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Tax Shields, Sample-Selection Bias, and the Information Content of Conversion-Forcing Bond Calls

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ABSTRACT

The information content of conversion-forcing bond calls depends on the after-tax cash flow to bondholders. If the dividend after conversion exceeds the after-tax coupon but is less than the before-tax coupon, the call reveals unanticipated decreases in dividends and/or earnings that reduce the tax shield from interest payments. In contrast, a call when the dividend is less than the after-tax coupon reveals the timing of an anticipated shift from exceptional firm-specific positive growth to the industry norm. Efforts to document properties of convertible calls are subject to sample-selection bias because calls are disproportionately associated with positive pre-call firm-specific growth.

BRENNAN AND SCHWARTZ (1977, 1980) and Ingersoll (1977a) show that if capital markets are perfect the optimal policy is to call and force conversion the first time the bond's conversion value exceeds its cash redemption value. However, Ingersoll (1977b)[1] and Constantinides and Grundy (1987) provide evidence that firms delay calling convertible debt, and Mikkelson (1980, 1981), Ofer and Natarajan (1987), and Singh, Cowan, and Nayar (1990) document a statistically significant negative return to equity at the call announcement.

To explain these results, which are inconsistent with the optimal call policy and its predicted effect on equity value in a perfect capital market, several asymmetric information hypotheses have been put forth. Mikkelson (1981, 1985) hypothesizes that the negative market reaction results from the market inferring that management expects a decline in the present value of the debt's tax shield—possibly due to a decline in future earnings. This suggests that managers refrain from calling due to the tax shields provided by the debt. Harris and Raviv (1985) present a signaling model in which a

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[1] Ingersoll (1977b) examines the impact of the required notice period and underwriting fees on the optimal call policy. Both are found to have only a marginal effect on the optimal call policy and are insufficient to explain observed call delays.

delay signals management's positive information regarding the firm's future value. In equilibrium, managers call only if they expect the future value of the firm to be less than the value that would induce conversion at maturity. Constantinides and Grundy (1987) hypothesize that the relation between the coupon and dividends is a primary determinant of management's decision to call the bonds. Viewing voluntary conversion as a low cost substitute for involuntary conversion, managers delay calling when they anticipate that dividend increases will induce investors to voluntarily convert the bonds. Calls that force conversion when the coupon is greater than the dividend are hypothesized to reveal negative information in that management does not anticipate dividends will rise sufficiently to induce voluntary conversion. Consistent with all of these hypotheses, Ofer and Natarajan (1987) find these firms experience a significant decline in earnings growth rates subsequent to calls forcing conversion.

We hypothesize that the information content of conversion-forcing calls depends on the after-tax cash flows paid to bondholders. In the presence of corporate taxes, current equityholders lose if management calls to force conversion, and the present value of the dividend payments to the former bondholders exceeds the present value of the after-tax interest payments on the bonds. Consequently, for bonds with a current dividend less than the coupon, the decision to call conveys different information when the current dividend exceeds the after-tax coupon than when it is lower than the pre-tax coupon. When the dividend to be received on conversion is lower than the after-tax coupon, a decision not to call reveals that management expects cash flows and dividends to grow. Hence, when management calls, the market learns that this future growth is unlikely to occur. However, when the dividend is higher than the after-tax coupon, it only makes sense for management to call if it expects dividend decreases and/or a decrease in earnings that reduces the tax shield from interest payments.

We test our hypothesis that the information content of conversion-forcing calls differs depending on the relation between dividends and pre- and after-tax coupon payments by examining i) the stock price reaction to the call announcement, ii) stock returns before and after the call, and iii) earnings growth before and after the call. We find no market reaction to calls or changes in cash flows when current dividends exceed the pre-tax coupon. When dividends are less than the pre-tax coupon, we find that the stock price reaction is similar irrespective of whether the dividend exceeds the after-tax coupon or not. We attribute this to differences in the degree to which the post-call change in earnings is anticipated by the market.

Since at issuance the conversion value of bonds is set below par, equity price appreciation is a necessary condition for a call to force conversion. Hence, using stock returns or earnings growth before the call to evaluate post-call stock returns or earnings growth creates a sample selection bias. Using procedures that eliminate this bias, we find, contrary to some previous evidence, that the stock price reaction incorporates all the information revealed by the call so that post-call cumulative abnormal returns are zero, on

average. We also find that firms that call when the dividend is lower than the after-tax coupon are firms that have higher earnings growth and stock returns than the typical firm in their industry before the call. After calling they experience a fall in earnings growth to a lower, but still positive, rate that approximates the growth rate of noncalling firms in their industry. In contrast, firms that call when the dividend exceeds the after-tax coupon have roughly the same earnings growth rate as noncalling firms in their industries prior to calling, and a substantial proportion of these firms experience a decrease in earnings and/or dividends following the call.

The remainder of the paper is organized as follows. Our hypothesis regarding the information content of conversion-forcing calls is developed in Section I, and our sample is described in Section II. Section III provides evidence of sample-selection bias in estimates of expected returns and presents an appropriate alternative. The importance of the sample-selection bias with respect to earnings performance evidence is examined in Section IV. In Section V our hypothesis that the information revealed by a call is conditioned by the difference between current after-tax interest payments and current dividends to be paid if the bond is converted is examined empirically. Section VI presents our conclusions.

I. Predicted Role of Dividends, Coupons, and Taxes in the Information Inferred from Management's Call Decision

We argue that management calls or delays calling in order to minimize the present value of after-tax payments to convertible bondholders. This implies that the information revealed by a call depends on the relation between the dividends to be received after conversion, the pre-tax coupon rate, and the after-tax coupon rate. Accordingly, we separate opportunities for conversion-forcing calls and their information content into the following three groups.

Case A. Low Dividend

If the current dividend to be received on conversion is less than after-tax coupon payments, a conversion-forcing call reduces the current after-tax payments to bondholders. Nevertheless, it is rational for management to delay calling if growth in earnings and dividends is anticipated such that the present value of expected future dividends is greater than the present value of after-tax interest payments.[2] In this case management's expectation of growth is revealed to the market in the form of a call delay when a call would force conversion. A call that results in a reduced current net after-tax payout to bondholders conveys management's belief that offsetting increases in future cash flows and dividends are not expected. A call after a delay reveals a revision in management's expectations in that the exceptional increases in

[2] This difference must also be greater than the put value of the bond. However, the put value is small from management's perspective if they anticipate increases in equity value.

cash flows and dividends which had previously been anticipated are no longer expected. Note that while a call in this situation conveys negative information, it does not imply that management necessarily anticipates losses or a drop in firm value—just that cash flow and dividend increases to reverse this inequality are no longer anticipated.

Case B. Intermediate Dividend

If the current dividend is less than the before-tax coupon and greater than the after-tax coupon, the current after-tax payment to bondholders is minimized by delaying a call. Asquith and Mullins (1988) conclude that most firms in this group delay calling due to this after-tax cash flow benefit. A decision not to call when a call would force conversion reveals only that management expects cash flows and dividends to remain at levels sufficient to maintain this inequality. However, it is rational for management to call if it has information indicating the present value of after-tax coupon payments to convertible bondholders exceeds the present value of anticipated future dividends due to dividend decreases and/or a decrease in earnings that reduce the tax shield from interest payments.[3] The firm may delay calling until after dividends or tax shields actually decline if they are sure the conversion value will still exceed the adjusted call price. If, however, management fears that the conversion value may fall below the adjusted call price, they are rational to call as soon as their expectations are revised. Thus: calls in this case are normally a surprise and convey new negative information; there is little, but still positive, information in not calling; and calling firms in this group are predicted to experience poorer post-call earnings and dividend performance than firms for which the after-tax coupon exceeds current dividends (Case A).

Case C. High Dividend

If current and anticipated dividends exceed the pre-tax coupon, investors have an incentive to voluntarily convert the bonds. Constantinides and Grundy (1987) report that once the dividend exceeds the coupon, a median of 23.6% of the original issue is outstanding after 2 years and 6.2% after 5 years. Thus, managers would rationally anticipate the conversion of most, but not all, of the bond once the annual dividend exceeds the coupon. Constantinides and Grundy hypothesize that management delays calling to minimize payments to bondholders since bonds not converted will continue to receive the lower coupon payment. They argue that management calls in this situation in order to clean up the issue after most of the bonds have been converted,[4] or they call in connection with a previously announced change in corporate control.

[3] The firm may also call even if the present value of the expected dividends slightly exceeds the expected after-tax coupon payments if the put value of the bond exceeds this difference.

[4] Cleaning up implies that managers call to remove the servicing costs associated with allowing the bond to remain outstanding. Bradley and Wakeman (1983) consider this hypothesis as a possible explanation for targeted share repurchases of small shareholders.

In the spirit of Constantinides and Grundy's (1987) hypothesize management generally delays calling when dividends exceed the coupon in order to minimize the after-tax payments to bondholders. Here calling is a cleanup operation and void of information. Neither a call nor a delay in calling reveal any information regarding management's information set of the firm's future performance, and little market reaction to the call announcement is predicted.

II. Data Sample and Sources

The data sample consists of calls forcing conversion of convertible bonds between July 1962 and December 1985 by firms listed on the NYSE or AMEX. *Standard & Poor's Bond Guide* was used to identify calls of convertible bonds between January 1979 and January 1986 and thereby update Mikkelson's (1981) sample covering July 1962 through December 1978.[5]

The date of the first call announcement was obtained from the *Wall Street Journal Index* and verified by reading the indexed article. If either the index or the article indicates another announcement on the day prior to or on the press date, the call announcement and the associated bond(s) were excluded from the sample. Further, observations were excluded if the index indicates the firm has been the target of a change in corporate control during the year prior to the call announcement.

Each bond's call price schedule, call restriction,[6] interest payment dates, and initial issue amount were obtained from *Moody's Industrial*, *Transportation*, *Public Utilities*, and *Bank and Finance Manuals*. For calls occurring in 1979 through 1985, the conversion rate and coupon rate were obtained from the *Standard & Poor's Bond Guide* and cross-checked with the *Wall Street Journal* article if the information was reported. The conversion rate and coupon rate for convertible bonds called prior to 1979 were obtained from the *Wall Street Journal* article, and from *Moody's Manuals* when they were not reported in the article. The outstanding amount of the debt issue at the call announcement was obtained from the *Wall Street Journal* article and *Moody's Manuals* for calls in both time periods. When possible, the information reported in the article was cross-checked with that in *Moody's Manuals*.

The bond was excluded if its conversion value the day before the announcement was less than the call price plus accrued interest,[7] or if daily returns

[5] Mikkelson's (1981) sample was collected from *Moody's Industrial, Transportation*, and *Public Utility Manuals*.

[6] Twenty-five bonds in the sample have call restrictions. Five and ten bonds were called within 1 month and 6 months, respectively, of the call restriction expiring.

[7] Since bondholders choosing not to convert receive the call price plus accrued interest, the conversion value must exceed the call price plus accrued interest. Therefore, interest was accrued to the end of the call notice period which was assumed to be the typical 30 calendar days. Ignoring accrued interest would result in the inappropriate inclusion of 18 additional call announcements in our final sample. Henceforth, we use the term *adjusted call price* to refer to the call price plus accrued interest.

were not available on the Center for Research in Security Prices (CRSP) data base for a minimum of 360 trading days prior to and subsequent to the call.

