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Is a convertible bond call really bad news?

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Is a Convertible Bond Call Really Bad News?*

We test and reject the hypothesis that managers call in-the-money convertibles when they view a decline in the value of the firm as likely. Inconsistent with this view, we find that insiders generally buy equity before conversion-forcing calls. Also, analysts tend to raise their earnings forecasts following a call. Thus, our evidence supports the alternative hypothesis that the price decline immediately following conversion-forcing calls is a purely transitory decline caused by the anticipated increase in the supply of equity. Indeed, our evidence confirms that the initial price decline is reversed in the weeks following the announcement.

I. Introduction

Numerous studies have found that the stock market reacts negatively to conversion-forcing calls of convertible securities. The prevailing explanation is that managers call in-the-money convertibles in order to force the holders of these convertible securities to convert to equity and therefore share with existing stockholders in an anticipated decline in the firm's value and that, knowing this, market participants view a conversion-forcing call as a negative signal.

We test and reject this signaling hypothesis. Examining 298 conversion-forcing calls of convertible bonds between 1/1/85 and 12/31/93, we find no evidence that managers of calling firms view the firm's common equity as overvalued and no evidence that stock analysts view a conversion-forcing call as bad news. Instead our evidence supports the opposite conclusion that both managers and professional analysts think the calling firm's future prospects are quite positive. Thus, our evidence tends to support the alternative hypothesis of Mazzeo and Moore (1992), Byrd

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and Moore (1996), and Howe, Lin, and Singh (1998) that the price decline immediately following a conversion-forcing convertible call is a purely transitory event caused by the sudden increase in the supply of equity. Confirming Mazzeo and Moore (1992), we further find that the equity price decline which accompanies the call is completely reversed over the next 2–3 weeks.

The article is organized as follows. In the next section, we review existing theories and evidence on conversion-forcing calls of convertible securities and outline our tests of the signaling hypothesis. Our data are described in Section III. In Section IV, we test whether managers who call and force conversion view their firm's equity as overvalued, while in Section V we test whether stock analysts view a conversion-forcing call as bad news. In Section VI we conclude.

II. The Signaling Hypothesis

A. The Hypothesis and Its Critics

In early theoretical work on convertible security calls, Ingersoll (1977*a*, 1977*b*) and Brennan and Schwartz (1977) hypothesized that, in the interest of existing stockholders, firms should call a convertible bond as soon as (or almost as soon as) the bond's conversion value exceeded its call price, thus forcing the bondholders to convert to stock.[1] By forcing conversion, they reasoned, managers would eliminate the bondholder's option to hold bonds, instead of stock, if the price of the firm's equity should decline in the future. Since all firms with in-the-money convertibles should call, their theory implied that a call was not an informative event.

However, numerous empirical studies quickly established two facts. One, in contradiction of this prescription, many firms delay calling until well after their bonds are in the money.[2] Two, the price of a calling firm's equity reacts negatively to the call.[3] Harris and Raviv (1985) advanced a theory to explain both phenomena. Since firms whose managers think their equity is likely to decline in value in the future would have the most reason to call, Harris and

1. Bondholders have roughly 30 days in which to decide whether or not to convert. Consequently, if the price of the firm's equity declines, they can choose cash instead of stock. To avoid this, Ingersoll (1977*b*) argued that the firm should delay calling until the conversion value exceeded the call price by a small safety premium. Asquith (1995) has argued that this premium is really fairly large.

2. See Ingersoll (1977*a*), Campbell, Ederington, and Vankudre (1991), and Singh, Cowan, and Nayar (1991). While Asquith (1995) reports that most firms call fairly quickly after the conversion value exceeds the call price by 20%, he examines only firms that did in fact call. Ederington, Caton, and Campbell (1997) and Byrd et al. (1998) find that most firms delay longer. Byrd et al. (1998) argue that a conversion-forcing call transfers value from holders of convertibles to common stockholders only if the market price of the convertibles exceeds their conversion value and that the market price should rise in anticipation of the call. They find no discernible option value in the prices of convertible preferred stocks once they are in the money and callable.

3. Mikkelson (1981), Ofer and Natarajan (1987), Campbell et al. (1991), Singh et al. (1991), Mazzeo and Moore (1992), Asquith (1995), Byrd and Moore (1996), and Kadapakkam and Tang (1996).

Raviv reasoned that by refraining from calling, firms that do not expect a decline in equity values could distinguish themselves from firms that do. They argued that a separating equilibrium could arise in which only those firms whose managers viewed their equity as overvalued would call. Knowing this, a conversion-forcing call should be interpreted as bad news by market participants.

Initial evidence by Ofer and Natarajan (1987), who found that earnings growth declined sharply following in-the-money convertible calls, strongly supported this signaling hypothesis. Indeed, Ofer and Natarajan found that market prices seemed to impound only a minor portion of the full information in conversion-forcing calls. While the value of equity fell 1%–2% at the time of the call, abnormal returns of −11% were observed over the first full year following a call and an astonishing mean abnormal return of −72.6% was documented over the first 5 years.

