

CONVERTIBLE DEBT ISSUANCE, CAPITAL STRUCTURE CHANGE AND FINANCING-RELATED INFORMATION

Some New Evidence*

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Received December 1982, final version received December 1983

This paper provides evidence on the valuation effects of convertible debt issuance. Common stockholders earn significant negative abnormal returns at the initial announcement of a convertible debt offering, and also at the issuance date. In contrast, the average valuation effect on common stock at the announcement of non-convertible debt offerings is only marginally negative, and is zero at issuance. The significant negative average effect on common stock value appears not to be systematically related to either the degree of leverage change induced by the convertible debt issuance or the extent to which the proceeds from issuance are used for new investment or to refinance existing debt. If, as appears likely, the issuance of convertible debt on average increases financial leverage, these results are inconsistent with evidence from other recent studies documenting common stock price effects of the same sign as the change in leverage. The evidence suggests that convertible debt offerings convey unfavorable information about the issuing firms, but the specific nature of such information remains unidentified.

1. Introduction and overview

Corporations frequently issue debt that is convertible into common stock. However, despite the frequent use of convertible debt financing, analysis of the role of convertible debt in the corporate financing decision has received relatively little attention in the finance literature.¹ Moreover, the evidence that

*This paper has benefited from the helpful comments of H. DeAngelo, M. Hopewell, R. Masulis, D. Mayers, M. Partch, G. Racette, C. Smith, C. Stickney, P. Wier, the participants of finance workshops at Dartmouth College, New York University, Ohio State University, UCLA, the University of Minnesota, the University of Oregon and the University of Utah, and G. Hite, the referee for this journal. Valuable research assistance was provided by M. Ahearn, L. Maxfield, L. Mykrantz and D. Robinson. Both authors are currently visiting at the University of Chicago. Part of this work was completed while W. H. Mikkelson was at Dartmouth College.

¹Recent investigations include development of contingent claims valuation models for convertible debt and derivation of optimal call policy for outstanding convertible debt [Brennan and Schwartz (1977), Ingersoll (1977a,b)], a survey of issuers' stated reasons for issuing convertible debt [Hoffmeister (1977)], analysis of an agency cost motivation for issuance of convertible debt [Mikkelson (1980)] and analysis of security returns around announcements of calls of convertible debt [Mikkelson (1981)].

does exist raises, but does not fully answer, questions about how convertible debt financing affects stockholder wealth. For example, in a recent study of convertible debt, Mikkelson (1981) reports that announcement of the call of convertible bonds, when conversion is the economical response by bondholders, results in a statistically significant negative return to common stockholders and an estimated negative impact on aggregate firm value.² Unanswered questions raised by Mikkelson's study are (1) why does removal of convertible debt reduce stockholder wealth, (2) why do corporate managers voluntarily undertake these wealth-reducing actions, (3) why do corporations raise capital using convertible debt in the first place, and (4) what are the valuation effects of doing so.

Our study provides evidence on the valuation effect of the *issuance* of convertible debt. Our results enlarge the convertible debt puzzle. Common stockholders of firms issuing convertible debt during the years 1970 through 1979 earn statistically significant negative average returns at the initial announcement of a convertible debt offering. In contrast, the announcement of a straight (non-convertible) debt issue during the same time period is associated with an average common stock valuation effect that is not different from zero at the 0.05 level of statistical significance, but is significantly negative at the 0.10 level.

In analyzing the price response to the announcement of a convertible debt offering, we address several potential explanations of our findings, including: (1) announcement of a leverage decrease conveys unfavorable information about the firm, (2) financing new investment by issuing securities conveys unfavorable information about the firm, and (3) original issue underpricing transfers wealth from current securityholders to buyers of the underpriced security. Our evidence is not fully consistent with any of these potential explanations. The negative common stock valuation effect does not appear to be systematically related to the estimated leverage change induced by the added convertible debt, the extent to which the proceeds are used for new investment or to refinance existing debt, or possible underpricing of the new offerings.

We also compare the price effects of convertible debt issuance with those of other major capital structure changes. Viewed in this broader context, the negative price impacts of convertible debt issuance are apparently anomalous. Studies of exchange offers [Masulis (1978), McConnell and Schlarbaum (1981)], stock repurchases [Masulis (1980), Dann (1981), Vermaelen (1981)], convertible debt calls [Mikkelson (1981)], and common stock issuances [Korwar (1982), Asquith and Mullins (1983)] collectively document a consistent positive relation between the sign of a leverage change and the sign of the price impact on common stock. If, as the evidence appears to indicate, the issuance of convert-

²Statistical significance is not reported for estimated average firm value change.

ible debt on average increases financial leverage, the results presented here are an exception to this empirical regularity.

The paper is organized as follows: Section 2 describes the samples and methodology used. Section 3 presents an analysis of common stock returns around the dates of announcement and issuance of convertible debt and straight debt offerings. Potential explanations of the results are examined in section 4. Section 5 summarizes the results and presents the conclusions of the study.

2. Data sources and sample design

The initial sample of convertible debt issues consists of all (537) primary public offerings of convertible debt reported in the *Investment Dealers' Digest Corporate Financing Directory* during the years 1970 through 1979. A final sample of issues satisfies the following selection criteria:

- (1) The issuing company's daily common stock returns around the announcement and issuance are included in the CRSP Daily Returns File (245 of the 537 offerings meet this criterion).³
- (2) A pre-issuance date announcement of the convertible debt offering is identifiable in *The Wall Street Journal* (31 of 245 CRSP-listed offerings fail to meet this criterion).
- (3) No other securities were offered with the convertible debt issue and no other contemporaneous firm-specific announcements appear in *The Wall Street Journal* (41 offerings made simultaneously with other primary or secondary offerings, 16 exchange offers and 13 offerings with contemporaneous other announcements are excluded).
- (4) The convertible debt must be registered with the U.S. Securities and Exchange Commission and offered for sale in the U.S. (15 offerings made between late 1970 and early 1973 are excluded because they were not registered with the SEC and were offered for sale entirely outside of the U.S.).

The final sample consists of 132 public announcements of forthcoming convertible debt issues made by 124 different firms.⁴ Because the sample is

³The Center for Research in Security Prices, the University of Chicago.

⁴The security offerings section of the *Investment Dealers' Digest Corporate Financing Directory* only includes offerings that were proposed and completed. However, in the course of data collection two announcements of convertible debt offerings were identified that were later canceled, and one was subsequently modified and issued as non-convertible debt. These three observations are included in the announcement sample. Thus, the sample consists of 132 announcements of convertible debt offerings, but only 129 issuances.

Use of the *Investment Dealers' Digest* to identify convertible debt issuances imparts to the sample an *ex post* selection bias of unknown impact. However, the three announcements that were later canceled or modified do not appear to differ in any other systematic way from the 129 announcements for which the issuance did take place.

Table 1

Distribution of years of announcement of convertible debt public offerings in the final sample (132 announcements).

| Year of announcement | Number of announcements in the final sample |
|----------------------|---|
| 1969 ^a | 7 |
| 1970 | 23 |
| 1971 | 41 |
| 1972 | 15 |
| 1973 | 2 |
| 1974 | 3 |
| 1975 | 15 |
| 1976 | 6 |
| 1977 | 4 |
| 1978 | 7 |
| 1979 | 9 |
| 1969-79 | 132 |

^aIssued in 1970.

restricted to firms included in the CRSP Daily Returns File, all of the firms were listed on the New York or American Stock Exchange at the time of the offering announcement.

Table 1 presents the distribution of announcement dates by calendar years for the sample of 132 announcements of convertible debt public offerings. More than one-half of the announcements were made during 1970 through 1972, whereas only 5 announcements occurred during the period 1973-1974. No explanation for the concentration of announcements in the early 1970's has been uncovered.

Table 2 presents descriptive statistics regarding the average size and impact on financial structure for the final sample of public offerings of convertible debt.⁵ The first four rows indicate that the average size of the offerings was not insignificant. The median offering size was \$30.0 million. For the median firm, the convertible debt issue was 15% of the market value of common stock and 26% of total liabilities prior to the offering. Row (4) indicates that complete conversion of the median convertible debt issue would increase the number of common shares outstanding by 13%. According to row (5), at the time of the offering the conversion price exceeded the median issuing firm's stock price by 12%. With only two exceptions, the implicit option associated with the convertible debt issue was 'out of the money' at the time of the offering.

⁵Two complementary sources (*Moody's Manuals* and the offering prospectuses) provide the data from which the statistics in table 2 are compiled. Moody's provides relatively complete coverage (125 of 129 offerings) of the firms in the final sample, but financial structure information on these firms is only available for fiscal year-end, and therefore includes the effects of any other financing decisions made during the year of the convertible debt issuance. On the other hand, offering prospectuses provide actual and pro forma financial structure data at or shortly before issuance, thereby isolating the impact of the convertible debt offering, but only 76 of 129 offering prospectuses could be obtained.

