



American Finance Association

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Source: *The Journal of Finance*, Vol. 52, No. 1 (Mar., 1997), pp. 379-396

Published by: Blackwell Publishing for the American Finance Association

Stable URL: <http://www.jstor.org/stable/2329569>

Accessed: 25/11/2009 10:04

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The Pricing of Initial Public Offers of Corporate Straight Debt

SUDIP DATTA, MAI ISKANDAR-DATTA, and AJAY PATEL*

ABSTRACT

This study examines the initial-day and aftermarket price performance of corporate straight debt IPOs. We find that IPOs of speculative grade debt are underpriced like equity IPOs, while those rated investment grade are overpriced. IPOs of investment grade debt are typically issued by firms listed on the major exchanges and underwritten by prestigious underwriters. In contrast, junk bond IPOs are more likely to be handled by less prestigious underwriters and are typically issued by OTC firms. Our analysis also reveals that bond rating, market listing of the firm, and investment banker quality are significant determinants of bond IPO returns.

THIS STUDY EXAMINES THE pricing of initial public straight debt issues by focusing on the initial-day and aftermarket price performance. Although there is substantial empirical evidence on new issue price performance of various types of corporate securities, similar evidence on straight bonds is absent in the literature. The recent initial public offering (IPO) literature has adequately established that IPOs of common stock are underpriced.¹ This finding of systematic underpricing of equity IPOs has led to the development of theoretical models designed to explain the existence of this phenomenon under equilibrium conditions. The models are based on the existence of information asymmetry between market participants (Allen and Faulhaber (1989), Grinblatt and Hwang (1989), Rock (1986), and Welch (1989)), the risk of litigation due to legal liability (Tinic (1988) and Hughes and Thakor (1992)), monopsony power of investment banks (Ritter (1984)), and incomplete markets (Mauer and Senbet (1992)).

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¹ Smith's (1986) survey of the equity IPO literature suggests that the degree of underpricing appears to exceed 15 percent, on average. Ibbotson (1975) reports that although the mean abnormal initial-day return is significant and large, the median value is close to zero, indicating that a large number of equity IPOs are overpriced.

Our study of the pricing of IPOs of straight corporate debt contributes in several respects to the growing literature on the pricing of new issues.² First, by examining the pricing of corporate debt IPOs we shed light on whether corporate straight debt IPO returns are similar to returns observed for equity IPOs. The traditional bond literature examines the pricing of newly issued bonds relative to seasoned bonds, which is referred to as the seasoning process (see Wasserfallen and Wydler (1988), and Weinstein (1978)). However, the samples in these studies are generally composed of new bonds issued by *seasoned* offerers, and hence, are not investigations of bond IPOs. Moreover, this literature is unconcerned with the information asymmetries that drive the more recent IPO literature. In general, IPO models predict that information asymmetry increases underpricing. While the degree of information asymmetry between investors and the firm is probably largest at the equity IPO, information asymmetry between managers and capital markets is not eliminated subsequent to the equity IPO. Therefore, models incorporating information asymmetry are also valuable in gaining insights into the pricing of initial public offers of corporate straight debt.

Second, since straight debt can be viewed as being made up of risk-free debt and equity, the riskier the straight debt offer, the larger the equity component in the security. Therefore, junk grade debt (rated BB or below) may be thought of as being more like equity than investment grade debt (rated BBB or above). Weinstein (1981) shows that junk bonds have more systematic risk, while other empirical evidence indicates that low grade bonds behave more like equity than investment grade bonds (Chang and Pinegar (1986), Cornell and Green (1991), Blume, Keim, and Patel (1991), and Shane (1993)).³ Since low grade debt contains a larger equity component than investment grade debt, the IPO returns of low grade debt should behave more like equity IPO returns. Specifically, we hypothesize that the higher the bond rating, the lower the degree of underpricing at the bond IPO.

Investment grade bonds differ from junk bonds in more respects than just differences in perceived risk. In fact, the markets for these two grades of bonds are different. Conversations with investment bankers indicate that the markets for investment and junk grade bonds are segmented in terms of marketing of the issue, where investment houses employ different sales forces for the two broad classes of bonds. This is motivated by the fact that those who buy

² There are a number of recent studies that examine new issue price behavior of various types of corporate securities other than common stock. Loderer, Sheehan, and Kadlec (1991) report that IPOs of preferred stock are not underpriced. Similarly, Muscarella (1988) and Michaely and Shaw (1994) document that the mean initial-day returns of IPOs of master limited partnerships are not significantly different from zero. For closed-end fund IPOs, Peavy (1990) finds no significant underpricing, while Wang, Chan, and Gau (1992) document significant and systematic overpricing of IPOs of real estate investment trusts.

³ For example, Chang and Pinegar (1986) show that junk bonds, like equities, exhibit a January seasonal effect that is less visible in investment grade debt and nonexistent in U.S. government bond issues. Cornell and Green (1991) document that junk bonds are less sensitive to changes in interest rates than investment grade bonds. They also find that junk bonds are more sensitive to movements in stock prices than investment grade bonds.

investment grade bonds have different investment objectives than those who are interested in junk bonds. Investment grade issues are sold exclusively on bond rating to investors who are interested primarily in safety of the principal and not in appreciation in price. On the other hand, not unlike equity offerings, junk grade issues are sold based on stories that relate to future prospects of the firms.