However, the Ofer and Natarajan evidence was soon challenged. Campbell et al. (1991) pointed out that since convertible bonds are issued out of the money while conversion-forcing calls are in the money, by definition firms making conversion-forcing calls must have experienced positive returns prior to the call. Both Ofer and Natarajan's abnormal returns and earnings growth measures were based on this precall period since they compared postcall with precall earnings growth and used a market model estimated over the precall period to calculate abnormal returns. Campbell et al. found that, while calling firms tended to be firms that had experienced particularly strong earnings growth prior to the call, their postcall earnings growth was no lower than at other firms in the same industry. Campbell et al. further found that when abnormal returns were calculated using a procedure that was not dependent on precall returns, the large apparent negative postcall abnormal returns vanished.[4]

Mazzeo and Moore (1992), Byrd and Moore (1996), and Kadapakkam and Tang (1996) have presented evidence that the decline in equity values immediately following a conversion-forcing call is only temporary—that over the next month or so the firm's equity tends to rebound.[5] Consequently, they argue that the decline in equity value is only a temporary dip caused by the anticipated increase in the number of shares on the market.[6] Further, Byrd and Moore (1996) find that the Value Line Investment Survey actually increases their forecasts of the firm's earnings following a conversion-forcing

4. Along the same lines, Ederington et al. (1997) found that earnings growth at calling firms was not significantly higher than that at firms with in-the-money convertibles that did not call. Emery et al. (1994) found that calling firms grow faster than noncalling firms and argued that firms call to increase the equity on their balance sheets.

5. A price rebound also appears in Mikkelson's original data, although it was not emphasized.

6. Howe et al. (1998) posit that many holders of convertible preferred stock choose to sell rather than convert to common equity. Consistent with this, they find that at the time of the call announcement, the price of convertible preferred stock falls even more than the price of the common so that market makers can make money by buying the preferred, shorting the common (driving down its price), converting, and then delivering the common.

call of its convertible bonds, while Shastri and Shastri (1996) find no evidence that analysts reduce their earnings forecasts following conversion-forcing calls of preferred stock as the signaling hypothesis would imply.

B. Testing the Signaling Hypothesis

We test the signaling hypothesis by testing both whether managers at calling firms expect a decline in the firms' market value and whether market professionals interpret a conversion-forcing call as bad news. Using a sample of 298 conversion-forcing convertible bond calls over the period 1/1/85 through 12/31/93, we examine how stock analysts adjust their forecasts of future earnings following a conversion-forcing call and whether insiders are buying or selling. If managers call convertible bonds because they think their firm's equity is overpriced, as the signaling hypothesis posits, then in their own interest, we should observe these officials selling equity prior to and concurrent with the call. However, our evidence indicates just the opposite, that is, insiders (firm officers in particular) are strong net purchasers of equity in the months just before a call and continue to accumulate equity following the call. Indeed, insiders purchase more stock than normal in the months just before a conversion-forcing call.

Likewise, if a conversion-forcing call is viewed by stock analysts as signaling that management expects bad times ahead, then stock analysts should adjust their earnings forecasts downward soon after the call. We do not observe this. Instead, our evidence indicates that analysts tend unexpectedly to raise their forecasts. As noted above, some evidence on this issue has been presented by Byrd and Moore (1996) and Shastri and Shastri (1996), but the former examine only Value Line forecasts and the latter only preferred stock calls. More important, we separate unexpected earnings forecast revisions from those that are predictable.

In summary, we find no evidence that managers of calling firms expect a decline in the firm's market value and no evidence that market professionals interpret a call this way.

III. Data and Descriptive Results

For this study, we collected a sample of all calls of convertible bonds between 1/1/85 and 12/31/93 from *Standard and Poor's Bond Guide*, a total of 552 convertible bond/calls. In order to obtain a sample in which there are no unusual reasons to call or not call, we dropped from our sample: (1) zero-coupon (or deep discount) bonds, (2) bonds convertible into something other than the firm's common equity, and (3) bonds with puts or other embedded

options, such as Liquid Yield Option Notes (LYONs).[7] A total of 39 bonds were eliminated for these reasons. Since the signaling hypothesis applies only to conversion-forcing calls, we also eliminated 106 bond/calls from the sample because they were out of the money at the time of the call, that is, the conversion value of the bonds was less than the call price. Finally we dropped 109 calls because no call announcement date was reported on the Lexis-Nexis database. The resulting sample consisted of 298 conversion-forcing calls.

Descriptive statistics on calling firms are reported in table 1. For comparison, we formed a matched sample of noncalling firms by choosing at random a noncalling firm (which might or might not have convertible debt) with the same two-digit SIC code as the calling firm. As shown in panel A of table 1, as compared with other firms in the industry, firms that call in-the-money convertible debt tend to be somewhat smaller, more levered, and considerably faster growing. As reported in panel B of table 1, while 54 different two-digit SIC codes are represented in our sample, a large number of convertible issuing and calling firms are concentrated in the financial and electronic industries.