Table 2
Descriptive statistics for the final sample of public offerings of convertible debt.

| Descriptive measure | Moody's Manuals data ^a | | Offering prospectus data ^b | |
|--|-----------------------------------|--------|---------------------------------------|--------|
| | Mean | Median | Mean | Median |
| (1) Issue size (\$ millions) | \$55.1 | \$30.0 | \$61.0 | \$35.0 |
| (2) (Issue size) ÷ (Market value of common stock) ^c | 0.22 | 0.15 | 0.22 | 0.15 |
| (3) (Issue size) ÷ (Total liabilities before the offering) ^{d,e} | 0.40 | 0.26 | 0.54 | 0.40 |
| (4) (Number of shares issued upon conversion) ÷ (Shares outstanding) ^c | 0.20 | 0.13 | 0.22 | 0.13 |
| (5) (Conversion price) ÷ (Stock price) ^c | 1.13 | 1.12 | 1.15 | 1.13 |
| (6) (Long-term debt before the offering) ^d ÷ (Market value of common stock) ^c | 0.58 | 0.26 | 0.63 | 0.28 |
| (7) (Total liabilities before the offering) ^{d,e} ÷ (Market value of common stock) ^c | 1.71 | 0.52 | 1.69 | 0.64 |
| (8) (Change in total liabilities) ^{d,e} ÷ (Issue size) | 1.57 | 0.75 | 0.48 | 0.33 |
| (9) (Debt ratio after the offering) ^f ÷ (Debt ratio before the offering) | 0.02 | 0.02 | 0.05 | 0.03 |

^aThe data represent 125 of 132 convertible debt financing announcements.

^bThe data represent 76 of 132 convertible debt financing announcements.

^cStock price is the closing price at the end of the week preceding the issuance date. Shares outstanding is the number reported at fiscal year-end following the issuance date.

^dAll debt obligations are measured at book value. For the data from Moody's Manuals, data from before the offering are measured from the fiscal year-end preceding the issuance date, and data from after the offering are measured at the fiscal year-end following the issuance date. For the data from the offering prospectuses, data from before the offering are as of the date provided in the Capitalization section of the prospectus, and data after the offering are the 'As adjusted' figures reported in the Capitalization section of the offering prospectus.

^eFor the data from Moody's Manuals, total liabilities represent long-term debt plus all current liabilities. For the data from the offering prospectuses, total liabilities represent long-term debt plus interest-bearing short-term debt.

^fFor the data from Moody's Manuals, the debt ratio is total liabilities (as defined in fn. e above) divided by total assets. For the data from the offering prospectuses, the debt ratio is total liabilities divided by the sum of interest-bearing debt and book value of equity.

Measures of the issuing firm's financial leverage prior to the offering are given in rows (6) and (7). As a proportion of the market value of common stock, fiscal year data (from *Moody's Manuals*) indicate that for the median firm long-term debt outstanding was 26% and total liabilities were 52%.⁶ Data from the offering prospectuses for a subset of these firms indicate that similar relative debt levels existed just prior to the offering.

⁶The striking difference between mean and median values for the total liabilities/common stock ratio in row (7) of table 2 is partially attributable to the high proportions of short-term debt claims in the financial structures of the nine commercial banks in the sample.

The change in total liabilities as a percentage of issue size reported in row (8) can be interpreted as a measure of the extent to which the convertible debt offerings represent new financing versus refinancing of existing debt. Offering prospectus data, which isolate the immediate financial structure impact of the convertible debt issuance, suggest that on average less than 50% of the issuance proceeds represented new financing. However, as will be shown in section 4, a closer look at the distribution of this measure indicates that approximately one-third of the issues represented virtually all (at least 90% of the proceeds) new financing, and another one-third of the issues were virtually all refinancing (at most 10% of the proceeds were new financing). Row (9) indicates that the average firm's financial leverage increased as a result of the issuance.⁷

The initial public announcement date of the convertible debt offering is defined as the earliest date news of the forthcoming issue appears in *The Wall Street Journal*. The earliest report of plans to offer convertible debt was identified in *The Wall Street Journal Index*. The article that appeared in *The Wall Street Journal* was also checked for any indication of an earlier public announcement of the debt offering. In most cases, the initial announcement in *The Wall Street Journal* reports the registration of the issue with the Securities and Exchange Commission. In the other cases, the issuing firm publicly announced plans to offer convertible debt prior to registration.

The stock price response to the initial announcement of a forthcoming new issue is measured over a two-day trading period that encompasses the publication date of the earliest report of the offering in *The Wall Street Journal* (day 0) and the preceding trading day (day - 1). This two-day announcement period return is utilized because it cannot be determined from published sources whether the initial post-announcement market transaction preceded or followed the close of trading on the trading day prior to the published announcement in *The Wall Street Journal*. Available evidence on capital market efficiency and other studies of the stock price responses to the announcement of capital structure changes suggest that most, if not all, of the price response to the initial announcement of a convertible debt offering is confined to this two-day trading period.⁸

For comparison purposes, a sample of 150 straight debt issuances was constructed by applying the same selection criteria used to form the final sample of convertible debt offerings. For each of the years 1970 through 1979, fifteen usable issuances of straight debt were selected randomly from the offerings reported in the *Investment Dealers' Digest*. Because only one firm in

⁷In computing the financial leverage measures given in rows (6) through (9) of table 2, the new convertible debt issue and any outstanding convertible debt are treated as debt claims.

⁸Masulis (1980), Dann (1981), Vermaelen (1981), and Mikkelson (1981) find that the common stock price response to announcements of capital structure changes are observed almost entirely in a two-day announcement period. No systematic patterns are found in the common stock returns following the announcement date.

the final sample of 132 convertible debt issuance announcements is a public utility company and many public utility companies frequently offer straight debt securities, offerings by public utility companies were excluded from the sample of straight debt issuances. The exclusion of public utility companies avoids a possible bias against finding no price response to the initial announcements of straight debt offerings, if debt issuances by these firms are anticipated to a greater degree by the capital market.

The announcement date of the straight debt issuances is the date of the earliest report of the debt offering in *The Wall Street Journal*. The common stock price response to a straight debt offering announcement is measured over the same two-day announcement period that is used for the convertible debt offerings. Initial announcements of convertible debt and straight debt offerings do not differ systematically in either timing or form.⁹

3. Empirical results

This section reports an analysis of common stock returns of firms issuing convertible debt or straight debt around the dates of both announcement and issuance. Even though the issuance date always follows the announcement date, the issuance date is examined because the specific terms of the offering such as the coupon interest rate, offering price and conversion ratio usually are announced just prior to the issuance. Therefore, the issuance date is also a potentially important date for disclosure of information relevant to the issue.

The common stock price impacts of convertible debt or straight debt announcement and issuance are measured relative to a benchmark estimated from the following market model:

$$r_{jt} = \alpha_j + \beta_j r_{mt} + u_{jt}, \quad (1)$$

where

r_{jt} \equiv rate of return on security j over period t ,

r_{mt} \equiv rate of return on the CRSP equal-weighted market index over period t ,

β_j \equiv $\text{cov}(r_{jt}, r_{mt}) / \text{var}(r_{mt})$,

α_j \equiv $E(r_j) - \beta_j E(r_m)$,

u_{jt} \equiv disturbance term of security j over period t with $E(u_{jt}) = 0$.

For each of the events, the market model (1) is estimated on daily returns for the period that begins 200 trading days before and ends 200 trading days following the event date, excluding the 121 trading days centered around the

⁹There does appear to be a systematic reporting difference by *The Wall Street Journal* between convertible debt and straight debt issuances at the issuance date. Of the 129 convertible debt issuances, 122 are mentioned in *The Wall Street Journal* on the issuance date. In contrast, only 102 of the 150 straight debt issuances were mentioned on the issuance date.

event date.¹⁰ The market model parameter estimates $\hat{\alpha}_j$ and $\hat{\beta}_j$ from this estimation period are used to predict equilibrium returns around the event (announcement or issuance) date, and the prediction errors (actual returns less predicted returns) are estimates of abnormal returns.

3.1. Common stock returns around the announcements of debt issuance

3.1.1. Convertible debt

For the announcements of 132 convertible debt offerings, table 3 presents a time series of average daily common stock prediction errors (*PE*) centered around the announcement dates (day 0). Column (1) identifies the trading day relative to the announcement date. Column (2) contains the average daily *PE*. The cumulative average common stock prediction errors (*CPE*) are reported in column (3).

The average two-day announcement period *PE* (days -1 and 0) is -2.31% and represents the largest two-day *PE* in absolute value for the entire 121 trading day period. The day -1 average return is -1.33% and the day 0 average return is -0.99% . In contrast, the mean two-day average *PE* for the surrounding period is -0.01% .