To compare annual dividends after conversion with the annual coupon payment, dividend data were collected from the CRSP data base. The proxy for the total annual per share dividend in the year of the call was the last regular dividend prior to the call, times the number of regular dividends typically paid in a year, plus the previous year's regular extra dividends, if any.[8] Irregular special dividends were excluded, as were firms paying only irregular dividends.[9] The annual per share dividend was multiplied by the conversion rate on the press data to obtain the annual dividend to a converted bond.

The final sample contains 167 calls by 143 firms of 172 bonds. Five firms announce the call of two bonds in the same press release. Seventeen firms call two bonds during the period and six firms call three bonds. Table I presents descriptive statistics on the complete sample and the three subsamples.

III. Cumulative Abnormal Returns and Sample-Selection Bias

A. Sample-Selection Bias in Pre-Event Market Model Parameter Estimates

Prior to presenting evidence on the information revealed by conversion-forcing calls, a methodological issue must be addressed. Past studies have utilized two measures of post-call performance: abnormal returns, and earnings. If either is based on pre-call benchmarks, the resulting abnormal performance measures are biased. When convertible bonds are issued, the conversion terms are typically set such that a bond's conversion value at issuance is less than its par value. Dann and Mikkelson (1984) and Wilson (1987) report the conversion value is on average 13% and 25%, respectively, below the par value. Consequently, equity value appreciation since the bonds' issuance is a necessary condition for the conversion value to exceed the adjusted call price so that the call forces conversion. The necessary appreciation in equity value may be due to overall market performance and/or exceptional firm-specific performance. While the former does not result in biased parameter estimates, the latter does.

Consider a market model $R_{it} = \alpha_i + \beta_i R_{mt} + U_{it}$ estimated for calling firm i using return data from the period between issuance and call. It is more likely that the conversion value will exceed the adjusted call price if a firm experiences systematically positive idiosyncratic returns U_{it} over this estimation period than if the U_{it} are less than or equal to zero. Consequently, firms

[8] A fairly common dividend policy is for firms to pay a periodic, e.g., quarterly dividend, plus an extra dividend at the end of each year. The year-end extra dividend is regularly paid, but it typically varies in dollar amount each year. A naive expectations model is used with respect to the market's expected regular extra dividend, i.e., it is the previous year's regular extra dividend.

[9] This restriction results in five call announcements being excluded. Each is associated with a real estate company paying special dividends upon the sale of property.

Table I

Descriptive Statistics for Conversion-Forcing Calls of Convertible Debt Issues between July 1962 and December 1985

Defining the marginal effective corporate tax rate (τ_c) as 46%; dividends (D) as the last regular dividend prior to the call announcement times the number of regular dividends plus the previous year's extraordinary, e.g., year-end, dividend if one is regularly paid, times the conversion rate; and the before-tax coupon (C), three subsamples are formed: 1) $D < C(1 - \tau_c)$; 2) $C > D > C(1 - \tau_c)$; and 3) $C < D$. Sample sizes vary according to the availability of data. One call announcement of two bonds (where the bonds would be assigned to different subsamples) is deleted.

Variable	Sample	N (Bonds)	Mean	Median	Standard deviation	Minimum	Maximum
Dividends less after-tax coupon payment on bond outstanding at call announcement (total per bond issue)	ALL	168	−$734,667	−$189,362	$2,043,707	$19,170,000	$3,618,228
	$D < C(1 - \tau_c)$	117	−$1,214,118	−$571,620	$2,247,689	−$19,170,000	−$2,480
	$C > D > C(1 - \tau_c)$	31	$347,491	$106,174	$743,820	$1,055	$3,618,228
	$C < D$[a]	18	$401,565	$191,366	$605,568	$11,316	$2,110,108
[(Conversion value at call)/ (Call price + Accrued interest at call)] − 1	ALL	172	47.74%	32.19%	50.88%	0.73%	396.38%
	$D < C(1 - \tau_c)$	118	45.18%	31.89%	48.39%	0.73%	396.38%
	$C > D > C(1 - \tau_c)$	32	32.52%	26.45%	24.41%	5.71%	126.20%
	$C < D$	20	81.32%	50.54%	76.57%	2.72%	299.68%
Percent of original issue outstanding at call announcement	ALL	164	73.19%	92.50%	31.83%	0.92%	100.00%
	$D < C(1 - \tau_c)$	115	82.45%	99.60%	26.08%	17.03%	100.00%
	$C > D > C(1 - \tau_c)$	29	64.67%	67.03%	31.77%	0.92%	100.00%
	$C < D$[a]	18	30.25%	22.92%	25.90%	2.50%	87.93%
Years between the first consecutive 30-trading-day period in which a call would force conversion and the call announcement	ALL	172	3.32	1.33	4.56	0.08	17.63
	$D < C(1 - \tau_c)$	118	2.68	0.94	4.08	0.08	17.63
	$C > D > C(1 - \tau_c)$	32	3.35	1.48	4.66	0.10	15.99
	$C < D$	20	6.49	4.97	5.36	0.08	15.54

[a]These figures are overstated to the degree voluntary conversion occurs between the most recently reported amount of the bond outstanding and the call.

with predominantly positive error terms will be oversampled. Since ordinary least squares assumes $E[U_{it}] = 0$ and chooses the estimate of α_i such that the residuals sum to zero, the regression estimate of α_i, $\hat{\alpha}_i$, and thus expected returns, will be biased upward. If this estimated model is then used to define an abnormal return as $AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt})$, the estimated abnormal returns will be biased downward.[10]

Unlike ordinary least squares estimates of α_i, estimates of β_i are not expected to be biased. While a call resulting in conversion is more likely if the overall market has been advancing and the firm's true β_i is large, it will lead to a biased estimate of β_i only if it results in a correlation between R_{mt} and U_{it}. However, the likelihood that a bond's conversion value will exceed its call price depends only on the total equity price appreciation over the period and not on the pattern of returns within the period. For instance, it does not matter whether U_{it} is large relative to its mean on the same days that R_{mt} is large relative to its mean.[11]

Ofer and Natarajan (1987) document substantial negative abnormal returns following conversion-forcing calls using a pre-call market model estimated over the period from 61 months prior to call through 2 months prior to call. They observe a cumulative abnormal return of -11.1% the first year after call and a cumulative abnormal return of -72.6% over the first 5 years after call. As they note, such evidence is inconsistent with market efficiency in that the signaled information is not fully incorporated into share prices at the announcement of the call. Further, they note that an alternative explanation is that the benchmarks they use are inappropriate, resulting in an overestimate of the normal rate of return for these securities. The sample-selection bias we document indicates the second explanation is more likely to be correct. To determine whether the large significant negative post-call cumulative abnormal returns observed by previous researchers are due to a sample-selection bias, we compare estimates of market model parameters using pre- and post-call data. First, we estimate market model parameters with pre-call data using the value-weighted market index and the CRSP return data from day -480 through day -241.[12] These parameter estimates are then used to calculate the portfolio's abnormal returns (AR) and the

[10] For their analysis of daily returns, Ofer and Natarajan (1987) estimate a single factor market model over the period from day -81 through day -20. For their analysis of monthly returns, the model is estimated over the period from month -61 through month -2. Mikkelson (1981, 1985), and Cowan, Nayar, and Singh (1990) base their expected return estimates on post-call data. Constantinides and Grundy (1987) measure abnormal returns as the calling firm's return minus the market return.

[11] In keeping with previous studies we do not compound daily returns in our empirical work. Compounding would imply that a bond's conversion value is slightly more likely to exceed its call price if R_{mt} and U_{it} are positively correlated (assuming the mean R_{mt} is positive), but this effect would be quite small. A more detailed development of the econometric propositions is available from the authors on request.

[12] A minimum of 120 trading days in the estimation period is required. The tests in this section using an equally-weighted index result in the same qualitative results.

portfolio's cumulative abnormal returns (CAR) over periods in the event window defined as −240 through +240, with day 0 being the publication date of the call announcement.

Results are shown in the second column in Table II and in Panel A of Figure 1. Consistent with previous studies, there is a significant negative 2-day abnormal return of −1.507%. The percentage of calls for which firms' abnormal returns are negative is significantly greater than 50% at the 1% level on both day −1 and day 0.[13] II, Fig. 1, Ftn. 13

We also observe statistically significant negative CAR subsequent to the call announcement using pre-call market model parameter estimates to determine expected returns. Over the time period day +1 through +240, the CAR is −17.074% with a *t*-statistic of −6.242 and a *z*-statistic of −6.586.[14]

Mean values of the market model parameters underlying these results are shown in the first row of Table III. The mean $\hat{\alpha}$ is 0.066%, which alone translates into a 240-day return of 15.84%. Consistent with the alphas estimated with pre-call data having a positive bias due to sample-selection bias, $\hat{\alpha}$ is positive for 68.3% of the firms. Consistency between the CAPM and the market model implies that in equilibrium, $\alpha \simeq (1 - \beta)r_f$ where r_f is the risk-free rate. Since $\hat{\beta} > 1$ for 100 of 167 observations, negative $\hat{\alpha}$ are generally expected and the opposite is observed. As shown in the fourth column of Table III, for an $E(R_{mt})$ of 0.04354%, which is the 1962–1987 mean daily value-weighted market return, and using the mean estimated values of α_i and β_i, the daily expected return is 0.119%, or 28.79% over the period from day +1 through day +240. When such expected returns are used as benchmarks to measure CAR, it is not surprising that the latter are negative with a high significance level subsequent to the call announcement.

If the market is efficient, this sample-selection bias is avoided by estimating the market model using post-call data. Portfolio returns based on market

[13] Using the percentage of negative abnormal returns reported in Table II, the normal approximation to the binomial test (Kendall and Stuart 1979) yields a *z*-statistic of 3.80 for both day −1 and day 0.

[14] The *t*-statistic, i.e., $t = \bar{\mu}_t / \sqrt{s^2_{pe_t}}$ is calculated as the mean abnormal return divided by the standard deviation of the prediction error.

$$S^2_{pe_t} = \frac{\sum_{\tau=1}^{T}(\mu_\tau - \bar{\mu})^2}{T-2}\left(1 + \frac{1}{T} + \frac{(R_{mt} - \bar{R}_m)^2}{\sum_{\tau=1}^{T}(R_{m\tau} - \bar{R}_m)^2}\right)$$

where t is the day during the event window, $\tau \ldots T$ is time during the estimation period, R_m is the market return, $\bar{R}_m$ is the mean market return during the estimation period, μ_τ is the portfolio's abnormal return, and $\bar{\mu}$ is the portfolio's abnormal return during the estimation period.

The *z*-statistic is calculated as

$$z = \sum_{i=1}^{N} \frac{\mu_{it}}{s_{pe_{it}}} \Bigg/ \left[\sum_{i=1}^{N} \frac{T_i - 2}{T_i - 4}\right]^{1/2}$$

where there are N securities in the portfolio, and $s_{pe_{it}}$ is s_{pe_t} calculated using an individual security's abnormal returns.