Moreover, we also examine whether factors that have been found to determine the pricing of equity IPOs, such as investment bank reputation and market listing certification, influence the price performance of initial bond issues. Carter and Manaster (1990) suggest that underwriter reputation plays a role in reducing the degree of information asymmetry. Investment banks offer independent certification of the issuer's risk, whereas more reputable investment banks handle less risky IPOs to protect their reputation capital. Hence, the degree of underpricing is expected to be inversely related to the underwriter's reputation where the more prestigious the investment bank, the smaller the degree of underpricing for the bond IPO, *ceteris paribus*.

Affleck-Graves, Hegde, Miller, and Reilly (1993) propose that trading systems certify the quality of IPOs via their quantitative and qualitative initial and continued listing standards. The standards for firm size, distribution of ownership and earnings are substantially higher for firms listed on the New York Stock Exchange (NYSE) or American Stock Exchange (AMEX) than for Nasdaq firms. In addition, bond IPOs of NYSE/AMEX firms are expected to be associated with much larger firms than those of over-the-counter firms (OTC). It is well acknowledged that larger firms tend to be followed more closely and by a greater number of analysts, thus reducing information asymmetry. Both of these contentions suggest that the higher the listing standards, the less the *ex ante* uncertainty about the value of the bond IPO and consequently, the lower the degree of underpricing.⁴

Using a sample of 50 straight bond IPOs between 1976 and 1992, we document that the average initial-day excess return to investors of initial public offers of bonds, while positive, is not statistically different from zero. Since, unlike the equity IPO market, there is a high degree of informational homogeneity across investor groups in the corporate bond market, our finding is consistent with theoretical models that predict no underpricing when investors are homogeneous. In addition, consistent with the notion of market efficiency, the aftermarket abnormal performances for the full sample of bond IPOs and for various subsamples are not significantly different from zero. Only the subsample of bonds underwritten by non-Drexel, low-quality investment banks exhibit a positive and marginally significant cumulative mean excess return over a three-month period. When we examine various subsets of the full

⁴ Since a majority of bond trades occur in the OTC market whether or not the bond is listed on an exchange, it is more instructive to examine the pricing of the bond IPO based on the firm's equity listing. Not only does the equity listing proxy for firm size, it also provides certification of the quality of the IPO since the market listing implies that the firm meets the minimum exchange listing requirements.

sample of bond IPOs, we document significant differences between the subgroups with respect to initial-day excess return. Specifically, we find that low quality or junk issues tend to be significantly underpriced, while investment grade issues are significantly overpriced. Investment grade bond IPOs are found to be underwritten by more prestigious investment banks and tend to be issued by firms listed on NYSE/AMEX, whereas junk bond IPOs are typically underwritten by less prestigious investment banks and are primarily issued by OTC firms. Overall, our findings are consistent with the notion that junk bonds behave more like equity than investment grade debt.

The remainder of the article is organized as follows. Section I details the sample formation process and describes the data. The methodology is provided in Section II. The results of the analysis are presented in Section III. Section IV concludes the study and summarizes the results.

I. Sample Selection and Description

A preliminary sample of initial public offerings of corporate straight bonds made between January 1976 and December 1992 is obtained from two sources. The initial public offers of bonds made during the period 1976–1988 are obtained from the Securities and Exchange Commission's *Registered Offerings Statistics (ROS) tape*. This sample of firms is then cross-checked with *Moody's Manuals* to verify that the firms did not have any preexisting public straight debt outstanding. Since the ROS tape ends in 1988, we collect bond IPOs issued during the period 1989–1992 through the following method. We first collect all bond offerings from the *Calendar of New Offerings* section of *Standard and Poor's Bond Guide*. For each debt offering made between 1989 and 1992, we then search the *S&P's Bond Guide* in which the new bond offering appears, to determine whether the offering firm has other straight bond issues traded at the time of the offer. All firms with other traded straight debt are omitted from the sample. This results in a sample of all firms issuing debt with no other straight debt trading at the time of offer. This sample of potential bond IPOs is then screened further through use of various *Moody's Manuals* to determine whether the firm had any outstanding public straight debt prior to the offer announcement. If a firm had no outstanding issues during the offer year, we check previous *Moody's Manuals* at three-year intervals going back until the firm's inception as a public entity.

During the 17-year period of the study, we identify 237 firms that made a straight bond initial public offering. Observations are deleted from the initial sample if the issue is thinly traded in the aftermarket. The final sample contains 50 initial public offerings of straight bonds.⁵

⁵ Our finding that daily bond price data is available for about 21 percent of the original sample of straight bond IPOs is consistent with the findings of Dhillon and Johnson (1994). For 178 firms that announced large dividend increases, they find only 46 bonds with sufficient daily price data—a success rate of approximately 25 percent.