Column (3) indicates that the convertible debt offering announcements on average follow a slight positive cumulative abnormal return between trading days -60 and -2 , virtually all of which occurs between trading days -60 and -30 . Following announcement, there is a slight downward drift in the *CPE*, which, as will be shown later, is attributable principally to negative prediction errors at issuance (which for most companies came within 60 trading days of the initial announcement).

We test the null hypothesis that the two-day announcement period average prediction error equals zero using the following test statistic:

$$t = \overline{PE}_0 / \hat{\sigma}, \quad (2)$$

where \overline{PE}_0 is the two-day event period average prediction error and $\hat{\sigma}$ is the estimate of the standard deviation of two-day average prediction errors.¹¹ On the assumption that the two-day average prediction errors are independent

¹⁰Selection of this estimation period means that in all but a few instances the issuance date price impact will not affect the market model parameter estimates for the announcement date, and similarly, the announcement date impact will not affect issuance date parameter estimates.

¹¹The standard deviation of two-day average prediction errors is estimated from the 58 non-overlapping two-day average *PE*'s over the trading days -60 to -3 and $+3$ to $+60$. Note that this method avoids the problem identified by Brown and Warner (1983) of test statistic misspecification due to autocorrelation of average market model residuals, since the standard deviation is estimated from prediction errors spanning the same length of time (two trading days) as the designated event period.

Table 3

Common stock daily average prediction errors (*PE*) and cumulative average prediction errors (*CPE*) for 121 trading days around the announcement dates of U.S. public offerings of convertible debt (132 events).

| (1) Trading day | (2) Average prediction error | (3) Cumulative average prediction error |
|--------------------|------------------------------------|---|
| - 60 | -0.17% | -0.17% |
| - 50 | 0.21 | 1.32 |
| -40 | 0.13 | 1.64 |
| -30 | -0.41 | 2.46 |
| -20 | -0.26 | 1.96 |
| -19 | 0.19 | 2.15 |
| -18 | -0.13 | 2.02 |
| -17 | 0.33 | 2.35 |
| -16 | -0.10 | 2.25 |
| -15 | 0.06 | 2.31 |
| -14 | 0.06 | 2.37 |
| -13 | -0.37 | 2.00 |
| -12 | 0.14 | 2.14 |
| -11 | 0.29 | 2.43 |
| -10 | 0.25 | 2.68 |
| - 9 | -0.15 | 2.53 |
| - 8 | 0.10 | 2.62 |
| - 7 | 0.10 | 2.72 |
| - 6 | -0.12 | 2.61 |
| - 5 | -0.21 | 2.40 |
| - 4 | -0.49 | 1.90 |
| - 3 | -0.04 | 1.86 |
| - 2 | -0.01 | 1.84 |
| - 1 | -1.33 | 0.52 |
| 0 ^a | -0.99 | -0.47 |
| 1 | -0.06 | -0.53 |
| 2 | -0.31 | -0.84 |
| 3 | 0.22 | -0.63 |
| 4 | 0.19 | -0.44 |
| 5 | -0.13 | -0.56 |
| 6 | -0.45 | -1.02 |
| 7 | -0.09 | -1.11 |
| 8 | -0.07 | -1.18 |
| 9 | 0.27 | -0.91 |
| 10 | 0.00 | -0.91 |
| 11 | -0.41 | -1.32 |
| 12 | 0.00 | -1.32 |
| 13 | -0.12 | -1.43 |
| 14 | -0.07 | -1.50 |
| 15 | 0.03 | -1.48 |
| 16 | -0.15 | -1.63 |
| 17 | -0.14 | -1.76 |
| 18 | 0.07 | -1.70 |
| 19 | -0.06 | -1.75 |
| 20 | 0.18 | -1.57 |
| 30 | -0.39 | -2.17 |
| 40 | 0.14 | -2.88 |
| 50 | 0.33 | -3.09 |
| 60 | -0.17 | -3.49 |

^aThe date of the earliest report of the offering in *The Wall Street Journal*.

Table 4

Distribution of two-day announcement period common stock prediction errors (PE) for the sample of U.S. public offerings of convertible debt (132 events).

| Two-day announcement period PE | Number of observed returns |
|----------------------------------|----------------------------|
| $8.0\% \leq PE < 10.0\%$ | 1 |
| $6.0\% \leq PE < 8.0\%$ | 1 |
| $4.0\% \leq PE < 6.0\%$ | 2 |
| $2.0\% \leq PE < 4.0\%$ | 9 |
| $0.0\% \leq PE < 2.0\%$ | 16 |
| | <hr/> 29 |
| $-2.0\% \leq PE < -0.0\%$ | 29 |
| $-4.0\% \leq PE < -2.0\%$ | 34 |
| $-6.0\% \leq PE < -4.0\%$ | 26 |
| $-8.0\% \leq PE < -6.0\%$ | 9 |
| $-10.0\% \leq PE < -8.0\%$ | 2 |
| $-12.0\% \leq PE < -10.0\%$ | 3 |
| | <hr/> 103 |
| | <hr/> 132 |

drawings from a stationary normal distribution, the statistic given by (2) is Student t -distributed with fifty-seven degrees of freedom. Given that \overline{PE}_0 equals -2.31% and $\hat{\sigma} = 0.30\%$, the t -statistic for the announcement period average prediction error is -7.70 . The null hypothesis is rejected at the 0.01 significance level.

The statistically significant negative announcement period average PE is not attributable to the returns of a small subset of firms. Of the 132 two-day announcement period prediction errors, 103 are negative and 29 are positive. Furthermore, the distribution of two-day announcement period prediction errors reported in table 4 indicates that 86% of the negative announcement period PE 's are between 0% and -6% , and no return is less than -12% . Moreover, for subsets of offerings grouped by calendar years (not shown), announcement period average prediction errors are negative throughout the period 1970 through 1979. The results presented in tables 3 and 4 indicate that announcements of convertible debt offerings typically are associated with an immediate and significant decrease in the price of common stock.

3.1.2. Straight debt

Table 5 presents average common stock prediction errors around the announcement dates of straight debt offerings. The format of table 5 is the same as table 3. Column (1) identifies the trading day relative to the announcement date (day 0). Column (2) contains the average common stock prediction errors and column (3) contains the cumulative average prediction errors.

Table 5

Common stock daily average prediction errors (*PE*) and cumulative average prediction errors (*CPE*) for 121 trading days around the announcement dates of public offerings of straight debt (150 events):

| (1) Trading day | (2) Average prediction error | (3) Cumulative average prediction error |
|--------------------|------------------------------------|---|
| - 60 | -0.09% | -0.09% |
| - 50 | 0.24 | -0.35 |
| - 40 | -0.01 | -0.29 |
| - 30 | 0.05 | -0.68 |
| - 20 | -0.14 | -1.15 |
| - 19 | 0.26 | -0.89 |
| - 18 | 0.05 | -0.84 |
| - 17 | -0.04 | -0.88 |
| - 16 | 0.12 | -0.76 |
| - 15 | 0.07 | -0.69 |
| - 14 | -0.05 | -0.73 |
| - 13 | 0.01 | -0.72 |
| - 12 | -0.24 | -0.96 |
| - 11 | 0.05 | -0.91 |
| - 10 | -0.02 | -0.93 |
| - 9 | -0.05 | -0.98 |
| - 8 | 0.12 | -0.86 |
| - 7 | -0.06 | -0.92 |
| - 6 | -0.13 | -1.05 |
| - 5 | -0.27 | -1.32 |
| - 4 | 0.02 | -1.30 |
| - 3 | 0.04 | -1.26 |
| - 2 | -0.04 | -1.30 |
| - 1 | -0.04 | -1.34 |
| 0 ^a | -0.33 | -1.67 |
| 1 | 0.05 | -1.63 |
| 2 | -0.14 | -1.77 |
| 3 | 0.04 | -1.73 |
| 4 | 0.33 | -1.40 |
| 5 | -0.17 | -1.58 |
| 6 | 0.02 | -1.56 |
| 7 | -0.09 | -1.65 |
| 8 | 0.05 | -1.60 |
| 9 | -0.28 | -1.88 |
| 10 | -0.01 | -1.89 |
| 11 | 0.40 | -1.49 |
| 12 | 0.13 | -1.36 |
| 13 | -0.07 | -1.43 |
| 14 | 0.01 | -1.42 |
| 15 | -0.02 | -1.44 |
| 16 | 0.01 | -1.43 |
| 17 | 0.04 | -1.39 |
| 18 | -0.02 | -1.41 |
| 19 | -0.16 | -1.57 |
| 20 | 0.08 | -1.49 |
| 30 | -0.08 | -1.35 |
| 40 | 0.02 | -1.79 |
| 50 | -0.06 | -2.03 |
| 60 | 0.32 | -3.16 |

^aThe date of the earliest report of the offering in *The Wall Street Journal*.

