Factors Affecting The Equity Price Impacts of Convertible Bonds

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Abstract

This study examines abnormal stock returns associated with both the date a convertible bond issue is announced and the date it is sold. Results suggest the negative stock price effects observed in this and previous studies are due to the equity component inherent in convertible bonds, and an easily observed measure of that equity component is offered. In addition, results suggest that convertible bond issues sold by firms with previously issued outstanding convertibles are met with larger negative abnormal equity returns.

I. Introduction

Empirical research on the impacts which new security issues have on the prices of existing common shares has documented three common findings:

First, straight debt securities appear to cause little or no impact on the firm's stock value. For example, in a survey of research published through 1986, Smith (1986) reports an average (statistically insignificant) announcement date two-day abnormal stock return on -0.26%. Barclay and Litzenberger (1988) report negative but statistically insignificant abnormal returns during the day of a straight debt announcement. Studies of straight debt issues consistently report statistically insignificant negative abnormal stock returns on the date of issue.

Second, common equity securities cause a relatively sizable negative impact on the firm's stock value. Smith reports an average two-day abnormal return of -3.14% in his survey of current research. Barclay and Litzenberger report that stock prices fall, on average, 1.5% in the first 15 minutes after an equity sale announcement and between 2.7% and 3.0% during a three hour period surrounding the announcement. Mikkelson and Partch (1986) report a statistically significant average 2-day abnormal return on -0.7% at the date of sale.

Third, convertible debt securities cause impacts between those of straight debt and equity. Smith reports an average two-day announcement date abnormal return of -2.07%. Mikkelson and Partch report an average 2-day issue date abnormal return of -1.71%.

Theories have been developed which attempt to explain why such price effects arise, and several of these theories suggest that equity price impacts are caused by asymmetric information between firm managers and existing or potential investors in the stock. These theories suggest the greater the equity component inherent in a new convertible issue, the greater the equity price impact will be. However, we are aware of only two research studies which have examined this possibility. In their study of convertible bond issues, Dann and Mikkelson (1984), briefly examine the extent to which a convertible issue changes the issuer's financial leverage and whether this seems to be related to the negative stock price reaction at the date of issue. Their conclusion is that leverage changes inherent in the convertible have no discernible correlation with equity price impacts. We believe this result is due to the nature of their tests and suggest an alternative methodology.(1)

Janjigian (1987) tests convertible bond equity valuation as a function of probability of call. Using a proxy which includes conversion terms, his results suggest the equity valuation of the issue is positively related to the probability of call, and for industrial firms, the announcement date impact is related to the equity valuation of the convertible. Conversion terms are not available at the announcement date, however. A more precise test of the correlation between equity valuation and equity price impacts would involve the date the terms of the issue are publicly announced which is usually concurrent with the date the issue is sold.

Announcement Effect Hypotheses

A single unifying theory of why new security issues should have an impact on equity values does not exist. Instead, a variety of hypotheses have been offered which are often interrelated. Our categorization scheme integrates the hypotheses suggested by Smith and Barclay & Litzenberger. The hypotheses include: Leverage, Market Inefficiency, Price Pressure and Informational Asymmetry.

The Leverage, Market Inefficiency and Price Pressure hypotheses are based on forces other than asymmetric information between management and investors. That is, no new information is disclosed to investors by the unanticipated sale of new securities. Recent theoretical work, however, has investigated the possible role of management's signalling through the issuance of new securities, and two information hypotheses are currently recognized. These come from the works of Myers and Majluf (1984) and Miller and Rock (1985).

The Asset Value Signalling hypothesis is based on work by Myers and Majluf (1984). A principal result of their model is that management might chose not to accept all positive NPV projects if new securities need to be issued in order to do so. An implication of their model is that new equity sales would have a larger negative equity impact than new straight debt issues. This could imply that the greater the equity component inherent in a convertible bond issue the greater the negative stock return.

The Cash Flow Signalling hypothesis was first suggested by Miller and Rock (1985). Their analysis suggests any unanticipated security offering conveys negative information about the firm's internal cash flows and will result in decreased equity prices. Thus, announcements of debt, equity and convertibles all provide negative information and cause negative stock returns. The larger the issue size, regardless of type, the more negative the information and the larger the equity impact.

Additional insight is offered by Brennan and Schwartz (1988) who argue that since the value of convertibles is relatively insensitive to the risk of the issuing firm, using convertibles "shelters firms of high or indeterminate risk from the prohibitively high costs of straight debt." Thus, it could be argued that riskier firms would be more inclined to sell convertible debt.