We collect the daily prices for each sample bond from *Data Resources Inc. (DRI)* database or the *Dow Jones Tradeline* database for six months (131 trading days) after the *first* day of trading of the bond IPO (which is not necessarily the day after the offering).⁶ Both *DRI* and *Tradeline* prices reflect actual bond transaction prices and are not matrix prices. Treasury bond prices with matching coupons and maturities as those of the sample bonds are also collected from *DRI* and *Tradeline* databases. To compute daily returns from bond prices, with cumulated daily coupon interest, *Moody's Bond Survey* is used to identify the interest payment dates of the sample bonds and their bond ratings. Finally, the exact offering dates are identified from the *SEC tape* and cross checked with *Moody's Bond Survey* or *Standard and Poor's Bond Guide* for accuracy. Information concerning the bond IPOs—such as the main underwriter, purpose of the issue, etc.—is collected from *Moody's Bond Survey*, *Standard and Poor's Bond Guide*, and *Moody's Manuals*. Finally, financial variables are retrieved from COMPUSTAT tapes and supplemented with information from *Moody's Manuals* where necessary.

Panel A of Table I describes the sample in terms of bond rating at the time of issue. Only about a third of the sample bonds are rated investment grade. Panel B, which segregates the bonds by market listing, indicates that over two-thirds of the sample bonds (70 percent) are issued by firms listed on either the NYSE or AMEX exchanges. Panel C of the table partitions the sample by the quality of the investment bank managing the bond offer. Our sample indicates that 69 percent of the bonds are underwritten by low quality investment banks. Of the less prestigious investment banks, Drexel was the underwriter for 9 of 33 issues. Panel D reports the trading distribution of the bond IPOs over the six month period. Seventy six percent of the bonds have 65 or more trades during the six month period.

Table II documents some attributes of the issuing firms and their initial public bond offerings. The average (median) size of the firm issuing the bond IPO, as measured by the market value of equity, is \$583.20 million (\$207.53 million). The mean (median) time lag between stock IPO and bond IPO is 3.89 (2.33) years, suggesting that our sample bond IPOs occur fairly early in the firm's life. The mean (median) issue size is \$114.99 million (60.00 million) with a range between \$14 million and \$400 million. This is much larger than the average size of common stock IPOs. For example, Ritter (1991) reports that the average size of equity IPOs is \$13.8 million. Underwriter compensation as a percent of the issue size is 2.31 percent, on average, which is larger than the 1.3 percent for seasoned bond offers reported by Mikkelsen and Partch (1986). Moreover, total expenses for the bond offer, including underwriter compensation, as a percent of issue size varies from a low of 0.53 percent to a high of 7.38 percent, with a mean of 2.96 percent.

⁶ Datta and Dhillon (1993) and Bagnani, Milonas, Saunders, and Travlos (1994), among others, use daily bond prices from the WSJ or one of the commercial databases.

Table I
Sample Description of 50 Bond Initial Public Offerings Issued during 1976–1992

Initial public offerings of bonds are obtained from the Securities Exchange Commission's *Registered Offerings Statistics* tape (for the years 1976–1988) and from examination of all debt offerings in *Standard & Poor's Bond Guide* and *Moody's Manuals* (for the years 1989–1992). Daily bond prices are obtained from *Data Resources Inc.* database and *Dow Jones Tradeline* for 131 trading days after the first day of trading of the bond IPO. Investment bankers quality is measured using Carter and Manaster's (1990) rankings. Issues with a ranking of 9 are considered prestigious while all issues with ranking of less than 9 are categorized as less prestigious. Market listing reflects the listing of the firm's equity.

Variable	Number of Firms	Percent of Firms
Panel A: Moody's Bond Rating		
Aa	4	8.00
A	9	18.00
Baa	5	10.00
Ba	5	10.00
B or lower	25	50.00
NR	2	4.00
Panel B: Market Listing		
NYSE/AMEX	35	70.00
OTC	15	30.00
Panel C: Investment Bank Quality ^a		
Prestigious	15	31.25
Less prestigious	33	68.75
Drexel	9	18.75
Non-Drexel	24	50.00
Panel D: Bond Trading Distribution		
Trades > 95	32	64.00
65 > Trades ≥ 95	6	12.00
35 > Trades ≥ 65	5	10.00
35 ≥ Trades	7	14.00

^a The underwriter of the bond offering was unavailable for two issues.

II. Bond Event Study Methodology

The mean-adjusted returns methodology adapted for bonds by Handjinicolaou and Kalay (1984) is used to estimate excess bond returns. To adjust for changes in the term structure of interest rates, each corporate bond is matched with a treasury bond according to maturity and coupon rate. A 71-day post-IPO interval is used to estimate the comparison and announcement period returns. The day of the initial public bond offering is identified as day 0 in event time and the first trading day as day +1. The comparison period is day $t + 61$ to day $t + 131$. The adjusted bond return is calculated as the holding period return for

Table II
Descriptive Statistics of 50 Initial Public Offerings of Bonds and Their Underwriting Characteristics

Variables related to the offering are obtained from *Moody's manuals*, *Investment Dealer's Digest*, and the Securities and Exchange Commission's *Registered Offerings Statistics* tape. Common equity, obtained from the Center for Research in Security Prices (CRSP) tapes, is the market value of the common stock measured at the month-end prior to the bond IPO.