The day the call appeared on the news wires according to Lexis-Nexis (which may be after the market closes) is designated as day 0. If the call is reported in the *Wall Street Journal*, the announcement usually appears on day $+1$, but delays are sometimes observed and all calls are not reported in the *Wall Street Journal*. For this reason, we use two announcement windows: (0,1) and (0,3).

While the phenomenon has been very well documented heretofore, we first confirm that conversion-forcing calls tend to be accompanied by a decline in stock values. Particular care must be exercised in measuring abnormal returns around these calls. As noted above, Campbell et al. (1991) showed that since convertible bonds are issued out of the money but called in the money, those firms making conversion-forcing calls tend to be firms that have experienced abnormally high positive returns over the precall period. Consequently, we use a postcall period, specifically days $(+251, +506)$ and close-to-close return data from the Center for Research in Security Prices (CRSP) database to estimate a market model. Of the 298 conversion-forcing bond calls in our sample, 271 have sufficient data on CRSP to estimate a market model over this window. Using this postevent market model, abnormal returns and cumulative abnormal returns are calculated in the usual manner.

As shown in table 2, cumulative abnormal returns over the period from day -250 thru -1 are a substantial and highly significant $+37.23\%$. While impressive, positive precall abnormal returns were expected since firms mak-

7. Since we investigate management's motives for calling and what motives the market infers from a call, we desire a sample with no unusual motives for calling besides those discussed in the literature. While all convertible bonds are puttable for equity, a few (like LYONs) are also puttable for cash. Since this injects a different motive for calling, we delete them. In the case of zero-coupons and LYONs, the conversion ratio changes over time, so managers might wish to call before the conversion ratio rises.

TABLE 1 Characteristics of Firms Making Conversion-Forcing Calls of Convertible Bonds

	Comparative Means			Calling Firms	
	Calling Firms	Matched Firms	*t*-Statistic	Median	SD
A. Financial characteristics:					
Total assets (in millions)	$4,359	$5,709	−1.39	$893	$9,929
Market capitalization (in millions)	$1,578	$2,882	−2.56	$566	$3,794
Total debt as a percent of total assets	33.6%	27.5%	3.76	31.0%	16.8%
Tobin's Q	1.052	.962	.88	.942	.743
Return on assets (ROA)	3.91%	3.88%	.06	4.31%	6.08%
Annualized growth rate in total assets over last 3 years	17.8%	10.9%	4.22	14.8%	17.6%
	SIC Code	Number of Firms			
B. Classification of calling firms by SIC code (industry description):*					
Financial holding companies and other financial	67	34			
Computer equipment and industrial machinery	35	26			
Electrical equipment and components	36	19			
Business services	73	17			
Chemicals and allied products	28	12			

NOTE.—Descriptive statistics are reported for firms making conversion-forcing calls of convertible bonds during the period 1/1/85–12/31/93. For comparison, each calling firm is matched with a noncalling firm chosen at random from the same industry.

* We report the five two-digit SIC codes with the most companies calling convertible debt.

TABLE 2 **The Market Response to Conversion-Forcing Calls of Convertible Bonds**

Day or Window	Mean AR-CAR (%)	*z*-Statistic	% Positive	*z*-Statistic
−10	.13	1.38	49.08	.68
−9	.23	1.53	50.55	1.17
−8	.26	1.50	52.40	1.78
−7	.12	1.26	48.71	.56
−6	.05	.45	49.82	.93
−5	−.03	−.5	46.13	−.29
−4	.22	1.55	48.71	.56
−3	.28	2.25*	50.92	1.29
−2	.02	.07	48.34	.44
−1	−.11	−.06	46.49	−.17
0	−.44	−3.27**	45.02	−.66
1	−.26	−3.33**	41.33	−1.87
2	−.29	−2.43*	40.59	−2.12*
3	−.18	−1.78	45.39	−.53
4	.19	1.05	46.49	−.17
5	.06	.89	50.55	1.17
6	.18	.95	49.08	.68
7	.06	.38	47.60	.20
8	.09	.45	46.86	−.05
9	.14	1.43	49.82	.93
10	.14	1.34	46.13	−.29
(−250,−1)	37.23	16.75**	78.23	10.30**
(0,+1)	−.70	−4.67**	38.01	−2.97**
(0,+3)	−1.17	−5.40**	35.79	−3.70**
(+4,+10)	.86	2.45*	52.77	1.90*
(+4,+20)	2.55	4.34**	60.15	4.33**
(+21,+250)	6.70	3.92**	57.56	3.48**

NOTE.—Mean abnormal returns (AR) and mean cumulative abnormal returns (CAR) surrounding the announcements of 271 conversion-forcing convertible bond calls over the period 1/1/85–12/31/93 are reported. Abnormal returns are calculated using a market model estimated over the period (+251,+506) where 0 is the announcement day as reported in news wire reports from the Lexis-Nexis database.