Brennan and Schwartz suggest different motives for issuing convertibles. They state convertible issuers tend to have more highly levered capital structures, and they tend to be smaller, faster grower firms. This could imply firms in a growth mode that sell a convertible issue, retire (call) it, and issue another. Larger, more

mature firms, argued by Brennan and Schwartz, have no good reason for issuing convertibles. Our interpretation of this argument is that firms effectively using convertibles (younger, faster growing firms) would tend to have few and probably only one issue outstanding at a time.(2) Other firms might tend to have different motives for selling convertibles and have several issues outstanding at any given time.

II. Issues Examined

The intent of this study is to examine the empirical validity of the information asymmetry hypotheses. Asset Value Signalling would suggest abnormal returns will be positively related to the size of the equity component in new convertible issues. In contrast, the Cash Flow Signalling hypothesis would predict only a relationship between negative abnormal returns and issue size. The size of the equity component would be unrelated to abnormal stock returns.

The measurement of the equity and debt components inherent in a given convertible issue is theoretically and empirically a difficult problem.(3) To simplify the process, the security's conversion price is divided by the market price of the underlying common stock. We refer to this as the issue's CP ratio. This proxy derives from an option pricing argument which relates the value of a call option to the difference between stock price and exercise price. Janjigian (1987) uses a similar measure to capture the probability of conversion and assumes the higher the probability of conversion, the greater the value of the equity component. This would coincide with a low CP ratio as we calculate it.

Besides being a measure of the probability of call, the CP ratio can be interpreted in a slightly different manner using what we call our Good-Poor Firm hypothesis. In that case, the lower the CP ratio, the earlier management's ability to use the information value of a call/no call decision, thus signalling a "poor" firm. A stronger firm ("good" firm) would not need the benefit of the ability to force conversion as early as a "poor" firm. Using either interpretation, the lower the CP ratio, the greater the equity valuation placed on the convertible and the greater the expected (negative) equity price impact. Janjigian's equation 6 (page 17) is similar to our CP ratio but includes the volatility of the underlying stock and the time to maturity, both standard variables in option pricing, so our tests will employ two forms of the CP ratio.

Janjigian uses his equity proxy to measure the relationship with announcement date equity impacts. Since conversion terms are available only at issuance, this study expands on that work by testing both the announcement and issue dates. CP ratios are calculated for each convertible examined: (1) using the closing

price of the stock two days before the announcement date, and (2) using the closing price two days before the date of the actual sale.

To test the argument of Brennan and Schwartz (1988), if the issue in the sample will represent the firm's only currently outstanding convertible issue, it is labeled "single." If the firm has at least one other issue outstanding when the issue in the sample is announced, the sample issue is labeled "multi." It is our anticipation that those firms with more than one issue of convertibles outstanding ("multi" firms) will be perceived as utilizing convertibles less efficiently and suffer greater (more negative) abnormal returns. "Single" firms, on the other hand, will be construed as utilizing convertibles as part of a growth strategy and suffer less of an equity impact.(4)

III. Data

The sample of convertibles used in this study includes all convertible bond issues identified in *Moody's Bond Record* as issued between June, 1963, and June, 1986, meeting the following criteria:

1. The firm was listed on the CRSP Daily Excess Returns tape,
2. Announcement and/or issue dates were clearly identifiable,
3. No other announcements were made by the firm at such dates,
4. The issue consisted solely of convertible bonds, and
5. The stock price was identifiable at one of the two dates.

Data pertaining to each issue (such as pricing, rating, etc.) were obtained from *Moody's Industrial Manual* and *Moody's Bond Survey*. Announcement dates were obtained from the *Wall Street Journal Index*.

After the six data restrictions above were applied a sample of 232 announcement date and 298 issue date observations was available.(5)

Sample Observations

	AD	ID
Single	171	225
Multi	61	73
Total	232	298

A summary of the data is reported in Table 1. The average issue size was $51.9 million with a minimum and maximum size equal to $5.5 million and $250 million. Relative size is a ratio which reflects the extent to which the firm is relying on a given convertible issue as a source of financing. It is calculated by dividing the dollar value of the convertible announced or issued by

the total market value of the firm's equity at that date. The average relative size was 19%, and over 89% of the issues were less than 35% of the value of the firm's equity. The average ratio of conversion price to stock price, our CP ratio, was 1.17 at the issue date. Relatively few firms set high conversion prices. In fact, about 90% of all firms had a CP ratio of 1.3 or less at the issue date. Such relatively low conversion prices, calculated by dividing the face value of the bond by the conversion ratio, are consistent with our Good-Poor Firm hypothesis. A high conversion price, vis a vis the current stock price, would usually not give management an option to signal information for a relatively long time period.

