We control for the maturity and relative size of the loan to account for contractual differences, as well as the type of loan using fixed effects (not reported). Asset tangibility (net physical plant, property and equipment dividend by total assets) is used to capture the firm's ability to secure the loan and, thus, as another proxy for the risk of the loan. Book leverage, is a control for capital structure effect on risk. Profitability (EBITDA / total assets), cash flow volatility (historical standard deviation of EBITDA / total assets), and idiosyncratic return volatility (see Campbell and Taksler (2003)) are proxies for information asymmetry and default risk. Leverage and profitability may also proxy for potential agency costs (e.g., Jensen and Meckling (1976) and Jensen (1986)). Finally, also included in the specification are fixed effects for calendar years and Fama-French 38 industries (not reported).

The regression results provide several important insights, beginning with confirmation of our earlier evidence in Table III. Loan yield spreads are strongly inversely related to firm size consistent with the view that small firms are riskier. We also see a significantly positive association between yields and book-to-market, consistent with the evidence found in the equity markets: value firms experience higher costs of capital (e.g., Fama and French (1992)). If the assumption that institutional investors are more rational than investors in the equity market is correct, then this evidence suggests that risk is an important factor behind the higher expected returns that we observe for firms with higher book-to-market ratios. The coefficient on equity beta is positive but insignificant, consistent with the findings in the equity market.

Not surprisingly, measures of total risk such as cash flow volatility and idiosyncratic risk have a positive effect on promised yield. While those variables' coefficients are positive under all regression specifications, they are not always significant. Firms that borrow relatively more (Loan Amount / Assets) experience lower yields - perhaps a consequence of economies of scale. Interestingly, loan maturity is inversely related to yield, a result that is persistent even after including a measure of the term spread in an expanded specification.[11] In sum, our specification illustrates that the pricing of corporate loans is dependent on a number of factors, most of which are consistent with economic intuition.

[10] The t-statistics are robust in the sense that our standard errors are computed by assuming that within-firm observations are dependent with a constant correlation. We control for longitudinal dependence by incorporating year dummies into the regression specification.
[11] In particular, we include the yield difference between the 10-year Treasury bond and the 1-year T-bill.

Most importantly, the Base regression results indicate that IPO firms command roughly the same yield as otherwise similar seasoned firms, as revealed by the IPO indicator variable. Under most specifications, SEO firms' yield is significantly below the bond yield of non-issuing firms, although the economic significance of the estimated differences is small. A 6.4 basis point differential (Base specification), in conjunction with an average loan size of approximately $171 million, translates into just over $100,000. This evidence suggests that the unconditional results reported earlier are not driven by differences in firm characteristics and the type of loan into which issuing and non-issuing firms enter. After accounting for these differences, we see that issuing and non-issuing firms face similar interest rates on their loans.

In the third column of the table we add dummy variables for the identity of the lead lenders on the loans as well as the log of the loan syndicate size. The lead lender in a loan syndicate is the lender responsible for the management of the deal and for the ultimate pricing and contract terms of the loan. The type of lead lending institution may influence the contract terms of the loan. For example, Drucker and Puri (2005) present evidence that commercial banks are more likely than investment banks to discount loan yields to win underwriting business.

Most of the loans in our sample are syndicated. The average number of lending institutions participating in a loan in our sample is six. Often the lender role recorded in DealScan will explicitly identify one member of the syndicate as the lead lender. For those syndicates for which the recorded lender role does not give an unambiguous lead lender, we use the institution with the largest stake in the loan. The vast majority (around 85%) of loans with lead lender information have depository institutions as lead lenders (SIC codes between 6000 and 6099), most of which are commercial banks. Other lead lender types are non-depository institutions (SIC codes 6100 to 61999), security broker dealers (SIC codes 6200 to 6299), and insurance companies (SIC codes 6300 to 64999). The excluded lender type in the regressions is all other lender types (SIC codes 6500 to 6999). Because most loans are missing lead lender type information, our estimation sample drops from 13,228 loans to 5,780 loans in our lender regression specification. However, importantly, the basic results are similar to those reported for the base regression.

Depository institutions, which are primarily commercial banks, charge much lower yield spreads (almost 100 basis points) than non-depository institutions – primarily investment banks. This finding is consistent with claims that commercial banks may discount loans to win underwriting business (e.g., Drucker and Puri (2005)). Most importantly, however, the inclusion of lender type controls does not alter our main finding that issuing firms are not charged different yields than similar non-issuing firms.

Finally, we test the robustness of our findings on the determinants of loan yield spreads to the inclusion of loan covenant restrictions. As we saw in the previous section, there are multiple types of covenants than can be included in a loan contract. Instead of reporting a dummy variable coefficient for each type of covenant in the loan yield spread regression, we follow Bradley and Roberts (2003) and form a loan covenant index which simply adds the total number of covenants contained in the loan contract. Doing so does not affect our findings and enables us to more easily model yields, covenants, and maturity in a simultaneous regression framework (as we do later in the paper). The fourth column of Table IV presents the results. Because so many loans are missing covenant information, our estimation sample drops to 2,877 loans. However, again our basic findings remain unchanged. The IPO dummy is statistically and economically insignificant and the SEO dummy is negative and statistically significant– even after controlling for covenants, of which IPO loans have more – though economically small. The covenant index enters the regression positively and significantly, consistent with riskier firms being charged both higher loan yields and being subject to more restrictive covenants on their loans. Of course, there is a potential endogeneity issue with our covenant variable (Bradley and Roberts (2003) and Chava, Kumar, and Warga (2004)). We explore this possibility below but briefly note that our results are largely unaffected by relaxing the exogeneity assumption on covenants and loan maturity.

As a final check, we estimate a regression with both lender and covenant variables. The coefficient estimates and robust t-statistics for this specification are reported in the last column of Table IV. Our findings remain mostly unchanged. The IPO dummy variable is once again insignificantly different from zero, but the SEO dummy also becomes insignificant. That is, after controlling for borrower characteristics, lender type, loan covenants and maturity, there is no difference in loan yield spreads for issuing firms (both IPOs and SEOs) and non-issuing firms.

III. Loan Expected Returns

The evidence thus far suggests that issuing firms' loans are viewed by institutional lenders as being of equal risk to those of similar non-issuing firms' loans. Our analysis, however, has not distinguished between systematic and idiosyncratic risk. Of crucial importance in the debate over why IPOs and SEOs earn relatively low average equity returns is distinguishing between these two types of risks. One way to view the results we have presented so far is that we have implicitly assumed all default risk is systematically driven. The more realistic alternative, however, is that at least some of the default risk is idiosyncratic. As such, we now turn to a decomposition of the yield into two components: expected return unrelated to default and a default risk premium. The latter component is a function of the likelihood of default and the loan recovery rate.

Our approach to computing the expected return follows Benninga (2000) by computing the internal rate of return corresponding to each loan's expected cashflows. We first calculate the semi-annual coupon payments, conditional on the loan not defaulting, by adding the loan's coupon rate and the realized six-month LIBOR.[12] Then, using estimated firm default probabilities and an assumed loan recovery rate, we calculate the expected cash flow in each six-month period of the loan's maturity. Since we know the loan's price at issuance, we are able to compute the loan's internal rate of return, which is our estimate of the loan's expected rate of return. The difference between our estimated expected return and the corresponding loan yield is our estimate of the loan default risk premium.

Before continuing, we make two comments. First, if different lenders face different marginal tax rates and taxes are impounded in asset returns then part of the variation in our estimates of expected returns may be attributable to variation in these taxes. However, we believe that this issue is of relatively little concern since the majority of lenders in our sample are commercial banks, which likely face similar tax rates. Additionally, by incorporating lender dummies into the specification we implicitly capture any variation in tax rates across the lenders. Second, our valuation approach is simply the "physical" counterpart to risk-neutral valuation. Rather than using the risk-neutral probabilities in conjunction with the risk-free rate to price the loans, we are using the physical (or subjective) probabilities in conjunction with banks' ex ante prices of the loan to back out the ex ante expected loan returns.

The remainder of this section details our estimation of default probabilities, assumed recovery rates, and analysis of expected loan returns.

A. *Estimating the Probability of Default*

For each loan in our sample, we estimate a hazard function for the maturity of the loan or the probability that the borrowing firm defaults in each six-month period of the loan's maturity, conditional on having not defaulted in the previous six months. This procedure requires data on bankruptcies, which we obtain from two sources. First, we use BankruptcyData.com to obtain Chapter 11 filings by publicly traded companies between 1987 and 2004. This data is merged with the CRSP/Compustat database using firm name and bankruptcy filing date in conjunction with the historical header file. Since BankruptcyData.Com does not collect information on Chapter 7 bankruptcy filings until the late 1990s, we use Compustat footnote 35 to identify firms that were deleted from Compustat due to Chapter 7 liquidations from 1987 to 2003.[13] We classify a loan as having defaulted if the borrowing firm files for bankruptcy prior to the maturity of a loan.

