Valuation Effects of Convertible Security Calls: An Update

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This article attempts to interpret what is known about firm valuation effects of firms' decisions to call, hence force conversion of in-the-money convertible bonds and preferred stocks. Although the topic is defined narrowly, the task has proved a daunting one. The various theoretical arguments regarding valuation consequences of convertible calls and the empirical evidence that has been amassed in various studies, several of which are as yet unpublished, are summarized. Fresh evidence also is presented on valuation responses to call announcements based on the largest and most comprehensive sample examined thus far.

INTRODUCTION

Calls of in-the-money convertible securities represent a valuable laboratory for testing various theories of capital structure because they entail unambiguous and immediate reductions in financial leverage. Such calls are also valuable because they are unaccompanied by simultaneous changes in asset composition; thus, the effects of essentially pure capital structure shifts may be investigated. Most of the empirical studies reviewed here document a significant average equity value reduction upon announcement of in-the-money calls of convertible bonds and preferred stocks. The opportunity exists to shed some light upon capital structure theory by confronting various predictions with data that exhibit a significant valuation effect.

The purpose of this paper is threefold. First, empirical findings, both published and unpublished, are reviewed in order to develop as complete a picture as possible of the magnitude and extent of the valuation effects. Next, the various theoretical predictions pertinent to such changes in financial leverage are described. An attempt is made to reconcile those predictions with existing empirical findings. Finally, a replication study with the largest sample examined to date and using the most defensible study method available of the announcement effect is analyzed.

PREVIOUS RESEARCH

Table 1 summarizes the announcement period stock price reactions documented in previous studies of convertible calls. Mikkelson (1981) finds that calling firms experience significant, negative equity valuation effects for convertible bond calls but not for convertible preferred stock calls. He concludes that these findings are consistent with a corporate tax effect, as firms lose valuable tax deductions by calling convertible bonds. Mais, Moore, and Rogers (1989) cast doubt upon the tax argument as a completely general explanation, however, when they find that convertible preferred stock calls are associated with significant, average stock price reactions of about -1.6 percent. This dif-

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Table 1—Summary of Published Studies of Convertible Security Call Announcement Effects on Common Stock Prices: Sample Size, Time Period Studied, and Reported Cumulative Average Abnormal Return (CAAR)

	Sample Size	Time Period	Average Annual Period CAAR (%)
Panel A Convertible Bond Call Announcements			
Mikkelson (1981)	113	1963-78	-2.13
Ofer and Natarajan (1987)	111	1971-80	-1.10
Singh, Cowan, and Nayar (1991)	65	1968-83	-2.00[1]
Mazzeo and Moore (1992)	111	1963-80	-1.20
Panel B Convertible Preferred Stock Call Announcement			
Mikkelson (1981)	57	1963-78	-0.36[2]
Mais, Moore, and Rogers (1989)	67	1963-86	-1.60
Cowan, Nayar and Singh (1992)	74	1964-83	-0.67
Mazzeo and Moore (1992)	58	1963-86	-1.50

Except as noted, all CAAR values are statistically significant at the .05 level or better
[1]The CAAR value is for underwritten calls only.
[2]Not statistically significant at conventional levels

ference in findings occurs because the Mais, Moore, and Rogers sample of convertible preferred stock calls removes firms that have other material announcements published in the *Wall Street Journal* during the call announcement period. The authors argue that their results are consistent with the free cash flow (Jensen, 1986) and signaling explanations (Harris and Raviv, 1985). Weak evidence is found that some of the negative reaction results from dilution of voting rights (Stulz, 1988).

An information signaling explanation is developed for the valuation effects of calls of convertible bonds by Harris and Raviv (1985). According to their argument, if a firm's manager expects firm value to be insufficient to encourage voluntary conversion, conversion will be forced by calling a bond issue. Calls therefore signal negative information to the market. This hypothesis is tested by Ofer and Natarajan (1987) who document unexpected declines in four different profit variables following calls. In addition, Ofer and Natarajan find average cumulative abnormal returns of -11.1 percent the first year after the call and -72.6 percent over the first five years after the call. Although these results support the information signaling hypothesis, the authors note that the magnitude of the average five year return suggests either market inefficiency or some bias in estimating returns.[1]

[1] Cowan, Nayar, and Singh (1990) and Campbell, Ederington, and Vankudre (1991) both show that the Ofer and Natarajan results are biased due to their use of precall data to estimate the market model parameters. The bias occurs as a result of the unusually large positive stock returns that typically precede convertible bond calls. Using postcall data, Cowan, Nayar, and Singh find statistically insignificant average abnormal returns for the first year and for the first five years following convertible bond calls.