Table 1
Summary Data

	Issue Size ($Million)	Firm Equity Value ($Million)	Relative Issue Size	CP Ratio
Average	51.9	550.0	0.19	1.17
Minimum	5.5	6.6	0.02	1.00
Maximum	250.0	6786.0	3.55	1.91

Distribution of CP Ratios

Ratio	Issues
$1.50 \leq CP < 2.00$	4
$1.40 \leq CP < 1.50$	3
$1.35 \leq CP < 1.40$	2
$1.30 \leq CP < 1.35$	3
$1.25 \leq CP < 1.30$	15
$1.20 \leq CP < 1.25$	72
$1.10 \leq CP < 1.15$	77
$1.05 \leq CP < 1.10$	37
$1.00 \leq CP < 1.05$	10

As shown in Table 1, the average value of common stock outstanding for firms in the data sample was about $550 million. During the same time frame the market values of firms in the S&P Composite Index ranged from about $9 to $25 billion. Although our largest firm had an equity value of $7 billion, the firms in our sample clearly tend to be medium sized to small firms as predicted by Brennan and Schwartz (1988).

IV. Methodology and Results

Abnormal returns(6) on any non-event date would be expected to have a zero mean and some non-zero variance. At a suspected economic event, however, the mean expected abnormal return might be non-zero, and the variance would likely differ from that on a non-event date. Therefore, significance tests utilize the standard deviation of the abnormal returns over the 120-day period surrounding the event, either the announcement or issue date, excluding the event "window" including the event date and the previous day.

In Tables 2a and 2b, average abnormal returns (AR) and cumulative average abnormal returns (CAR)(7) are displayed for the aggregate sample around the announcement and the issue dates. At the announcement date the average abnormal return is statistically significant at -0.73%. The average issue date abnormal return is also statistically significant at -0.48%. The announcement and issue date two-day abnormal returns (day 0 plus day -1) are -1.43% and -0.61%, respectively. These results are consistent with previous studies of convertible bond sales, i.e., both the announcement and subsequent issuance of convertibles have a negative impact on stock prices.

Table 2a
Daily Abnormal Returns (AR) and Cumulative
Abnormal Returns (CAR) For 121 Days
Around the Announcement of
Convertible Bond Issues:
Full Sample, n = 232

Trading Day	AR	t	CAR	t	
-60	0.06 %	0.38	0.06 %	0.38	
-50	0.05	0.35	1.15	2.30	***
-40	0.11	0.72	2.13	3.07	***
-30	-0.20	-1.30	2.91	3.46	***
-20	-0.06	-0.37	3.27	3.38	***
-15	0.15	0.98	3.75	3.66	***
-14	-0.13	-0.83	3.63	3.50	***
-13	-0.08	-0.52	3.55	3.39	***
-12	0.11	0.71	3.66	3.45	***
-11	0.03	0.18	3.68	3.45	***
-10	-0.06	-0.43	3.62	3.35	***
-9	0.07	0.49	3.69	3.39	***
-8	0.24	1.60	3.94	3.58	***
-7	0.17	1.10	4.10	3.69	***
-6	0.02	0.15	4.12	3.68	***
-5	0.13	0.86	4.25	3.76	***
-4	-0.02	-0.10	4.24	3.71	***
-3	-0.18	-1.20	4.06	3.52	***
-2	-0.19	-1.26	3.87	3.33	***
-1	-0.70	-4.61	3.17	2.71	***
0 a	-0.73	-4.81	2.44	2.07	**
1	-0.21	-1.40	2.23	1.87	*
2	-0.21	-1.40	2.02	1.68	*
3	0.11	0.74	2.13	1.76	*
4	0.02	0.11	2.15	1.76	*
5	0.06	0.40	2.21	1.80	*
6	0.07	0.46	2.28	1.84	*
7	-0.06	-0.41	2.21	1.78	*
8	0.10	0.68	2.32	1.85	*
9	-0.08	-0.51	2.24	1.77	*
10	-0.07	-0.45	2.17	1.71	*
11	-0.34	-2.24	1.83	1.43	**
12	-0.07	-0.48	1.76	1.36	
13	0.11	0.75	1.87	1.44	
14	-0.30	-1.96	1.58	1.21	**
15	-0.21	-1.39	1.37	1.04	
20	-0.04	-0.29	1.29	0.95	
30	-0.14	-0.93	2.02	1.40	
40	0.16	1.07	1.25	0.82	
50	-0.09	-0.58	0.60	0.38	
60	-0.18	-1.19	-0.30	-0.18	

*** Significant at 1% Level
**   Significant at 5% Level
*   Significant at 10% Level
a Announcement date

Table 2b
Daily Abnormal Returns (AR) and Cumulative
Abnormal Returns (CAR) For 121 Days
Around the Sale of Convertible Bond Issues:
Full Sample, n = 298