While this definition is intuitively appealing, it can be a noisy measure of loan defaults for several reasons. First, loans can be prepaid prior to maturity. Second, revolving loans may not be drawn down before the bankruptcy event. These two facts will lead us to overstate loan defaults. Third, loans may be renegotiated before a firm actually files for bankruptcy. This third fact will lead us to understate the number of loan defaults.[14]

With our bankruptcy measure, we estimate four different models of firm default that we briefly describe here. A more detailed discussion of the models and their estimation are included in the Appendix. We estimate two types of default models – a panel logit model similar to that estimated by Shumway (2001) and a Cox proportional hazard model. For each type of model, we estimate two different specifications, one of which contains the explanatory variables in

[12] For loans ending after 2004, we use the forward yield curve in place of the actual spot rates.

[13] We assume that the Chapter 7 bankruptcy filing date happens during the last quarter the firm has information in Compustat.

[14] We thank Chris James for pointing this out. Loans in the Dealscan database can also experience technical default (e.g., due to a covenant violation), be renegotiated, and then re-appear as a new loan in the database. However, this fact does not contaminate the yield analysis since all loans taken out by the same firm are assumed to be dependent observations. Indeed, a renegotiated loan is technically a new loan that reflects the changed characteristics of the firm and perception by the bank of the risk of the firm's debt.

Altman (1968) and one of which contains the explanatory variables of Zmijewski (1984). We estimate the panel logit because it enables us to more easily incorporate time varying covariates. A drawback of this model is that it requires that we explicitly form estimates of the private lender's forecasts of the evolution of the borrower's characteristics over the life of its loan in order to predict loan default probabilities. For this, we rely on a rational expectations assumption to use the *ex-post* realized values.[15] However, to ensure that our results are robust we also estimate a Cox proportional hazard model, which only uses information about the borrower in the quarter prior to which it takes out a loan.[16]

Panel A of Table V reports the average predicted cumulative probabilities of default over the life of the loans in our sample from each of our four models, as well as the fraction of loans undertaken in each year of our sample whose borrowers ultimately default (i.e., empirical probabilities). We report these default probabilities separately for IPO, SEO and non-issuer loans. There are several insights that emerge from Panel A. IPO loans are, on average, more likely to default (6.46%) than either SEO loans (5.37%) or non-issuers loans (4.85%). Loans reveal cyclicality in their default rates, reflected in higher default rates for loans taken out in the first several years of the sample and in the period 1998 to 2000. Additionally, issuers default rates appear to exhibit greater variation over time than those of non-issuers loans. Overall, the initial evidence appears consistent with the possibility that lenders set higher yields for IPO firms due to higher default risk. More generally, default probabilities appear to increase during the 1997 - 2000 period, contemporaneous with the increase in average yield spreads (see Panel A of Table I). Recall that the figures in Table V correspond to the fraction of loans undertaken during each of these years that eventually default or are predicted to default, as opposed to the fraction of defaults occurring in each of those years. We also mention that the predicted hazard model probabilities are closer in magnitude to the empirical fraction of loans that ultimately default. This result is due to the sample used for the estimation, which consists only of firms that appear in our DealScan sample. For the panel logit model, our estimation sample uses information on

[15] If we run out of Compustat data because the maturity of the loan ends after our sample, for example, we assume that future values of the firm-level variables are equal to their last values.

[16] This is the same as saying the lender assumes the firm characteristics will remain constant over the life of the loan.

[18] In unreported results we have repeated the analysis in this section conditioning on loans whose maturity is larger than 34 months, the average loan maturity in our sample, as the pricing of these loans might better reflect long run risks that borrowing firms face. We find, however, that our results regarding IPO and SEO pricing remain unaltered.

any firm that ever took out a loan on DealScan, both before and after the firm appeared on DealScan.

While our subsequent results are robust to all four of our estimated firm default models, we present results using the panel logit model with the Zmijewski covariates as our model of firm default. We also note that our approach to estimating expected debt returns differs from several previous studies which use Moody's historical default rates tables and transition matrices for public bonds of different credit ratings (see, e.g. Elton, Gruber, Agrawal, and Mann (2001) and Campello, Chen, and Zhang (2005)). Explicitly modeling the default likelihood for borrowing firms provides two advantages. First, the use of credit rating information will reduce the size of our sample significantly as most of our sample consists of private loans without credit ratings. Second, we are able to employ firm characteristics to assess the likelihood a loan will default, which is what credit scorers do when they assign a credit score to a bond. Thus, our estimation procedure offers a significantly finer estimate of default risk relative to the methods used in previous studies.

B. Loan Recovery Rates

In addition to our estimates of firm default probabilities in each six-month period of a loan we need an estimate of the loan recovery rate, or fraction of loan value that the lender can recover in the event of a default, to estimate the expected returns for our sample of loans. Unfortunately, information on private debt recovery rates is sparse in comparison to the information available for public debt. We assume a recovery rate of 70% throughout the analysis, using Moody's studies' average estimated recover rate for private debt (Moody's Investors Service (1998, 2000)). However, we also examine the effect of alternative recovery rates (60%, 80%) and varying the recovery rate across firm types (lower recovery rates for small, growth firms and higher recovery rates for large value firms). None of these perturbations have a significant effect on our results.

C. Loan Expected Returns

Panel B of Table V presents the average and median expected excess (over LIBOR) loan returns, i.e., default adjusted loan spreads, corresponding to our different estimates of default probabilities. The expected excess loan returns provide an estimate of that part of the loan yield spread corresponding to systematic risk. The unadjusted yield spread statistics are also presented for ease of reference. Focusing on the second row containing the expected excess loan return using our baseline measure of default likelihood, i.e., the Zmijewski panel logit model, we see that the magnitude of the expected excess loan returns is approximately 75% that of the raw yield spreads. IPO firms experience an average expected excess loan return that is significantly larger (17.1 basis points) than that faced by non-issuing firms. SEO firms experience an average expected excess loan return that is significantly lower (48.3 basis points) than that faced by non-issuing firms. Whether these differences remain after controlling for differences in firm characteristics and loan features is examined below.

D. Determinants of Loan Expected Returns

Using our estimates of loan expected excess returns we now repeat the regression analysis conducted in Section III.*B* but the dependent variable is now the loan expected return rather than the loan total promised yield. Estimation of this regression allows us to uncover differences in systematic risk between issuing and non issuing firms while controlling for heterogeneity in loans and the characteristics of the borrowing firms. Additionally, we also wish to see whether the key variables that lead to large differences in total yield (e.g., firm size, leverage, and book-to-market ratio) retain their explanatory power. To avoid spurious correlations, we drop book leverage and profitability from the right hand side of the regressions, as they appear implicitly on the left hand side through the estimated default probabilities. The results are presented in Table VI, whose format mimics that of Table IV.

We see that the results from Table IV are largely unaffected by the default risk adjustment. The IPO indicator is insignificant across all specifications, and the SEO indicator is significant but negative in all but one of the specifications, suggesting that institutional investors view SEO firms' loans to be less risky than otherwise identical non-issuing firms' loans. The estimated coefficient on firm size is unaffected by the adjustment, as is the book-to-market ratio: Small firms and high book-to-market firms have higher expected loan returns. Loan maturity and tangible assets both still exhibit significantly negative coefficients, though the magnitude of these estimates has been amplified by the adjustment. The covenant index coefficient is still positive and significant, indicating that riskier firms' loans have both higher yield and more restrictive covenants. The simultaneous determination of covenants and yield may cause an endogeneity problem and therefore the results of this regression should be interpreted with caution. In the next sub-section we address the endogeneity issue directly.

In sum, the default adjustment to yields has little effect on our previous results and conclusions. Institutional lenders appear to view IPO firms and non-issuing firms in a similar light with respect to risk, both total and systematic and appear to view SEO firms as slightly less risky than similar non-issuing firms.

IV. Endogeneity of Contract Features

Many studies suggest that lenders can adjust the maturity of the loans and vary the number of covenants in conjunction with the pricing of the loans (see, for example, Smith and Warner (1979), Berger and Udell (1990), Booth (1992), Barclay and Smith (1995)). This idea that certain loan features are determined simultaneously also has empirical support from studies by Bradley and Roberts (2003) and Chava, Kumar, and Warga (2004). While previous work examining expected bond returns has largely ignored this issue, it remains an empirical question as to whether the endogeneity of maturity and covenant structure has a meaningful effect on any inferences concerning expected returns. Therefore, we model the determination of loan yield, maturity, and covenants jointly to determine the impact of endogeneity on our results and conclusions thus far.