The Harris and Raviv (1985) signaling hypothesis is extended by Singh, Cowan, and Nayar (1991) and Cowan, Nayar, and Singh (1992). In each of these studies, the authors test three hypotheses: the negative information hypothesis, the agency cost hypothesis, and the shareholder wealth maximization hypothesis. The negative information explanation argues that underwritten calls send stronger negative signals than do nonunderwritten calls. During the conversion period, usually three to four weeks in duration,[2] a decline in stock value could trigger financial distress in the event it were sufficient to drive the convertible out of the money. The convertible issue would be redeemed for cash, possibly straining the firm's liquidity. An underwriter may be engaged in a standby agreement, effectively insuring against this outcome.[3] The negative information hypothesis argues that if managers have highly unfavorable information concerning future earnings, they will have the call underwritten. Therefore, underwritten calls send stronger negative signals than do nonunderwritten calls.

The agency cost hypothesis also predicts a stronger, negative stock price response for underwritten calls, but for a different reason. In this case, risk-averse managers employ underwriters in convertible calls for personal risk reduction (Amihud and Lev, 1981). Therefore, the market perceives that calls are underwritten in order to benefit managers at the expense of shareholders.

The shareholder wealth maximization hypothesis interprets the call underwriting process as both a purchase of insurance and a certification of firm value. The value of the insurance feature of the standby contract may be viewed as a put option. To price the put option correctly, the underwriter must scrutinize the firm carefully. The price of the put option therefore reveals firm value. By providing insurance against possible illiquidity and by providing certification of firm value, underwritten calls help to maximize shareholder wealth. Consequently, undervalued and correctly valued firms will choose to make underwritten calls. Overvalued firms, however, make nonunderwritten calls because they have nothing to gain by revealing their true quality.

The shareholder wealth maximization hypothesis predicts a price reaction different from that predicted by the negative information and agency cost hypotheses. According to this hypothesis, the stock price reactions to announcements of underwritten calls should be less severe than those for nonunderwritten calls. In both studies, the authors find that underwritten calls result in stronger negative stock price reactions than do nonunderwritten calls. These results, in addition to results of other empirical tests, are interpreted to be consistent with the negative information hypothesis.

Singh, Cowan, and Nayar (1991) argue that underwritten convertible bond calls send stronger negative signals than do nonunderwritten convertible bond calls. They (1992) contend that underwritten convertible preferred stock calls send stronger negative signals than do their nonunderwritten counterparts. The results of the two studies are summarized in Table 2 below.

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[2] See Mazzeo and Moore (1992) and the results in Table 4 below.

[3] Jaffee and Shleifer (1990) exploit a similar argument to explain why firms call convertible securities late; i.e., they delay calling until convertibles are deep in the money.

Table 2—Summary of Valuation Effects of Underwritten versus Nonunderwritten Convertible Calls: Cumulative Average Abnormal Return (CAAR) for Two Day Announcement Period, Test Statistic (Z), and Sample Size (n)

	CAAR (Z)	n
Convertible Bonds[1]		
Underwritten Calls	-2.00% (-5.57)	65
Nonunderwritten Calls	-0.84% (-1.94)	64
Convertible Preferred Stocks[2]		
Underwritten Calls	-2.00% (-3.34)	23
Nonunderwritten Calls	-0.07% (-1.03)	51

[1]Singh, Cowan, and Nayar (1991).
[2]Cowan, Nayar, and Singh (1992).

The results in Table 2 support their argument that average stock price reactions to underwritten calls of convertible bonds (-2.00 percent) and preferred stocks (-2.00 percent) are more severe than those for nonunderwritten calls of convertible bonds (-.84 percent) and preferreds (-.07 percent). The differences are reported to be significant.

Constantinides and Grundy (1987) hypothesize that the relative size of common stock dividends and coupon interest payments affects managers' decisions to call convertible bonds. High dividends should entice bondholders to convert voluntarily. Therefore, if managers expect dividends to rise enough in the future to induce voluntary conversion, they will delay calls. A delay consequently is interpreted as a positive signal. If the bond coupon is greater than the cash dividend and managers do not expect dividends to rise, conversion-forcing calls will signal negative information.