* Mean ARs or CARs that are significantly different from zero at the .05 level in two-tailed tests or percentages of positive abnormal returns, which are significantly different from .5 in two-tailed tests.

** Mean ARs or CARs that are significantly different from zero at the .01 level in two-tailed tests or percentages of positive abnormal returns, which are significantly different from .5 in two-tailed tests.

ing conversion-forcing calls must by definition have experienced price increases in the period between bond issuance and call. This illustrates the danger in using precall benchmarks to judge the reaction to conversion-forcing calls.

As reported in table 2 and illustrated in figure 1, calling firms experience an average cumulative abnormal return (CAR) of −.70% over the (0,+1) call window and −1.17% over the (0,+3) window. With *z*-values of −4.67 and −5.40, respectively, both are significant at the .01 level. Also, 64.2% of the calling firms experience negative abnormal returns over the (0,+3) window, a figure that is significantly greater than 50% at the .01 level.

As noted above, Mazzeo and Moore (1992), Byrd and Moore (1996), and Kadapakkam and Tang (1996) observe that the stock price tends to recover following this initial decline. As shown in table 2 and figure 1, we confirm this finding in our much larger sample. The CAR over the period (+4,+10)

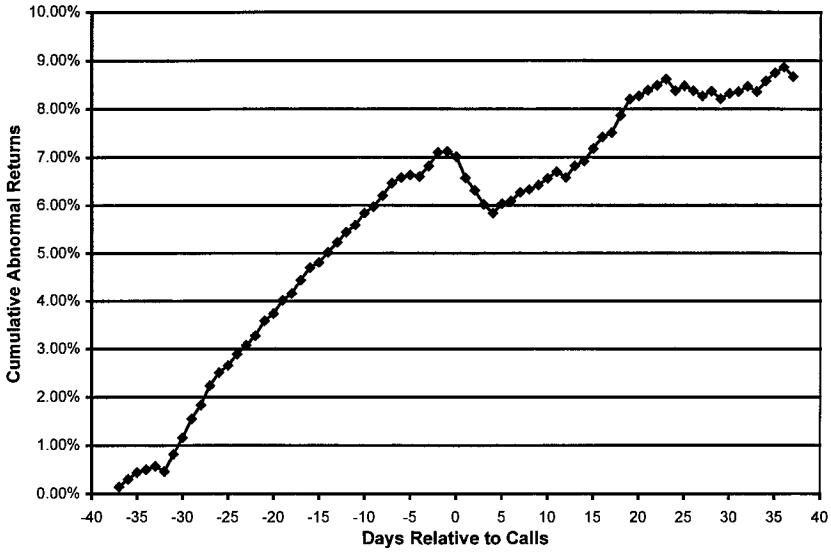

FIG. 1.—Stock returns surrounding conversion-forcing convertible bond calls

is +.86% with $z = 2.45$. Over the period (+4,+20), the CAR is +2.55%, with $z = 4.34$, which is significant at the .01 level. Moreover, 60% of calling firms experience positive abnormal returns over the (+4,+20) window. Clearly, the decline in stock values associated with the convertible bond call is purely temporary. Indeed the positive abnormal return over the (+4,+20) window is over twice as large as the negative abnormal return over the (0,+3) window associated with the call. This finding that the negative returns observed immediately following conversion-forcing calls are totally reversed over the next 2–3 weeks is inconsistent with the signaling hypothesis but is consistent with the price pressure hypothesis of Mazzeo and Moore (1992) and Byrd and Moore (1996).

IV. Do Managers of Calling Firms Think Their Equity Is Overvalued?

As explained above, the traditional explanation for the negative market reaction to conversion-forcing calls is that firms call convertible securities only if management foresees a strong possibility that the value of the firm's equity will decline in the future. According to this theory, managers who think their equity is overvalued call in the interest of existing stockholders in order to force the bondholders to share in the coming decline.[8] If management does

8. If they fail to call and the equity price declines, then the convertible bonds may fall out of the money, so managers call to eliminate the bondholders' option to continue to hold the bonds.

not foresee such a decline, then according to this signaling hypothesis, they will refrain from calling in order to avoid sending a negative signal and to distinguish themselves from the calling firms.

If indeed managers of calling firms view their equity as overvalued, then, in their own interest, they should be divesting their personal stock holdings. Of course, counterposed to this incentive is the fact that sections 17(a) and 17(b) of the Securities and Exchange Act of 1934 and SEC Rule 10(b)-5 prohibit trading on material inside information by insiders, who are defined by section 16(b) of the Exchange Act as officers, directors, and owners of 10% or more of the firm's equity. However, only trading on "material" inside information is prohibited where "material" has effectively been interpreted as information that results in a substantial change in equity prices when it is made public (Arshadi, Eyssell, and Kempf 1993). For instance, Meulbroek (1992) finds that in her sample of insider trading charges brought by the SEC, the average absolute 1-day price change when the inside information is made public is 18.5%. She further reports that 79% of the charges involve trading prior to corporate control or takeover events and virtually all the rest involve trading before bankruptcy or major earnings announcements. Given the figures in table 2, it appears that the reaction to convertible bond calls falls far below the material event threshold, and we can find no instance in which anyone has been charged with insider trading because they sold stock prior to such a call.