The challenge, of course, is in finding exogenous variation in loan maturity and covenants. Our instruments for the covenant index are lender variables, such as syndicate size and dummy variables corresponding to the lead bank SIC code. Our instruments for loan maturity are deal purpose dummies. The motivation for the covenant instruments is that the market for loans is priced competitively but where banks can more easily differentiate themselves is on the covenant specification. Indeed, in discussions with commercial lenders, loans often begin with boiler plate covenant specifications, most likely unique to the lender. Additionally, some firms may prefer more monitoring or information gathering than others and this is indirectly reflected in the covenant provisions. The maturity instruments are motivated by the idea that firms match asset and liability durations. Thus, the maturity of the loan will likely be dictated by the use of its funds.

Table VII reports coefficient estimates from a system of equations for loan expected excess return, loan covenants, and loan maturity. We first estimate a Poisson regression for the covenant index and use the predicted values from this regression in a second stage seemingly unrelated regression of loan maturity and yield. Because so many loans (over half of our sample) have missing covenant information, estimating the covenant equation first enables us to use imputed values for the second stage. Additionally, the nonlinearity and nonnormality associated with the Poisson regression would make simultaneous estimation of all three equations extremely burdensome, as joint normality is no longer an appropriate assumption.

Turning to the results, the syndicate size variable and depository institution and brokerage dummy variables enter significantly in the covenant index equation. Similarly, the deal purpose dummies in the maturity equation are statistically significant, except for the *takeover* variable (not reported). In the covenant equation, both the IPO dummy coefficient and the SEO dummy coefficient are statistically insignificant. Issuing firms are treated in the same way as similar seasoned firms when institutional lenders set their loan covenants. The maturity equation, however, indicates that both IPOs and SEOs firm, issue debt with longer maturity than non-issuing firms, as both the IPO dummy coefficient and the SEO dummy coefficient are statistically significant.

The IPO indicator variable in the expected excess return equation is also insignificantly different from zero. Consistent with prior results, the SEO dummy is negative and significant, suggesting that SEO firms' loans are issued with lower expected returns—even with other loan and firm characteristics are held constant. This result confirms that allowing for endogeneity does not alter our main conclusion that IPO loans have similar expected returns to those of similar non-issuing firms and SEO loans have slightly lower expected returns than non-issuing firms. Most of the sensitivities on the remaining independent variables are similar to those reported in Tables IV and VI. Firm size is inversely related to loan yield while book-to-market ratio is positively related to the yield. Cash flow volatility retains its sign but loses significance in the joint estimation. Overall, our results are very similar to those presented earlier and our conclusions unchanged.[18]

V. Changes in Loan Returns around Equity Issuances

We have presented evidence that the private debt market does not price IPO and SEO firms' loans differently than non-issuing firms' loans when we control for firm characteristics, such as size and book-to-market, and default risk. Moreover, our analysis suggests that institutional lenders view firm characteristics, such as size and book-to-market, when pricing loans in a manner consistent with the asset pricing model of Fama and French (1993). In our final analysis, we use the time dimension of our sample of IPO and SEO loans to examine the recent theoretical arguments put forth by Benninga, Helmantel and Sarig (2005), and Carlson, Fisher and Giammarino (2004). These studies argue that equity issuances should be associated with lower exposure to risk since raising capital and investing that capital is tantamount to the exercise of a call option and acquisition of the underlying asset. Thus, according to these arguments, we should observe loan yields and returns decline following IPOs and SEOs due to a reduction in firm asset risk.

To test this implication, we examine the change in loan yields and expected returns around the time of IPOs and SEOs. We require each issuing firm in our sample to have at least one pair of loans – one loan before the equity issuance and one after – with 18 months to two years difference in the loan dates. For each pair of loans, we calculate the change in loan yields and expected returns following the IPO or SEO.[19] We do this for all IPO and SEO loan pairs in which the later loan is taken out in any of the four six-month event windows following the equity issuance – event windows [0,0.5), [0.5,1.0), [1.0,1.5), and [1.5,2.0].[20]

The average loan yield changes following equity issuances are reported in Table VIII. Panel A reports yield changes for IPO firms; panel B reports yield changes for SEO firms. Turning first to the IPO firms in Panel A, the results indicate an economically meaningful drop in loan yields following IPOs. For the 44 firms in our sample that took out a loan in the six months following their IPOs, the average decline in their loan yields following their IPOs is 56 basis points. For the 66 firms that took out a loan six months to one year after their IPOs, the average decline in their loan yields following their IPOs is 64 basis points. The average decline in loan yields for the 93 firms that took out loans one year to 18 months after their IPOs, diminishes to 31 basis points. Finally, for the 86 firms that took out a loan 18 months to two years after their IPOs, the average change in their loan yields is actually positive, though smaller

[19] If the firm takes out more than one loan at the same time, we take the weighted average (by loan amount) of the loan yields.

in absolute value than the previous yield declines.

The pattern revealed in Panel A indicates that most of the decline in loan yields following an IPO happens around the time of the IPO and in the year following. Loan yields decline less and ultimately stop declining in the second year following an IPO. The pattern for SEO firms' loan yields is similar, though the yield declines following SEOs are less pronounced than the declines following IPOs. The changes in loan yields following IPOs and SEOS we uncover is consistent with the real options models mentioned above (e.g., Benninga, Helmantel and Sarig (2005), and Carlson, Fisher and Giammarino (2004)).[21] However, it is also possible that the decline in loan yields following IPOs and SEOs could be explained by other factors, such as greater bargaining power of IPO firms vis-à-vis banks after going public or a decrease in firm leverage following equity issuances, both IPOs and SEOs.

To examine whether these alternative explanations may be driving the observed decline in yields following equity issuances, we also examine the changes in *predicted* loan yields and expected returns for our sample of IPOs and SEOs. We do so by using the loan yield and expected return pricing model in the Base regression in Table IV. We then compute the changes in loan yields and expected returns corresponding to changes in their determinants (i.e., certain independent variables). We then ask which of these changes leads to an economically meaningful change in loan yields and returns according to our Base loan pricing regression. Examining changes in predicted loan yields and returns allows us to investigate whether changes in yields and expected returns can be largely attributed to changes in firm-level factors consistent with the real options models, such as size and book-to-market, or factors consistent with the alternative explanations, such as leverage.

In Table VIII we report the total change in predicted yields for both IPO and SEO firms as well as the contribution of three firm characteristics to the total change in predicted yields – size, book-to-market and leverage. The contribution of a firm characteristic to the total change in predicted yield is calculated by multiplying the estimated coefficient on that firm characteristic in the Base loan pricing regression by the observed firm-level change in the characteristic between the pre- and post-equity issuance dates. For example, to calculate the

[20] The results using yields and expected returns are very similar. Therefore, to conserve space we only report the results using yields.

[21] The pattern for expected loan returns is similar to the pattern for total loan yields.

contribution of firm size (Log(Assets)) to the total change in predicted yield for the 44 IPO firms taking out a loan in the six months after their IPOs, we take the coefficient on size in our Base loan pricing regression and multiply it by the average change in firm size for these 44 firms following their IPOs.

Several of the findings are worth mentioning. First, the change in predicted yields following equity issuances, like the change in actual yields, is negative, though declines are less pronounced for IPO firms. Second, the majority of the decline in predicted yields can be attributed to the increase in firm size: at least 50% of the change in the predicted yield can be attributed to this factor. Third, the book-to market variable is not a significant factor in the yield change. Fourth, the leverage effect is economically significant, but its effect is always lower than the size effect. Thus, while reduction in leverage following an equity issuance does lower predicted yield (especially on IPO loans), it can not explain the majority of the reduction in predicted yields. The findings on changes in predicted yields once again support the interpretation of the decline in loan yield stemming from a reduction in underlying asset risk following an equity issuance.

VI. Conclusions

Firms conducting initial and seasoned equity offerings have historically experienced relatively low long-run equity returns. To date, there is lack of consensus as to whether low average returns are due to mispricing or that these returns rationally reflect the risk characteristics of the issuing firms. By examining how institutional lenders perceive the risk of issuing and non-issuing firms we are able to shed new light on this issue. We have examined how institutional lenders perceive the risk of equity-issuing firms relative to non-issuing firms by focusing on the pricing and contract structure of loans to these two groups of firms. We find, first, that equity-issuing and otherwise similar non-issuing firms face comparable yields on their loans, even after adjusting for default risk and accounting for potential endogeneity between the various components of the loan contract.

Second, we find that firm characteristics that have been identified in equity market research, such as size and book-to-market, play a similar role in the pricing of private debt. In particular, small, high book-to-market "value" firms are deemed riskier, thus requiring higher expected rates of return, *ex-ante*. This evidence is consistent with that from the equity market showing that IPOs and SEOs earn returns similar to seasoned firms with the same characteristics, including size and book-to-market.