Trading Day	AR	t	CAR	t	
-60	0.06 %	0.48	0.06 %	0.48	
-50	0.14	1.13	1.06	2.58	***
-40	-0.26	-2.10	0.87	1.53	**
-30	0.03	0.24	1.19	1.73	*
-20	-0.03	-0.24	1.01	1.27	
-15	-0.04	-0.32	1.25	1.49	
-14	0.21	1.70	1.46	1.72	*
-13	0.04	0.32	1.50	1.75	*
-12	-0.15	-1.21	1.35	1.56	
-11	-0.02	-0.16	1.33	1.52	
-10	-0.26	-2.10	1.07	1.21	**
-9	-0.12	-0.97	0.95	1.06	
-8	-0.13	-1.05	0.82	0.91	
-7	-0.04	-0.32	0.78	0.86	
-6	0.00	0.00	0.78	0.85	
-5	-0.05	-0.40	0.73	0.79	
-4	0.05	0.40	0.78	0.83	
-3	-0.06	-0.48	0.72	0.76	
-2	-0.16	-1.29	0.56	0.59	
-1	-0.13	-1.05	0.43	0.45	
0 a	-0.48	-3.88	-0.05	-0.05	***
1	-0.09	-0.73	-0.14	-0.14	
2	-0.18	-1.45	-0.32	-0.33	
3	-0.05	-0.40	-0.37	-0.37	
4	0.01	0.08	-0.36	-0.36	
5	0.17	1.37	-0.19	-0.19	
6	-0.08	-0.65	-0.27	-0.27	
7	0.04	0.32	-0.23	-0.23	
8	0.01	0.08	-0.22	-0.21	
9	0.01	0.08	-0.21	-0.20	
10	-0.09	-0.73	-0.30	-0.29	
11	0.20	1.62	-0.10	-0.10	
12	0.04	0.32	-0.06	-0.06	
13	-0.19	-1.54	-0.25	-0.23	
14	0.06	0.48	-0.19	-0.18	
15	0.05	0.40	-0.14	-0.13	
20	-0.10	-0.81	-0.58	-0.52	
30	-0.02	-0.16	-0.81	-0.69	
40	-0.06	-0.48	-1.02	-0.82	
50	-0.07	-0.57	-1.55	-1.19	
60	-0.15	-1.21	-2.25	-1.65	*

*** Significant at 1% Level
**   Significant at 5% Level
*   Significant at 10% Level
a   Issue date

cumulative abnormal returns (CAR) for the 121-day period surrounding the announcement date for single and multi firms. Although CAR's for the Multi firms are only marginally significant at any time prior to the announcement, those for Single firms are quite large and significant at the .01 level for most of the preceding 60 days. "Single" firms clearly perform better than "multi" firms prior to the announcement of the intent to use convertibles.

Table 5 shows average 2-day abnormal returns (2AR) for 121 days around the sale of convertible bonds for Single and Multi firms. The 225 Single firms experienced an average 2AR of -0.39% which is only marginally significant. The average 2AR for Multi firms is a highly significant -1.28%. A t-test revealed that the issue date impacts for Single and Multi firms are statistically different at the .01 level.

Table 3 shows 2-day abnormal returns for Single and Multi firms for 121 days surrounding the announcement date. At the announcement date, Single firms incur an average 2-day abnormal return of -1.37%. This contrasts with -1.59% for Multi firms. A t-test shows these results are not significantly different. Table 4 shows

Table 3
Two-Day Abnormal Returns (2AR) For
121 Days Around the Announcement
of Convertible Bond Issues