Table II

Portfolio Abnormal Returns (AR) and Cumulative Abnormal Returns (CAR) around 167 Conversion-Forcing Call Announcements of 172 Convertible Debt Issues between July 1962 and December 1985 Using Three Different Estimation Techniques

A maximum (minimum) of 240 (120) trading days prior to day −240, or subsequent to day +240 are used to estimate the pre- and post-event market models, respectively. The *Wall Street Journal* announcement date is defined as day zero. *t*- and *z*-statistics appear in parentheses beneath the AR or CAR. *t*-statistics are not calculated for the AR and CAR using CRSP excess returns data since the estimation period over which β is estimated is not available.

	AR/CAR (t, z)		AR/CAR (z)
AR/CAR Time period	Using pre-event market model estimates	Using post-event market model estimates	Using CRSP excess returns
−240, −201	1.657% (1.485, 2.004)	4.412% (4.365, 3.913)	2.408% (2.307)
−240, −161	3.269% (2.071, 2.580)	10.084% (7.053, 6.426)	6.053% (4.021)
−240, −121	5.192% (2.686, 3.238)	15.771% (9.008, 8.234)	9.127% (4.871)
−240, −81	7.536% (3.377, 3.786)	21.892% (10.829, 9.985)	12.105% (5.469)
−240, −41	12.528% (5.018, 5.596)	30.512% (13.498, 12.546)	18.366% (7.528)
−240, −2	16.060% (5.879, 6.534)	37.700% (15.251, 14.255)	22.561% (8.295)
−1	−0.759% (−4.306, −5.219) % neg = 64.7	0.050% (0.316, 0.162) % neg = 46.1	−0.727% (−4.920) % neg = 64.1
0	−0.748% (−4.212, −4.434) % neg = 64.7	−0.630% (−3.949, −3.882) % neg = 62.9	−0.659% (−3.791) % neg = 63.5

Table II—*Continued*

AR/CAR Time period	AR/CAR (t, z) Using pre-event market model estimates	AR/CAR (t, z) Using post-event market model estimates	AR/CAR (z) Using CRSP excess returns
− 1, 0	−1.507%	−0.580%	−1.386%
	(−6.023, − 6.825)	(−2.569, − 2.630)	(−6.160)
1, 40	−1.100%	1.939%	0.642%
	(−0.545, − 0.843)	(1.921, 1.116)	(0.145)
1, 80	−3.277%	3.520%	0.636%
	(−2.073, − 2.596)	(2.466, 1.419)	(−0.234)
1, 120	−6.728%	3.851%	−0.713%
	(−3.477, − 3.960)	(2.203, 1.093)	(−0.999)
1, 160	−9.712%	4.831%	−2.159%
	(−4.349, − 4.778)	(2.391, 1.337)	(−1.645)
1, 200	−13.172%	5.297%	−2.535%
	(−5.274, − 5.559)	(2.346, 1.415)	(−1.637)
1, 240	−17.074%	4.956%	−3.734%
	(−6.242, − 6.586)	(2.003, 0.899)	(−1.800)

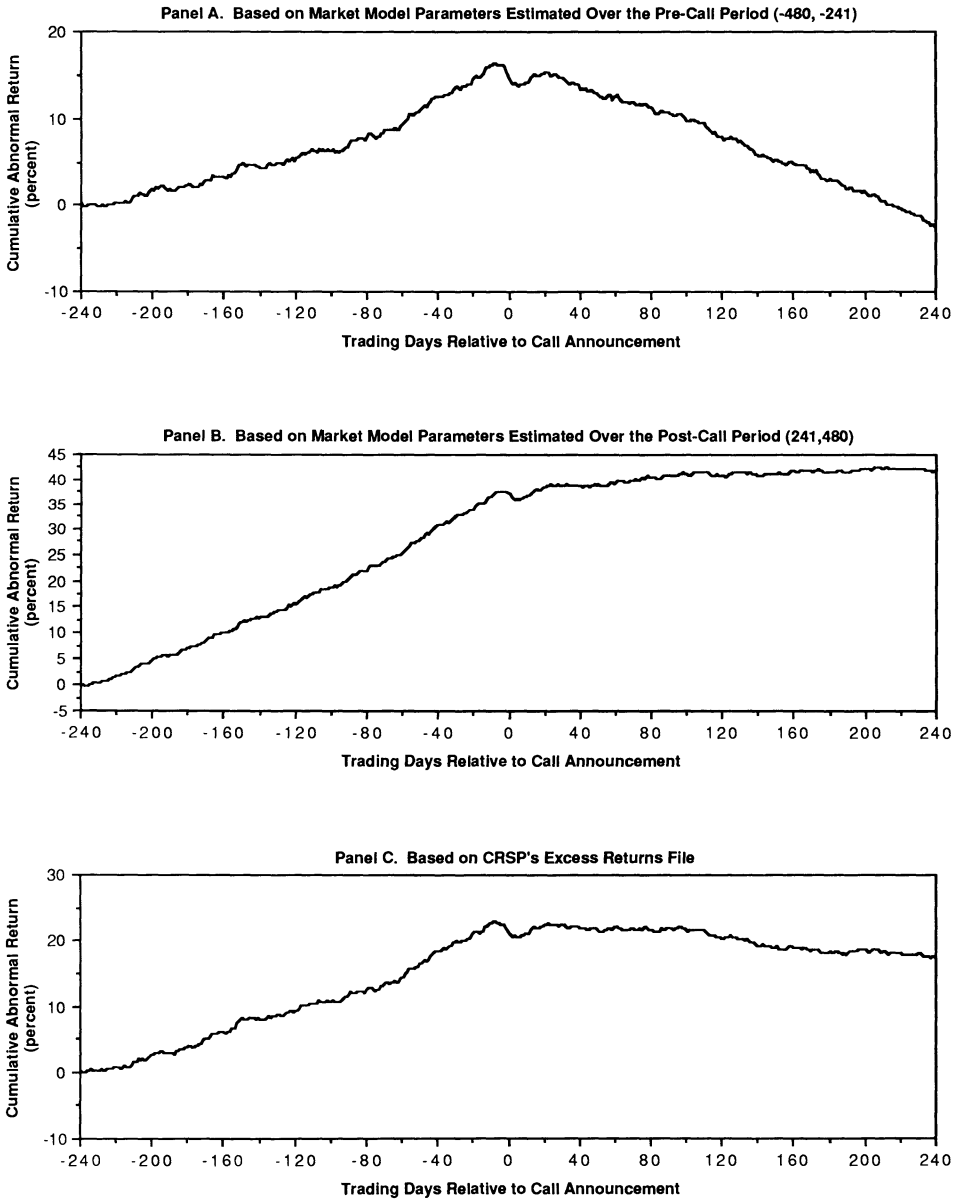

Figure 1. Cumulative abnormal returns (CAR) around 167 conversion-forcing call announcements of 172 convertible debt issues from 1962 through 1985 based on three different estimation techniques. In Panels A and B, CAR are generated using pre- and post-event market models, respectively. A maximum (minimum) of 240 (120) trading days prior to day -240, or subsequent to day $+240$ are used to estimate the pre- and post-event market models, respectively. In Panel C, CRSP excess returns data which use beta-ranked portfolios to measure expected returns are used to calculate CAR.

Table III

Comparison of Pre-Event and Post-Event Market Model Parameter Estimates of 167 Call Announcements Resulting in Conversion of 172 Convertible Debt Issues

Market models are estimated for 167 conversion-forcing call announcements between July 1962 and December 1985. The means of the market model parameters, i.e., $\bar{\hat{\alpha}}$ and $\bar{\hat{\beta}}$, are the arithmetic means of the individual securities' intercept and slope coefficient estimates, respectively. A maximum (minimum) of 240 (120) trading days prior to day −240, or subsequent to day +240 are used to estimate the pre- and post-event market model parameters, respectively. $E(R_{mt})$ is defined as the arithmetic mean of the daily market returns from 7/3/62 through 12/31/87 using the value-weighted CRSP index, i.e., 0.04354%. A measure of the daily expected portfolio return is shown in the final column. The number of positive and negative parameter estimates, respectively, is shown in parentheses under the parameter means except for the first two rows under $\bar{\hat{\beta}}$ where the number of $\hat{\beta}$ less than, and greater than one are shown, respectively.

Estimation period	$\bar{\hat{\alpha}}$	$\bar{\hat{\beta}}$	$\frac{1}{N}(\sum_{i=1}^{N}\hat{\alpha}_i + \hat{\beta}_i[E(R_{mt})])$
Pre-event:	0.066%	1.240	0.119%
(−480, − 241)	(114, 53)	(67, 100)	(150, 17)
Post-event:	−0.025%	1.223	0.027%
(+241, +480)	(72, 95)	(65, 102)	(108, 59)
Pre- less post-event	0.091%	0.017	0.092%
parameter estimates	(116, 51)	(78, 89)	(120, 47)
Tests for differences in the estimates: (pre- less post-):			
t-statistic[a]	6.929**[c]	0.265	7.144**
Wilcoxon[b]	6.370**	−0.010	6.517**

[a]The test statistic is the mean difference of the pre-event less post-event estimates divided by the estimated standard deviation of the differences.

[b]The null hypothesis for this nonparametric test based on ranks is that the location of the pre-event parameter estimates is greater than or equal to the location of the post-event parameter estimates. The alternative hypothesis is that the location of the post-event parameter estimates is greater than the location of the pre-event parameter estimates.

[c]Significance of the parametric and nonparametric test-statistics for a difference in the location of the estimates at the 1% level is indicated by two asterisks.

model estimates using data from the period +241 through +480 are shown in the third column of Table II and in Panel B of Figure 1. We observe: a larger CAR prior to call as compared with the pre-call model in the second column of Table II and in Panel A of Figure 1; a smaller but still statistically significant negative price reaction of −0.630% to the call announcement; and insignificant abnormal returns after the call. The mean market model parameter estimates that underlie these results are shown in the second row of Table III. The difference between the post-call CAR based on pre-call and those based on post-call market models is due to the differences in the estimated α. As shown in rows 1 and 2 in the lower panel of Table III, alpha

values estimated over the post-call period are significantly lower at the 1% level using either a parametric t-test or a nonparametric (Wilcoxon) test. There is no significant difference in the estimated beta values. The mean difference of pre-event less post-event estimates of alpha is 0.091%, which translates into a 240-day return of 21.84%. This is comparable to the difference of 22.03 percentage points between the significant, negative 240-day post-call CAR of -17.074% in the second column and the CAR of 4.956% in the third column of Table II.

It is not clear whether pre-call or post-call market model estimates are more appropriate. Post-call estimates avoid the sample-selection bias associated with pre-call estimates. However, if the market inefficiency argument is correct, i.e., if true post-call risk-adjusted returns are negative, then $\hat{\alpha}$ based on the post-call period will be biased downward, and the resulting CAR will show no post-call trend by construction.[15] Since the results in Table III indicate that the difference between CAR based on pre-call and those based on post-call market models is due to a difference in the estimated α values, what is needed are excess return estimates that are not dependent on $\hat{\alpha}$.