While the evidence is mixed on whether significant numbers of insiders trade prior to specific major announcements such as takeovers or bankruptcies,[9] it is well established that insiders are able to exploit their information advantage in less dramatic situations. Evidence shows that insiders tend to buy before stock price increases and sell before stock price declines (Jaffe 1974; Seyhun 1986, 1992). Consequently, we can use insider purchases and sales as a proxy for how insiders, officers in particular, view their firms' equity.

Our basic measure of insider trading is the number of net trades or purchases of firm i's equity by insiders defined as $NT_i = NP_i - NS_i$, where NP_i represents the number of insider purchases of firm i's equity during a period of time, and NS_i is the number of sales as reported to the SEC.[10] The number NT_i is calculated separately for 12 30-day periods relative to the call date. For instance, $NT(-30,-1)_i$ represents net purchases of firm i's equity by insiders over the 30 days from day -30 to day -1 where day 0 is the day of the call announcement according to Lexis-Nexis. Similarly $NT(+1,+30)_i$ represents net purchases over the 30 days from day $+1$ through day $+30$.

9. For instance, Loderer and Sheehan (1989) and Gosnell, Keown, and Pinkerton (1992) find no significant insider selling prior to bankruptcy announcements, while Seyhun and Bradley (1997) do. However, Penman (1982), Karpoff and Lee (1991), and Seyhun (1992) all find evidence of insider trading before acquisition, new issue, and earnings announcements, respectively.

10. Required to report their transactions to the SEC by section 10(b) of the Securities and Exchange Act of 1934 are corporate officers, directors, and outsiders holding 10% or more of the firm's equity.

Like most studies, we base our measure on the number of trades, rather than number of shares, since large stockholders tend to trade in larger amounts than the supposedly better informed officers and since fears of legal penalties may discourage large transactions. Our data set includes only pure purchases and sales; in other words, insider trades associated with gifts, compensation plans, or option exercises as well as any trades due to conversion of convertibles held by insiders are excluded. The number NT_i is measured separately for (1) all insiders, (2) officers (since they presumably have better information than large outside stockholders), and (3) top executives defined as presidents, CEOs, board chairmen, and inside directors (since they should have the best information of all). Of our 298 convertible bond/calls, the SEC tapes contain data on insider trades for 247.[11]

Mean values of the $NT(x,x+30)_i$, that is, $NT(x,x+30) = \sum_{i=0}^{I}(1/I)NT(x,x+30)_i$, for values of x in 30-day increments from 180 days before the conversion-forcing convertible call through 180 days after are reported in table 3. In table 3, we also report the percentage of firms with positive net insider purchases ignoring those firm/months in which there was no insider trading in firm i's stock.

As reported in table 3, there is no evidence of insider selling prior to conversion-forcing calls. Instead, we observe net insider purchases every month prior to conversion-forcing calls. For instance, at the average calling firm, there are 2.923 insider purchases over the 90-day period prior to a conversion-forcing call and only .907 insider sales so $NT(-30,-1) = 2.016$, a figure that is significantly different from zero at the .01 level. Moreover at 69.7% of the observed firms, more insiders are buying than are selling over the 90 days just prior to a conversion-forcing call, and at 73.1% more insiders are buying than selling over the 30 days just before the call.[12] Both figures are significantly different from 50% at the .01 level.

As explained above, some insiders may be more informed than others, and the most informed are likely to be company officers and especially top executives. The separate figures for these two subgroups reveal that they too are net buyers, and this is particularly true in the months immediately surrounding the call. Over the 90 days prior to conversion-forcing calls, NT averages 2.016 ($t = 3.652$) for all insiders, 2.263 ($t = 5.424$) for officers, and .923 ($t = 3.242$) for top executives.

While it is clear that insiders are not divesting their ownership in convertible-calling firms, it is possible that the net purchases documented in table 3 merely represent the normal course of affairs. In other words, these insiders might normally be even more active net purchasers of their company's stock.

11. Our data samples differ slightly between tables 1 through 5 because, of our 298 firms, 27 are not on the CRSP tapes, 51 are not on the insider trading tapes, and 20 are not on the IBES tapes, with considerable overlap between these three sets. When we repeat tables 1 through 5 using only firms in all three data sets, there is virtually no change in the results.

12. The mean NT_t values in table 3 are based on all 247 firms, including those at which there was no insider trading in month t. The percentages are based on those with insider trading only.