	Single Firms n = 171		Multi Firms n = 61	
Trading Day	2AR	t	2AR	t
-59,-60	0.26 %	0.96	0.11 %	0.28
-50,-51	0.15	0.56	0.16	0.41
-40,-41	0.24	0.89	0.76	1.95 *
-30,-31	-0.36	-1.33	-0.11	-0.28
-28,-29	0.22	0.81	0.03	0.08
-26,-27	0.10	0.37	0.39	1.00
-24,-25	0.30	1.11	-0.29	-0.74
-22,-23	-0.30	-1.11	0.04	0.10
-20,-21	0.21	0.78	-0.34	-0.87
-18,-19	0.40	1.48	0.47	1.21
-16,-17	-0.26	-0.96	0.43	1.10
-14,-15	0.04	0.15	-0.04	-0.10
-12,-13	0.02	0.07	0.05	0.13
-10,-11	0.01	0.04	-0.18	-0.46
-8,-9	0.33	1.22	0.27	0.69
-6,-7	0.27	1.00	-0.05	-0.13
-4,-5	0.22	0.81	-0.20	-0.51
-2,-3	-0.26	-0.96	-0.69	-1.77 *
0,-1	-1.37 a	-5.07 ***	-1.59 a	-4.08 ***
1,2	-0.51	-1.89 *	-0.19	-0.49
3,4	-0.15	-0.56	0.90	2.31 **
5,6	0.20	0.74	-0.08	-0.21
7,8	-0.03	-0.11	0.24	0.62
9,10	-0.20	-0.74	0.03	0.08
11,12	-0.61	-2.26 **	0.16	0.41
13,14	0.06	0.22	-0.84	-2.15 **
15,16	0.05	0.19	-0.73	-1.87 *
17,18	0.24	0.89	-0.47	-1.21
19,20	-0.17	-0.63	-0.20	-0.51
21,22	-0.11	-0.41	-0.19	-0.49
23,24	0.84	3.11 ***	0.14	0.36
25,26	0.19	0.70	0.11	0.28
27,28	0.18	0.67	-0.14	-0.36
29,30	-0.15	-0.56	0.22	0.56
40,41	0.08	0.30	0.40	1.03
50,51	-0.12	-0.44	0.29	0.74
59,60	-0.31	-1.15	-0.31	-0.79

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***  Significant at the 1% level
**   Significant at the 5% level
*    Significant at the 10% level
a    Two-day excess return for the announcement
     date and the previous day
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Table 4
Cumulative Abnormal Returns (CAR) for 121 Days
Around the Announcement of Convertible Bond Issues

	Single Firms, n = 171		Multi Firms, n = 61	
Trading Day	CAR	t	CAR	t
-60	0.10 %	0.58	-0.07 %	-0.25
-50	1.26	2.14 **	0.86	0.95
-40	2.16	2.67 ***	2.04	1.63
-30	3.01	3.06 ***	2.64	1.73 *
-20	3.55	3.14 ***	2.48	1.42
-15	3.84	3.21 ***	3.50	1.89 *
-14	3.73	3.08 ***	3.34	1.78 *
-13	3.56	2.91 ***	3.51	1.85 *
-12	3.75	3.04 ***	3.38	1.77 *
-11	3.77	3.02 ***	3.43	1.78 *
-10	3.77	2.99 ***	3.21	1.64 *
-9	3.81	2.99 ***	3.37	1.71 *
-8	4.10	3.19 ***	3.47	1.75 *
-7	4.33	3.34 ***	3.45	1.72 *
-6	4.37	3.34 ***	3.42	1.69 *
-5	4.65	3.52 ***	3.15	1.54
-4	4.60	3.45 ***	3.22	1.56
-3	4.40	3.27 ***	3.10	1.49
-2	3.82	2.82 ***	2.53	1.21
-1	3.18	2.33 **	1.67	0.79
0 a	2.46	1.78 *	0.95	0.44
1	2.21	1.59	0.84	0.39
2	1.95	1.39	0.75	0.35
3	1.90	1.34	1.33	0.61
4	1.80	1.27	1.66	0.75
5	1.94	1.36	1.49	0.67
6	2.01	1.39	1.58	0.71
7	1.81	1.25	1.88	0.83
8	1.98	1.35	1.82	0.80
9	1.98	1.34	1.51	0.66
10	1.77	1.19	1.84	0.80
11	1.35	0.90	1.74	0.75
12	1.15	0.77	2.00	0.86
13	1.38	0.91	1.80	0.77
14	1.21	0.79	1.16	0.49
15	1.12	0.73	0.60	0.25
20	1.31	0.82	-0.23	-0.10
30	2.26	1.34	-0.09	-0.03
40	1.78	1.00	-1.68	-0.61
50	1.28	0.69	-2.76	-0.96
60	0.24	0.12	-3.25	-1.08

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***  Significant at 1% Level
**   Significant at 5% Level
*    Significant at 10% Level
a    Announcement date
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Cumulative abnormal returns for Single and Multi firms (Table 6) offer no help in explaining this phenomenon. Neither Single nor Multi firms experience significant CARs before or after the sale date. Without a clear theory that would explain why Single and Multi issues should convey different levels of information, particularly at the issue date, considerable care must be given to any interpretations placed on these results. However, it has been suggested that firms might use convertible bonds as a continuing means of issuing common stock during a period of growth. That is, the firm issues convertibles, forces them into conversion by calling, and then sells another issue. This would agree with the argument of Brennan and Schwartz (1988) as it would imply a potentially stronger firm than those which sell convertibles without first retiring outstanding issues.