These findings have important implications concerning the interpretation of the long-term performance observed in the data. Since the debt in our sample is being held by institutions, and it is plausible that institutions are more rational investors, the findings are consistent with the notion that the motive for the long-term performance is rational. That is, in a market with almost only rational investors we document the same return pattern that has been found in the equity market. Moreover, our findings have implications beyond the pricing of issuing and non-issuing firms. Specifically, firms' expected bonds returns are positively correlated with their book-to-market ratios, consistent with a rational risk interpretation as posited by Fama and French (1993).

But even if one does not subscribe to the assumption that institutional investors are rational, the evidence in this paper is important as it provides an additional test corroborating the interpretation of these firm characteristics as proxies for systematic risk (Fama and French (1993)). Recently, Campello, Chen, and Zhang (2005) have shown, using publicly traded debt, that firm size and book-to-market ratio are priced consistent with the idea that smaller firms and those with high book-to-market ratios are expected to earn higher rates of return. Our evidence relies on a broader and markedly different set of firms, since most firms do not have publicly traded debt (Faulkender and Petersen (2005)). Thus, we provide an additional piece of evidence consistent with the idea that size and book-to-market capture exposure to systematic risk that is compensated in expected returns.

Finally, we find that firms' loan yields and returns decline following equity issuances and that this decline is due in large part to an increase in the size of the equity-issuing firm. This evidence is consistent with the predictions of models in Benninga, Helmantel and Sarig (2005) and Carlson, Fisher and Giammarino (2004), for example, in which firms issue equity to exercise a real option and after so doing experience a reduction in the risk of their underlying assets.

Overall, our analysis indicates that institutional lender pricing of loans to equity-issuing firms is consistent with claims that low equity returns of IPOs and SEOs reflect the underlying risk characteristics of the equity-issuing firms.

Appendix: Default Model Estimation

In this appendix, we describe the estimation of the firm default models and how we use them to predict the loan default probabilities we use to calculate our expected loan returns in Section III. We estimate four different models of firm default. First, we estimate two panel logit models, one with the covariates of Altman (1968) and one with the covariates of Zmijewski (1984). We then estimate two Cox proportional hazard models using the two different sets of covariates.

A. Panel Logit Models

The panel logit models take the form

$$\Pr\left(Firm\ j\ defaults\ in\ quarter\ t\right) = \Lambda\left(b_0 + b_1 X_{j,t-1} + e_t\right) \tag{A1}$$

Λ is the standard cumulative logistic distribution function, and X is a matrix of firm level accounting information taken from the previous quarter.

In the Altman specification of the panel logit, the covariates are WC/TA (WC = working capital=current assets – current liabilities; TA = total assets), RE/TA (RE = retained earnings), EBITA/TA (EBITA = earnings before interest, taxes and amortization), ME/TL (ME = market equity; TL = total liabilities), S/TA (S = sales).

In the Zmijewski specification the covariates are NI/TA (NI = net income), TL/TA, and CA/CL (CA = current assets; CL = current liabilities). We estimate these two panel logit models on the subsample of firms in Compustat that also appear in Dealscan, i.e., they take out a loan between 1987 and 2003 as recorded in Dealscan. We include all quarters for which we have Compustat data in our estimations. In both models, we also include a dummy variable LOAN, which equals one in the quarter in which a firm takes out a loan. The estimated coefficients for both the Altman and Zmijewski models are reported in the last two columns of Table IX.

Using our panel logit estimates, we calculate the probability that the borrowing firm defaults in each six-month period of its loan. The predicted probability that a firm defaults in a given quarter is

$$PP_{i,t} \equiv \Pr edicted\ \Pr ob\ Firm\ j\ defaults\ in\ quarter\ t = \Lambda\left(\hat{b}_0 + \hat{b}_1 X_{j,t-1}\right) \tag{A2}$$

Where $\hat{b}$ are the estimated coefficients. The probability of firm default in a six-month period is 1-((1-$PP_{j,t}$)*(1-$PP_{j,t-1}$)), or one minus the probability that the firm does not default in either of the two quarters comprising the six-month period, $(1\text{-}PP_{j,t})*(1\text{-}PP_{j,t-1})$.

When predicting probabilities using the panel logit estimates, we use realized financial statement numbers and assume that banks can accurately predict the evolution of firms' characteristics. Thus, the predicted loan default probability is a function of the borrowing firm characteristics at the time of the loan, the bank's prediction of the firm's future characteristics and the loan maturity. If future data for a firm is not available, then we assume future values of the covariates equal the final observed values.

B. Cox Proportional Hazard Models

The Cox proportional hazard model takes the form of

$$h(t, X_j) = h(t,0)\exp\lfloor \beta' X_j \rfloor \quad \text{(A3)}$$

The function $h(t, X_j)$ is the hazard rate at time t for a firm j with covariates X, or the probability that a firm with covariates X defaults conditional on surviving to time t. The dependent variable in our Cox proportional hazard models is the time it takes a firm to default from the point at which it takes out a loan on Dealscan and we measure time to default of the loan, where a loan is classified as defaulting if the borrower files for bankruptcy before the maturity of the loan. The maximum likelihood estimation accounts for right censoring in the time to default dependent variable. The first two columns of Table IX reports the estimated coefficients for the two different hazard models using the Altman and Zmijewski covariates.

To predict the probability of firm default for each six-month period of a loan, we compute the survival function at the end of the six-month period and subtract it from the survival function at the beginning of the six-month period. The survival function is defined as

$$S(t) = \exp(-H(t)) \quad \text{(A4)}$$

where $H(t)$ is the integrated hazard function given by

$$H(t) = \int_0^t h(s,0)\exp(\beta' X_j)ds \quad \text{(A5)}$$

We use the predicted firm default probabilities in each six-month period of a loan, together with an assumed recovery rate, to compute expected cashflows and an internal rate of return, or expected rate of return, for our sample of loans as described in Section III.

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Table I

Dealscan Loan Data Summary Statistics

The sample consists of all nonfarm, nonfinancial, nonutility domestic firms entering into US dollar denominated loans between 1987-2003 and appearing in both the Dealscan and merged CRSP/Compustat databases. The table presents summary statistics for our sample of loans by year and across all years. Panel A presents the number of loans, the number of packages (one or more loans entered into by a firm at the same point in time), and the number of companies in our sample. Panel B presents the fraction of loans that are 364-day loans, term loans, and revolving loans, which represent the most popular loan types of the 23 in our sample. Panel C presents the fraction of loans that are for general corporate purposes, debt repayment, takeover financing, and working capital, which represent the most popular purposes of the 26 in our sample. Panel D presents the average promised spread in basis points over the 6-month LIBOR (Promised Yield), loan Amount, and loan Maturity. Panel E presents summary statistics for various covenants. Secured is the fraction of loans that are secured. Dividend Rest. is the fraction of loans that contain a dividend restriction. # Fin. Rest. is the average number of accounting ratios that are restricted to lie within a certain range. Net Worth is the fraction of loans containing a minimum net worth covenants. Sweep provisions (asset, debt, equity) are pre-payment provisions.

Panel A: Loans, Packages and Borrowers

Variable	All Years	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
# of Co.s	5,337	268	533	513	558	496	670	812	942	860	1,125	1,311	1,043	976	964	941	900	763
# of Loans	22,048	445	990	897	903	790	1,022	1,269	1,476	1,365	1,796	2,120	1,761	1,664	1,570	1,481	1,351	1,148
# of Packages	15,758	328	682	632	676	604	796	946	1,072	965	1,271	1,493	1,174	1,090	1,098	1,071	989	871

Panel B: Loan Type

Variable	All Years	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
364-Day	0.08	0.00	0.00	0.01	0.01	0.01	0.01	0.04	0.07	0.06	0.04	0.06	0.10	0.11	0.18	0.19	0.19	0.17
Term	0.25	0.22	0.26	0.27	0.27	0.24	0.23	0.24	0.22	0.23	0.23	0.24	0.27	0.29	0.24	0.20	0.25	0.26
Revolver	0.61	0.59	0.55	0.60	0.63	0.62	0.69	0.67	0.67	0.67	0.70	0.67	0.60	0.54	0.52	0.54	0.51	0.54

Panel C: Deal Purpose

Variable	All Years	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Gen. Purp.	0.24	0.19	0.22	0.19	0.25	0.35	0.37	0.33	0.36	0.27	0.23	0.19	0.15	0.14	0.16	0.22	0.28	0.32
Debt Repay	0.26	0.15	0.20	0.17	0.24	0.23	0.23	0.20	0.20	0.35	0.41	0.39	0.33	0.28	0.30	0.21	0.11	0.06
Takeover	0.12	0.10	0.13	0.13	0.09	0.05	0.05	0.05	0.10	0.14	0.14	0.17	0.22	0.20	0.11	0.06	0.05	0.05
Work Cap.	0.17	0.36	0.20	0.29	0.27	0.24	0.20	0.21	0.15	0.10	0.08	0.09	0.08	0.09	0.11	0.21	0.31	0.34