B. Results Using Unbiased Estimates of Expected Returns

For abnormal returns unaffected by estimates of α, we use CRSP Daily Excess Returns Files containing daily returns for each stock in excess of the returns on a portfolio of similar risk stocks.[16] As shown in the fourth column of Table II and in Panel C of Figure 1, using the CRSP Excess Return measure there are: large positive abnormal returns prior to the call; a significant negative price reaction to the call announcement; and insignificant CAR subsequent to the call.[17]

The large, statistically significant excess return over the period -240 through -2 of 22.561% is consistent with firms calling after periods of exceptional firm-specific performance. If the calls are delayed, these positive pre-call CAR are consistent with hypotheses that are not calling conveys positive information to the market.

[15] Cowan, Nayar, and Singh (1990) examine Ofer and Natarajan's (1987) finding of negative CAR subsequent to the call using post-call, not pre-call, data to estimate the market model. They find negative post-call CAR are small and no longer significant.

[16] In constructing the Excess Returns File, CRSP first estimates each stock's beta using its daily returns and the value-weighted market index over a given year. Next, the stocks are divided into 10 beta-ranked portfolios and firm i's excess return on day t is calculated as $ER_{it} = R_{it} - \overline{R}_{P_{it}}$ where $\overline{R}_{P_{it}}$ represents the mean return on day t for the stocks in firm i's beta portfolio. Using mean beta portfolio returns (rather than market model forecasts) to adjust for market movements gives us an excess return measure which is not dependent on an estimate of α_i. This approach would be affected by a bias in estimating β_i if such a bias systematically assigns these firms to the wrong portfolios. However, the evidence in Table III indicates the estimates of β_i are not sufficiently biased to result in the firms being systematically misassigned to portfolios.

[17] Using CRSP excess returns it is possible to add to our sample five call announcements for which sufficient CRSP data to estimate market model parameters is not available after day $+240$. These five observations do not significantly affect any results reported in this paper.

As shown in the fourth column of Table II and in Panel C of Figure 1, the cumulative excess return over the period +1 through +240 is −3.734% with a z-statistic of −1.800.[18] This compares with a CAR of −17.074% and a z-statistic of −6.586 for the CAR based on the pre-call data.[19]

Consistent with the findings of Mikkelson (1981), Ofer and Natarajan (1987), and Singh, Cowan, and Nayar (1990), there is a significant negative market reaction to the call announcement. With a z-statistic of −6.160, the 2-day portfolio excess return of −1.386% is statistically significant at the 1% level.[20]

In summary, when excess returns are measured in an unbiased manner, we observe significant positive CAR prior to the call and a significant negative reaction to the call announcement but little evidence of market inefficiency following the call.

IV. Earnings Performance and Sample-Selection Bias

A. Sample-Selection Bias and Shifts in Earnings Growth Rates

The sample-selection bias issue is also pertinent to the potential earnings performance information provided by either a call forcing conversion or a delay when the call would force conversion. Harris and Raviv (1985) hypothesize that a call forcing conversion is a negative signal since in their model management calls only if they expect the future value of the firm will be less than the value that would induce conversion at maturity. Consistent with this, Ofer and Natarajan (1987) document a significant decline in earnings

[18] The estimation period and the firm's benchmark portfolio return are not specified by CRSP for the excess returns file. Therefore, the t-statistic is not calculated, and the z-statistics reported in the final column of Table II and in Table VIII are calculated as

$$z = \frac{1}{\sqrt{W_2 - W_1}} \sum_{t=W_1}^{W_2} \left(\frac{1}{\sqrt{N_t}} \sum_{i=1}^{N_t} ER_{it} \Big/ \sqrt{\left(\frac{1}{T_i - 1} \right) \sum_{t=1}^{T_i} \left(ER_{it} - \overline{ER}_i \right)^2} \right)$$

where ER_{it} represents firm i's excess return on day t between −480 and −241 (when available); T_i, the number of excess return observations between −480 and −241; $\overline{ER}_i$, the mean excess return over the period −480 through −241; N_t, the number of firm excess returns observed on day t in the event window; W_1, the beginning of the event window; and W_2, the end of the event window.

[19] Using Ofer and Natarajan's (1987) sample reported in the Appendix of their paper and applying data requirements similar to theirs, we find that using CRSP excess returns and our estimation procedures, the CAR subsequent to the call are −9.486% with a z-statistic of −2.754 at +240 and −19.146% with a z-statistic of −4.264 at +480. Values of CAR using the pre-call market model are −23.000% and −43.031% with z-statistics of −7.107 and −9.000 at days +240 and +480, respectively. Use of the alpha-independent estimation procedure substantially reduces but does not eliminate their post-call findings.

[20] While our sample-selection bias argument would imply that the 2-day call window AR in Table II are biased, the bias should be quite small over a 2-day window (Brown and Warner 1985), and indeed the 2-day CAR in the final column of Table II is only slightly less in absolute terms than the 2-day CAR in the first column.

growth rates following calls forcing conversion. However, if firms making such calls are predominantly firms with exceptional firm-specific price performance in the pre-call period, as documented above, then it is likely their pre-call earnings performance is also exceptional. If so, the market may not have expected such earnings to continue. To test if calling firms have exceptional earnings performance prior to calling, we examine in this section the pre- and post-call earnings performance of these firms relative to that of noncalling firms in the firm's industry.

We estimate the following models:

$$\text{Model 1:} \quad P_{it} = \phi_i + \lambda_i D_{it} + \epsilon_{it}$$

$$\text{Model 2:} \quad P_{it} = \phi_i + \lambda_i D_{it} + \gamma_i P_{it}^I + \epsilon_{it}$$

$$\text{Model 3:} \quad \left(P_{it} - P_{it}^I\right) = \phi_i + \lambda_i D_{it} + \epsilon_{it}$$

where P_{it} = calling firm i's earnings growth rate in year t, i.e.,

$$P_{it} = \left(E_{it} - E_{i,t-1}\right) / \left| E_{i,t-1} \right| \tag{1}$$

and

E_{it} = firm i's earnings in year t,
D_{it} = 0 for years prior to call and 1 for years after call, and,
P_{it}^I = the mean earnings growth rate using equation (1) of noncalling firms in i's industry denoted by I.

Models 1 and 2 are identical to Ofer and Natarajan's (1987) first and third models, respectively. Our third model is used to determine whether a firm's earnings growth rate is inferior, superior, or similar to its industry's, both prior and subsequent to the call.

We utilize three measures of earnings, E_{it}, from the annual *COMPUSTAT* tapes: earnings before interest and taxes (EBIT); earnings before taxes (EBT); and earnings per share (EPS).[21] For inclusion in the earnings sample, we require that sufficient data be available to calculate P_{it} for at least 2 years prior to the call announcement, the year of the call, and at least 2 years following the call. There are 140 such calls in our original sample of 167 calls.[22] Where possible, P_{it} is calculated for up to 11 years for each calling firm: 5 years prior to, the year of, and 5 years after the call announcement.

[21] These three earnings measures are also examined by Ofer and Natarajan (1987) who also calculate P_{it} using equation (1). We do not utilize their fourth measure, EBT adjusted for the interest charge on the converted bond(s), because the face value of the debt outstanding at the call announcement is not reported in the *Wall Street Journal* for about one-third of our sample. While an amount outstanding is reported in *Moody's Bond Survey* and *S&P's Bond Guide*, the figures reported in these two publications apparently lag the actual amounts outstanding. They frequently differ and are greater than the amounts reported in the *Wall Street Journal* article.

[22] In the original sample, there are four instances in which a firm called convertible bonds on two dates in 1 year. Since our earnings analysis is in terms of annual earnings, these become single observations in this sample. There are 18 firm-calls for which no data is available on the COMPUSTAT tapes, four firm-calls for which 2 years of earnings after call are unobservable, and one call for which earnings 2 years before call are unobservable.

For calculating P_{it}^I, we define an industry in terms of COMPUSTAT's four digit DNUM (principally SIC) code. If there are less than three noncalling firms in a four digit industry, i.e., for 19 calls, a three digit or two digit definition is utilized. Our final earnings sample is 138 calls because P_{it}^I could not be calculated for two calls.

When percentage growth rates are calculated using equation (1), P_{it} and P_{it}^I can be extremely large in absolute terms if $|E_{i,t-1}|$ is small. For instance, one firm's EPS fell from \$0.12 to −\$13.62 in 1 year—a decline of 11,450%. Initially, for purposes of comparison, we use Ofer and Natarajan's (1987) filter which eliminates observations for which $|P_{it}| > 5|\bar{P}_i|$ where $\bar{P}_i$ represents the time-series average of P_{it}.

B. Empirical Results on Earnings Performance

Regression evidence of the relation between calls and earnings is presented in Table IV. For Model 1 presented in Panel 1, we find $\hat{\phi} > 0$, $\hat{\lambda} < 0$, and $\hat{\phi} + \hat{\lambda} > 0$ for all three earnings measures. Paying particular attention to EBIT since it is the only measure not directly affected by the shift from interest to dividends, we find that earnings increase at an unweighted average rate of 29.1% prior to the call ($\hat{\phi}$) and 13.9% ($\hat{\phi} + \hat{\lambda}$) after the call. Since $\hat{\phi} + \hat{\lambda}$ is significantly greater than zero for all three earnings measures, the results in Panel 1 indicate that the average calling firm continues to experience statistically significant positive, albeit significantly lower, earnings growth after the call. Qualitatively the same results, i.e., $\hat{\phi} > 0$, $\hat{\lambda} < 0$, $\hat{\phi} + \hat{\lambda} > 0$, are observed when P_{it}^I is added to the regression in Panel 2 to control for fluctuations in earnings due to macroeconomic and industry factors. For the typical calling firm, the continued significant positive growth in earnings subsequent to the call, whether measured by EBIT, EBT, or EPS, contradicts a fundamental prediction of Harris and Raviv's (1985) signaling model—that calls result from managers expecting the conversion value will be less than the face value at maturity. Further, as reported in Panels 1 and 2, EPS does not decline for a significant majority of these firms. Since EPS reflects after-tax earnings, this result contradicts Mikkelson's (1981, 1985) hypothesis that most calls are due to an expected loss of tax shields resulting from declining earnings.

In Panel 3 of Table IV, earnings growth rates of calling firms are compared with those of noncalling firms in the same industry, both before and after calling. Again, we observe $\hat{\phi}$ significantly greater than zero, implying that the earnings growth of calling firms tends to exceed that of noncalling firms prior to calling. Since $\hat{\phi}_i + \hat{\lambda}_i$ is small and insignificant, calling and noncalling firms have similar earnings growth rates after the call.