Variables	Mean	Median	Minimum	Maximum
Common equity (\$mil)	583.20	207.53	3.84	2631.72
Time between stock and bond IPOs (years)	3.89	2.33	0.00	12.28
Amount of issue (\$mil)	114.99	60.00	14.00	400.00
Issue's maturity (years)	12.10	10.00	5.00	30.00
Offering price	98.21	100.00	52.59	100.00
Compensation/amount of issue (%)	2.31	3.00	0.53	5.46
Compensation and expenses as percent of amount of issue (%)	2.96	3.58	0.53	7.38

each firm minus the return over the same period for the matched treasury bond. Daily accrued coupon interest is added to the price change to calculate the bond's holding period return. Since bond returns are a series of single and multiple day returns, they are adjusted to yield equivalent *single day* returns. The mean excess return for the portfolio of bonds for each day over the entire 60-day period is then estimated (for further details, see Handjinicolaou and Kalay). Although we report unstandardized excess returns, the *z*-statistics are based on standardized returns.

III. Empirical Results on the Pricing of Initial Public Offers of Straight Debt

A. Initial-Day Returns

Panel A of Table III presents the daily mean bond excess return for the full sample following an initial public offering of straight debt. The average excess bond return for the full sample of 50 bond IPOs on day 1 is 0.15 percent,⁷ which is statistically insignificant with a *z*-statistic of 0.67. This result is corroborated by the insignificant nonparametric sign *z* value of -1.41.⁸ Initial-day

⁷ We report mean *unstandardized* excess returns to be consistent with the results reported in equity IPO studies. Handjinicolaou and Kalay (1984), Datta and Dhillon (1993), and Dhillon and Johnson (1994) report standardized excess returns that are *technically* not percentage returns. However, the *standardized* mean excess returns are very similar to the *unstandardized* returns.

⁸ When computing the raw initial-day returns for the whole sample, the results are similar to those obtained using mean-adjusted and yield-curve-adjusted excess returns. Raw initial-day return is defined as $(CP - OP)/OP$, where CP is the closing price on the first day the bond trades and OP is the offering price. The raw initial day return of -0.22 percent is also insignificant with a *t*-statistic of -1.35.

Table III

Daily Mean Bond Excess Returns and Cumulative Bond Excess Returns for Three Months Following Initial Public Offering

The mean adjusted returns methodology adapted for bonds in Handjinicolaou and Kalay (1984) is used to estimate excess bond returns that adjust for changes in the term structure of interest rates and multiple day returns. The comparison period, day $t + 61$ to day $t + 131$, is used to estimate the comparison and announcement period returns. The day of the initial public offering is identified as day 0 in event time and the first trading day as day +1. BER is the daily mean bond excess return; CER is the cumulative bond excess return; Pos:Neg is the number of positive to negative excess bond returns.

Panel A: Initial-Day Bond Excess Returns (BER)			
Trading Day	BER (%)	z-statistic	Pos:Neg
1	0.154	0.67	20:30
2	0.769*	2.09	17:19
3	-0.753*	-2.05	18:18
4	-0.101	-0.28	14:21
5	0.034	0.09	16:18
6	-0.012	-0.03	15:23
7	0.037	0.10	20:16
8	-0.240	-0.65	18:15
9	-0.111	-0.30	14:19
10	-0.283	-0.77	13:20
Panel B: Aftermarket Cumulative Bond Excess Returns Over Various Holding Periods (CER)			
Holding Period	CER (%)	z-statistic	Pos:Neg
2-5	-0.051	-0.08	21:20
2-10	-0.650	-0.60	19:29
2-20	0.711	0.53	27:23
2-30	0.883	0.69	27:23
2-40	1.049	0.75	28:22
2-50	1.454	1.15	29:21
2-60	1.362	0.97	26:24

* Significant at the 0.05 level.

excess returns (BER_1) range between -13.64 percent and 34.52 percent.⁹ Consistent with Ibbotson's (1975) finding for equity IPOs, a large number of bond IPOs appear to be overpriced since the initial-day return for 30 offers is negative. In contrast to equity IPOs, these results document that underwriters, on average, do not underprice IPOs of straight debt.¹⁰ This finding is

⁹ Raw initial-day returns (unadjusted for shifts in the treasury yield curve and estimation period returns) vary from a low of -7.54 percent to a high of 1.66 percent. Clearly, the differences between raw returns and excess returns are due to the adjustments for the term structure of interest rates and comparison period return estimates. It is instructive to note that interest rates varied dramatically during our sample period and hence the adjustment for term structure of interest rates is appropriate.

¹⁰ Although the mean bond excess returns on days +2 and +3 (0.77 percent and -0.75 percent) are significant, they are clearly driven by outliers. On day +2, even though the mean excess return

consistent with the notion that the degree of underpricing should be lower for bond IPOs (as opposed to stock IPOs) because institutional investors, who are well-informed, dominate the bond market. Thus, we provide new evidence that supports Rock's (1986) model which is based on informational asymmetry between informed and uninformed investors. Moreover, similar to the findings of Loderer, Sheehan, and Kadlec (1991), our results suggest that underwriters appear to be able to accurately price new securities, on average, by observing the prices on other traded claims of the firms, e.g., equity.¹¹

The cumulative abnormal bond excess returns for various intervals following the initial offer are presented in Panel B of Table III. Similar to the findings in Panel A, there appears to be no evidence of systematic overpricing or underpricing in the aftermarket. It does not appear that investors can purchase the bonds in the aftermarket and generate excess returns over any of the holding periods examined. Hence, our results for the full sample are consistent with the notion of bond market efficiency.