Panel D: Loan Details

Variable	All Years	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Promised Yield	219.54	221.78	260.44	263.93	239.04	259.68	248.04	235.39	192.41	187.94	203.34	189.68	194.99	224.76	213.02	217.21	238.76	235.22
Amount	171.47	169.40	174.57	181.33	110.34	99.17	95.01	113.50	164.98	173.26	152.61	175.67	175.28	183.90	227.94	241.49	187.17	209.71
Maturity	42.43	45.73	46.31	47.13	43.34	36.81	40.36	40.40	44.99	46.19	44.96	45.48	45.99	44.13	40.58	35.01	34.36	37.68

Panel E: Covenants for a Subsample of Loans

Variable	All Years	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Secured	0.82	0.76	0.88	0.93	0.89	0.91	0.87	0.85	0.79	0.80	0.79	0.80	0.85	0.81	0.76	0.76	0.81	0.80
Dividend Rest.	0.86	.	1.00	1.00	1.00	1.00	0.71	0.84	0.78	0.89	0.88	0.91	0.89	0.88	0.85	0.81	0.83	0.84
# Fin Rest.	2.56	.	.	1.00	1.75	2.00	1.60	2.35	2.04	2.30	2.43	2.38	2.55	2.89	2.73	2.58	2.62	2.69
Net Worth	0.25	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.06	0.30	0.48	0.47	0.41	0.37	0.31	0.30	0.36	0.29
Asset Sweep	0.66	.	.	1.00	1.00	.	1.00	0.32	0.47	0.42	0.44	0.51	0.72	0.86	0.92	0.95	0.98	0.99
Debt Sweep	0.48	.	.	.	1.00	.	.	0.18	0.33	0.22	0.26	0.36	0.51	0.69	0.70	0.79	0.89	0.94
Equity Sweep	0.49	.	.	.	1.00	.	.	0.24	0.36	0.24	0.29	0.37	0.53	0.71	0.72	0.75	0.86	0.92

Table II

Firm Characteristics

The sample consists of all nonfarm, nonfinancial, nonutility domestic firms entering into US dollar denominated loans between 1987-2003 and appearing in both the Dealscan and merged CRSP/Compustat databases. Panel A presents mean and median (Med) loan characteristics for four samples: the entire Dealscan sample (All Firms), the subsample of Dealscan loans occurring within two years after the IPO (IPOs), the subsample of Dealscan loans occurring within two years after the SEO (SEOs), and the subsample of Dealscan loans not occurring within the two years following the IPO or SEO (Non-Issuers). The variables are as defined above, except Obs which corresponds to the number of observations in the particular sample. Panel B presents mean and median (Med) information on loan covenants. Panel C presents mean and median (Med) firm characteristics for these four samples and three additional samples: the entire merged CRSP/Compustat database during the period 1987-2003 (Compustat), all IPO firms on the SDC database that are matched to CRSP/Compustat (All IPOs), and SEO firms on the SDC database that are matched to CRSP/Compustat (All SEOs). Book leverage is the ratio of total debt (short-term + long-term) to total assets. Firm Size is the GDP-deflated market capitalization. Book-to-Market is the ratio of book equity to market equity. Tangible Assets is the ratio of net PPE to total assets. Profitability is the ratio of EBITDA to total assets. Cash Flow Volatility is the standard deviation of historical (or future when missing) operating cash flows.

Panel A: Loan Characteristics

	All Firms		Non-Issuers		IPOs		SEOs	
Variables	Mean	Med	Mean	Med	Mean	Med	Mean	Med
Promised Yield	219.54	225.00	224.86	225.00	231.69	225.00	179.55	162.50
Loan Amount	171.47	44.79	176.91	43.97	91.16	23.45	198.72	82.63
Loan Amount / Assets	0.31	0.16	0.30	0.16	0.42	0.22	0.26	0.18
Maturity	42.43	36.00	41.49	36.00	44.22	36.00	46.59	48.00
364-Day Loan	0.08	.	0.09	.	0.02	.	0.07	.
Term Loan	0.25	.	0.25	.	0.24	.	0.22	.
Revolving Loan	0.61	.	0.59	.	0.67	.	0.65	.
Corporate Purposes	0.24	.	0.24	.	0.23	.	0.24	.
Debt Repayment	0.26	.	0.25	.	0.26	.	0.30	.
Takeover	0.12	.	0.11	.	0.13	.	0.15	.
Working Capital	0.17	.	0.17	.	0.18	.	0.15	.
Obs	22,048	.	16,985	.	2,152	.	2,911	.

Panel B: Covenants

	All Firms		Non-Issuers		IPOs		SEOs	
Variables	Mean	Med	Mean	Med	Mean	Med	Mean	Med
Secured	0.82	.	0.82	.	0.87	.	0.79	.
Dividend Restricted	0.86	.	0.85	.	0.94	.	0.89	.
Number Financial Cov.	2.56	2.00	2.52	2.00	2.75	3.00	2.67	2.50
Net Worth	0.25	.	0.25	.	0.26	.	0.25	.
Asset Sweep	0.66	.	0.67	.	0.66	.	0.64	.
Debt Sweep	0.48	.	0.49	.	0.47	.	0.44	.
Equity Sweep	0.49	.	0.51	.	0.52	.	0.40	.

Panel C: Firm Characteristics

							Dealscan Sub-Samples							
	Compustat		All IPOs		All SEOs		All Firms		Non-Issuers		IPOs		SEOs	
Variables	Mean	Med	Mean	Med	Mean	Med	Mean	Med	Mean	Med	Mean	Med	Mean	Med
Book Leverage	0.58	0.24	0.38	0.27	0.27	0.26	0.32	0.29	0.33	0.30	0.31	0.26	0.30	0.29
Firm Size (Mcap)	1165.83	77.70	385.43	113.79	1216.59	297.28	1793.08	188.43	1985.85	171.39	476.82	125.04	1724.05	438.54
Firm Size (Assets)	1260.96	70.42	208.63	23.75	1339.63	150.15	1716.05	243.98	1873.44	260.97	623.98	98.04	1738.93	389.02
Book-to-Market	2.06	0.54	0.36	0.29	0.37	0.28	0.58	0.49	0.61	0.52	0.51	0.41	0.52	0.44
Tangible Assets	0.32	0.24	0.24	0.17	0.32	0.24	0.32	0.26	0.32	0.27	0.27	0.20	0.32	0.26
Profitability	-0.08	0.03	-0.01	0.03	0.02	0.04	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04
Cash Flow Volatility	0.30	0.04	0.16	0.04	0.15	0.03	0.04	0.03	0.04	0.03	0.04	0.02	0.03	0.02
Cons NonDur	0.04	.	0.05	.	0.05	.	0.09	.	0.09	.	0.10	.	0.08	.
Cons Dur	0.02	.	0.02	.	0.03	.	0.04	.	0.04	.	0.03	.	0.03	.
Manuf	0.08	.	0.07	.	0.10	.	0.18	.	0.19	.	0.14	.	0.14	.
Enrgy,Oil,Gas,Coal	0.03	.	0.02	.	0.06	.	0.06	.	0.05	.	0.04	.	0.08	.
Chem & Allied Prods	0.01	.	0.01	.	0.02	.	0.03	.	0.03	.	0.02	.	0.03	.
Bus Equip	0.12	.	0.20	.	0.19	.	0.16	.	0.16	.	0.18	.	0.14	.
Tel & TV Trans	0.02	.	0.03	.	0.05	.	0.05	.	0.04	.	0.07	.	0.07	.
Utilities	0.02	.	0.00	.	0.07	.	0.00	.	0.00	.	0.00	.	0.00	.
Whlsl, Ret, & Serv	0.07	.	0.11	.	0.13	.	0.17	.	0.17	.	0.17	.	0.18	.
Hlth, Med Eq, & Drugs	0.06	.	0.11	.	0.14	.	0.08	.	0.07	.	0.08	.	0.08	.
Money,Finance	0.01	.	0.01	.	0.00	.	0.00	.	0.00	.	0.00	.	0.00	.
Other	0.11	.	0.13	.	0.16	.	0.15	.	0.15	.	0.17	.	0.17	.
Obs	883,292	.	4,446	.	5,182	.	22,048	.	16,985	.	2,152	.	2,911	.