As explained above, the filters $|P_{it}| > 5|\bar{P}_i|$ and $|P_{it}^I| > 5|\bar{P}_i^I|$ are applied before estimating the regressions in the first three panels of Table IV to prevent the results from being affected by a few outliers. There are difficulties associated with these filters. One, there are several instances in which a calling firm experiences more than 1 year of extreme earnings

Table IV

Firm and Firm Relative to Industry Earnings Growth Rates around Convertible Bond Calls Forcing Conversion: The Regression Evidence

Observations in the sample of 167 call announcements between July 1962 and December 1985 are deleted if less than 2 years of data both before and after the call are available for both the firm and at least three other firms in the firm's industry as defined by SIC codes. Further, in the first three panels we use the filter Ofer and Natarajan (1987) employ where observations are deleted when $|P_{it}| > 5|\bar{P}_i|$, where $\bar{P}_i$ is the time series mean of P_{it}, the rate of growth in firm i's earnings over year t, and P_{it}^I is the mean rate of earnings growth of noncalling firms in firm i's industry in year t. In Panel 4 observations are deleted if $|P_{it}| > 5|\bar{P}_{it}|$ (or $|P_{it}^I| > 5|\bar{P}_{it}^I|$) and $|P_{it}|$ (or $|P_{it}^I|$) > 1 (100%) or if $|P_{it}|$ (or $|P_{it}^I|$) > 3. N_i is the resulting sample size. $\hat{\phi}_i$ is the 5-year average annual pre-call earnings growth rate prior to the call; $\hat{\lambda}$ represents the estimated shift in earnings growth rates subsequent to the call where D_{it} is 0 prior to call and 1 after call; and, $\widehat{(\phi + \lambda)}$ is the 5-year average annual post-call earnings growth rate. In the weighted average each parameter estimate is weighted by the reciprocal of its standard error divided by the average of the standard error weights in the sample. The z-statistics are for the null hypotheses $\phi \leq 0$, $\lambda \geq 0$, and $(\phi + \lambda) \leq 0$. Also, a two-tailed binomial test is used to test the null hypothesis that the percentage of parameter values greater (less) than zero equals 50%.

Earnings Measure	Number of calls (N_i)	$\hat{\phi}$: Pre-call annual earnings growth rate				$\hat{\lambda}$: Shift in annual earnings growth rate				$\widehat{(\phi + \lambda)}$: Post-call annual earnings growth rate			
		Unweighted average	Weighted average	z-statistic	% > 0	Unweighted average	Weighted average	z-statistic	% < 0	Unweighted average	Weighted average	z-statistic	% > 0
Panel 1	**Model 1:** $P_{it} = \phi_i + \lambda_i D_{it} + \epsilon_{it}$												
EBIT	135	0.291	0.233	24.87**[a]	97.1**	−0.153	−0.102	−7.45**	69.6**	0.139	0.132	13.44**	77.0**
EBT	135	0.300	0.202	18.68**	88.9**	−0.184	−0.072	−4.56**	64.5**	0.115	0.120	10.90**	71.9**
EPS	130	0.249	0.194	22.22**	90.0**	−0.188	−0.124	−9.18**	70.8**	0.060	0.079	8.04**	70.0**
Panel 2	**Model 2:** $P_{it} = \phi_i + \lambda_i D_{it} + \gamma_i P_{it}^I + \epsilon_{it}$												
EBIT	133	0.229	0.181	16.70**	85.5**	−0.153	−0.088	−6.33**	68.7**	0.076	0.092	8.25**	65.6**
EBT	129	0.229	0.202	15.12**	79.0**	−0.149	−0.096	−5.42**	66.9**	0.080	0.105	7.52**	66.9**
EPS	121	0.171	0.163	16.47**	81.0**	−0.089	−0.092	−6.58**	66.4**	0.081	0.071	6.70**	69.0**
Panel 3	**Model 3:** $(P_{it} - P_{it}^I) = \phi_i + \lambda_i D_{it} + \epsilon_{it}$												
EBIT	133	0.150	0.080	7.00**	68.4**	−0.114	−0.064	−3.80**	57.9**	0.037	0.012	0.99	55.6
EBT	129	0.113	0.089	6.02**	69.0**	−0.114	−0.083	−3.72**	62.0**	−0.001	0.005	0.29	49.6
EPS	121	0.085	0.042	2.96**	62.8**	−0.103	−0.060	−2.72**	61.2**	−0.018	−0.016	1.00	47.1
Panel 4	**Model 3:** $(P_{it} - P_{it}^I) = \phi_i + \lambda_i D_{it} + \epsilon_{it}$												
EBIT	138	0.114	0.074	6.34**	68.1**	−0.087	−0.056	−3.27**	58.7*	0.027	0.016	1.30	52.9
EBT	137	0.132	0.093	6.43**	68.6	−0.115	−0.072	−3.30**	62.0**	0.017	0.020	1.31	46.7
EPS	136	0.092	0.059	4.21**	64.0**	−0.064	−0.054	−2.53**	58.1*	0.028	0.000	0.03	47.0

[a] One and two asterisks denote significance at the 0.05 and 0.01 levels, respectively.

growth so that some fairly large $|P_{it}|$ pass the filter, e.g., 756% and −1088% for EPS. Two, when $|\bar{P}_i|$ is small, the filter rejects many moderate values of P_{it}, e.g., 15% or 20%. In Panel 4 of Table IV, we present an estimation of Model 3 using an alternative filter. This filter excludes observations if $|P_{it}| > 5|\bar{P}_{it}|$ (or $|P_{it}^I| > 5|\bar{P}_{it}^I|$) and $|P_{it}|$ (or $|P_{it}^I|$) > 1 (100%), or if $|P_{it}|$ (or $|P_{it}^I|$) > 3. The results are qualitatively unchanged.

Both filters are arbitrary. Further, regression models force the growth rates before call (ϕ_i) and after call ($\phi_i + \lambda_i$) to be the same in each year. To avoid these restrictions, we present unfiltered median values of P_{it} and P_{it}^I in Table V for several years relative to the call. The results confirm the regression evidence. Median earnings growth rates of calling firms decline following a call. For EBIT, median growth rates consistently exceed 20% prior to calling and are consistently below 20% after calling. Independent of the measure of cash flows, prior to calling the median growth rates of calling firms consistently exceed those of noncalling firms in the same industry. This difference is particularly large in the year of the call. After calling, the differences in the median values of P_{it} and P_{it}^I are much smaller and are generally insignificant.

In summary, consistent with previous work there is evidence of a significant decline in firms' earnings growth rates subsequent to calls forcing conversion. However, it is the years prior to, and not after, calling in which calling firms' earnings growth rates are abnormal relative to non-calling firms in their industries. Subsequent to calling, earnings growth rates remain significantly positive. This finding is inconsistent with calls resulting from management expecting the bond's conversion value to be less than its face value at maturity and with management calling due to an expected loss of tax shields. The above industry-level earnings performance prior to call and industry-comparable performance subsequent to call is consistent with positive abnormal returns prior to calling and insignificant abnormal returns subsequent to calling. Again, it appears that samples of firms that call and force conversion are biased in that they oversample those firms that successfully exploited firm-specific growth opportunities.

Calls are associated with a negative shift in firms' earnings performance. If, prior to the call, market participants view situations in which $P_{it} > P_{it}^I$ as transitory, then the market reaction to a call should be less than if the market views the pre-call growth rate as permanent. Since the market reaction to the call announcement is small relative to the decline in earnings growth rates, it seems most of the decline in earnings growth rates for calling firms is anticipated prior to the call. Thus, most calls mainly convey information regarding the timing of the end of a high-growth period.

V. After-Tax Cash Flows to Convertible Bondholders and the Information Content of the Call

For brevity and to facilitate comparison with previous work, we treated conversion-forcing calls as a homogeneous group in Sections III and IV. In

Table V

Median Earnings Growth Rates of Calling Firms and Their Industries before and after Conversion-Forcing Calls of Convertible Bonds

The 167 call announcements from July 1962 through December 1985 in the original sample are reduced by the additional requirements that at least 2 years of data both before and after the year of the call be available for both the firm and for at least three other firms in the firm's industry as defined by SIC codes. The chi-square statistic testing the null hypothesis that the median of the calling firms' growth rates equals the median of their industry growth rates is zero is shown in parentheses (Kendall, Stuart, and Ord 1983).

Year relative to call date	Number of call announcements	Median % Δ EBIT			Median % Δ EBT			Median % Δ EPS		
		Calling firm	Industry	Difference	Calling firm	Industry	Difference	Calling firm	Industry	Difference
− 5	118	0.251	0.168	0.082 (6.78)**[a]	0.259	0.168	0.091 (6.78)**	0.244	0.165	0.079 (5.49)*
− 4	128	0.233	0.172	0.062 (3.06)	0.260	0.173	0.087 (4.00)*	0.227	0.162	0.065 (3.06)
− 3	137	0.235	0.130	0.105 (10.64)**	0.235	0.107	0.127 (14.03)**	0.185	0.124	0.061 (1.77)
− 2	138	0.254	0.146	0.108 (14.02)**	0.242	0.141	0.101 (9.12)**	0.195	0.151	0.044 (2.47)
− 1	138	0.216	0.130	0.086 (8.35)**	0.216	0.123	0.093 (5.80)*	0.203	0.139	0.064 (5.80)*
0	138	0.294	0.141	0.153 (33.39)**	0.379	0.112	0.267 (30.67)**	0.222	0.125	0.096 (13.04)**
1	138	0.174	0.133	0.041 (2.84)	0.172	0.124	0.049 (2.84)	0.104	0.090	0.014 (0.23)
2	138	0.140	0.100	0.040 (0.53)	0.114	0.073	0.041 (0.94)	0.096	0.026	0.071 (4.76)*
3	124	0.128	0.096	0.032 (1.61)	0.125	0.105	0.020 (1.03)	0.126	0.018	0.109 (3.16)
4	119	0.119	0.117	0.002 (0.02)	0.131	0.126	0.005 (0.02)	0.116	0.116	−0.000 (0.02)
5	95	0.153	0.161	−0.008 (0.19)	0.158	0.168	−0.010 (0.02)	0.130	0.141	−0.011 (0.19)

[a]One and two asterisks denote significance at the 5% level (critical value = 3.84), and 1% level (critical value = 6.64), respectively.

this section we test our hypothesis that the information content of a conversion-forcing bond is related to the observable net after-tax coupon payments made to convertible bondholders versus the dividends they would receive if conversion is forced. The sample of convertible bond calls resulting in conversion into equity is divided into three subsamples based on current annual dividends and before-tax and after-tax[23] annual coupon payments. The first subsample, which consists of those calls where current dividends are less than the after-tax coupon, contains 114 calls of 118 bonds by 99 firms; four firms announce calls of two bonds in one press release, there are two call announcements for eleven firms, and three separate calls by two firms. The second subsample is composed of calls where the coupon is less than the dividend, but the dividend is greater than the after-tax coupon and contains 32 calls of 32 bonds by 29 firms (one firm made three separate call announcements). In the third subsample voluntary conversion is anticipated due to the dividends being greater than the before-tax coupon payment; it contains 20 calls of 20 bonds by 20 firms.

One of the call announcements in the original sample of 167 is deleted because the call included two bonds which belonged in different subsamples.