B. Cross-Sectional Analysis

We now examine the hypotheses stated earlier through cross-sectional regression analysis. Various configurations of the following model are estimated.

$$\begin{aligned} \text{SER}_i = & \beta_0 + \beta_1 \text{LAG}_i + \beta_2 \text{AMOUNT}_i + \beta_3 \text{QUALITY}_i + \beta_4 \text{COMP}_i \\ & + \beta_5 \text{LISTING}_i + \beta_6 \text{RATING}_i + \varepsilon_i \end{aligned} \quad (1)$$

where

- SER_i : is the initial-day standardized bond excess return after a bond IPO by firm i ,
- LAG_i : is the time lag between equity IPO and bond IPO for firm i ,
- AMOUNT_i : is the amount of the issue standardized by the sum of the market value of equity and the book value of debt for firm i ,
- QUALITY_i : represents the quality ranking of the lead investment banker as quantified by Carter and Manaster (1990) for the bond IPO by firm i ,

is positive, only 17 of the excess bond returns are positive while 19 are negative. Similarly, while mean excess return for day +3 is negative, the number of negative and positive bond excess returns are equal.

¹¹ We also examine whether the initial-day return at the equity IPO is related to the initial-day bond excess return at the straight bond IPO. The exact announcement date of the equity IPO, the offer price and daily returns at the equity IPO, are only available for a subset of the bonds examined in this study. For the firms with adequate data, the initial-day excess return at the equity IPO is a statistically significant 11.41 percent. The magnitude of the mean excess return at the equity IPO for the firms in our sample is consistent with that reported in previous studies. Further, the correlation coefficient between the initial-day stock return at the stock IPO and the excess bond return at the bond IPO is an insignificant -0.081 , suggesting that there is no systematic relationship between underpricing at the equity IPO and subsequent pricing of debt.

Table IV
Ordinary Least Squares Regression Explaining the Initial-Day
Standardized Excess Returns for 50 Bond IPOs Issued During
1976–1992

LAG represents the number of months from stock initial public offering to bond initial public offering, AMOUNT denotes the amount of the issue standardized by the market value of the stock plus the book value of total debt, QUALITY represents the quality of the investment bank as quantified by Carter and Manaster (1990), COMP denotes the underwriter compensation as a percent of the amount of the issue, LISTING takes a value of 1 if the firm is listed on *New York Stock Exchange* or *American Stock Exchange* and 0 for OTC firms, and RATING takes a value of 0 if the issue is junk quality and 1 if it is of investment quality. The dependent variable is the initial-day standardized excess bond return. *t*-statistics are computed using White's (1980) correction.

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
CONSTANT	5.102 (1.44)	-1.409 (-1.28)	0.051 (0.03)	-2.263 (-1.07)	-6.809 (-2.45)
LAG	-0.027 (-0.16)	0.036 (0.11)	-0.052 (-0.32)	0.191 (0.63)	0.368 (0.23)
AMOUNT	-0.012 (-1.12)	-0.003 (-0.53)	-0.009 (-0.00)	-0.008 (-1.28)	-0.007 (-1.16)
QUALITY	-0.608** (-1.41)	—	—	—	—
COMP	—	42.283** (2.07)	—	—	—
LISTING	—	—	-1.295** (-1.77)	—	-0.927** (-1.64)
RATING	—	—	—	-3.644* (-2.29)	-3.325** (-1.68)
R ²	0.053	0.126	0.115	0.167	0.183
Adjusted R ²	0.004	0.052	0.055	0.111	0.111

* Significant at the 0.01 level.

** Significant at the 0.05 level.

- COMP_{*i*}: is the underwriter's compensation as a percent of issue proceeds for firm *i*,
 LISTING_{*i*}: takes a value of 1 if firm *i* issuing the bond IPO is listed on the NYSE/AMEX, or 0 if the firm is listed on OTC,
 RATING_{*i*}: takes a value of 1 if the bond IPO for firm *i* is rated Baa or higher (investment grade) and 0 otherwise, and
 ε_{*i*}: is the random error term for firm *i*.

While the regression results presented in Table IV are estimated using ordinary least squares (OLS), the significance levels are computed using White's (1980) correction for heteroskedasticity. Since investment grade bonds are more likely to be issued by higher quality investment banks and/or by firms listed on NYSE/AMEX, we analyze the degree of correlation between these variables as shown in Table V. Consistent with our expectations, the quality of the bond IPO is significantly positively correlated with the quality of the

Table V

Pearson Correlation Coefficients for Variables Related to Bond IPOs

QUALITY represents the quality of the investment banker as quantified by Carter and Manaster (1990), COMP denotes the underwriter compensation as a percentage of the amount of the issue. RATING takes a value of 0 if the issue is junk quality and 1 if it is of investment quality, and LISTING takes a value of 1 if the firm was listed on *New York Stock Exchange* or *American Stock Exchange* and 2 for over-the-counter market firms. *p*-values are in parentheses.

Variables	Quality	Comp	Rating	Listing
QUALITY	1.000	-0.630 (0.000)	0.451 (0.001)	-0.280 (0.056)
COMP		1.000	-0.815 (0.000)	0.381 (0.015)
RATING			1.000	-0.280 (0.049)
LISTING				1.000

investment bank and significantly negatively correlated with underwriter compensation as a percent of the issue size. In addition, firms with higher quality bonds are more likely to be listed on NYSE/AMEX.¹² The presence of collinearity among the noncontrol variables precludes us from including all variables in the same model.