TABLE 3 Insider Trading Activity Surrounding Conversion-Forcing Calls of Convertible Bonds

	All Insiders		All Officers		Top Executives	
Days Relative to Call	NT	% Positive	NT	% Positive	NT	% Positive
(−180,−151)	.429*	64.368**	.473**	64.286**	.067	52.273
	(2.381)	[.002]	(2.816)	[.004]	(.861)	[.761]
(−150,−121)	.263	60.759	.432**	64.103*	.120	52.632
	(1.569)	[.054]	(3.256)	[.017]	(1.329)	[.871]
(−120,−91)	.660**	76.344**	.712**	77.419**	.383**	70.909**
	(4.005)	[.000]	(4.621)	[.000]	(3.799)	[.003]
(−90,−61)	.684*	73.256**	.786**	72.152**	.440	59.574
	(2.480)	[.000]	(3.300)	[.000]	(1.909)	[.243]
(−60,−31)	.725**	68.750**	.683**	69.333**	.234*	60.000
	(3.084)	[.001]	(3.706)	[.001]	(2.353)	[.233]
(−30,−1)	.607*	73.118**	.794**	75.294**	.249**	62.500
	(2.380)	[.000]	(3.926)	[.000]	(2.842)	[.079]
(+1,+30)	.713**	68.675**	.770**	70.513**	.402**	70.213**
	(3.724)	[.000]	(4.225)	[.000]	(3.540)	[.008]
(+31,+60)	.615**	61.111*	.745**	65.476**	.287*	57.895
	(2.844)	[.013]	(3.803)	[.001]	(2.113)	[.229]
(+61,+90)	.316	62.500*	.300	64.474*	.033	54.348
	(1.806)	[.033]	(1.734)	[.015]	(.256)	[.659]
(+91,+120)	.741**	62.500*	.506**	61.446*	.163	49.057
	(2.830)	[.013]	(3.045)	[.026]	(1.577)	[1.000]
(+121,150)	.494*	57.143	.428*	57.647	.062	48.276
	(2.400)	[.208]	(2.481)	[.193]	(.568)	[.896]
(+151,180)	.449**	58.065	.457**	58.889	.077	50.000
	(2.920)	[.117]	(3.023)	[.089]	(.752)	[1.000]
(−90,−1)	2.016**	69.737**	2.263**	69.178**	.923**	57.692
	(3.652)	[.000]	(5.424)	[.000]	(3.242)	[.115]
Number of observations	247		243		209	

NOTE.—We report mean net insider trades, NT, defined as the number of insider purchases − the number of insider sales. *t*-statistics are in parentheses below each mean. We also report the percentage of firms in which insider purchases exceed insider sales, ignoring those firms with no insider trades during the 30-day period. *p*-values for the null hypothesis that purchases and sales are equally likely are reported in the square brackets below each percentage. Results are reported for 30-day periods relative to the call announcement date, day 0.

* On NT, significantly different from zero at the .05 level in two-tailed tests. In the "% positive" column, significantly different from 50% at the .05 level.

** On NT, significantly different from zero at the .01 level in two-tailed tests. In the "% positive" column, significantly different from 50% at the .01 level.

To gauge how insider purchases surrounding conversion-forcing calls compare with usual insider trading patterns at these firms, we construct a measure of abnormal net insider trades following the procedure utilized by Karpoff and Lee (1991). Using data for each firm i outside the window from 180 days before the call through 180 days after, we estimate the model

$$\mathrm{NT}(x,x+30)_i = \alpha_i + \beta_i \mathrm{NT}(x-31,x-1)_i + u_i \qquad (1)$$

for values of x in 30-day increments. For trades by all insiders, α_i averages +.44 ($t = 2.71$) across the 247 firms, indicating that insiders are net purchasers of shares on average. For 65% of our firm/calls α_i is positive. Furthermore, β_i averages .04 ($t = 2.22$) and is positive for 63%, indicating that, if insiders have been net purchasers (sellers) one month, there is a slight

TABLE 4 Abnormal Insider Trading Activity Surrounding Conversion-Forcing Calls of Convertible Bonds

	All Insiders		All Officers		Top Executives	
Days Relative to Call	ANT	*t*-Statistic	ANT	*t*-Statistic	ANT	*t*-Statistic
(−180,−151)	.197	1.135	.249	1.574	−.018	−.235
(−150,−121)	−.078	−.456	.093	.692	−.098	−.964
(−120,−91)	.321	2.036*	.368	2.514*	.166	1.714
(−90,−61)	.370	1.450	.446	2.028*	.254	1.180
(−60,−31)	.493	2.278*	.425	2.533*	.110	1.164
(−30,−1)	.361	1.503	.553	2.872**	.104	1.348
(+1,+30)	.384	2.294*	.436	2.726**	.236	2.626*
(+31,+60)	.335	1.748	.463	2.799**	.138	1.164
(+61,+90)	.121	.751	.122	.764	−.013	−.099
(+91,+120)	.456	1.800	.217	1.381	−.040	−.373
(+121,+150)	.271	1.425	.200	1.305	−.080	−.762
(+151,+180)	.242	1.747	.238	1.707	−.088	−.884
(−90,−1)	1.224	2.506*	1.424	3.936**	.446	1.819
Number of observations	247		243		209	

NOTE.—We report mean net insider surprise trades, ANT, defined as the number of insider purchases − the number of insider sales after adjusting for normal insider trading activity at these firms. *t*-statistics are reported in parentheses beside each mean. Results are reported for 30-day periods relative to the call announcement date, day 0.