Case A. Low Dividend

If the current dividend to be received on conversion is less than the after-tax coupon payment on the bond, a conversion-forcing call reduces the current after-tax payment to bondholders. In this situation, a call is argued to convey the information that management does not anticipate that future cash flows will be high enough to warrant dividend increases sufficient to make the present value of anticipated dividends exceed the present value of the after-tax coupon payments.[24] Nevertheless, it is rational for management to delay calling if growth in earnings and dividends is anticipated such that the present value of expected future dividends is greater than the present value of after-tax interest payments. Thus, a call delay when the bond's conversion value exceeds its adjusted call price is predicted to convey management's expectation of continued strong increases in cash flows. Further, a call subsequent to a period of time where conversion could be forced reveals a revision in management's expectations such that the exceptional increases in cash flows and dividends which had been previously anticipated are no longer expected.

The earnings evidence supports the view that calls in this situation reveal that a period of exceptional earnings growth is ending. Panel 1 of Table VI reports regression evidence on the calling firms' EBIT growth rates prior and subsequent to calling. There is a significant decline in growth rates

[23] A marginal corporate tax rate of 46% is used.

[24] An additional benefit to calling is the removal of the bond's put value viewing a convertible bond as stock plus a put option to receive the call price if the conversion value falls below the call price. However, Constantinides and Grundy (1987) find that the put value associated with convertible bonds is small.

Table VI

Firm and Firm Relative to Industry EBIT Growth Rates around Convertible Bond Calls Forcing Conversion for Three Portfolios Formed on the Basis of Before-Tax and After-Tax Coupon Payments to Convertible Bonds Relative to Dividend Payments: The Regression Evidence

Defining the marginal effective corporate tax rate (τ_c) as 46% and dividends as the last regular dividend prior to the call announcement times the number of regular dividends plus the previous year's extraordinary, e.g., year-end, dividend if one is regularly paid, times the conversion rate, three subsamples are formed: *Dividend* < *Coupon*$(1 - \tau_c)$ with 114 calls of 118 bonds by 99 firms; *Coupon* > *Dividend* > *Coupon*$(1 - \tau_c)$ with 32 calls of 32 bond by 29 firms; and *Coupon* < *Dividend* with 20 calls of 20 bonds by 20 firms. Observations in the sample of 167 call announcements from July 1962 through December 1985 are deleted if less than 2 years of data both before and after the call are available for both the firm and at least three other firms in the firm's industry as defined by SIC codes. Further, observations are deleted if $|P_{it}| > 5|\bar{P}_{it}|$ (or $|P^I_{it}| > 5|\bar{P}^I_{it}|$) and $|P_{it}|$ (or $|P^I_{it}|$) > 1 (100%) or if $|P_{it}|$ (or $|P^I_{it}|$) > 3 where $\bar{P}_{it}$ is the time series mean of P_{it}, the rate of growth in firm i's earnings over year t, and P^I_{it} is the mean rate of earnings growth of noncalling firms in firm i's industry in year t. N_i is the resulting sample size. $\hat{\phi}_i$ is the 5-year average annual pre-call earnings growth rate prior to the call; $\hat{\lambda}$ represents the estimated shift in earnings growth rates subsequent to the call where D_{it} is 0 prior to call and 1 after call; and $\widehat{(\phi + \lambda)}$ is the 5-year average annual post-call earnings growth rate. The first and second regressions in each panel are $P_{it} = \phi_i + \lambda_i D_{it} + U_{it}$ and $P_{it} - P^I_{it} = \phi_i + \lambda_i D_{it} + U_{it}$, respectively. In the weighted average each parameter estimate is weighted by the reciprocal of its standard error divided by the average of the standard error weights in the sample. The z-statistics test the null hypotheses $\phi \leq$, $\lambda \geq 0$, and $(\phi + \lambda) \leq 0$. Also, a two-tailed binomial test is used to test the null hypothesis that the percentage of parameter values greater (less) than zero equals 50%.

Dependent Variable	Number of calls (N_i)	$\hat{\phi}_i$: Pre-call annual earnings growth rate: Unweighted average	Weighted average	z-statistic	% > 0	$\hat{\lambda}_i$: Shift in annual earnings growth rate Unweighted average	Weighted average	z-statistic	% < 0	$\widehat{(\phi_i + \lambda_i)}$: Post-call annual earnings growth rate Unweighted average	Weighted average	z-statistic	% > 0
Panel 1. Subsample where Coupon$(1 - \tau_c)$ > Dividend													
P_{it}	97	0.304	0.278	21.47**[a]	94.8**	−0.182	−0.142	−7.40**	70.1**	0.122	0.142	10.40**	72.2**
$P_{it} - P^I_{it}$	97	0.155	0.114	7.09**	73.2**	−0.119	−0.080	−3.31**	58.8*	0.037	0.034	1.95*	52.6
Panel 2. Subsample where Coupon > Dividend > $(1 + \tau_c)$ Coupon													
P_{it}	24	0.182	0.171	8.43**	95.8*	−0.105	−0.106	−3.59**	83.3*	0.077	0.065	3.06**	62.5
$P_{it} - P^I_{it}$	24	0.007	0.012	0.58	54.2	−0.037	−0.037	−1.18	66.7	−0.030	−0.027	−1.18	50.0
Panel 3. Subsample where Dividend > Coupon													
P_{it}	16	0.195	0.168	8.89**	100.0**	−0.030	0.009	0.35	50.0	0.165	0.178	9.26**	93.8**
$P_{it} - P^I_{it}$	16	0.35	0.014	0.60	62.5	0.040	0.006	0.06	43.7	0.075	0.019	0.078	62.5

[a]One and two asterisks denote significance at the 0.05 and 0.01 levels, respectively.

subsequent to the call, whether the shift in the EBIT growth rate is measured against a firm's growth rate prior to the call or relative to its industry's EBIT growth rate. Prior to the call the unweighted average firm's EBIT growth rate is 30.4%, which exceeds its industry's growth rate by 15.5 percentage points. This difference is statistically significant with a z-statistic of 7.09. Subsequent to the call, the average calling firm's EBIT growth rate is 12.2%, which exceeds its industry average by an insignificant 3.7 percentage points. As reported in Panel 1 of Table VII, for each of the 5 years prior to and the year of the call, the median EBIT growth rates of the calling firms are statistically significantly above the median industry growth rates. In each of the 5 years subsequent to the call, the median growth rates are comparable to the industry medians. If the market anticipated that growth in earnings would not exceed the industry norm indefinitely, the statistically significant positive earnings growth rate of 12.2%, with a z-statistic of 10.40 subsequent to the call, is not consistent with the view that firms in this group call due to an expected decline in firm value such that the bond will not be converted at maturity. Nor is this result consistent with firms calling due to anticipating an inability to fully utilize tax shields. Both pre- and post-call earnings are consistent with firms calling to minimize the present value of the after-tax cash flows to bondholders.

For this subsample, the conversion value at the time of the call exceeds the adjusted call price by an average of 45.18%. Moreover, an average (median) of 2.68 (0.94) years have elapsed since the first time a call might force conversion,[25] indicating a substantial number of these calls are delayed. Disregarding any information content of the after-tax payments to bondholders, the sample-selection bias documented in Sections III and IV implies that excess returns and above average earnings growth prior to call should be observed in all three subsamples. However, this is the only subsample for which our after-tax cash flow argument implies that a delay in calling may reveal the positive information to the market that management anticipates rapid increases in cash flows. Consistent with this prediction, and as reported in column 2 of Table VIII and pictured in Panel A of Figure 2, this subsample has much larger CAR than do the other two subsamples over the year prior to call, i.e., a CAR of 26.977% ($z = 8.156$) versus CAR of 13.329% ($z = 1.338$) and 12.231% ($z = 2.384$) when the after-tax coupon is less than the dividend. Moreover, firms in this group also experience earnings growth rates prior to call which are substantially greater than their industries' earnings growth rates. As shown in Table VII, relative to the industry, the median calling firm's earnings growth rates in this subsample exceed those of the median firms in the other two subsamples prior to call. As reported in Table VI, the

[25] The first time firms could call the bond and force conversion is defined as a minimum of 30 consecutive trading days during which the conversion value is greater than the call price plus accrued interest. Accrued interest includes 1 calendar month of additional interest to cover possible interest payments over the period from the call announcement through the redemption date, which is typically 30 calendar days.

Table VII

Median EBIT Growth Rates of Calling Firms and Their Industries before and after Conversion-Forcing Calls of Convertible Bonds and Chi-Square Difference Tests for Three Portfolios Formed on the Basis of Before-Tax and After-Tax Coupon Payments Relative to Dividends

Defining the marginal effective corporate tax rate (τ_c) as 46% and dividends as the last regular dividend prior to the call announcement times the number of regular dividends plus the previous year's extraordinary, e.g., year-end, dividend if one is regularly paid, times the conversion rate, three subsamples are formed: *Dividend* < *Coupon*$(1 - \tau_c)$ with 114 calls of 118 bonds by 99 firms; *Coupon* > *Dividend* > *Coupon*$(1 - \tau_c)$ with 32 calls of 32 bonds by 29 firms; and *Coupon* < *Dividend* with 20 calls of 20 bonds by 20 firms. The number of call announcements is shown in parentheses in the first column in each panel. The sample sizes of call announcements from July 1962 through December 1985 are reduced by the additional requirements that at least 2 years of data both before and after the year of the call are available for both the firm, and for at least three other firms in the firm's industry as defined by SIC codes. The chi-square statistic with one degree of freedom testing the null hypothesis that the median of calling firm's growth rates equals the median of their industry growth rates is shown in parentheses (Kendall, Stuart, and Ord 1983). Due to the small sample size in subsamples two and three, the null hypothesis is tested using a two-tailed binomial homogeneity test (Kendall and Stuart 1979).

Year relative to call date	Dividend < $(1 - \tau_c)$ Coupon			Coupon $(1 - \tau_c)$ < Dividend < Coupon			Dividend > Coupon		
	Calling firm	Industry	Difference	Calling firm	Industry	Difference	Calling firm	Industry	Difference
−5	0.272	0.180	0.092	0.247	0.136	0.111	0.173	0.150	0.023
	(79)		(4.28)*[a]	(22)			(16)		
−4	0.260	0.151	0.108	0.238	0.227	0.011	0.144	0.106	0.039
	(87)		(5.17)**	(24)			(16)		
−3	0.285	0.133	0.162	0.195	0.118	0.077	0.128	0.128	0.000
	(96)		(12.00)**	(24)			(16)		
−2	0.302	0.125	0.177	0.190	0.189	0.002	0.232	0.167	0.066
	(97)		(16.33)**	(24)			(16)		
−1	0.237	0.117	0.119	0.129	0.149	−0.020	0.166	0.145	0.021
	(97)		(10.91)**	(24)			(16)		
0	0.322	0.147	0.176	0.233	0.071	0.163*	0.206	0.145	0.061
	(97)		(25.26)**	(24)			(16)		
1	0.181	0.137	0.044	0.140	0.115	0.025	0.120	0.100	0.020
	(97)		(1.67)	(24)			(16)		

Table VIII—*Continued*

Year relative to call date	Dividend < $(1 - \tau_c)$ Coupon			Coupon $(1 - \tau_c)$ < Dividend < Coupon			Dividend > Coupon		
	Calling firm	Industry	Difference	Calling firm	Industry	Difference	Calling firm	Industry	Difference
2	0.152	0.115	0.036	0.113	0.068	0.044	0.190	0.080	0.110
	(97)		(0.53)	(24)			(16)		
3	0.169	0.094	0.075	0.122	0.098	0.024	0.080	0.135	−0.055
	(83)		(1.95)	(24)			(16)		
4	0.152	0.117	−0.034	−0.006	0.140	−0.134	0.180	0.110	0.069
	(81)		(0.22)	(22)			(15)		
5	0.153	0.148	0.006	0.041	0.168	−0.127	0.238	0.164	0.073
	(63)		(0.03)	(19)			(13)		

[a]One and two asterisks denote rejection of the null at 5% and 1% levels of significance, respectively.

average pre-call EBIT growth rate in this subsample is 30.4% versus 18.2% and 19.5% for the other two subsamples. Moreover, the pre-call EBIT growth rate less the industry growth rate for this sample averages 15.5 percentage points versus 0.7 and 3.5 percentage points for the other two subsamples.