Table III
Average Yield Spreads for Size and Book-to-Market Portfolios

The sample consists of all nonfarm, nonfinancial, nonutility domestic firms entering into US dollar denominated loans between 1987-2003 and appearing in both the Dealscan and merged CRSP/Compustat databases. The table presents average yields, measured in basis points above the 6-month LIBOR, for portfolios of loans formed on GDP-deflated total assets and book-to-market quintiles. The number of loans in each portfolio is presented in parentheses below the average yield. The Non-Issuing Loans sample consist of all loans not occurring within two years after an IPO or SEO. The IPO Loans sample consists of all loans occurring within two years after the IPO (but not an SEO). The SEO Loans sample consists of all loans occurring within two years after the SEO. The portfolio breakpoints are determined from quintiles based on the entire Dealscan sample (i.e., common breakpoints are used for both IPO and Non-IPO loans).

	Book-to-Market														
	Non Issuing Loans					IPO Loans					SEO Loans				
Size	Low	2	3	4	High	Low	2	3	4	High	Low	2	3	4	High
Small	347	308	295	291	297	256	287	284	259	285	323	270	286	265	270
	(702)	(527)	(516)	(497)	(611)	(141)	(178)	(132)	(87)	(49)	(58)	(31)	(42)	(25)	(25)
2	270	220	235	244	273	223	216	226	222	263	241	195	196	233	229
	(434)	(487)	(557)	(641)	(761)	(156)	(157)	(156)	(97)	(82)	(103)	(128)	(105)	(97)	(47)
3	217	184	195	203	253	218	214	223	191	246	172	185	176	191	200
	(434)	(540)	(544)	(632)	(706)	(103)	(113)	(93)	(77)	(79)	(127)	(133)	(137)	(118)	(68)
4	180	144	154	170	220	212	159	200	169	191	158	149	162	171	184
	(463)	(528)	(634)	(603)	(594)	(58)	(41)	(47)	(50)	(40)	(93)	(181)	(184)	(148)	(92)
Big	103	71	90	99	139	157	136	155	156	138	108	96	109	117	131
	(563)	(562)	(592)	(661)	(447)	(21)	(19)	(18)	(20)	(40)	(105)	(79)	(128)	(130)	(60)

Table IV
Raw Spread Regressions

The sample consists of all nonfarm, nonfinancial, nonutility domestic firms entering into US dollar denominated loans between 1987-2003 and appearing in both the Dealscan and merged CRSP/Compustat databases. The table presents the estimated coefficients from a regression of loan yield, measured in basis points above the 6-month LIBOR, on various determinants. Four different regressions are presented, varying only in the specification of the right-hand side variables. The Base specification presents our primary specification. The Beta/Vol specification further conditions on the firms equity beta and idiosyncratic volatility. The Lender specification further conditions on the availability of lender data. The Covenant specification further conditions on the availability of covenant data. The All specification further conditions on the availability of both lender and covenant data. IPO Indicator is an indicator variable equal to one if the loan occurred within two years after the IPO (but not SEO). SEO Indicator is an indicator variable equal to one if the loan occurred within two years after the SEO. Maturity is the loan maturity, measured in months. Loan Amount / Assets is the ratio of the loan principal to the total assets of the firm in the quarter preceding the loan. Book leverage is the ratio of total debt (short-term + long-term) to total assets expressed in percent. Log(Assets) is the log of the GDP-deflated total assets. Log(Book-to-Market) is the log of the ratio of book equity to market equity. Tangible Assets is the ratio of net PPE to total assets expressed in percent. Profitability is the ratio of EBITDA to total assets expressed in percent. Cash Flow Volatility is the standard deviation of historical (or future when missing) operating cash flows expressed in percent. Equity Beta is estimated using 24-60 months (as available) of monthly returns data over the period beginning in the month after the issuance. The beta is the sum of the estimated coefficients on the contemporaneous and lagged excess market return. Equity Idiosyncratic Vol is the RMSE from the beta regression. Depository Inst (Insurance Co.; Non-Depository Inst, Brokerage) is an indicator variable equal to one if the lead bank on the deal is of the corresponding type denoted by their SIC code. Syndicate Size is the number of banks in the lending syndicate. Covenant Index equals the number of covenants present in the loan contract. Obs is the number of observations. Also included in the regressions but not reported are fixed effects for the Fama-French 38 industries, calendar year, deal purpose and type of loan. All standard errors are cluster-adjusted for dependence within firms.

Variable	Base	Beta/Vol	Lender	Covenant	All
Intercept	534.09	497.17	515.13	274.10	412.10
	(7.17)	(4.95)	(5.94)	(7.98)	(7.29)
IPO Indicator	-0.35	-2.87	5.22	1.52	9.77
	(-0.11)	(-0.80)	(1.13)	(0.26)	(1.24)
SEO Indicator	-6.40	-8.49	-6.45	-10.37	-0.27
	(-2.24)	(-2.74)	(-1.78)	(-2.10)	(-0.04)
Log(Maturity)	-21.21	-17.75	-19.72	-39.33	-24.88
	(-9.25)	(-7.59)	(-5.57)	(-5.97)	(-2.79)
Loan Amount / Assets	-0.01	-0.01	-0.01	-0.01	-0.01
	(-5.70)	(-4.35)	(-11.30)	(-3.20)	(-3.98)
Book Leverage	1.24	1.22	1.19	1.10	0.91
	(17.26)	(14.97)	(13.12)	(10.23)	(6.79)
Log(Assets)	-36.26	-33.17	-29.37	-25.67	-16.13
	(-41.39)	(-33.51)	(-20.90)	(-14.47)	(-5.83)
Log(Book-to-Market)	13.43	10.75	15.66	15.91	9.34
	(8.55)	(5.83)	(7.99)	(6.13)	(2.60)
Tangible Assets	-0.15	-0.01	-0.02	0.20	0.14
	(-2.13)	(-0.10)	(-0.28)	(1.88)	(1.08)
Profitability	-4.41	-3.13	-2.97	-5.69	-3.87
	(-9.81)	(-7.05)	(-4.24)	(-6.39)	(-4.03)
Cash Flow Volatility	0.30	1.00	0.87	1.38	1.15
	(1.44)	(3.17)	(2.81)	(2.42)	(1.47)
Equity Beta	.	2.30	.	.	1.40
	(.)	(1.52)	(.)	(.)	(0.41)
Equity Idiosyncratic Vol	.	2.30	.	.	1.00
	(.)	(7.45)	(.)	(.)	(1.80)
Depository Inst	.	.	-20.95	.	-21.85
	(.)	(.)	(-2.45)	(.)	(-1.75)
Insurance Co	.	.	16.27	.	0.00
	(.)	(.)	(0.32)	(.)	(.)
Non-Depository Inst	.	.	95.79	.	10.54
	(.)	(.)	(9.21)	(.)	(0.60)
Brokerage	.	.	35.51	.	16.26
	(.)	(.)	(5.83)	(.)	(1.89)
Log(Syndicate Size)	.	.	-1.81	.	-5.39
	(.)	(.)	(-0.98)	(.)	(-1.79)
Covenant Index	.	.	.	9.62	12.06
	(.)	(.)	(.)	(8.22)	(8.23)
Adj. R^2	0.50	0.53	0.59	0.56	0.66
Obs	13,228	9,396	5,780	2,877	1,147

Table V

Default Probabilities and Adjusted Loan Spreads

The sample consists of all nonfarm, nonfinancial, nonutility domestic firms entering into US dollar denominated loans between 1987-2003 and appearing in both the Dealscan and merged CRSP/Compustat databases. Panel A presents average predicted loan default probabilities by year for IPO loans, SEO loans and Non-Issuer loans defined as all loans occurring within two years after the IPO but not an SEO, all loans occurring within two years after the SEO, and all other loans, respectively. Empirical Fraction is the ratio of the number of loans issued that ultimately default to total loans issued in a particular year. Hazard Zmijewski (Altman) is the average predicted probability of loan default at issuance averaged across all loans issued in a particular year, where the individual loan default probabilities are obtained from an estimated hazard model of firm default whose covariate specification is the same as in Zmijewski (1984) (Altman (1968)). Logit Zmijewski (Altman) is the average probability of loan default at issuance averaged across all loans issued in a particular year, where the individual loan default probabilities are obtained from an estimated panel logit model of firm default whose covariate specification is the same as in Zmijewski (1984) (Altman (1968)). For example, in 1987 the Empirical Fraction reveals that 5.72% of the loans taken out by Non-Issuer firms ultimately defaulted, whereas the predicted probability of loan defaults according to the Hazard Zmi estimate is 5.4%. Panel B presents average (medians in brackets) unadjusted and default adjusted yield spreads for the Pooled sample of loans, Non-Issuer loans, IPO loans, and SEO loans. Default adjusted spreads are computed as the internal rate of return to the loan, based on the par value and expected cash flows (see Section III). The alternative default adjusted spreads are computed using the predicted default probabilities described above. The Empirical Adjusted Spread is the unadjusted spread minus the average empirical fraction of loan defaults in a loan category times (1 - loan recovery rate). The assumed recovery rate on a defaulted loan is 70%.