An extension of this argument is presented by Campbell, Ederington, and Vankudre (1991). In this study, the authors hypothesize that the information conveyed by conversion-forcing calls depends on the after tax cash flows paid to bondholders. The assumed objective of management regarding the call decision is to minimize the present value of the after tax payments made to the bondholders. Three different scenarios are considered:

- Low dividend—If the amount of the dividend is less than the after tax coupon, a delay in calling sends the positive signal that managers expect future earnings and dividends to increase sufficiently to induce voluntary conversion. A call conveys the negative information that increases in future cash flows and dividends are not expected;
- Intermediate dividend—If dividends are higher than after tax coupon payments but lower than before tax coupons, a delay sends a weak, but positive, signal that managers expect dividends to remain at the current level. A call, however, signals a future decline in earnings and dividends. This is a strong negative signal. Managers only call if they receive new, negative information that leads them to believe that the amount of the dividend will drop below the after tax coupon;

- High dividend—If the dividend is higher than the before tax coupon, investors have an incentive to convert voluntarily. A delay in calling is expected because management wants to minimize payments to the bondholders. A delay therefore sends no information. Managers only call when they want to clean up the remainder of an issue after most of it has been converted. Consequently, a call in this case has no information content.

The evidence presented by Campbell, Ederington, and Vankudre (1991) is consistent with their hypotheses. They find two day announcement period average abnormal returns of -1.528 percent for low dividend firms and -1.689 percent for intermediate dividend firms, both significant at the .01 level and consistent with predictions. Call announcements for high dividend firms produce no detectable abnormal performance, consistent with the prediction.

A similar rationale is presented by Asquith and Mullins (1991) in their study of call policy. They argue that managers delay calls in order to save cash, and that this motivation has a number of signaling implications. If dividends are less than after corporate tax coupon interest, delaying a call suggests that managers expect to raise dividends in the future. A delay sends a positive signal. If dividends are greater than after corporate tax interest, calling may signal that managers expect dividends or firm value to decline in the future (a negative signal) or that managers merely are cleaning up an issue where most of the bondholders voluntarily have converted (no signal). Delaying the call implies that no negative events are anticipated and that managers are content to continue collecting the cash flow advantage from sleeping investors. Their empirical evidence supports the signaling predictions.

Mazzeo and Moore (1992) suggest the selling pressure hypothesis as a possible explanation for the negative stock price reaction to calls of convertible securities. Investors who convert, for a variety of reasons, may decide to sell their newly acquired shares at some point following the conversion. Dealers respond to conversion-forcing call announcements by reducing bid and ask prices. The reductions are intended to help manage order flow and to prevent the necessity of purchasing large amounts of new shares on their own accounts. By reducing ask prices, dealers attempt to deter some of the sellers, while bid quote reductions attract buyers to the market to match some of the new sell orders. Negative abnormal returns represent increased short-term liquidity costs rather than a permanent decline in firm value.

A key prediction of Mazzeo and Moore (1992) that distinguishes their explanation from those based on information signaling is that the price decline should be temporary. As conversion ends, order flow should be restored to equilibrium at the preannouncement stock price, assuming no information effect. Using postannouncement market model estimates, Mazzeo and Moore (1992) report two day announcement period average abnormal returns of -1.2 percent for 111 convertible bond calls and -1.5 percent for 58 convertible preferred calls. They report a 2.2 percent cumulative average abnormal stock return following calls of both types of securities for the period following announcement and extending through the last day to convert. The average announcement period returns and conversion period returns are significant at the .01 level. The announcement effect (or at least a component of it) appears to be transitory, as predicted by the selling pressure explanation.

Other explanations of valuation effects of convertible security calls include those based on agency costs. Mikkelson (1981) suggests that senior securityholders may benefit from conversion-forcing calls of subordinated issues because reductions in financial leverage generally reduce the magnitude of potential wealth transfers from senior securityholders to common stockholders, a manifestation of the agency problem among competing classes of claimants (Jensen and Meckling 1976) and because expropriation incentives are reduced to the extent senior claims are reduced in magnitude. Wealth may be shifted from stockholders to senior securityholders. Mikkelson (1981) finds no significant abnormal performance during the announcement period using weekly returns on nonconvertible securities, inconsistent with the expropriation scenario. Mais and Moore (1992) also document no abnormal average performance using daily returns on nonconvertible bonds and preferred stocks.