Acharya (1988) and Lin and Chen (1989) present evidence that a delay in calling when the conversion value exceeds the call price contains positive information. To the extent their samples overlap with this subsample, which represents 69% of our total sample, implicit information regarding anticipated increases in cash flows and dividends is released by a call delay when the net after-tax payout to bondholders is higher than if conversion were forced.[26]

As expected, the call announcement is associated with a significant negative equity reaction. As reported in Table VIII, the 2-day AR for this subsample is -1.528% with a z-statistic of -4.752. Given the relatively large shift in earnings performance and the relatively small market response to the call, it appears that either the market assesses a high probability to the call or the decline in earnings growth rate is largely anticipated. Consistent with the former, Acharya (1988) finds the market's assessment of the probability of a call increases with the spread between the coupon and dividends. However, the earnings and CAR evidence are more consistent with our hypothesis that the information the call conveys is that the *supernormal* growth period is ending and exceptionally large increases in cash flows and associated dividends are no longer anticipated by management. The size of the negative market response is inconsistent with the call, revealing that management expects the bond will be less than its face value at maturity. First, the market response is -1.528%, yet the conversion value at the time of the call exceeds the adjusted call price by an average of 45.18%. Second, the earnings of the typical firm grow at a significantly positive rate subsequent to the call.

In the 5 years prior to calling, this group's average annual growth in dividends is 14.44%.[27] In the year of the call for the 117 (of 118) bonds in this subsample for which sufficient data are available, the original equityholders' mean and median current savings on an annual after-tax basis due to calling are \$1,214,118 and \$571,620, respectively.[28] In the 5 years subsequent to calling, the annual dividend growth rate averages 3.72% per year. Further,

[26] A definitive test of information releases resulting from the call delay cannot be performed without examining those firms that have the opportunity to call and yet never do so in this and the other two subsamples.

[27] An annual dividend growth rate is calculated as $(D_t - D_{t-1})/[0.5(D_t + D_{t-1})]$, so that for a given magnitude of change, increases and decreases will result in the same absolute percentage. Each firm has equal weight in the overall average.

[28] This understates the savings since the costs of servicing the debt versus servicing the new equityholders is ignored. Servicing costs of the debt versus the new equity are likely to be small. Citicorp, Inc. reports fixed trustee fees averaging 0.012% per annum of the amount outstanding. Transaction driven fees on a per bondholder account basis are approximately \$1.50 per account with a minimum annual per bond issue charge of \$500.

Table VIII

Abnormal Returns (AR) and Cumulative Abnormal Returns (CAR) around Call Announcements Forcing Conversion of Convertible Debt for Three Portfolios Formed on the Basis of the Before-Tax and After-Tax Coupon Payments to Convertible Bonds Relative to Dividend Payments

Defining the marginal effective corporate tax rate (τ_c) as 46%; dividends (D) as the last regular dividend prior to the call announcement times the number of regular dividends plus the previous year's extraordinary, e.g., year-end, dividend if one is regularly paid, times the conversion rate; and the before-tax coupon as (C), three subsamples of call announcements from 1962 through 1985 are formed: $D < C(1 - \tau_c)$ with 114 calls of 118 bonds by 99 firms; $C > D > C(1 - \tau_c)$ with 32 calls of 32 bonds by 29 firms; and $C < D$ with 20 calls of 20 bonds by 20 firms. The portfolio's abnormal return is over the time period indicated in the first column where the return on both the beginning and ending day, relative to the event day, are included. Abnormal returns are the average excess returns to the portfolio based on the CRSP excess return data. The z-statistic is the average of the standardized abnormal returns of firms in the portfolio where each firm's daily return is divided by the standard deviation of the CRSP abnormal firm return over the period −480 through −241 relative to the *Wall Street Journal* announcement date, which is defined as zero.

	AR/CAR (z-statistic)		
	Coupon > Dividend		
Time period	Coupon $(1 - \tau_c)$ > Dividend N = 114	Coupon $(1 - \tau_c)$ < Dividend N = 32	Dividend > Coupon N = 20
− 240, − 201	2.722%	3.402%	−1.849%
	(2.353)	(1.691)	(−1.294)
−240, − 161	6.899%	3.580%	4.023%
	(3.820)	(1.255)	(0.682)
−240, − 121	11.040%	5.441%	2.996%
	(5.073)	(1.436)	(−0.039)
−240, − 81	14.299%	8.376%	4.613%
	(5.505)	(1.902)	(0.096)
−240, − 41	22.222%	9.908%	9.880%
	(7.497)	(2.235)	(0.938)
−240, − 2	26.977%	12.231%	13.329%
	(8.156)	(2.384)	(1.338)
−1	−0.827%	−0.900%	0.110%
	(3.834)	(−3.560)	(−0.523)
	% neg = 65.8	% neg = 65.6	% neg = 50.0
0	−0.701%	−0.789%	−0.273%
	(−2.886)	(−2.672)	(−0.721)
	% neg = 63.2	% neg = 65.6	% neg = 65.0
−1, +0	−1.528%	−1.689%	−0.163%
	(−4.752)	(−4.407)	(−0.879)
1, 40	1.413%	−0.197%	−1.912%
	(0.744)	(−0.232)	(−0.969)
1, 80	3.560%	−4.901%	−6.544%
	(1.543)	(−1.958)	(−1.787)
1, 120	2.555%	−6.640%	−9.427%
	(0.842)	(−2.285)	(−1.945)

Table VIII—*Continued*

	AR/CAR (z-statistic)		
	Coupon > Dividend		
Time period	Coupon $(1 - \tau_c)$ > Dividend N = 114	Coupon $(1 - \tau_c)$ < Dividend N = 32	Dividend > Coupon N = 20
1,160	1.154%	−11.096%	−6.342%
	(0.918)	(−3.110)	(−0.990)
1,200	0.102%	−9.221%	−5.720%
	(−0.233)	(−2.537)	(−0.866)
1,240	−0.590%	10.691%	−3.112%
	(−0.227)	(−3.318)	(−0.381)

in the 5 years following the call only 16 of the 114 firms, or 14.04%, have dividend increases such that dividends paid on the converted bonds are higher than the after-tax coupon payment. Thus, ex post the typical firm in this group minimized the after-tax payments to bondholders by calling and forcing conversion.

When firms experience atypical positive firm-specific growth, the market is rational to anticipate that the exploitation of firm-specific growth opportunities is temporary and to assess a high probability to a downward shift in performance at some time in the future. Call delays when the after-tax coupon payments are greater than the dividends if conversion is forced are associated with continued exceptional firm-specific cash flow growth. Since the call coincides with the shift from the *super-normal* growth to a rate more normal for its industry, as evidenced by the shift in the CAR and earnings growth rates, it appears to reveal the end of the *super-normal* growth period. Since the earnings growth rate continues to be significantly positive and the market reaction is small in relation to the difference between the conversion value and the adjusted call price, the call cannot release the information that management expects the bonds' conversion value will be less than par at maturity. The continued positive earnings growth rate is also inconsistent with the negative market reaction being explained by management expecting the loss of tax shields. Rather, it is consistent with management maximizing current equityholders' wealth by minimizing the after-tax cash flow paid to the convertible bondholders and thereby revealing the timing of the anticipated decline in earnings growth from a superior to an industry-norm growth rate.

Case B. Intermediate Dividend

If the current dividend is less than the before-tax coupon and greater than the after-tax coupon, the current after-tax payment to the bondholders is minimized by delaying a call. However, it is rational for management to call if it has information indicating the present value of after-tax coupon