Tests of Equity Impacts

Abnormal returns at both the announcement and

issue dates are regressed against SM, CP, and ISIZE. SM is a dummy variable with a value of 1 if the issue is classified as "single" and 0 if "multi." CP, in its two forms, is a proxy for the relative size of the equity component inherent in the convertible. ISIZE is the total dollar value of the issue sold.(8)

Tables (7) and (8), respectively, show announcement and issue date regression results.

At the announcement date, none of the tested variables is statistically significant in explaining abnormal returns. SM, dummy variable for "single" or "multi," and "ISIZE," the dollar size of the issue, are both insignificant. CP1 and CP2 are our CP ratio, conversion price divided by current stock price, and the Janjigian CP, respectively. The Janjigian CP, which incorporates variance and time to maturity, is the only variable which shows any promise but it still falls short of being statistically significant.

Table 5
Two-Day Abnormal Returns (2AR) For 121 Days Around
the Sale of Convertible Bond Issues

	Multi Firms	n = 73		Single Firms	n = 225
Trading Day	2AR	t		2AR	t
-59,-60	0.49	1.36		-0.12	-0.55
-50,-51	-0.25	-0.69		0.13	0.59
-40,-41	-0.71	-1.97 **		-0.34	-1.55
-30,-31	-0.19	-0.53		-0.07	-0.32
-28,-29	0.44	1.22		0.10	0.45
-26,-27	0.28	0.78		-0.56	-2.55 **
-24,-25	0.45	1.25		0.00	0.00
-22,-23	0.25	0.69		-0.11	-0.50
-20,-21	0.06	0.17		-0.16	-0.72
-18,-19	0.10	0.28		0.26	1.18
-16,-17	-0.53	-1.47		0.23	1.05
-14,-15	0.11	0.31		0.19	0.86
-12,-13	-0.02	-0.06		-0.14	-0.64
-10,-11	-0.54	-1.50		-0.20	-0.91
-8,-9	0.51	1.42		-0.51	-2.32 **
-6,-7	-0.31	-0.86		0.06	0.27
-4,-5	-0.29	-0.81		0.10	0.45
-2,-3	-0.24	-0.67		-0.22	-1.00
0,-1 a	-1.28	-3.56 ***		-0.39 a	-1.77 *
1,2	-0.16	-0.44		-0.31	-1.41
3,4	-0.14	-0.39		-0.01	-0.05
5,6	0.05	0.14		0.10	0.45
7,8	-0.24	-0.67		0.15	0.68
9,10	0.00	0.00		-0.12	-0.55
11,12	0.22	0.61		0.25	1.13
13,14	-0.29	-0.81		-0.07	-0.32
15,16	0.54	1.50		-0.10	-0.45
17,18	-0.22	-0.61		-0.26	-1.18
19,20	-0.64	-1.78 *		-0.06	-0.27
21,22	-0.12	-0.33		-0.20	-0.91
23,24	-0.41	-1.14		-0.21	-0.95
25,26	0.05	0.14		-0.03	-0.14
27,28	-0.61	-1.69 *		0.26	1.18
29,30	0.08	0.22		0.23	1.05
40,41	0.07	0.19		0.05	0.23
50,51	0.38	1.06		-0.24	-1.09
59,60	-0.21	-0.58		-0.17	-0.77

***	Significant at the 1% level
**	Significant at the 5% level
*	Significant at the 10% level
a	Two-day excess return for the issue date and the previous day

The issue date results are more promising. SM is significant at the 0.10 level, and the Janjigian CP, CP2, is significant at the 0.01 level. This indicates that firms with previously issued outstanding convertible bonds experience greater (more negative) issue date equity impacts than firms selling their only (current) issue of convertibles. The conversion terms of the issue, along with the variability of the issuing firm's stock returns and maturity of the issue, also affect the equity impact. This would imply that the equity component of the issue, measured by the probability of conversion, is positively related to the degree of impact experienced, but at the issue date, only. Our simple CP is very marginally significant. Issue size, included in response to the work of Miller and Rock (1985), shows no relationship at either date.

VI. Discussion and Additional Tests

The tests above suggest abnormal stock returns at the date convertible bonds are sold are affected by the size of the equity component inherent in the securities as well as whether the issuing firm has previously issued outstanding convertible bonds. An intriguing question arises when studying these results. Specifically, why are the tested variables significant at the issue date and not the announcement date? It would appear that additional, economically important, information is released when management announces the conversion terms and sells the issue.