Another agency cost explanation that suggests a negative stock price reaction is due to Jensen (1986), who predicts a negative effect on firm value due to conversion-forcing calls because replacing fixed claims (preferred dividends or coupon payments) with variable cash flows (common dividends) may induce or exacerbate the agency problem of free cash flow. Mais, Moore, and Rogers (1989) test the free cash flow prediction for convertible preferred stock calls and find support for the agency cost explanation.

Another source of wealth transfer that is perhaps more subtle is pointed out by Mikkelson (1981). Calls of convertible bonds and preferred stocks result in changes in relative priority of outstanding claims. In the event bankruptcy judges avoid strict application of absolute priority in settling claims, conversion of subordinated claims may benefit senior debtholders to the detriment of stockholders. There is ample evidence that absolute priority is violated frequently. (See Eberhart, Moore, and Roenfeldt, 1990, for example.) The null findings of Mikkelson (1981) and Mais and Moore (1992) are not consistent with this explanation.

Finally, a negative stock price reaction to in-the-money calls of convertibles could be driven by imperfect substitutes for the calling firm's shares, implying a downward sloping long-run demand curve. This explanation has proven difficult to distinguish from those explanations based on information signaling and others. For example, the magnitude of the increase in outstanding shares should be linked inversely to the price reaction upon announcement according to the imperfect substitutes hypothesis, but the size of the called issue is predicted to have the same relation to the price reaction according to any number of the theories summarized above.

METHODOLOGY

The methodology used to examine stock price reactions to convertible call announcements is the event study which incorporates both market model returns and mean-adjusted returns.

The market model methodology is based on the following linear return-generating model:

$$(1)\ R_{jt} = \alpha_j + \beta_j R_{mt} + \varepsilon_{jt}$$

where:

R_{jt} = Equity return for security j on day t;

R_{mt} = Day t return on a market index; and

ε_{jt} = A mean zero error term.

Equation (1) is estimated for the preevent and postevent estimation periods described below using ordinary least squares (OLS). This process yields parameter estimates for both the intercept (α) and the slope (β). The abnormal return (AR_{jt}) for security j on day t is modelled as a random variable as follows:

$$(2)\ AR_{jt} = R_{jt} - \hat{\alpha}_j - \hat{\beta}_j R_{mt}$$

where:

$\hat{\alpha}_j$ = The OLS estimate of the intercept parameter for firm j; and

$\hat{\beta}_j$ = The OLS estimate of the slope parameter for firm j.

The cross-sectional average abnormal return (AAR) for any day in the event period is an estimate of the population mean abnormal return for that day. The average abnormal return (AAR_t) for day t is given by:

$$(3)\ AAR_t = \frac{1}{n} \sum_{j=1}^{n} AR_{jt}$$

where:

n = Number of securities in the sample.

Average abnormal returns are combined to form a cumulative measure. The cumulative abnormal return for security j (CAR_{jT}) for the T-day event window from day T1 to day T2 is given in equation (4).

$$(4)\ CAR_{jt} = \sum_{t=T1}^{T2} AR_{jt}$$

where:

T = Number of days in the event window;

T1 = First day in the event window; and

T2 = Last day in the event window.

A two day event window is used to estimate abnormal returns due to call announcements; thus, for the announcement period, T1 = day -1 and T2 = day 0, the press date. The cross-sectional cumulative average abnormal return for the T-day event window ($CAAR_T$) is given by:

$$(5)\ CAAR_T = \frac{1}{n}\sum_{j=1}^{n} CAR_{jT} = \frac{1}{n}\sum_{j=1}^{n}\sum_{t=T1}^{T2} AR_{jt}$$

The $CAAR_T$ provides an estimate of the population cumulative average abnormal return for the T-day event window.

Following Mikkelson and Partch (1988), the variance of the cumulative abnormal return for security j is calculated as:

$$(6)\ \text{vâr}\,(CAR_{jT}) = \hat{\sigma}_j^2\left[T + \frac{T^2}{N} + \frac{T^2(\overline{R}_{mT} - \overline{R}_m)^2}{\sum_{t=a}^{b}(R_{mt} - \overline{R}_m)^2}\right]$$

where

N = 120, the number of days in the estimation period;

a = First day of the 120-day estimation period;

b = Last day of the 120-day estimation period;

$\hat{\sigma}_j^2$ = Residual variance from estimating the market model (with OLS) over the estimation period for security j;

$\overline{R}_m = \frac{1}{N}\sum_{t=a}^{b} R_{mt}$ = Average market return during the estimation period; and

$\overline{R}_{mT} = \frac{1}{T}\sum_{t=T1}^{T2} R_{mt}$ = Average market return during the event window.