The control variables used for the cross-sectional regression are the relative issue size (AMOUNT), and the time lag (LAG) between the equity IPO and the bond IPO. Relative issue size is defined as the size of the bond issue divided by the sum of the market value of equity and the book value of debt.¹³ Similar to Beatty and Ritter (1986), this variable is used to proxy ex ante uncertainty about the issue. If the relative size of the issue is inversely related to the degree of ex ante uncertainty, AMOUNT should be negatively related to the degree of underpricing, i.e., the larger the offering, the smaller the initial-day return. The time lag between equity IPO and bond IPO is used to proxy for the degree of information asymmetry surrounding the firm.¹⁴ The larger the time lag between equity IPO and bond IPO, the greater the expected amount of information available about the firm, and hence, the lower the degree of information asymmetry. Neither of these variables is significant in any of the five models. The insignificance of our size variable is similar to results obtained by Carter and Manaster (1990) in their study of stock IPOs.

¹² The results based on Spearman correlations are essentially identical to those reported in Table V.

¹³ Four alternative specifications are considered. They are the inverse of the absolute amount of the issue, the log of (1 + the number of uses of the offering proceeds) (Beatty and Ritter (1986)), the natural logarithm of the issue size (Michaely and Shaw (1994), Carter and Manaster (1990)), and the issue size standardized by the market value of equity. None of these variables is statistically significant and hence the results are omitted for space considerations.

¹⁴ The natural logarithm of the time lag between equity IPO and bond IPO is used as an alternate specification. The results are similar to those presented in this article.

In Models 1 and 2, we examine the role of underwriter reputation for the bond IPO market. If underwriter reputation is useful in reducing information asymmetry, then the degree of underpricing should be inversely related to the quality of the underwriter. The results in Model 1 are consistent with this hypothesis. This finding for bond IPOs is consistent with the results of equity IPO studies, which show that investment bank reputation is an important determinant of IPO return.

In Model 2, the variable COMP is used as another proxy for underwriter reputation. Booth and Smith (1986) propose that underwriting certification cost is a function of the potential impact of asymmetric information between insiders of the issuing firm and outside investors. Not surprisingly, the degree of underpricing is positively and significantly related to underwriter compensation as a percentage of issue size. This result suggests that the greater the certification cost (due to larger asymmetric information between insiders and outsiders), the greater the underpricing of the bond IPO.

In addition, market listing has explanatory power in Models 3 and 5 suggesting that bond IPOs of NYSE/AMEX firms are less underpriced than those of OTC firms. This result is consistent with the notion that market listing provides certification for bond IPOs. It is also congruent with the view that NYSE/AMEX firms, which are typically followed by more analysts, have less information asymmetry.

The results for investment bank reputation and market listing are not specific to bond IPOs, but are general to IPOs of all financial assets. We now examine a hypothesis that is more specific to bond IPOs. Bonds are rated by an independent agency, and this rating essentially certifies the financial strength of the firm. Moreover, since lower rated bonds have a larger equity component, they should behave more like equity than investment grade bonds. Therefore, the degree of bond underpricing should be negatively related to the quality of the issue. Models 4 and 5 indicate that investment grade bonds (BBB or better) are significantly less underpriced than junk bonds.¹⁵ This result supports the notion that junk bond IPOs are more akin to equity IPOs than initial offerings of investment grade debt. Further, this finding is also consistent with Beatty and Ritter's (1986) proposition on *ex ante* uncertainty.¹⁶ To assess the contribution of the LISTING variable to Model 5, we compute the *F*-statistic. The *F* value of 0.90 indicates that the marginal explanatory power of the LISTING variable is insignificant.

¹⁵ We reestimate the model using a slightly different classification of investment grade and junk debt, where we define investment grade to be A or better and junk grade as BBB or lower. In addition, the variable RATING is also specified as a discrete variable that takes on values from 1 to 6 based on *Moody's* bond rating. A break down of the ratings assigned by *Moody's* is given in Table I. The results using these specifications are similar to those presented in the article.

¹⁶ In another variation of the model, we add the subordination status of the bond as an explanatory variable. This variable is found to be unrelated to the degree of underpricing.

Table VI

**Initial-Day Mean Excess Bond Return (%) by Different Risk Proxies
of the Initial Public Bond Offering**

Investment bankers quality is measured using Carter and Manaster's (1990) rankings. Issues with a ranking of 9 are considered prestigious, while all issues with ranking of less than 9 are categorized as less prestigious. Market listing reflects the listing of the firm's equity. High grade bonds are those with a Baa rating or above while low grade issues are those rated Ba or lower. The purpose of the offering is obtained from *Moody's Manuals* or the *Investment Dealer's Digest*. The initial day excess return is calculated using the mean adjusted returns methodology adapted for bonds in Handjinicolaou and Kalay (1984), which adjusts for changes in the term structure of interest rates and multiple day returns.

Categories	Initial-Day Excess Return	z-Statistic	Minimum	Median	Maximum
Investment bank quality					
Prestigious	-0.677	-1.56	-13.64	-1.95	25.91
Less prestigious	0.853**	2.02	-13.15	-0.98	34.52
Drexel	1.444	0.86	-13.15	-0.31	15.53
Non-Drexel	0.631**	2.58	-10.36	-0.06	34.52
Market listing					
NYSE/AMEX	-1.777*	-2.72	-13.64	-1.64	15.53
OTC	4.659*	13.07	-6.68	-0.39	34.52
Bond rating					
High grade	-2.876*	-5.84	-13.15	-2.25	9.74
Low grade	1.858*	7.39	-13.64	-0.31	34.52

* Significant at the 0.01 level.