In comparison to the sample of convertible debt announcements, there is a smaller negative average common stock *PE* during the two-day announcement period. The day -1 and day 0 average prediction errors are -0.04% and -0.33% , respectively. The two-day announcement period average prediction error is -0.37% . The same *t*-test used to test the average announcement period return for convertible debt offerings produces a *t*-statistic of -1.76 for the two-day announcement period prediction error. The null hypothesis that the average two-day announcement period *PE* equals zero is not rejected at the 0.05 significance level, but it is rejected at the 0.10 level of significance.¹²

The common stock prediction errors at the announcement date differ between the samples of straight debt and convertible debt issuances. Unlike convertible debt offerings, at the 0.05 level no statistically significant average common stock abnormal return is found at the announcement of straight debt issuances. In addition, whereas 78% (103 of 132) of announcement period prediction errors are negative for convertible debt announcements, only 53% (80 of 150) of announcement period *PE*'s are negative for straight debt offerings. The hypothesis that the two-day announcement period average prediction errors for the convertible debt and straight debt samples are equal is rejected at the 0.01 level.¹³ There appear to be effects on the price of common stock that are peculiar to (or at least far more pronounced for) announcements of convertible debt offerings. Section 4 discusses possible explanations of these results.

3.2. Common stock returns around the issuance date of debt securities

Table 6 reports average daily common stock prediction errors around the issuance dates for public offerings of convertible debt and straight debt. Column (1) identifies the trading day relative to the date news of the issuance is published in *The Wall Street Journal* (day 0). In those instances where *The Wall Street Journal* did not report the issuance, the trading day that follows the issuance date reported in the *Investment Dealers' Digest Corporate Financing Directory* is designated as day 0. Day -1 typically is the initial offering date of the new debt securities. The average common stock prediction errors for the

¹²Analysis of daily raw (unadjusted) returns and simple market-adjusted returns ($r_{it} - r_{mt}$) yields the same inferences drawn from the prediction errors. Announcement date impacts for convertible debt are significant at the 0.01 level, whereas the significance level for straight debt announcement date impacts is approximately 0.10.

¹³The standard deviation \hat{s} of the difference between two-day average prediction errors for convertible debt (*CD*) and straight debt (*SD*) is estimated from the differences between the paired average two-day prediction errors of the two samples over trading days -60 to -3 and $+3$ to $+60$. The test statistic is given by $t = (\overline{PE}_0^{CD} - \overline{PE}_0^{SD})/\hat{s}$. Assuming that paired differences in two-day average prediction errors are independent drawings from a stationary normal distribution, this test statistic is Student *t*-distributed with 57 degrees of freedom. The calculated value of *t* is -5.39 .

Table 6

Common stock daily average prediction errors (*PE*) and cumulative average prediction errors (*CPE*) for 121 trading days around the issuance dates of public offerings of convertible debt (129 events) and straight debt (150 events).

| (1) Trading day | Convertible debt | | Straight debt | |
|--------------------|-----------------------------|--|-----------------------------|--|
| | (2) Average <i>PE</i> | (3) Cumulative average <i>PE</i> | (4) Average <i>PE</i> | (5) Cumulative average <i>PE</i> |
| -60 | 0.11% | 0.11% | 0.23% | 0.23% |
| -50 | 0.32 | 1.92 | -0.06 | 0.20 |
| -40 | 0.09 | 0.07 | 0.20 | 0.04 |
| -30 | 0.19 | 0.13 | 0.10 | -0.04 |
| -20 | -0.20 | -0.99 | -0.17 | -0.63 |
| -19 | -0.01 | -1.00 | -0.04 | -0.67 |
| -18 | 0.04 | -0.96 | -0.23 | -0.90 |
| -17 | -0.20 | -1.16 | -0.13 | -1.03 |
| -16 | 0.03 | -1.13 | 0.23 | -0.80 |
| -15 | -0.30 | -1.42 | 0.24 | -0.56 |
| -14 | -0.07 | -1.49 | 0.11 | -0.45 |
| -13 | -0.16 | -1.65 | -0.24 | -0.69 |
| -12 | -0.42 | -2.07 | 0.07 | -0.62 |
| -11 | -0.36 | -2.43 | 0.34 | -0.28 |
| -10 | 0.41 | -2.02 | 0.05 | -0.23 |
| -9 | -0.17 | -2.19 | 0.16 | -0.07 |
| -8 | -0.17 | -2.36 | -0.02 | -0.09 |
| -7 | 0.41 | -1.95 | -0.34 | -0.44 |
| -6 | -0.17 | -2.12 | 0.11 | -0.33 |
| -5 | 0.09 | -2.03 | -0.05 | -0.38 |
| -4 | -0.13 | -2.16 | 0.26 | -0.12 |
| -3 | -0.15 | -2.31 | -0.17 | -0.29 |
| -2 | -0.29 | -2.60 | 0.25 | -0.04 |
| -1 | -1.50 | -4.10 | 0.17 | 0.13 |
| 0 ^a | -0.04 | -4.14 | -0.09 | 0.04 |
| 1 | 0.27 | -3.87 | -0.15 | -0.11 |
| 2 | 0.31 | -3.56 | -0.09 | -0.20 |
| 3 | -0.07 | -3.63 | -0.28 | -0.48 |
| 4 | 0.01 | -3.62 | -0.10 | -0.58 |
| 5 | -0.06 | -3.68 | 0.17 | -0.41 |
| 6 | 0.03 | 3.65 | 0.02 | -0.39 |
| 7 | 0.14 | -3.51 | 0.14 | -0.24 |
| 8 | 0.07 | -3.44 | -0.20 | -0.45 |
| 9 | -0.15 | -3.59 | 0.14 | -0.31 |
| 10 | 0.18 | -3.41 | -0.14 | -0.44 |
| 11 | -0.18 | -3.59 | -0.02 | -0.46 |
| 12 | 0.22 | -3.37 | -0.12 | -0.58 |
| 13 | 0.10 | -3.27 | 0.10 | -0.48 |
| 14 | -0.33 | -3.60 | -0.17 | -0.65 |
| 15 | 0.09 | -3.51 | -0.20 | -0.85 |
| 16 | -0.05 | -3.55 | 0.15 | -0.70 |
| 17 | 0.05 | -3.50 | 0.14 | -0.56 |
| 18 | -0.05 | -3.55 | 0.08 | -0.49 |
| 19 | -0.22 | -3.77 | 0.28 | -0.20 |
| 20 | -0.09 | -3.86 | -0.06 | -0.27 |
| 30 | -0.12 | -3.18 | -0.11 | -0.30 |
| 40 | -0.03 | -3.75 | -0.13 | -1.31 |
| 50 | 0.05 | -3.12 | -0.03 | -0.95 |
| 60 | 0.05 | -3.33 | -0.11 | -1.60 |

^aThe date of the report of the debt issuance in *The Wall Street Journal*. When no report is found, day 0 is the trading day following the issuance date.

samples of convertible debt and straight debt issuances are reported in columns (2) and (4), respectively. Columns (3) and (5) contain the cumulative average prediction errors around the issuance dates of convertible debt and straight debt, respectively.

For the convertible debt sample, the two-day average common stock prediction error at the issuance date is similar to the average *PE* at the announcement date. The day -1 and day 0 average *PE*'s for the convertible debt sample are -1.50% and -0.04% , respectively. The two-day average *PE* is -1.54% . The *t*-value given by (1) for the two-day average *PE* over trading days -1 and 0 is -4.81 . Therefore, the null hypothesis that the two-day average *PE* equals zero is rejected at the 0.01 level of significance. The distribution of two-day issuance period average prediction errors reported in table 7 indicates that the statistically significant average return cannot be explained by a few large negative returns. Of the 129 two-day issuance period prediction errors, 32 are positive and 97 are negative.