We define the preevent estimation period as the 120 day period ending 31 days before the call announcement date in the *Wall Street Journal*. The postevent estimation period is the 120 day span beginning with the date conversion ends.

The following test statistic (Z) has a standard normal distribution with a mean of zero and a standard deviation of one:

$$(7)\ Z = \frac{1}{\sqrt{N}}\sum_{j=1}^{n}\left[\frac{CAR_{jT}}{\sqrt{\text{vâr}\,(CAR_{jT})}}\right]$$

The market model event study methodology is dependent on its assumption that returns are generated according to the one factor linear model. It is possible, however, that β may fail to account for relevant risks and therefore bias estimated returns. For this reason, the mean-adjusted returns methodology is employed in addition to the market model method as a test of whether the results are robust to different assumed return-generating processes.

The mean-adjusted returns method is based on average returns for each security over the estimation period. The assumed return-generating process is:

(8) $R_{jt} = k_j + \varepsilon_{jt}$

where:

R_{jt} = Daily return on security j on day t;

k_j = Constant mean return; and

ε_{jt} = Mean zero disturbance term.

It is useful to note that the mean-adjusted returns model is equivalent to the market model without the slope coefficient. Consequently, OLS estimation of the mean-adjusted returns model is the same as estimating the market model with β suppressed. In this case, the OLS estimate of the market model intercept becomes an estimate of the constant mean return, k_j, in the mean-adjusted returns model.

The abnormal return (AR_{jt}) for security j during day t is computed according to equation (9).

(9) $AR_{jt} = R_{jt} - \overline{R}_j$

where:

$\overline{R}$ = Average return for security j over the N day estimation period:

(10) $\overline{R}_j = \frac{1}{N} \sum_{t=a}^{b} R_{jt}$

Because the mean-adjusted returns methodology does not include a slope parameter in the return-generating process, the last portion of equation (6) does not appear in the estimated variance of the CAR. The test statistic implies the following variance computation for the mean-adjusted returns method:

(11) $\hat{var}\,(CAR_{jT}) = \sigma_j^2 \left(T + \frac{T^2}{n} \right)$

The following test statistic (z) is distributed unit normal:

$$(12)\ Z = \frac{1}{\sqrt{n}} \sum_{j=1}^{n} \left[\frac{CAR_{jT}}{\sqrt{\hat{var}\,(CAR_{jT})}} \right]$$

DATA SOURCES AND SAMPLE SELECTION

CALLS OF CONVERTIBLE BONDS

The list of in-the-money convertible bond call announcement dates used by Mazzeo and Moore (1992) was provided by the authors for use in this study. This list includes 111 announcements of conversion-forcing calls of 120 convertible bonds from 1963 through 1980. These announcements have passed the selection criteria described in this section.

This sample is updated through 1990. Calls occurring during this period are obtained from *Standard & Poor's Bond Guide*. Call announcement dates are obtained from the *Wall Street Journal* and the *Wall Street Journal Index*. For the entire sample, details such as the call price, conversion ratio, the expiration date of the option to convert to common stock (the effective call date), and the dollar amount of the convertible debt issue outstanding are collected from *Standard & Poor's Bond Guide*, *Moody's Bond Record*, and various *Moody's Industrials* manuals. In addition, all of the original articles announcing convertible bond calls that appeared in the *Wall Street Journal* are examined to find missing details and to check for accuracy.

CALLS OF CONVERTIBLE PREFERRED STOCKS

The list of in-the-money convertible preferred stock calls used by Mazzeo and Moore (1992) was provided by the authors. This list includes 62 announcements of calls of 70 convertible preferred stock issues from 1963 through 1986. As with their convertible bond sample, this list has passed the selection criteria described in the next section.

The convertible preferred stock sample also is updated through 1990. For this period, convertible preferred stock calls are obtained from *Moody's Dividend Record*. The call announcement dates are found in the *Wall Street Journal* and the *Wall Street Journal Index*. The call price, conversion ratio, effective call date, and number of convertible preferred shares outstanding are obtained from *Moody's Dividend Record*, *Standard & Poor's Stock Guide*, and various *Moody's Industrials* manuals. As with the convertible bond call sample, the convertible preferred stock call announcements are checked by examining the original articles that appeared in the *Wall Street Journal*.