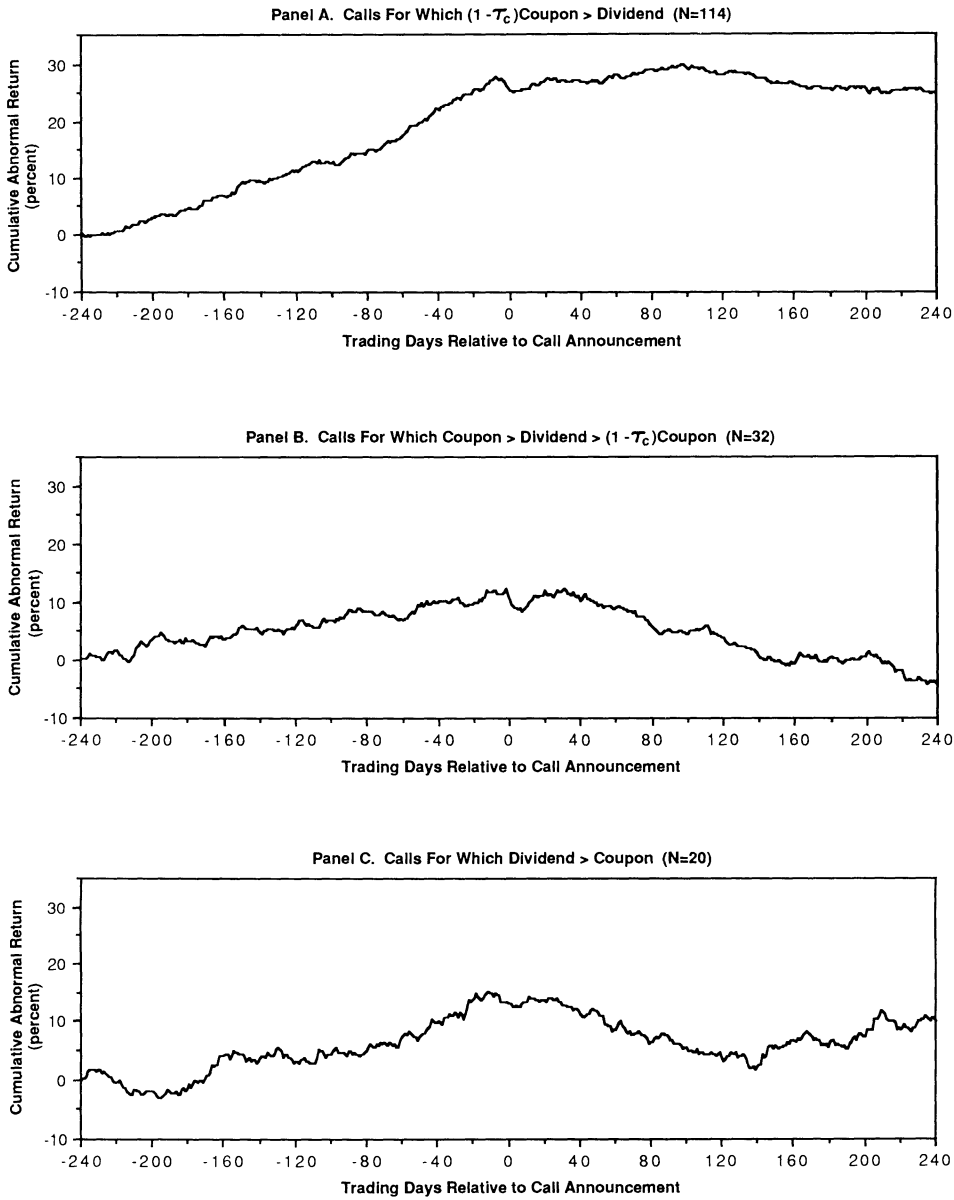

Figure 2. Cumulative abnormal returns (CAR) around conversion-forcing call announcements of convertible debt from 1962 through 1985 for three portfolios formed on the basis of the before-tax and after-tax coupon payments relative to dividend payments. CRSP excess returns data which uses beta-ranked portfolios to measure expected returns are used to calculate CAR. Defining the marginal effective corporate tax rate (τ_c) as 46%; dividends (D) as the last regular dividend prior to the call announcement times the number of regular dividends plus the previous year's extraordinary, e.g., year-end, dividend if one is regularly paid, times the conversion rate; and the before-tax coupon as (C), three subsamples are formed: $D < C(1 - \tau_c)$ with 114 calls of 118 bonds by 99 firms; $C > D > C(1 - \tau_c)$ with 32 calls of 32 bonds by 29 firms; and $C < D$ with 20 calls of 20 bonds by 20 firms.

payments to convertible bondholders exceeds the present value of anticipated future dividends due to dividend decreases and/or a decrease in earnings that reduces the tax shield from interest payments. Consequently a call conveys new unanticipated negative information while there is little, but still positive, information in not calling.

For the 31 (of 32) bonds for which data are available the mean increase in annual after-tax payments as a result of calling is \$347, 491 in the year of the call; the median is \$106,174. At the time of the call, the conversion value exceeds the adjusted call price by an average of 32.52%, and a mean (median) of 3.35 (1.48) years have elapsed since the first time a call might force conversion, indicating that a substantial number of these calls are delayed. During the period of time when a call would force conversion, the after-tax coupon is less than the dividends. These figures are consistent with call delays occurring because the net after-tax payout to bondholders is minimized by not calling.

As reported in Panels 2 of Tables VI and VII, the mean and median growth rates in earnings for this group of firms are not significantly different from those of noncalling firms in their industries either prior or subsequent to the call. The only year in which the median growth rate is statistically significantly above the industry at the 5% level is the year of the call. Consistent with the above-industry earnings performance in this year, the CAR in the year prior to the call as pictured in Panel B of Figure 2 and reported in column 3 of Table VIII is 12.231%, with a z-statistic of 2.384.

There is evidence in Panel 2 of Table VI of a decline in earnings growth rates after calling which is significant at the 5% level. However, the decline is substantially less than the decline in the subsample in which after-tax coupons exceed dividends. Prior to the call, firms in this subsample have an unweighted average growth in EBIT of 18.2%, with a z-statistic of 8.43, and 95.8% have a positive earnings growth rate. Subsequent to calling, the unweighted average growth in EBIT of these firms is 7.7%, and 37.5% experience negative EBIT growth versus 12.2% and 17.8%, respectively, for the subsample in which after-tax coupon payments are greater than dividends.

The average annual dividend growth rate is 13.69% prior to calling and 2.45% subsequent to calling. Over the 5 years subsequent to the call, 12 (37.5%) of the firms in this subsample reduce dividends. For 11 of the 12 firms reducing dividends, the decrease is such that dividends are less than the after-tax interest payment assuming no change in the marginal tax rate.

Negative information is conveyed by a call announcement by firms in this subsample. In column 3 of Table VIII, the 2-day AR at the call announcement is -1.689%, with a z-statistic of -4.407. This negative equity response is consistent with the statistically significant downward shift in the average EBIT growth rates reported in Panel 2 of Table VI. The AR is similar to and indeed slightly exceeds that of the group paying more in after-tax coupons than in dividends, while the change in earnings performance is dramatically smaller. The market response to the announcement supports the argument

that calls in this situation are not generally anticipated, i.e., that management is not expected to call when current after-tax payments are minimized by not calling. When a call occurs, it unexpectedly reveals management's increased probability assessment of a decline in earnings and/or dividends or tax shields. The realized decline in both earnings and dividends for a large proportion of the firms in this subsample is consistent with our hypothesis. Results reported on this subsample are also consistent with Mikkelson's (1981, 1985) hypothesis that calls occur because management anticipates an inability to fully utilize future tax shields due to a decline in earnings.

Case C. High Dividend

If current and anticipated dividends exceed the pre-tax coupon, investors have an incentive to voluntarily convert the bonds. In the spirit of Constantinides and Grundy (1987), we argue that management is rational to delay calling in this situation in order to minimize the after-tax payments to bondholders. Management is rational to call once the bulk of the issue has been voluntarily converted and the cost of servicing the few remaining bondholders exceeds the after-tax cash flow savings. Consequently a call (or a call delay) in this situation is predicted to be uninformative and unassociated with any change in management's expectations of the firm's future performance.

Excluding calls associated with changes in corporate control, Constantinides and Grundy find an insignificant market response to calls when dividends exceed the coupon and when the call results in retirement of 5% or less of the original issue. Of the 18 out of 20 bonds in our sample for which data are available, the mean percent of the original issue retired as a result of the call is 30.25%; the median, 22.92%.[29] Subsequent to calling, the average annual rate of dividend growth is 14.7% versus 18.2% prior to calling, indicating that management expects voluntary conversion to continue. Like Constantinides and Grundy (1987) we find that a call where the coupon is less than the dividends reveals little information. The average abnormal return over the 2-day event window as reported in column 4 of Table VIII is only -0.163%, with an insignificant z-statistic of -0.879.

The mean annual increase in current after-tax payments to the bondholders in the year of the call is \$401,565; the median, \$191,366. This statistic assumes: the reported amount outstanding is correct; no further voluntary conversion occurs; and dividends do not change.

[29] These figures overstate the amounts outstanding to the degree voluntary conversion is occurring. It appears that both the *Wall Street Journal* and *Moody's* may not always be accurate with respect to the amount of bonds outstanding. For example, two bonds with reported amounts outstanding in excess of 80% and a per bond dividend greater than the coupon of \$11.79 and \$15.00 actually had 34% and 14.8% outstanding when called. The lower figures were determined through careful examination of balance sheet footnotes which are not available for all firms in this subsample.

As reported in column 4 of Table VIII and pictured in Panel C of Figure 2, the CAR over the year prior to the call is an insignificant 13.329%, with a z-statistic of 1.338. As expected and as reported in Panel 3 of Table VI, this group of firms does not experience a significant shift in the mean EBIT growth rates following a call. Further, as reported in Panel 3 of Table VII, the median EBIT growth rates are positive and comparable to the industry EBIT growth rates in each of the 5 years prior to the call, the year of the call, and the 5 years subsequent to the call. Since there is no significant shift in earnings, this finding indicates managers in this subsample of firms do not call due to an anticipated decline in cash flows.

The results for this sample are consistent with managers delaying calls to minimize the after-tax payments to bondholders and calling in anticipation of continued voluntary conversion as well as with the possible benefits of removing the bond's put value, covenant restrictions, and costs of servicing the debt.

VI. Conclusion

We hypothesize that management seeks to minimize the present value of after-tax payments to convertible bondholders. In the presence of corporate taxes, current equityholders lose (win) if management calls to force conversion and the present value of the dividend payments to the former bondholders exceeds (is less than) the present value of the after-tax interest payments on the bonds. The market infers information both from management's decision to call or delay calling and from the current and observable after-tax coupon paid to convertible bondholders versus the dividends to be paid if the bonds are converted.

When the after-tax interest payment on the bond is greater than the dividends that would be paid if the bond is converted, delaying is predicted to reveal management's expectation that cash flows and dividends will increase sufficiently that the expected present value of the after-tax cash flow paid to bondholders is minimized by delaying. Calling reveals that such increases in cash flows are not expected. For calling firms in this situation, which represents the majority of calling firms, the pre-call earnings growth rates are significantly greater than those of noncalling firms in the same industry, and pre-call CAR are positive and highly significant. Subsequent to the call, the firms' earnings growth rates remain significantly positive but drop to growth rates insignificantly above their industry norms. The significant negative reaction at the call announcement is consistent with the market inferring that management no longer anticipates that the past successful exploitation of firm-specific growth opportunities will continue. In relation to the dramatic decline in the firms' earnings growth rates, the negative market reaction is small. This small market response is consistent with a situation in which the market anticipates a decline in growth at some unknown time before the call occurs, and the call releases information with respect to the timing of the downward shift in earnings growth rates. The

significantly positive post-call earnings growth and the small negative market reaction to the call is inconsistent with most calls resulting from management expecting less than full utilization of tax shields in the future. This evidence in conjunction with the large difference between the conversion value and the adjusted call price is also inconsistent with signaling models in which managers force conversion because they expect that the conversion value will be less than the face value at maturity. Confirming that management calls to minimize the present value of after-tax cash flows paid to the convertible bondholders, we find that ex post managers of these firms minimized the after-tax payments to bondholders by forcing conversion.

When the dividends are less than the coupon but greater than the after-tax coupon, the current after-tax payments to the convertible bondholders are minimized by not calling. A call announcement unexpectedly conveys the negative information that management now assesses a higher probability to a decline in cash flows such that future after-tax coupon payments are expected to exceed the dividends. Consistent with this prediction and the negative market reaction to the call, these firms' earnings growth rates shift downward, and nearly 40% experience negative earnings growth subsequent to the call. Moreover, a third of the sample subsequently reduces dividends such that ex post the after-tax payments to bondholders were minimized by calling. The post-call decline in earnings growth rates for this subsample is much smaller than the decline for firms where after-tax coupon payments exceed dividends, yet the market response to the call is similar for the two subsamples. This finding is consistent with the former subsample's eventual reduction in earnings growth rates being generally anticipated by the market while the latter's is not.

When the coupon exceeds dividends, it is rational to delay a call until the voluntary conversion is almost complete. Consequently, we expect that a calling firm's earnings growth rates will be similar to its industry's both before and after the call announcement, that there will be no significant change in earnings growth rates, and that there will be an insignificant market reaction to the call announcement. These predictions are supported by the data.

In summary, we find that a call forcing conversion of a bond is an informative event for most firms and that the information inferred by the market depends on the relation between the currently observable after-tax interest payments made to the convertible bondholders and the dividends to be paid if conversion is forced.

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