** Significant at the 0.05 level.

C. Univariate Analysis

In this section we present univariate analysis for three subsamples based on (a) the investment bank quality, (b) the market listing, and (c) the bond rating. Although the regression analysis reveals the relative pricing of the various subsamples, it is unclear whether they are overpriced, fairly priced, or underpriced on an absolute basis. The univariate results presented in Table VI address this issue. Based on Carter and Manaster's (1990) rankings, we define the investment bank as being less prestigious if the Carter-Manaster ranking is less than 9; otherwise, the investment bank is defined as being prestigious. While the initial-day excess return of 0.85 percent for bond IPOs underwritten by less prestigious investment banks is positive and statistically significant, the comparable figure for issues handled by prestigious underwriters of -0.68 percent is negative and insignificant. Our results indicate that the degree of underpricing is inversely related to the quality of the underwriter which is consistent with the results obtained by equity IPO studies.

Given that Drexel had a pioneering role in the junk bond market, we examine whether our results for bond IPOs underwritten by less prestigious investment banks is driven by bonds handled by Drexel. Our analysis reveals that the initial-day return for the non-Drexel group of 0.63 percent is statis-

tically significant. The initial-day return of 1.44 percent for the Drexel subsample, although larger in magnitude, is insignificant, perhaps due to the small size of this subsample. However, the mean excess returns for these two groups are not statistically different, indicating that our results are not sensitive to issues underwritten by Drexel.

Consistent with our earlier stated hypothesis, we find that the degree of underpricing is lower for bonds of NYSE/AMEX firms as opposed to OTC firms. In fact, bonds issued by NYSE/AMEX firms are significantly overpriced with a mean initial-day excess return of -1.78 percent. On the other hand, bonds of OTC firms are significantly underpriced with an initial-day excess return of 4.66 percent ($z = 13.07$). The mean excess returns for the two groups are statistically different ($t = 2.65$), which is consistent with Affleck-Graves *et al.*'s (1993) notion of trading system certification.

As shown in Table VI, the mean initial-day excess return for junk grade bonds is a statistically significant 1.86 percent ($z = 7.39$), while the corresponding excess return for investment grade bonds of -2.88 percent, is negative and significant at the 1 percent level. Consistent with our earlier results, the mean excess returns for the two groups are significantly different at the 1 percent level ($t = 4.70$).^{17,18} However, what appears to be overpricing at issuance may not be *economically* significant if the bid-ask spread in after-market trading is taken into consideration.¹⁹

D. Aftermarket Performance

Table VII examines the aftermarket performance for subsets of bond IPOs segmented on the basis of the quality of the bond issue, the quality of the investment bank, and the market listing of the firm. The cumulative bond excess returns are measured over various intervals after the offering date. The aftermarket performance of the different subsets are similar indicating that

¹⁷ To test one of Myers and Majluf's (1984) predictions, we examine whether the change in stockholder wealth at bond IPO offer announcement differed for safe investment grade debt versus risky junk grade debt. Excess returns during the two-day announcement period are calculated for each firm using standard event-study methodology. The two-day excess return for firms announcing offers of investment grade bonds is not found to be more positive than that observed for firms announcing offers of below-investment grade bonds. This result is consistent with previous findings of Eckbo (1986) and Shyam-Sunder (1991), who examine offers of seasoned debt.

¹⁸ We further examine junk bond IPOs by subdividing these issues into two groups: (1) those underwritten by prestigious bankers and (2) those underwritten by nonprestigious bankers. The results indicate that the underwriter's reputation plays a significant role in the pricing of junk bond IPOs. Specifically, we find that junk issues underwritten by nonprestigious bankers tend to be significantly underpriced (2.08 percent), while junk issues handled by prestigious underwriters are correctly priced.

¹⁹ Hegde and Miller (1989) document that the average bid-ask spread in the first month following an equity IPO is nearly 4 percent. Unfortunately, the bid-ask spread for the bond market is not directly comparable to that of the stock market because of the nature of bond trading. The majority of bond trading is conducted off-the-floor, predominantly by institutional investors, where buy and sell orders are matched. Hence, the bid-ask spread may have a large variance. As such, no definitive statement can be made concerning the *economic* significance of this result.

Table VII

Aftermarket Performance for Subsamples of Bond IPOs

Bond IPOs with a *Moody's* rating above Ba are considered high quality, whereas bonds with ratings lower than Baa are classified as low quality. Issues with a Carter and Manaster (1990) ranking of 9 are considered high quality, while all issues with ranking of less than 9 are categorized as lower quality. Market listing are categorized into two groups: (a) firms listed on New York Stock Exchange/American Stock Exchange (NYSE/AMEX) and (b) firms trading on Over the Counter (OTC). The mean adjusted returns methodology adapted for bonds in Handjinicolaou and Kalay (1984) is used to estimate excess bond returns, which adjusts for changes in the term structure of interest rates and multiple day returns. The comparison period, day $t + 61$ to day $t + 131$, is used to estimate the comparison and announcement period returns. The day of the initial public offering is identified as day 0 in event time and the first trading day as day +1.