Unlike the sample of convertible debt offerings, there is no evidence of systematic common stock price changes around the issuance date of straight debt. The two-day issuance period average common stock *PE* for straight debt reported in column (4) of table 6 is $+0.08\%$, and 75 of the 150 two-day prediction errors are negative. The null hypothesis that the average issuance period *PE* equals zero is not rejected at the 0.10 level of significance. But the

Table 7

Distribution of two-day issuance period common stock prediction errors (*PE*) for the sample of public offerings of convertible debt (129 events).

| Two-day issuance period <i>PE</i> | Number of observed prediction errors |
|-----------------------------------|--------------------------------------|
| $8.0 \leq PE < 10.0$ | 1 |
| $6.0 \leq PE < 8.0$ | 0 |
| $4.0 \leq PE < 6.0$ | 8 |
| $2.0 \leq PE < 4.0$ | 7 |
| $0.0 \leq PE < 2.0$ | 16 |
| | <hr/> 32 |
| $-2.0 \leq PE < 0.0$ | 48 |
| $-4.0 \leq PE < -2.0$ | 25 |
| $-6.0 \leq PE < -4.0$ | 13 |
| $-8.0 \leq PE < -6.0$ | 6 |
| $-10.0 \leq PE < -8.0$ | 2 |
| $-12.0 \leq PE < -10.0$ | 2 |
| $-15.0 \leq PE < -12.0$ | 1 |
| | <hr/> 97 |
| | <hr/> 129 |

hypothesis that the two-day issuance period prediction errors of the convertible debt and straight debt samples are equal is rejected at the 0.01 level.¹⁴

3.3. Summary of the results

The principal results reported in this section are summarized in table 8. A negative and statistically significant average abnormal common stock return is observed during both the two-day announcement period and issuance period for public offerings of convertible debt. The negative common stock prediction errors are statistically significant and pervasive among the sample of events. In contrast, average common stock prediction errors for public offerings of straight debt are only marginally (0.10 significance level) different from zero at announcement, and are not significant at issuance. The difference in average stock price behavior between the convertible debt and straight debt samples is statistically significant for both the announcement period and issuance period. The following section examines potential explanations for these results.

Table 8

Summary of common stock prediction errors around the announcement and issuance dates of public offerings of convertible debt and straight debt.

| Summary statistic | Announcement date results | | Issuance date results | |
|--|---------------------------|---------------|-----------------------|---------------|
| | Convertible debt | Straight debt | Convertible debt | Straight debt |
| (1) Two-day avg. prediction error (days -1 and 0) | -2.31% | -0.37% | -1.54% | 0.08% |
| (2) Estimated standard deviation of avg. two-day prediction error | 0.30% | 0.21% | 0.32% | 0.21% |
| (3) <i>t</i> -value for two-day avg. prediction error (d.f. = 57) | -7.70 | -1.76 | -4.81 | 0.38 |
| (4) Cumulative avg. prediction error (days -60 through -2) | 1.84% | -1.30% | -2.60% | -0.04% |
| (5) Cumulative avg. prediction error (days -60 through +60) | -3.49% | -3.16% | -3.33% | -1.60% |
| (6) Number of two-day prediction errors (days -1 and 0) Positive : Negative | 29:103 | 70:80 | 32:97 | 75:75 |
| (7) Number of events | 132 | 150 | 129 | 150 |
| (8) Avg. size of offering (\$ millions) | \$51.9 | \$72.9 | \$52.3 | \$72.9 |

¹⁴Utilizing the test statistic and distributional assumptions described in footnote 13, the *t*-value for the null hypothesis of equality of convertible debt and straight debt issuance period average prediction errors is -4.26.

4. Interpretation of the results

4.1. *Announcement date common stock price impacts*

This section examines three potential explanations of the significant negative stock price response to announcements of convertible debt offerings. One hypothesis, consistent with the information signalling model of Ross (1977), is that a leverage-increasing capital structure change conveys favorable information about the firm's prospects, and a leverage-decreasing capital structure change conveys unfavorable information. Considerable empirical support for this viewpoint exists.¹⁵ If the issuance of convertible debt increases leverage, the negative average abnormal common stock return at the announcement of convertible debt offerings is not consistent with this hypothesis, and contrasts markedly with the extant evidence from other studies. But the effect of convertible debt issuance on leverage is not obvious, and therefore it is not obvious whether leverage-related information can explain the results in section 3. In section 4.1.1 we examine in greater detail the leverage-related information hypothesis, the impact of convertible debt issuance on financial leverage and the evidence from other studies.

A second hypothesis, in the spirit of models developed by Myers and Majluf (1984) and Miller and Rock (1982), is that announcement of new external financing conveys unfavorable information about the firm's investment opportunity set (Myers and Majluf) or current earnings (Miller and Rock). In section 4.1.2 we examine this hypothesis more fully.

The third hypothesis is that negative common stock returns at the announcement of a forthcoming new issue are attributable at least in part to systematic underpricing of public offerings. If public offerings are underpriced, then wealth is transferred from the firm's current stockholders to the purchasers of the underpriced securities. While underpricing of public offerings is difficult to explain, evidence that underpricing occurs is reported by Ibbotson (1975) and Smith (1977) for common stock new issues, by Weinstein (1978) for new corporate bond issues, and by Vinson (1970) and Stover and Alexander (1978) for convertible debt issues. Examination of this hypothesis is presented in section 4.1.3.

4.1.1. *Leverage-related information and the impact of convertible debt issuance on leverage*

Several other recent studies investigate the impact of announcements of capital structure change on security values. Masulis (1978) and McConnell and

¹⁵See, e.g., Masulis (1978, 1980), Dann (1981), Vermaelen (1981), Mikkelson (1981), McConnell and Schlarbaum (1981), Korwar (1982), and Asquith and Mullins (1983). Evidence from these studies is presented and analyzed in the context of leverage-related information in section 4.1.1.

Schlarbaum (1981) study intrafirm exchange offers that involve at least two different classes of securities. Dann (1981), Masulis (1980) and Vermaelen (1981) examine common stock repurchases. Mikkelson (1981) studies convertible security calls and Korwar (1982) and Asquith and Mullins (1983) investigate issuances of common stock. Table 9 summarizes the two-day announcement period average returns of the various capital structure events that have been studied. Column (1) identifies the study, column (2) describes the capital structure change studied, column (3) indicates the sample size, and column (4) reports the average two-day announcement period common stock return.

For every study except the present one, the sign of the average stock price impact corresponds with the apparent sign of the leverage change. Moreover, except for the conversion of preferred stock into common stock, the results of

Table 9

Summary of two-day announcement period average common stock returns associated with various types of capital structure changes.

| (1) | (2) | (3) | (4) |
|---------------------------------|---|------------------|------------------------------------|
| Study | Type of capital structure change | Number of events | Two-day announcement period return |
| Masulis (1978) | Exchange offers: | | |
| | Common stock issued for debt | 20 | - 7.44% |
| | Debt issued for common stock | 65 | + 10.52 |
| | Common stock issued for preferred stock | 30 | - 2.29 |
| | Preferred stock issued for common stock | 13 | + 5.78 |
| | Preferred stock issued for debt | 9 | - 14.29 |
| | Debt issued for preferred stock | 34 | + 2.13 |
| Mikkelson (1981) | Conversion of debt to common stock | 113 | - 2.13 |
| | Conversion of preferred stock to common stock | 57 | - 0.36 ^a |
| McConnell and Schlarbaum (1981) | Exchange offer of income bonds issued for preferred stock | 18 | + 2.18 |
| Dann (1981) | Repurchase of common stock | 142 | + 15.41 |
| Masulis (1980) | Repurchase of common stock | 199 | + 16.35 |
| Vermaelen (1981) | Repurchase of common stock | 131 | + 14.14 |
| Korwar (1982) | Issuance of common stock | 424 | - 2.48 |
| Asquith and Mullins (1983) | Issuance of common stock: | | |
| | Industrial companies | 128 | - 3.0 |
| | Public utilities | 264 | - 0.9 |
| Dann and Mikkelson (1984) | Issuance of convertible debt | 132 | - 2.31 |
| | Issuance of straight debt | 150 | - 0.37 ^a |

^aAverage return is not interpreted as statistically significant at the 0.05 level by the author(s).

these other studies are statistically significant.¹⁶ In contrast, the significant negative common stock returns at announcement of convertible debt issuance and the marginally significant negative returns accompanying straight debt issuance announcements are not consistent with the empirical regularity observed in these other studies, assuming that convertible debt and straight debt issuances constitute leverage increases. But assessing whether convertible and straight debt issuances are indeed leverage-increasing is not as simple as it might seem. In particular, convertible debt, which is like a package of straight debt and warrants that can be exercised to acquire common stock, conceivably can increase or decrease leverage depending on the relative values of its debt-like and equity-like component claims (and the firm's financial structure prior to issuance). Moreover, for both straight and convertible debt issuances the impact on financial leverage depends in part on the extent to which the proceeds are used to repay existing debt claims. Each of these concerns must be addressed before the evidence in section 3 can be analyzed for consistency with the leverage-related information hypothesis.

Defining and measuring leverage. The concept of financial leverage is typically a simple one that involves two classes of financial claims, one of which has priority (in the sense of first claim to corporation resources) over the other. In this simple sense, defining the extent of financial leverage for a firm with more than two security issues outstanding requires that all securities be expressed as combinations of the two generic security types, the priority (debt) claim and the residual (equity) claim. The varied and complex contractual arrangements that characterize the financial claims structure of many corporations make this simple dichotomization a difficult, if not impossible, task. Moreover, even if an unambiguous partition of claims is possible based upon the formal contractual structure, departures from contractually specified absolute priority are commonplace in bankruptcy and reorganization proceedings; and, as Warner (1977) documents, the market prices of securities reflect the possibility of these departures. Uncertainty about adherence to the absolute priority doctrine increases the ambiguity of the dichotomization of complex securities.