Table 6
Cumulative Abnormal Returns (CAR) For 121 Days
Around the Sale of Convertible Bond Issues

	Single Firms, n = 225		Multi Firms, n = 73	
Trading Day	CAR	t	CAR	t
-60	-0.05	-0.35	0.41	1.69 *
-50	0.79	1.68 *	1.88	2.34 **
-40	0.83	1.28	0.99	0.89
-30	1.33	1.68 *	0.76	0.56
-20	0.60	0.66	2.23	1.44
-15	1.12	1.16	1.53	0.93
-14	1.28	1.32	1.91	1.15
-13	1.33	1.35	1.91	1.14
-12	1.14	1.15	1.89	1.12
-11	1.13	1.13	1.83	1.07
-10	0.94	0.93	1.35	0.78
-9	0.69	0.67	1.62	0.93
-8	0.43	0.42	1.86	1.06
-7	0.37	0.35	1.89	1.06
-6	0.48	0.46	1.55	0.86
-5	0.54	0.51	1.15	0.63
-4	0.58	0.54	1.26	0.69
-3	0.51	0.47	1.21	0.66
-2	0.36	0.33	1.02	0.55
-1	0.44	0.40	0.26	0.14
0 a	-0.03	-0.03	-0.26	-0.14
1	-0.10	-0.09	-0.42	-0.22
2	-0.34	-0.30	-0.42	-0.22
3	-0.37	-0.33	-0.54	-0.28
4	-0.35	-0.31	-0.56	-0.29
5	-0.16	-0.14	-0.46	-0.23
6	-0.25	-0.22	-0.51	-0.26
7	-0.20	-0.17	-0.49	-0.25
8	-0.10	-0.08	-0.75	-0.37
9	-0.13	-0.11	-0.64	-0.32
10	-0.22	-0.18	-0.75	-0.37
11	-0.07	-0.06	-0.37	-0.18
12	0.03	0.02	-0.53	-0.26
13	-0.11	-0.09	-0.87	-0.42
14	-0.04	-0.03	-0.82	-0.39
15	-0.11	-0.09	-0.39	-0.18
20	-0.46	-0.36	-1.14	-0.52
30	-0.42	-0.31	-2.15	-0.93
40	-0.80	-0.56	-1.82	-0.75
50	-1.18	-0.79	-2.87	-1.13
60	-1.92	-1.23	-3.46	-1.30

***	Significant at 1% Level
**	Significant at 5% Level
*	Significant at 10% Level
a	Announcement date

An alternative explanation, related to the equity component, is that investors base announcement date evaluations upon some average conversion terms. That is, convertible announcements are met with similar equity impacts based upon some average probability of conversion. Then, if the actual conversion terms differ significantly from expectations, the issue is reevaluated. Specifically, if the conversion price is lower, vis a vis the stock price, the probability of conversion and, hence the equity component of the issue, are deemed greater than average, and the firm's equity value is adjusted further. If the conversion price is set higher than expected, the firm experiences less of an issue date equity impact.

To test this rather simple explanation, we included a

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dummy variable for an "adjusted" CP ratio in place of the Janjigian CP. In this case, the dummy variable for CP took the value of 1 if the actual CP was above the sample average of 1.17 and 0 if below. These results are shown in Table 9, below.

Table 7
Announcement Date Abnormal Returns Regressed on
Single vs. Multi, CP Ratio, and Issue Size
(t-statistics in parentheses)

2AR(AD) =	alpha	SM	CP1	ISIZE
=	-1.59	0.17	-0.05	-0.001
	(-0.78)	(0.34)	(-0.03)	(-0.04)
			CP2	
=	-2.13	0.17	1.99	-0.002
	(-3.33)	(0.33)	(1.48)	(0.33)

CP1 is our simple measure of the CP ratio. That is, the conversion price divided by the current stock price.
CP2 is the ratio as presented by Janjigian (1987), equation 6, page 17.

As with the other announcement date tests, there is no significance detected. However, issue date results are highly significant. In this case SM is significant at the 0.05 level, and our adjusted CP is significant (at the 0.01 level) with the predicted sign and a t-statistic even stronger than that observed for the Janjigian CP. It would appear that the probability of conversion, used to measure the relative equity valuation of the issue, can be measured equally well with our simple adjusted CP or with the Janjigian CP which entails considerably more calculations.

Table 8
Issue Date Abnormal Returns Regressed on
Single vs. Multi, CP Ratio, and Issue Size
(t-statistics in parentheses)

2AR(ID) =	alpha	SM	CP1	ISIZE
=	-4.20	0.89	2.52	-0.004
	(-2.23)	(1.89)	(1.66)	(-0.73)
			CP2	
=	-2.16	0.89	3.16	-0.003
	(-4.03)	(1.90)	(2.59)	(0.83)

CP1 is our simple measure of the CP ratio. That is, the conversion price divided by the current stock price.
CP2 is the ratio as presented by Janjigian (1987), equation 6, page 17.