Panel A: Average Default Probabilities by Year

	Non-Issuer Loans					IPO Loans					SEO Loans				
Year	Empirical Fraction	Hazard Zmi	Hazard Alt	Logit Zmi	Logit Alt	Empirical Fraction	Hazard Zmi	Hazard Alt	Logit Zmi	Logit Alt	Empirical Fraction	Hazard Zmi	Hazard Alt	Logit Zmi	Logit Alt
1987	5.72	5.40	5.85	4.33	5.22	2.17	4.76	2.93	2.88	3.59	2.99	5.21	5.29	4.34	5.68
1988	7.90	5.27	5.73	4.70	5.02	2.70	5.86	5.18	4.39	5.04	3.19	5.23	5.21	4.52	5.01
1989	5.89	5.87	6.02	4.79	5.34	2.38	5.01	4.97	3.52	3.87	5.41	5.05	5.10	4.40	5.32
1990	4.46	5.45	5.60	4.23	4.93	1.49	5.18	4.85	3.39	3.92	6.85	4.54	4.79	2.67	3.82
1991	3.96	5.00	4.88	3.71	4.01	0.00	4.13	3.35	2.76	3.18	4.00	4.01	3.90	2.98	3.12
1992	2.24	5.66	5.33	3.76	4.23	2.63	6.17	3.69	2.96	3.09	0.67	5.10	4.68	3.42	3.70
1993	2.43	5.51	5.55	3.74	3.99	3.83	5.77	4.56	3.26	3.69	3.35	5.84	5.24	3.64	4.21
1994	2.99	5.76	5.60	4.21	4.45	3.27	6.17	5.27	3.70	4.37	3.93	5.53	5.38	3.68	4.20
1995	5.24	5.51	5.92	4.62	4.65	2.08	6.10	5.39	4.51	4.45	3.93	5.80	5.80	4.33	4.85
1996	5.78	5.53	5.50	4.21	4.43	6.06	6.33	4.78	4.22	4.00	4.24	6.17	5.17	4.96	4.89
1997	6.32	5.72	5.89	4.41	4.70	10.03	5.97	4.67	4.59	4.53	7.94	5.68	5.43	4.84	4.89
1998	7.18	5.58	5.56	4.69	4.82	12.25	6.64	5.11	4.39	4.81	9.93	6.09	5.18	4.96	5.21
1999	6.79	5.18	5.17	4.03	4.39	11.51	5.77	5.40	5.06	5.47	8.73	6.19	5.73	4.91	5.69
2000	6.55	4.94	4.96	4.11	4.35	16.67	6.88	4.79	5.32	4.68	10.59	6.34	5.46	4.34	4.45
2001	3.50	4.24	4.49	3.50	3.58	4.17	5.00	4.04	2.89	2.44	4.88	4.45	4.23	3.91	3.91
2002	3.18	4.26	4.52	3.13	3.35	0.00	6.42	4.58	3.06	2.97	0.71	5.15	4.78	3.65	3.76
2003	1.53	4.93	4.94	3.21	3.34	0.00	6.38	7.90	8.09	6.36	0.62	6.13	5.56	3.88	3.81
All Years	4.85	5.24	5.32	4.06	4.33	6.46	5.99	4.88	4.06	4.25	5.37	5.64	5.23	4.27	4.59

Panel B: Loan Yield Spreads (Raw and Default Adjusted)

Variable	Pooled	Non-Issuer	IPOs	SEOs
Unadjusted Spread	219.54	218.23	231.69	179.55
	[225.00]	[212.50]	[225.00]	[162.50]
Default Adj. Spread (Hazard Zmi)	165.91	164.21	181.30	132.98
	[155.75]	[152.71]	[175.53]	[116.19]
Default Adj. Spread (Hazard Alt)	164.01	162.10	181.48	134.83
	[153.89]	[150.72]	[177.20]	[120.34]
Default Adj. Spread (Panel Logit Zmi)	175.77	173.68	194.79	141.45
	[172.84]	[170.24]	[192.36]	[131.52]
Default Adj. Spread (Panel Logit Alt)	174.32	171.99	195.64	139.94
	[168.58]	[165.33]	[188.18]	[128.17]
Empirical Adjusted Spread	164.94	162.43	173.49	128.25
	[170.40]	[156.70]	[166.80]	[111.20]

Table VI
Default Adjusted Spread Regressions

The sample consists of all nonfarm, nonfinancial, nonutility domestic firms entering into US dollar denominated loans between 1987-2003 and appearing in both the Dealscan and merged CRSP/Compustat databases. The table presents the estimated coefficients from a regression of the default adjusted loan yield (i.e., the internal rate of return measured in basis points above the 6-month LIBOR, using the Zmijewski panel logit model of firm default and assuming a loan recovery rate of 70%) on various determinants. The Base specification present our primary specification. The Lender specification further conditions on the availability of lender data. The Covenant specification further conditions on the availability of covenant data. The All specification further conditions on the availability of both lender and covenant data. IPO Indicator is an indicator variable equal to one if the loan occurred within two years after the IPO (but not SEO). SEO Indicator is an indicator variable equal to one if the loan occurred within two years after the SEO. Maturity is the loan maturity, measured in months. Loan Amount / Assets is the ratio of the loan principal to the total assets of the firm in the quarter preceding the loan. Log(Assets) is the log of the GDP-deflated total assets. Log(Book-to-Market) is the log of the ratio of book equity to market equity. Tangible Assets is the ratio of net PPE to total assets expressed in percent. Cash Flow Volatility is the standard deviation of historical (or future when missing) operating cash flows expressed in percent. Equity Beta is estimated using 24-60 months (as available) of monthly returns data over the period beginning in the month after the issuance. The beta is the sum of the estimated coefficients on the contemporaneous and lagged excess market return. Equity Idiosyncratic Vol is the RMSE from the beta regression. Depository Inst (Insurance Co.; Non-Depository Inst, Brokerage) is an indicator variable equal to one if the lead bank on the deal is of the corresponding type denoted by their SIC code. Syndicate Size is the number of bank in the lending syndicate. Covenant Index equals the number of covenants present in the loan contract. Also included in the regressions but not reported are fixed effects for the Fama-French 38 industries, calendar year, deal purpose and type of loan. All standard errors are cluster-adjusted for dependence within firms.

Variable	Base	Beta/Vol	Lender	Covenant	All
Intercept	486.99	442.21	515.32	317.36	475.97
	(5.82)	(4.22)	(5.70)	(8.99)	(7.66)
IPO Indicator	-0.31	-2.43	4.54	-3.62	10.86
	(-0.09)	(-0.66)	(0.96)	(-0.58)	(1.35)
SEO Indicator	-7.28	-9.11	-7.42	-11.90	0.84
	(-2.45)	(-2.75)	(-1.96)	(-2.27)	(0.11)
Log(Maturity)	-14.49	-11.10	-13.24	-31.70	-19.64
	(-6.27)	(-4.67)	(-3.78)	(-5.13)	(-2.21)
Loan Amount / Assets	-0.01	-0.01	-0.01	-0.01	-0.01
	(-5.67)	(-4.70)	(-12.53)	(-3.82)	(-4.84)
Log(Assets)	-37.21	-33.85	-31.37	-25.27	-17.53
	(-41.95)	(-33.17)	(-21.55)	(-13.50)	(-5.59)
Log(Book-to-Market)	16.52	13.91	17.39	14.23	10.87
	(9.75)	(6.88)	(7.97)	(4.46)	(2.52)
Tangible Assets	-0.43	-0.27	-0.26	-0.14	-0.21
	(-5.29)	(-2.90)	(-2.57)	(-1.07)	(-1.16)
Cash Flow Volatility	0.26	0.55	-0.01	0.74	-0.29
	(1.58)	(1.18)	(-0.03)	(1.37)	(-0.31)
Equity Beta	.	2.75	.	.	0.88
	(.)	(1.78)	(.)	(.)	(0.22)
Equity Idiosyncratic Vol	.	2.37	.	.	0.64
	(.)	(7.42)	(.)	(.)	(0.98)
Depository Inst	.	.	-20.31	.	-31.87
	(.)	(.)	(-2.30)	(.)	(-2.69)
Insurance Co	.	.	12.82	.	0.00
	(.)	(.)	(0.28)	(.)	(.)
Non-Depository Inst	.	.	96.91	.	13.50
	(.)	(.)	(9.19)	(.)	(0.80)
Brokerage	.	.	38.73	.	16.88
	(.)	(.)	(5.49)	(.)	(1.60)
Log(Syndicate Size)	.	.	-0.94	.	-4.10
	(.)	(.)	(-0.49)	(.)	(-1.25)
Covenant Index	.	.	.	11.70	13.91
	(.)	(.)	(.)	(9.58)	(8.99)
Adj. R^2	0.48	0.52	0.58	0.51	0.61
Obs	13,198	9,372	5,759	2,868	1,141