The contractual terms of the typical convertible debt instrument further complicate the estimation of how convertible debt affects financial leverage. In addition to convertible debt being like a package of straight debt and stock warrants, most convertible debt issues are callable at the option of the issuer. This call feature permits firms to 'force' conversion when the conversion value exceeds the call price. Some corporate officials state that a purpose of the issuance of convertible debt is to raise equity capital on a deferred basis, and it

¹⁶Table 9 does not report significance levels for the returns presented in column (4) because the authors in most instances test single-day returns for statistical significance, and they do not all use the same test statistic. However, these authors, based on the statistical tests they utilize, interpret their results as being significant.

is not uncommon for a 'forced' conversion to occur within a few years following issuance.¹⁷ Consequently, it is likely that the expected time until call and with it the implicit equity portion of convertible debt vary substantially across issues.

Although precise estimates of a firm's financial leverage are difficult to obtain, cruder measures of leverage, such as those presented in rows (7) and (9) of table 2, may provide some indication of the average impact of convertible debt issuance on leverage. Measuring outstanding convertible debt as well as the new issue entirely as debt, the data in row (9) of table 2 indicate that the ratio of total debt to total capital is higher on average after the issuance than before. This treatment of new convertible debt biases upward the 'actual' leverage change, although categorizing currently outstanding convertible debt as all debt counteracts the bias to some degree. The extent of the bias in this proxy for leverage change is unknown.

A second estimate of the probable impact on leverage can be gleaned from row (7) of table 2. This indicates that the median ratio of the value of debt to equity before the offering is 0.52, implying that the equity component of the new convertible debt would have to comprise almost two-thirds of the new financing for the average firm in order for the issuance to reduce leverage. That equity is on average such a major component of newly issued convertible debt seems implausible.^{18,19}

The conclusion reached in the preceding paragraph rests on the assumption that proceeds of the issuance are entirely new financing. But as we mentioned in section 2, prospectus data indicate that for only about one-third of the convertible debt issuances were the proceeds substantially all new financing. Another one-third of the issuances were virtually entirely refinancing of existing straight debt. Whereas it appears reasonable to conclude that convertible debt issuances representing new financing are probably leverage-increasing, the same conclusion for convertible debt issued primarily to refinance existing debt may be unwarranted. Moreover, this same concern (new financ-

¹⁷Hoffmeister (1977) reports a summary of questionnaire responses received from corporate officials of 53 firms that issued convertible debt during the period June 1970 through June 1972. One question asked for the dominant purpose(s) for attaching a conversion provision to their bond issue. The most frequently cited purpose, in 70% of the responses, was 'to eventually shift this debt to common stock when stock prices rise'.

¹⁸As with the measure in row (9), for purposes of the measure in row (7) presently outstanding convertible debt is treated as if it were entirely debt (i.e., as if the equity component were zero). This treatment biases upward the pre-issuance leverage measure, and means that the equity-like fraction of new convertible debt that is necessary for convertible debt to be leverage reducing is even higher than we indicate.

¹⁹Analysis of outstanding (not newly issued) convertible bonds by King (1983) lends additional credence to our view. Using a contingent claims valuation model, King estimates that straight debt value of a convertible bond is 85% of the bond's total market value for the median bond in his sample. Although newly issued convertible bonds are probably not strictly comparable to outstanding convertibles, King's evidence nevertheless indicates that convertible bond values have a relatively large straight debt component.

Table 10

Common stock two-day announcement period average prediction errors (*PE*) for subsamples of debt issues grouped by use of proceeds from the issue and impact on financial leverage.

| | Type of security issued | | | |
|---|-------------------------------------|------------------|-------------------------------------|------------------|
| | Convertible debt | | Straight debt | |
| | Mean two-day announcement <i>PE</i> | Number of offers | Mean two-day announcement <i>PE</i> | Number of offers |
| (A) <i>Use of proceeds from debt issuance</i> ^a | | | | |
| Offerings with at least 90% of proceeds used for new investment | -2.58% | 24 | -0.47% | 32 |
| Offerings with at least 90% of proceeds used to refinance existing debt | -2.61% | 25 | -0.27% | 47 |
| (B) <i>Effect of issuance on debt ratio</i> ^a | | | | |
| Issuances producing largest increase in debt ratio | -1.82% | 20 | -0.34% | 30 |
| Issuances producing smallest increase in debt ratio | -2.84% | 20 | -0.12% | 33 |

^aUse of proceeds from debt issuance and effect of issuance on debt ratio are obtained from offering prospectuses. There are 76 convertible debt offerings and 121 straight debt offerings for which prospectuses were obtained.

ing *vs.* refinancing) exists regarding the impact on financial leverage of straight debt issuances. The leverage-related information hypothesis implies that leverage-increasing changes are accompanied by positive stock price impacts, and this in turn suggests that debt issuances that are principally new financing should be associated with more favorable common stock returns than issuances that are mainly to refinance existing debt.²⁰ In addition, debt offerings that produce large leverage increases are predicted to be associated with higher stock returns than debt offerings that have a lesser impact on financial leverage, *ceteris paribus*.

To address these aspects of the leverage-related information hypothesis, table 10 reports average common stock prediction errors at announcement for subsamples of debt issues. In part (A) of table 10, average prediction errors are reported separately for issues constituting new financing (at least 90% of the proceeds used for new financing) and for refinancing issuances (not more than 10% of the proceeds used for new financing). For both the convertible debt and straight debt samples, there is no discernible difference in average common stock returns between firms that issued debt for new financing and firms that

²⁰For our sample there were no cases of debt being issued to repurchase common stock.

issued debt to replace existing debt. This evidence appears to be inconsistent with the leverage-related information hypothesis.²¹

Part (B) of table 10 reports average announcement period common stock prediction errors for subsamples of issuances producing the highest and lowest leverage changes (issuances comprising approximately the top 25% and bottom 25%, respectively, of the distribution of leverage changes) measured by the debt ratio change [line (9) of table 2] taken from prospectus data. For straight debt issues there is not much difference between the average stock price behavior of the two groups. For convertible debt issues, the average stock price response is less negative for the large increases in leverage than for the small increases in leverage, but both groups have large negative average returns. While the relative stock price performance of the two groups is consistent with the leverage-related information hypothesis, we interpret the large negative average prediction error for the set of companies whose leverage increased most as a strong piece of evidence contrary to the leverage-related information hypothesis.

Comparing convertible debt and straight debt. A further refinement of the hypothesis that an increase in leverage conveys favorable information recognizes that convertible debt increases leverage less than an equivalent face value amount of straight debt. In this refined version of the leverage-related information hypothesis, the differential nature of the information supplied to the market with a convertible debt or straight debt announcement is not fully specified. But one important difference between the two forms of debt financing is that, for equal amounts of new financing, total interest payments are lower with convertible debt than with straight debt. If firms issuing debt balance the marginal corporate interest expense tax advantages of debt against the marginal costs of debt financing, including the personal tax disadvantages of debt analyzed by Miller (1977) and DeAngelo and Masulis (1980), companies whose anticipated earnings are not sufficient to fully utilize the higher interest expense deductions of straight debt may issue lower coupon convertible debt instead.²² According to this view, announcement of a convertible debt issuance conveys less favorable information about future earnings prospects than an otherwise similar straight debt announcement, and as a consequence implies that the stock price response to announcement of a convertible debt

²¹As with many cross-sectional comparisons, the interpretation of the evidence in table 10 is conditioned on a *ceteris paribus* assumption, the details of which are often difficult to specify.

²²This application of the DeAngelo and Masulis analysis to the issuance of convertible debt cannot explain the entire history of convertible debt financing. Prior to the institution of a corporate income tax the issuance of convertible debt was a common practice.

offering will be less favorable than the response to announcement of a straight debt offering, *ceteris paribus*.²³

The relative stock price response reported in section 3 (see especially footnote 13), and which carries over to the partitions by extent of new financing and degree of leverage change reported in table 10, is consistent with this refined leverage-related information hypothesis. But if investors' expectations are unbiased estimates of the form and amount of firms' future financing, then leverage-increasing financing announcements should be accompanied by positive stock price reactions according to the leverage-related information hypothesis. The negative common stock returns documented in section 3 and table 10 for all types of new debt issuance (convertible or straight debt, new financing or refinancing, high or low leverage change) indicate that leverage-related information does not by itself explain the stock price behavior surrounding debt offerings.