* Significantly different from zero at the .05 level in two-tailed tests.

** Significantly different from zero at the .01 level in two-tailed tests.

tendency to be net purchasers (sellers) the following month. Equation (1) is estimated separately for (1) all insiders, (2) officers, and (3) top executives, providing a forecast, $\hat{\text{NT}}(x,x+30)_i = \hat{\alpha}_i + \hat{\beta}_i \text{NT}(x-31,x-1)_i$, of expected net insider trades for each 30-day period based on insider activity over the previous 30 days. We then define net abnormal (or surprise) insider trades, $\text{ANT}(x,x+30)_i$, as

$$\text{ANT}(x,x+30)_i = \text{NT}(x,x+30)_i - \hat{\text{NT}}(x,x+30)_i. \quad (2)$$

Mean values of ANT_i over all firms i are reported in table 4. As expected, since insiders were generally net buyers of stock at these firms, the values of ANT are generally smaller than those of NT. However, the ANT are positive and significant in most 30-day periods surrounding conversion-forcing calls, implying that insiders at calling firms are purchasing more equity than normal during the period before and after calls. For instance, in the 30 days following the call, we observe positive mean abnormal net purchases that are significant at the .05 level for insiders in general and top executives and significant at the .01 level for officers. Over the 90-day period just before the call, ANT averages 1.224 for insiders in general, 1.424 for officers, and .446 for top executives. All are significantly greater than zero at the .01 level.

In summary, we find no evidence that managers of calling firms have inside information that leads them to suspect that their firm's equity is overvalued. Indeed, we find exactly the opposite—managers of calling firms are accumulating equity for their own accounts and are even buying more than they

normally do in the months surrounding the call. The signaling hypothesis is clearly rejected.

V. Do Stock Analysts View a Conversion-Forcing Call as a Negative Signal?

Having established that managers making conversion-forcing calls do not view their firm's equity as overvalued, we next examine whether informed professional outsiders, that is, stock analysts, view a conversion-forcing call as a negative signal. On the one hand, it seems unlikely that stock analysts would make this mistake if the managers themselves do not view the equity as overvalued. On the other hand, this is the very crux of the signaling hypothesis that a conversion-forcing call sends such a negative signal.

To test whether stock analysts interpret a conversion-forcing call as a negative signal, we examine whether they tend to lower their forecasts of the firm's future earnings following the call. As noted above, several previous studies have focused on the behavior of actual earnings following conversion-forcing calls. Ofer and Natarajan (1987) found that actual earnings growth rates declined sharply following conversion-forcing calls, but Campbell et al. (1991) argued that this reflected unusually strong earnings growth prior to the call and that postcall earnings growth simply returned to normal industry levels. While the behavior of actual earnings is debatable, what is more important in terms of the signaling hypothesis is whether analysts view a call as a negative earnings signal, and that is what is tested here.

Several studies have shown that analysts respond to managers' actions that they view as revealing new information. For instance, Ederington and Goh (1998) find that analysts lower their earnings forecasts following bond rating downgrades, Brous (1992) finds that analysts adjust their forecasts downward following new equity issue announcements, and Brous and Kini (1993) find that analysts adjust their forecasts following takeover announcements.

Byrd and Moore (1996) and Shastri and Shastri (1996) have examined whether analysts lower their earnings forecasts following conversion-forcing calls as the signaling hypothesis implies and find no evidence that they do so. Indeed, Byrd and Moore (1996) find that Value Line tends to raise their earnings forecasts following conversion-forcing calls. In addition to being based on a larger sample, our analysis extends theirs by examining surprise or unexpected forecast revisions. This is important because numerous studies have shown that many analysts revise their forecasts with a substantial lag and since conversion-forcing calls tend to occur after the firms have done extremely well, positive forecast revisions would be expected.

For this analysis, we utilize the Institutional Brokers Estimate System (IBES) data reporting the median of the earnings forecasts for a firm by its stock analysts each month. For inclusion in our sample, we require that the IBES tape contain earnings forecasts for the firm from 12 months prior to the

rating change through 12 months after. Since previous studies have shown that the IBES tapes contain data errors, we eliminate a firm from our sample if $FR_{i,t}$ is more than 5 standard deviations (defined over all firms) from the overall mean in any month. After the initial round of data eliminations, the standard deviation is recalculated and again firms with observations outside five standard deviations are eliminated. The resulting data set consists of 278 of our 298 calls. The per share earnings forecasts are adjusted by IBES for the dilution caused by stock splits, new issues, and conversions.