Days	Quality of Issue by Rating		Quality of Investment Baker				Market Listing	
	Low Grade	High Grade	Low Quality			High Quality	NYSE/AMEX	OTC
			Total	Drexel	Non-Drexel			
1	1.86*	-2.88*	0.85**	1.44	0.63**	-0.68	-1.78*	4.66*
2-5	-0.73	1.16	1.24	1.09	1.31*	-1.76	-0.36	0.68
2-10	-1.58	1.00	0.75	0.98	0.61	-2.90	-0.83	-0.24
2-20	0.45	1.18	1.45	1.36	1.46	-1.51	0.70	0.73
2-30	0.83	0.96	1.56	0.57	1.83	-0.58	0.82	1.02
2-40	1.15	0.87	2.63	1.99	2.67***	-1.33	1.14	0.87
2-50	1.95	0.56	3.45	1.78	3.89**	-2.06	1.54	1.24
2-60	2.50	-0.67	3.88	1.48	4.63***	-1.96	1.57	0.89

* Significant at the 0.01 level (using two-tailed test).

** Significant at the 0.05 level (using two-tailed test).

*** Significant at the 0.10 level (using two-tailed test).

the bond market is efficient in the aftermarket. Neither junk nor investment grade bond IPOs exhibit abnormal performance in the aftermarket over any of the intervals. The cumulative excess return of 2.50 percent over days 2 to 60 for the junk bonds, is not statistically different from the cumulative excess return (-0.67 percent) computed over the same period for the investment grade bond sample.

The aftermarket cumulative excess return for bonds issued through high quality investment banks is -1.76 percent over days 2 to 5, and -1.96 percent over days 2 to 60. In contrast, bonds underwritten by low quality investment banks experience a steady increase in cumulative excess returns from 1.24 percent over days 2 to 5, to 3.88 percent over days 2 to 60. The aftermarket performances over days 2 to 60 for the groups of bonds underwritten by low quality versus high quality investment banks are not statistically different. When the sample of bonds underwritten by low quality investment banks is further partitioned into Drexel and non-Drexel sub-groups, the results indicate that the subsample of bonds handled by non-Drexel investment banks cumulate, over days 2 to 60, a marginally significant positive mean excess return of 4.63 percent. The aftermarket performance for bonds of NYSE/AMEX listed

firms versus those that are listed on the OTC indicate no significant differences. Both groups consistently exhibit normal aftermarket performance.

IV. Discussion and Summary

This study contributes to the extant literature on the pricing of new securities by presenting new evidence on the initial-day and aftermarket price performance of corporate bond IPOs. In contrast to equity IPOs, we document that straight bond IPOs are not statistically underpriced, which supports IPO models that predict no underpricing when informational asymmetry across investors groups is minimal. Since in the bond market well-informed institutional investors dominate, informational asymmetry is expected to be limited. Our finding is also consistent with theoretical models that suggest that the degree of underpricing is related to the distribution of informed and uninformed investors. Moreover, our results indicate that, on average, underwriters are able to accurately price debt IPOs. This finding is consistent with and complements the findings of Loderer, Sheehan, and Kadlec (1991) for the pricing of seasoned equity offers and new issues of preferred stock.

Our analysis reveals that not all corporate straight debt securities are priced similarly at issue. Junk bond IPOs, which behave akin to equity IPOs, are significantly underpriced at issue while investment grade IPOs are significantly overpriced at offering. This result supports the view that riskier debt offers have a larger equity component and consequently have a higher degree of information asymmetry. This finding also indicates that the bond rating provides additional certification and mitigates the *ex ante* uncertainty associated with the new offer. One possible explanation for the intriguing result of overpricing of investment-grade bond IPOs may be the price competition among investment bankers. It is more likely that underwriters will compete more for high quality than for low quality issues. Lower quality issues would involve a higher risk to underwriters since junk bonds are more sensitive to company-specific information. That is, information asymmetry between the underwriter and the issuing firm is more of a concern to underwriters in the case of junk issues. In addition, the price competition among underwriters for investment grade issues has been intensified by the introduction of Rule 415 (shelf registration).²⁰ Kidwell, Marr, and Thompson (1984) find that bond issues offered under shelf-registration have lower yields and underwriter fees.

Our research reveals several other important results. We document that initial public offers of straight debt underwritten by low quality investment banks experience a significantly positive initial-day mean excess return, while the comparable return for issues handled by high quality investment banks are negative but insignificant. This result suggests that the degree of underpricing for bond IPOs, like stock IPOs, is inversely related to the reputation of

²⁰ Conversations with various underwriters confirm our arguments that scarcity of high quality bonds in general and price competition among underwriters are the main contributing factors to the documented overpricing in investment grade offerings.

the investment bank. We also find that market listing plays an important role in determining the initial-day price performance of bond IPOs. The degree of underpricing is found to be lower for bonds of NYSE/AMEX firms as compared to those issued by OTC firms. This finding is consistent with our contention that market listing provides certification for bond IPOs. The aftermarket performance for the full sample and various subsamples is consistent with the notion of bond market efficiency. Only bonds underwritten by non-Drexel low-quality investment banks cumulate mean excess returns that are positive and marginally significant.

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