4.1.2. Asymmetric information and the issuance of securities

Recent theoretical developments by Myers and Majluf (1984) and Miller and Rock (1982) analyze new financing by firms when managers have better information than outside investors about the earnings and investment opportunities of the firms they manage. The models in both of these studies focus primarily on the relationship between information disclosure and the decision to obtain new financing rather than the form the new financing will take, and both models imply a decrease in stock price at the announcement of new financing. In addition, both models predict a positive stock price response to a negative amount of new financing, such as common stock repurchase. Furthermore, Myers and Majluf posit a less unfavorable response to new debt financing than to a common stock offering. In the Miller and Rock model the stock price response is the same for debt and equity financing announcements.

²³In a strict sense, the *ceteris paribus* condition here is a strong one, and we make no claim that all other important differences between our samples of convertible and straight debt offerings have been eliminated. But the justification (implicit in most event studies) for focusing the analysis on the average common stock impact *within* a sample (such as convertible debt offering announcements) – namely that other factors affecting individual stock prices simultaneously with the event being examined are approximately independent across sample observations and hence attenuate with sample size – can (cautiously) be invoked and applied *across samples* here. Moreover, our additional analysis (not detailed here) indicates that stock price reactions to *straight* debt offerings made during the 1970's by firms in our *convertible* debt sample are qualitatively similar to the average announcement period prediction errors reported in tables 5 and 10. Assuming that the characteristics of firms issuing convertible debt did not change markedly during the 1970's, it appears that the difference between the average announcement period returns of convertible and straight debt offerings is attributable to the type of security being offered.

A subset of the studies summarized in table 9 provides evidence consistent with the central implication of the Myers–Majluf and Miller–Rock models.²⁴ The announcements of common stock issuance analyzed by Korwar (1982) and Asquith and Mullins (1983) and the convertible debt offering announcements examined here are accompanied by negative stock price reactions that are statistically significant at the 0.01 level. Positive stock price changes that are statistically significant at the 0.01 level are reported by Dann, Masulis and Vermaelen for common stock repurchases. The negative average stock price response to straight debt offering announcements, which is significantly different from zero at the 0.10 level but not the 0.05 level, is consistent with the Myers and Majluf prediction that debt financing is more favorably received by investors than equity financing.

But as with the leverage-related information hypothesis, what might be called the ‘new-financing-related information hypothesis’ is not entirely supported by the evidence reported in part (A) of table 10. In particular, for both straight debt and convertible debt offerings, there is no difference in the announcement period stock price response between offerings that were primarily new financing and offerings that were principally for the purpose of refinancing existing debt. A compilation of evidence from other studies listed in table 9 also indicates that new-financing-related information does not fully explain the average common stock return at announcement of security issuances or repurchases. For instance, both Vermaelen and Masulis find larger positive stock returns with stock repurchases where new (debt) financing is the predominant source of funds for repurchase than the stock returns for repurchases that are less reliant on external financing. In addition, Korwar reports large negative stock returns at announcement for a subsample of common stock offerings that are for refunding debt as well as for a subsample of offerings that are for new investment. Collectively, the evidence indicates that new-financing-related information does not by itself explain the stock price response to debt offerings.

4.1.3. Original issue underpricing

To investigate whether underpricing explains the negative announcement period common stock returns for convertible debt issuances, we note that new issues made directly to stockholders, i.e., rights offerings, do not transfer wealth to or from current owners, even if the new issue is ‘underpriced’.

²⁴The studies by Masulis, Mikkelson, and McConnell and Schlarbaum that examine exchanges of one type of security for another are not pertinent to the Myers–Majluf and Miller–Rock models. An alternative hypothesis which applies to all of the table 9 studies involving common stock is that managers estimate share value based on inside information, and they increase public ownership of common stock when the market price ‘overvalues’ the shares and decrease public ownership when the market price ‘undervalues’ shares. This version of the asymmetric information hypothesis has been suggested by Jensen and Ruback (1983) and Asquith and Mullins (1983).

Consequently, whereas underpricing of convertible debt issues implies a stock price decrease at the announcement of a forthcoming public offering, no price effect attributable to underpricing is expected at the announcement of a rights offering.

To test this predicted difference in stock price response between convertible debt public offerings and rights offerings, we collected a sample of rights offerings. Over the period 1970 through 1979, only 5 rights offerings of convertible debt are identified that satisfy the selection criteria used to construct the sample of convertible debt public offerings. To expand the sample of rights offerings, 33 additional rights offerings of convertible debt from the period 1965 through 1969 are identified that meet the sampling criteria of the public offerings sample.²⁵ The average issue size for the 38 convertible debt rights offerings is \$52.0 million, which is virtually identical to the average size of \$51.9 million for the sample of convertible debt public offerings.

Table 11 reports the average common stock prediction errors around the announcement date of convertible debt rights offerings. The information in table 11 is presented in the same format as the returns around convertible debt public offerings reported in table 3. As with the public offerings sample, the returns at announcement of a convertible debt rights offering are negative. The combined day -1 and day 0 average prediction error is -1.23% for rights offerings. Of the 38 two-day announcement period prediction errors, 10 are positive and 28 are negative. Utilizing the test statistic given by (2), the t -value for the two-day announcement period prediction error is -2.12 , which is significant at the 0.05 level for 57 degrees of freedom. In addition to statistically significant negative average returns at announcement, rights offerings of convertible debt follow a period of positive average common stock abnormal returns. The cumulative average prediction error for trading day -60 through -2 is $+8.22\%$. An explanation for this pre-announcement stock price behavior is not immediately apparent, but we note that it is not likely to be attributable to leakage of information about the convertible debt offering because the cumulative average abnormal returns are almost entirely concentrated in the period from day -60 to day -30 .

The hypothesis that the two-day announcement period average prediction errors are equal for convertible debt rights offerings and public offerings is tested by means of the statistic described in footnote 13. The t -value for this test is -1.83 , and consequently the hypothesis of equal stock price response for rights offerings and public offerings is not rejected at the 0.05 level (but it is rejected at the 0.10 level) of significance. Thus, although the abnormal stock price response to rights offerings is only about half the size of the response to public offerings (-1.23% versus -2.31% , respectively), in a statistical sense

²⁵ We do not know why rights offerings of convertible debt in the 1970's occurred so infrequently relative to their frequency of use in the 1965-1969 time period.

Table 11

Common stock daily average prediction errors (*PE*) and cumulative average prediction errors (*CPE*) for 121 trading days around the announcement dates of rights offerings of convertible debt (38 events).

| (1) Trading day | (2) Average prediction error | (3) Cumulative average prediction error |
|--------------------|------------------------------------|---|
| - 60 | 0.71 | 0.71 |
| - 50 | 0.33 | 4.01 |
| - 40 | - 0.06 | 3.76 |
| - 30 | - 0.13 | 6.20 |
| - 20 | - 0.02 | 7.28 |
| - 19 | 0.15 | 7.43 |
| - 18 | - 0.17 | 7.26 |
| - 17 | - 0.08 | 7.18 |
| - 16 | - 0.02 | 7.16 |
| - 15 | 0.22 | 7.38 |
| - 14 | 0.20 | 7.58 |
| - 13 | 0.63 | 8.21 |
| - 12 | - 0.21 | 8.01 |
| - 11 | 0.02 | 8.03 |
| - 10 | 0.47 | 8.50 |
| - 9 | - 0.64 | 7.87 |
| - 8 | 0.02 | 7.89 |
| - 7 | 0.27 | 8.16 |
| - 6 | 0.45 | 8.61 |
| - 5 | - 0.06 | 8.55 |
| - 4 | - 0.21 | 8.35 |
| - 3 | - 0.20 | 8.15 |
| - 2 | 0.07 | 8.22 |
| - 1 | - 0.94 | 7.28 |
| 0 ^a | - 0.26 | 7.02 |
| 1 | - 0.08 | 6.94 |
| 2 | - 0.24 | 6.70 |
| 3 | - 0.31 | 6.39 |
| 4 | 0.01 | 6.40 |
| 5 | 0.13 | 6.53 |
| 6 | - 0.07 | 6.46 |
| 7 | - 0.03 | 6.43 |
| 8 | - 0.32 | 6.11 |
| 9 | - 0.74 | 5.37 |
| 10 | - 0.65 | 4.72 |
| 11 | 0.04 | 4.76 |
| 12 | 0.06 | 4.81 |
| 13 | - 0.40 | 4.41 |
| 14 | - 0.24 | 4.17 |
| 15 | - 0.35 | 3.82 |
| 16 | 0.23 | 4.05 |
| 17 | 0.00 | 4.05 |
| 18 | - 0.02 | 4.03 |
| 19 | - 0.10 | 3.93 |
| 20 | 0.15 | 4.08 |
| 30 | 0.25 | 5.02 |
| 40 | 0.32 | 3.41 |
| 50 | 0.05 | 3.67 |
| 60 | - 0.15 | 3.11 |

^aThe date of the earliest report of the rights offerings in *The Wall Street Journal*.

there is at most a marginal difference between the two results. This interpretation of the relative stock price response, combined with the inference that rights offerings are accompanied by significant negative announcement period returns, indicates that original issue underpricing does not explain the statistically significant, negative average prediction errors at announcement of convertible debt offerings.²⁶

4.1.4. Summary

To summarize the analysis of this section, the announcement period stock price behavior is not fully consistent with any of the three explanations offered. It is likely that for the typical firm issuance of convertible debt increases financial leverage. Negative abnormal common stock returns at announcement of convertible debt offerings are therefore contrary to the prediction of the leverage-related information hypothesis, and are anomalous to the leverage change/stock price change pattern common to the other studies summarized in table 9. Analysis of subsamples of convertible debt issuances most likely to have positive stock price impacts (under the leverage-related information hypothesis) yields results similar to the findings for the full sample of convertible debt announcements, and therefore strengthens the rejection of the leverage-related information hypothesis as an explanation for the negative average stock returns at announcements of convertible debt offerings.