SAMPLE SELECTION CRITERIA

To be included in the final sample of convertible security calls, each observation in the initial sample must meet four requirements. First, each call announcement must appear in the *Wall Street Journal* between 1963 and 1990. Second, no other news reports concerning the calling firm should appear in the *Wall Street Journal Index* within two days before or after the call announcement. Third, calls must be in-the-money at the time of the announcement. If the call price is greater than the conversion value, the announce-

Table 3—Frequency of Announcements of 220 Convertible Bond Calls and 76 Convertible Preferred Stock Calls

	Convertible Bond Calls	Convertible Preferred Stock Calls
1963-1966	10	6
1967-1970	39	6
1971-1974	23	12
1975-1978	15	12
1979-1982	50	13
1983-1986	66	17
1987-1990	17	10
Total	220	76

ment is dropped from the sample. As a final requirement, the calling firm must have common stock returns on the Center for Research in Security Prices (CRSP) daily returns file. The selection criteria resulted in samples of 220 convertible bond calls and 76 convertible preferred stock calls.

The distribution of the sample of convertible security call announcements over time is presented in Table 3. As is evident from Table 3 the patterns over time are similar for both types of security calls. The highest frequency for each occurs from 1983 to 1986. This could be associated with the sharp rise in stock prices during the period, although such conjecture should be made cautiously.

RESULTS

SAMPLE DESCRIPTION

The samples of calls of convertible bonds and preferred stocks are described in Table 4. The average length of the conversion period is 21.4 days for bond calls and 26.7 days for preferred calls; the samples exhibit wide variations. The conversion period ranges from 9 days to 44 days for bond calls. The range is 11 days to 66 days for preferred calls.

Convertible security calls result in substantial increases in common shares; thus, these are not insignificant changes in capital structure. Convertible bond calls result in an average 11.65 percent increase, while preferred calls result in an average 11.96 percent increase, assuming full conversion. Firms calling convertible bonds are about the same size ($573.9 million equity value) as those calling convertible preferred stocks ($664.96 million). And, consistent with other studies, calls are made deep in-the-money on average, judging by the average ratios of conversion value to call price (1.509 for bond calls and 2.308 for preferred calls).

RESULTS OF EVENT STUDY TESTS

Event study methodologies commonly predict returns by estimating return-generating model parameters over a preevent estimation period. This estimation process can cause problems, however, when studying convertible calls because call announcements typically follow periods of large common stock price increases. As discussed earlier, studies by Cowan, Nayar, and Singh (1990) and Campbell, Ederington, and Vankudre (1991) show

Table 4—Mean Values of Selected Features of Samples of 220 Convertible Bond Calls and 76 Convertible Preferred Stock Calls (Medians in parentheses)

	Convertible Bonds	Convertible Preferred Stocks
Conversion Period (in Trading Days)	21.4 (21)	26.7 (23)
Common Shares Outstanding at Call	15,536,000 (8,264,000)	17,697,000 (9,845,000)
Number of New Shares Issued if Fully Converted	1,371,000 (750,000)	1,536,000 (661,000)
Percentage Increases in Shares Outstanding	11.65 (9.65)	11.96 (8.12)
Market Value of Equity at Call	$ 573,906,000 ($247,155,000)	$ 664,961,000 ($299,375,000)
Conversion Value Divided by Call Price	1.509 (1.363)	2.308 (1.426)

that results found by Ofer and Natarajan (1987) are biased due to their use of preevent estimation.

This study includes analyses based on both preevent estimation and postevent estimation. The results of the event study tests are provided in Table 5. As expected, some of the results are sensitive to the choice of estimation period. The finding of significant abnormal performance during the two day announcement period is robust to the choice of estimation period; however, assessment of performance after announcement varies with the choice. And, consistent with previous work, the findings are insensitive to the choice of the market model versus the mean-adjusted returns model.

During the preevent interval, days -11 to -2, the price run-up is detected using postevent estimation, but it is masked as expected when using preevent estimation. Stocks experience an average abnormal return of 2.173 percent (Z = 4.973) for the combined sample, 1.889 percent (Z = 4.379) for bond calls, and 2.987 percent (Z = 2.369) for preferred calls[4] using the mean-adjusted returns model and postevent estimation.