VII. Conclusions

Our intent in this paper was to study the impact of various firm and issue characteristics on the abnormal returns experienced by firms that announce and sell convertible bonds. To test the relationship between equity valuation and abnormal returns, we utilized a measure we term the CP ratio. Although more precise ways of valuing the equity component are possible, the CP ratio is easily observed and offers a very simple and effective approach.

Table 9
Announcement Date and Issue Date Abnormal Returns
Regressed on Single vs. Multi, CP Ratio, and Issue Size
(t-statistics in parentheses)

2AR(AD) =	alpha	SM	ADJCP
=	-1.98	0.36	0.78
	(-4.36)	(0.71)	(1.64)
2AR(ID) =	alpha	SM	ADJCP
=	-1.76	0.98	1.41
	(-4.19)	(2.12)	(3.21)

Regression analysis demonstrates the significance of the level at which management sets the conversion terms of the issue. That is, the lower the conversion price with respect to the firm's current stock price, the greater the perceived probability of conversion and, hence, the greater the equity valuation of the issue and the impact experienced by the selling firm. This is consistent with the Asset Value Signalling hypothesis of Myers and Majluf (1984) and our "Good-Poor Firm Signalling hypothesis."

We found no support for the hypothesis of Miller and Rock (1985) which would predict a relationship between issue size and abnormal returns, but we observed possible evidence of differing motives for selling convertibles. "Multi" firms, those firms with previously issued convertible bonds outstanding when the issue in the sample was announced, experienced the greatest (most negative) issue date equity price impact, and "single" firms demonstrated far better performance prior to the announcement to issue convertible bonds. This was interpreted as evidence in support of Brennan and Schwartz (1988) who hypothesize that smaller, faster growing firms tend to have reason to use convertibles, and older, larger firms have none.

VIII. Suggestions for Future Research

Using an option pricing argument, the CP ratio was calculated for each issue in the sample. Effectively, this compares the exercise price to the current stock price, and it is used to estimate the relative equity valuation of the convertibles. However, option values are also influenced by interest rates, variability, and time to maturity. An extension of the current research would be the inclusion of these option pricing variables.

Using a Brennan and Schwartz suggestion, we argue that equity impacts should be different for firms selling their only issue of bonds versus those with several previously issued outstanding convertibles. This is an interesting and potentially economically important question, and we do not suggest our answer is the only possibility. The tip, only, of this iceberg has been exposed.

The final suggestion deals with the date convertible bonds are called. Specifically, does the market accurately predict when management will call the bonds? We have shown that firms which set low conversion prices, vis a vis the current stock price, experience the greatest negative equity impacts when the bonds are sold. This suggests the market expects these bonds to be called and forced into conversion sooner than bonds with higher conversion prices. Do these firms actually call sooner, are their convertibles deeper "in the money" when called, and are call date equity impacts affected by the final conversion terms?   ❧

✳✳✳Footnotes✳✳✳

1. Dann and Mikkelson rely on book value measures of debt and convertible debt observations. They conclude that, on average, the straight debt component of the convertible is a major portion of the security's value. They note this is consistent with the results of King (1986). There are two problems with the Dann and Mikkelson discussion. First, their debt measures are (admittedly) crude and based on accounting book values. More important, however, they do not examine potential debt differences in individual issues but only refer to the likely debt impacts of all issues. Thus, their study doesn't truly test whether differences in the relative debt and equity components cause differences in abnormal returns.
2. The choice of one only issue outstanding as signalling a young, fast growing firm is arbitrary, but it is unlikely such a firm would have several issues of convertibles outstanding at any given time.
3. King (1986) suggests a numerical procedure for estimating the value of the straight debt component. Billingsley, Lamy, and Thompson (1986) have employed a standard bond discount model. In future expansions of this study, we intend to explore the use of similar procedures to evaluate the relative debt and equity components.
4. Since it is possible a young, fast growing firm might have more than one issue of convertibles outstanding, selecting the cutoff at one issue will only tend to lessen the probability of obtaining significant results.
5. The number of announcement date observations is smaller than the number of issue date observations because the announcement dates were not always identifiable.
6. Abnormal returns utilized in this study were obtained from the CRSP Daily Excess Returns Tape.
7. Significance in cumulative abnormal returns (CAR) was tested with the methodology proposed by Brown and Warner (1985), Appendix 3, pp. 28-29.
8. Issue size can be construed as a relative measure. That is, issues of approximately the same size might be considered large for a small firm and only average for a larger firm. To compensate, we used RSIZE, the ratio of the size of the issue to the total dollar value of the firm's outstanding equity. Results were not improved over using straight issue size.

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