The hypothesis that the decision to obtain new external financing reveals unfavorable news about the firm is supported by the evidence of a significant negative stock price response to convertible debt offering announcements and a marginally significant negative response to straight debt offering announcements. But since the stock price response is the same for firms refinancing existing debt as for firms using the proceeds for new investment, it is doubtful that the new-financing-related information hypothesis can fully explain the common stock price behavior associated with announcement of new debt offerings.

For the original issue underpricing hypothesis to explain the stock price response to convertible debt offering announcements, the convertible debt would have to be underpriced by an inconceivably high 15%. Moreover, rights offerings of convertible debt, wherein underpricing (if it exists) does not harm current stockholders, are also associated with significant negative common stock returns.

²⁶ This conclusion is underscored by the following line of reasoning. Given that the median ratio of convertible debt to equity is about 0.15, and assuming the value of claims other than equity do not change, the -2.3% stock return at announcement implies underpricing of the new issue by an implausibly high 15% for underpricing to fully explain the stock price behavior. We are grateful to Cliff Smith for pointing this out to us.

4.2. *Issuance date common stock price impacts*

The analysis to this point has concentrated on the abnormal common stock returns that accompany the initial announcement of a convertible debt or straight debt offering. The attention accorded the initial announcement date is warranted based on the extensive evidence in the finance literature that security prices rapidly impound the value of new information. But we would be remiss if we did not say something about the sizable, statistically significant, negative average common stock prediction errors on the issuance date of convertible debt. The difficulty lies in knowing what to say. Three potential explanations of the convertible debt issuance date stock price behavior come to mind, but none of them are particularly satisfying.

One potential explanation has to do with disclosure of detailed terms of a debt offering. A security's issuance date is a date of interest because final terms of a debt issuance typically are not established until the day before or the day of issuance. New information of value is particularly likely for convertible debt, where in addition to the coupon interest rate, offering price and size of issue the terms of conversion into common stock are initially disclosed. But in an efficient capital market, investors, forewarned by an earlier announcement of the forthcoming offering, form unbiased assessments of the final terms of the debt issue. The average prediction error of -1.54% , with 97 of 129 individual prediction errors being negative, is not consistent with the joint hypothesis of market efficiency and additional information being disclosed about terms of the issue on the issuance date.

A second possibility is that on the issuance date uncertainty is resolved about the convertible debt offering taking place. The negative price response observed at the announcement of convertible debt offerings reflects the expected value of the price responses to two possible outcomes: the offer taking place and the offer being withdrawn. But given that announced convertible debt offerings are only infrequently revised to a different form of security or cancelled altogether,²⁷ the apparently small revision in probability between announcement and issuance dates that a public offering of convertible debt will take place cannot explain a -1.54% abnormal return on the issuance date when the two-day announcement period abnormal return is only -2.31% .

A third possibility that has been suggested to us as a potential explanation of the issuance date stock price decline is a 'price pressure' or supply effect. There are at least two forms of this supply effect, both of which find the firm facing a downward sloping demand curve for its shares. In one, the stock price decline results from an increase in the number of common shares outstanding.

²⁷Examination of *Barron's* Coming Financing column for the years 1971 and 1976 (high frequency-of-issuance and low frequency-of-issuance years, respectively) indicates that of announced filings of convertible debt with the Securities Exchange Commission, 62 of 65 in 1971 and 7 of 8 in 1976 were subsequently issued.

In the other, the stock price decline results from an increase in the volume flow of common stock or relatively close substitutes for common stock at issuance. The first version is troublesome for the following reason. First, in almost all instances convertible debt is issued at a price that makes immediate conversion a non-wealth-maximizing decision by the convertible debtholder. Thus, convertible debt issuance potentially increases the number of common shares outstanding in the future, but is unlikely to increase this number immediately. But if current stockholders react unfavorably to *potential* future increases in shares outstanding, then any 'price pressure' effect of convertible debt issuance should arise at the initial announcement date rather than at the issuance date.²⁸ Consequently, price pressure of this form seems implausible as an explanation of issuance date common stock price behavior. The second form of supply effect is akin to the 'short-run liquidity effect' ('transaction away from the equilibrium price') posited by Kraus and Stoll (1972). But the absence of an offsetting price adjustment (return to the equilibrium price) in the post-issuance period suggests that price pressure of this sort does not fully explain the issuance date common stock price behavior.

The issuance date common stock average abnormal return at convertible debt offerings is significantly negative, and this result is pervasive across the sample. In contrast, no abnormal returns are earned by stockholders at the issuance date of straight debt.²⁹ The evidence indicates that new information is released at issuance, but only for public offerings of convertible debt. But no satisfactory explanation for this price effect or the nature of the information has been identified here.

5. Summary and conclusions

Significant negative abnormal returns accrue on average to common stockholders of firms announcing a new public offering of convertible debt. In addition to the stock price decline that occurs at the announcement, a further significant decline occurs on the actual issuance date. By way of contrast, common stockholders of firms offering straight (non-convertible) debt earn negative abnormal returns at announcement that are only marginally significant (at the 0.10 level but not the 0.05 level), and zero abnormal returns at issuance.

This investigation provides insights into this stock price behavior, but is not able to fully explain it. Three hypotheses that predict negative stock price reactions to convertible debt offering announcements are formulated and

²⁸Although it is unclear precisely how to separate any 'price pressure' effect from the impact of information about the firm's prospects, we find no significant relation between the stock price response at announcement (or, for that matter, at issuance) and the percentage increase in shares outstanding that would arise if full conversion were to occur.

²⁹Abnormal returns to stockholders at the start of the subscription period for convertible debt rights offerings are also zero.

tested, but the evidence is not entirely consistent with any of them. One hypothesis, which we designate the leverage-related information hypothesis, rests on the premise that a leverage increase conveys favorable information about the firm to investors, and this information generates a stock price increase. For the evidence to be consistent with this hypothesis, issuance of convertible debt must decrease financial leverage. Although we cannot unambiguously document the leverage change effect for all convertible debt issuers, the evidence indicates that for the typical convertible debt issuer financial leverage *increases* with the issuance. The leverage-related information hypothesis therefore does not explain the negative average stock price response to convertible debt offering announcements. Nor can it explain the negative stock price response to straight debt offering announcements. Average abnormal stock returns for subsamples of convertible debt and straight debt issuers having the largest measured leverage increases are similar to the average returns for their respective full samples, and this evidence strengthens the basis for rejecting the leverage-related information hypothesis. The evidence supporting this conclusion is in sharp contrast with other recent studies of capital structure change that collectively document a positive relationship between leverage changes and stock price behavior.

A second hypothesis, based upon the recent models of Myers and Majluf (1984) and Miller and Rock (1982), is that announcements of new financing convey unfavorable news about the firm's earnings or investment opportunities and thereby cause common stock price reductions. The negative average abnormal returns for convertible debt and, to a lesser extent, straight debt are consistent with this hypothesis. But average common stock prediction errors are virtually identical for issuances that constitute new financing and for issuances that constitute replacement financing of existing debt. Unless refinancing had been expected to be funded from current earnings, unfavorable information associated with external financing for new investment cannot explain the negative abnormal returns for issuances that are to refinance existing debt. Some other not yet identified common factor must be driving the common stock price response to debt offering announcements.

Finally, the original issue underpricing hypothesis posits that the stock price declines are due to wealth transfers from current stockholders to purchasers of the new convertible debt. The evidence that statistically significant negative abnormal stock returns also occur at the announcement of rights offerings of convertible debt, wherein no similar wealth transfers arise, implies that underpricing does not explain the common stock price response to announcements of convertible debt public offerings.

The evidence presented in this paper documents important empirical regularities in the stock price responses to corporate financing decisions. Even though no completely satisfactory explanation of the results is provided, several questions central to corporate finance theory have been posed and investigated. Further investigation of these questions is the subject of future research.

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