The two day announcement period exhibits highly significant negative price reactions for all samples, both models, and both estimation periods. In all cases the CAAR values are between -1 percent and -2 percent, consistent with previous studies.

Abnormal performance during the postannouncement period is positive and significant for all samples using both models with postevent estimation, consistent with the price recovery reported by Mazzeo and Moore (1992). Some or all of the announcement effect appears to be transitory. Using preevent estimation, which apparently biases model parameter estimates, suggests the opposite conclusion.

[4] Byrd (1992) examines prices as opposed to returns and shows that the run-up is real, not an artifact of a misspecified return-generating process.

Table 5—Cumulative Average Abnormal Returns (CAAR) and Test Statistics (Z) for Convertible Security Call Announcements

	Preevent Estimation		Postevent Estimation	
	Market Model CAAR(%) (Z)	Mean-Adjusted Returns Model CAAR(%) (Z)	Market Model CAAR(%) (Z)	Mean-Adjusted Returns Model CAAR(%) (Z)
Panel A Full Sample (n = 296)				
-11 to -2	-0.483 (-0.856)	-0.029 (-0.380)	0.605 (1.747)	2.173 (4.973)
-1 to 0	-1.597 (-10.872) (-10.393)	-1.650 (-8.341)	-1.386 (-6.638)	-1.189
1 to 10	-0.605 (-1.633)	-0.951 (-2.105)	0.489 (1.883)	1.302 (3.538)
11 to 20	0.485 (2.130)	-0.175 (-0.916)	1.642 (6.235)	2.067 (7.054)
21 to 30	-1.228 (-2.975)	-2.135 (-4.135)	.132 (.667)	.207 (.833)
Panel B Bonds Only (n = 220)				
-11 to -2	-.779 (-.358)	-.345 (-.397)	.237 (1.389)	1.889 (4.379)
-1 to 0	-1.630 (-9.654)	-1.680 (-9.050)	-1.395 (-7.368)	-1.202 (-5.922)
1 to 10	-.789 (-2.244)	-1.071 (-2.337)	.275 (.023)	1.234) (1.691)
11 to 20	.445 (1.857)	-.080 (-1.069)	1.512 (3.801)	2.213 (4.956)
21 to 30	-1.497 (-3.203)	-2.340 (-4.321)	-.112 (.302)	.083 (.904)
Panel C Preferred Only (n = 76)				
-11 to -2	.373 (.622)	.886 (1.425)	1.658 (1.088)	2.987 (2.369)
-1 to 0	-1.500 (-5.031)	-1.570 (-5.113)	-1.358 (-3.925)	-1.150 (-3.025)
1 to 10	-.072 (-.596)	-.602 (-.177)	1.101 (3.741)	1.499 (4.095)
11 to 20	.603 (1.045)	-.449 (-.011)	2.018 (5.823)	1.653 (5.479)
21 to 30	-.448 (-.420)	-1.535 (-1.651)	.833 (.802)	.566 (.112)

CONCLUSIONS

Our purpose has been to compile and summarize empirical and theoretical research results that pertain to calls of in-the-money convertible securities and to replicate the studies of stock price reactions to call announcements using a large and updated sample. Nearly every strand of the theory of capital structure has a prediction for equity valuation effects of such conversion-forcing calls. These events represent valuable testing grounds because they mark relatively pure shifts in capital structure.

The negative announcement effect documented in previous work and replicated here is consistent with information signaling, voting rights dilution, agency problems of free cash flow, and selling pressure, regardless of the type of security called. Lost tax shields could explain reactions to convertible bond calls, but this explanation does not extend to preferred stock calls. The effect could be due to wealth transfers, but studies cited here show no signs of wealth accruing to senior securityholders.

Price behavior during the conversion period is positive for both types of security calls, consistent with the selling pressure argument of Mazzeo and Moore (1992). The point estimates of postannouncement abnormal returns are greater in absolute value than the announcement period returns, but this does not imply full recovery necessarily; i.e., the announcement effect may not be due solely to selling pressure.

We find, as do others, that the results are robust to the choice of return-generating models and that the results are sensitive to the choice of estimation period. The latter finding points to further research. A key remaining question appears to be whether the conversion period price recovery is sufficient to account for the entire announcement effect. The answer to this question depends critically on the choice of estimation period.

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