Table VII
Simultaneous Equation Model

The sample consists of all nonfarm, nonfinancial, nonutility domestic firms entering into US dollar denominated loans between 1987-2003 and appearing in both the Dealscan and merged CRSP/Compustat databases. The table presents coefficient estimates from a system of equations for covenant index, loan maturity (measured in months), and default adjusted loan yield (measured in basis points, using the Zmijewski panel logit model of firm default and assuming a loan recovery rate of 70%). Covenant index, which assigns one point for each covenant present in the loan, is estimated separately in a first stage using a Poisson regression. The predicted values from this regression are then used in a second stage seemingly unrelated regression of maturity and loan yield. The instruments for the covenant index equation include lender variables, such as syndicate size and lead bank SIC code. The instruments for the maturity equation include deal purpose dummies. The table presents the estimated coefficients for the three equations: loan yield (measured in basis points above 6-month LIBOR), covenant index, and maturity (measured in months). IPO Indicator is an indicator variable equal to one if the loan occurred within two years after the IPO (but not SEO). SEO Indicator is an indicator variable equal to one if the loan occurred within two years after the SEO. Loan Amount / Assets is the ratio of the loan principal to the total assets of the firm in the quarter preceding the loan. Book leverage is the ratio of total debt (short-term + long-term) to total assets expressed in percent. Log(Assets) is the log of the GDP-deflated total assets. Log(Book-to-Market) is the log of the ratio of book equity to market equity. Tangible Assets is the ratio of net PPE to total assets expressed in percent. Profitability is the ratio of EBITDA to total assets expressed in percent. Cash Flow Volatility is the standard deviation of historical (or future when missing) operating cash flows expressed in percent. Depository Inst, Non-Depository Inst, Brokerage are indicator variables equal to one if the lead bank on the deal is of the corresponding type denoted by their SIC code. Syndicate Size is the natural logarithm of the number of lenders in the lending syndicate. Workcap is an indicator variable equal to one if the deal purpose is for working capital. Corpurp is an indicator variable equal to one if the deal purpose is for corporate purposes. Debt Repay is an indicator variable equal to one if the deal purpose is for debt repayment. Takeover is an indicator variable equal to one if the deal purpose is for a takeover. Also included in the regressions but not reported are fixed effects for the Fama-French 38 industries, calendar year, and type of loan. All standard errors are cluster-adjusted for dependence within firms.

Variable	Yield	Covenant Index	Log(Maturity)
Intercept	402.73	17.69	1.63
	(17.28)	(32.69)	(10.09)
Def Adj Yield	.	.	-0.00
	(.)	(.)	(-3.77)
Log(Maturity)	-9.84	.	.
	(-4.36)	(.)	(.)
Covenant Index	5.43	.	0.09
	(2.92)	(.)	(6.76)
IPO Indicator	3.45	-0.02	0.05
	(0.85)	(-0.13)	(2.28)
SEO Indicator	-8.12	0.05	0.05
	(-2.31)	(0.29)	(2.70)
Loan Amount / Assets	-0.01	-0.00	0.00
	(-3.83)	(-8.22)	(4.17)
Book Leverage	.	0.02	0.00
	(.)	(5.35)	(1.57)
Log(Assets)	-32.59	-0.72	0.09
	(-26.36)	(-9.38)	(10.43)
Log(Book-to-Market)	18.81	0.19	-0.05
	(12.33)	(2.96)	(-5.29)
Tangible Assets	-0.27	0.00	0.00
	(-4.06)	(0.56)	(2.32)
Profitability	.	-0.04	0.02
	(.)	(-2.05)	(7.78)
Cash Flow Volatility	0.32	-0.02	-0.00
	(1.20)	(-0.85)	(-2.01)
Depository Inst	.	0.71	.
	(.)	(2.49)	(.)
Non-Depository Inst	.	-0.34	.
	(.)	(-0.99)	(.)
Brokerage	.	0.83	.
	(.)	(5.84)	(.)
Syndicate Size	.	0.41	.
	(.)	(5.30)	(.)
Work Cap	.	.	-0.25
	(.)	(.)	(-8.88)
Corp Purp	.	.	-0.20
	(.)	(.)	(-8.27)
Debt Repay	.	.	-0.05
	(.)	(.)	(-2.12)
Takeover	.	.	0.03
	(.)	(.)	(1.39)
Adj R^2	0.46	.	0.47
Obs	5,758	1,691	5,758

Table VIII
Change in Equity Issuer Loan Yields in Event Time

The base sample consists of all nonfarm, nonfinancial, nonutility domestic firms entering into US dollar denominated loans between 1987-2003 and appearing in both the Dealscan and merged CRSP/Compustat databases. We further restrict the sample to those firms entering into at least one loan before and after an equity issuance. The event window defines the time, in years, after either an IPO (Panel A) or SEO (Panel B). For example, the [0, 0.5) window corresponds to loans taken out in the 6 months following equity issuance. Δ Yield is the average change in loan yields. Thus, loans entered into within 6-months of an IPO have a yield that is 56 basis points lower than loans taken out prior to the IPO. Δ Predicted Yield perform a similar exercise only using predicted yields from the base regression in Table IV, as opposed to actual yields. The change in predicted yield due to a firm characteristic is calculated by multiplying the estimated coefficient on that firm characteristic in the Base loan pricing regression by the average change in the characteristic following the equity issuance. For example, to calculate the contribution of firm size (Log(Assets)) to the total change in predicted yield for the 44 IPO firms taking out a loan in the six months after their IPOs, we take the coefficient on size in our Base loan pricing regression and multiply it by the average change in firm size for these 44 firms following their IPOs.

Panel A: IPOs

Event Window	# of		# of	Δ Predicted	Δ Predicted Yield due to		
(IPO = 0)	Firms	Δ Yield	Firms	Yield	Size	Book-to-Market	Leverage
$[0, 0.5)$	44	-56.0	6	-15.8	-8.7	0.0	-7.3
$[0.5, 1.0)$	66	-63.9	15	-30.1	-26.4	4.6	-8.9
$[1.0, 1.5)$	93	-31.4	50	-12.1	-20.2	4.3	-10.2
$[1.5, 2.0]$	86	11.7	56	1.0	-15.9	5.5	-1.2

Panel B: SEOs

Event Window	# of		# of	Δ Predicted	Δ Predicted Yield due to		
(SEO = 0)	Firms	Δ Yield	Firms	Yield	Size	Book-to-Market	Leverage
$[0, 0.5)$	67	-35.8	33	-22.7	-16.7	-6.0	1.7
$[0.5, 1.0)$	79	-38.6	35	-42.7	-20.9	-0.6	-2.5
$[1.0, 1.5)$	87	-25.4	46	-31.0	-20.3	4.4	-2.6
$[1.5, 2.0]$	96	20.4	53	12.8	-10.3	4.7	0.7

Table IX
Default Probability Models

The sample consists of all nonfarm, nonfinancial, nonutility domestic firms entering into US dollar denominated loans between 1987-2003 and appearing in both the Dealscan and merged CRSP/Compustat databases. The table presents coefficient estimates from four empirical models of default differing in the econometric method employed (hazard model or panel logit) and covariate specification (variables used by Zmijewski (1984) or Altman (1968)). The hazard specifications are estimated on the Dealscan sample only. The panel logit specification is estimated on the entire Compustat database over the period 1987-2003, using an indicator variable (LOAN) to identify Dealscan firms. WC/TA is the ratio of working capital (current assets - current liabilities) to total assets. RE/TA is the ratio of retained earnings to total assets. ME/TL is the ratio of market equity to total liabilities. S/TA is the ratio of sales to total assets. NI/TA is the ratio of net income to total assets. TL/TA is the ratio of total liabilities to total assets. CA/CL is the ratio of current assets to current liabilities. Obs is the number of observations.

Variable	Hazard Zmijewski	Hazard Altman	Logit Zmijewski	Logit Altman
Constant			-4.785	-5.488
			(-24.12)	(-17.90)
WC/TA		0.150		-0.573
		(0.61)		(-8.08)
RE/TA		-0.134		0.054
		(-1.96)		(4.58)
EBITA/TA		-2.296		-1.659
		(-7.11)		(-8.76)
ME/TL		-0.081		-0.361
		(-3.99)		(-1.32)
S/TA		0.217		0.133
		(3.75)		(0.87)
NI/TA	-1.125		-0.998	
	(-6.71)		(-7.95)	
TL/TA	1.268		0.092	
	(7.61)		(2.53)	
CA/CL	0.064		-0.930	
	(1.99)		(-6.31)	
LOAN			0.920	0.928
			(7.24)	(7.32)
Obs	13,515	11,624	250,725	250,725
Pseudo-R2			0.086	0.087