Like Lys and Sohn (1990), Brous (1992), Ederington and Goh (1998), and others, we measure the revision during month *t* of forecasts of firm *i*'s earnings, $FR_{i,t}$, as the change in the median forecast of annual earnings per share deflated by the stock price. Specifically,

$$FR_{i,t} = \frac{(F_{i,t} - F_{i,t-1})}{P_i^*} * 100, \tag{3}$$

where $F_{i,t}$ is the median analyst earnings forecast (from IBES) as of month *t* of firm *i*'s annual earnings per share for the current fiscal year and P_i^* is the price per share 1 month prior to the convertible call.[13] The *t* subscript represents the calendar month relative to the call date. For instance, if firm *i* calls its convertible bonds on March 10, then $F_{i,0}$ represents the median forecast as of March and $F_{i,-1}$ represents the median forecast in February. Note that for month 0, we do not know which occurred first: the call or the earnings forecast.

Previous studies of earnings forecast revisions by O'Brien (1988), Lys and Sohn (1990), Brous (1992), Kang, O'Brien, and Sivaramakrishnan (1994), and Ederington and Goh (1998) have shown that these revisions in earnings forecasts are partially predictable. Specifically they have documented two strong tendencies: (1) earnings analysts tend to be overly optimistic initially and to then lower their forecasts as the earnings release date approaches and (2) since all analysts do not update their forecasts each month, revisions in the median earnings forecast tend to be serially correlated, that is, if the median forecast rises one month due to new information, it will normally continue to rise in future months as other analysts update. To test whether analysts respond to conversion-forcing calls, we need a measure of the surprise forecast revisions after controlling for these two predictable changes.

Our procedure for obtaining a measure of the abnormal or surprise follows that of Ederington and Goh (1998), who document earnings forecast revisions following bond rating changes. We first chose 500 firms at random from the IBES data tape and then chose at random a 25-month period for each firm

13. We normalize the earnings forecasts using the price 1 month prior to the forecast revision to avoid picking up price changes caused by the conversion-forcing call. $F_{i,t}$ and $F_{i,t-1}$ always represent forecasts for the same fiscal year. For instance, suppose that the nearby forecasts in January and February are for the 1989 fiscal year while March's is for the 1990 fiscal year. In that case $FR_{i,t}$ is calculated for February using the January and February forecasts for 1989 earnings while March's is calculated using the February and March forecasts of 1990 earnings.

between 1/84 and 12/90. Using this pooled data, we estimated the following equation using a third-order Almon lag (*t*-values in parentheses):

$$\underset{}{FR_{i,t}} = \underset{(15.20)}{.1265} + \underset{(21.20)}{.1051}FR_{i,t-1} + \underset{(35.72)}{.0958}FR_{i,t-2} + \underset{(27.21)}{.0861}FR_{i,t-3} + \underset{(24.04)}{.0760}FR_{i,t-4} + \underset{(24.23)}{.0654}FR_{i,t-5} + \underset{(10.83)}{.0545}F, \quad (4)$$

where the $FR_{i,t}$ are as defined in equation (3) above. The significant negative intercept of $-.1265$ confirms that, ceteris paribus, analysts tend to reduce their forecasts over time. The significant coefficients on the lagged FR terms confirm the finding that, ceteris paribus, upward (downward) revisions in the median forecast tend to be followed by further upward (downward) forecast revisions as more analysts update. For instance, the .1 coefficient for $FR_{i,t-1}$ indicates that a doubling of the median forecast one month tends to be followed by an increase of approximately 10% the following month.

Using equation (4) and past values of FR, we calculate the expected forecast revision, $E(FR_{i,t}|FR_{i,t-j}, j = 1,6)$ for each firm *i*. We then define the abnormal (or surprise) earnings forecast revision, $AFR_{i,t}$, as the difference between the actual revision in the median forecast in month *t* and this expected forecast revision, specifically

$$AFR_{i,t} = FR_{i,t} - E(FR_{i,t}|FR_{i,t-j}, j = 1,6). \quad (5)$$

The resulting mean values of AFR are reported in table 5.[14] As shown there, contrary to the signaling hypothesis, positive abnormal revisions in analysts' earnings forecasts are observed in all the months surrounding conversion-forcing calls. Most are significant. Interestingly, the largest surprise forecast revision, $+.103$, occurs in the month of the conversion-forcing call. This certainly conflicts with the hypothesis that a conversion-forcing call is bad news.

While significantly different from zero, the implied surprise forecast revisions are small. For instance, for a stock with a P/E ratio of 21 (the average in our sample), the .103 AFR in the month of the call implies an upward revision in the median forecast of 2.2%. There is also no evidence of a change in analyst behavior after the call; small positive abnormal forecasts revisions are observed in the months prior to a conversion-forcing call, and small positive forecast revisions are observed afterward.

In summary, there is no evidence that earnings analysts interpret a conversion-forcing call as bad news. Indeed there is evidence that, relative to firms in general, analysts are revising their earnings forecasts upward in the months surrounding conversion-forcing calls. This is consistent with the evidence on actual earnings by Campbell et al. (1991) but inconsistent with that

14. The mean FRs before applying eq. (5) are generally small, insignificant, and of mixed sign.

TABLE 5 Abnormal Earnings Forecast Revisions Before and After Conversion-Forcing Calls of Convertible Bonds

Month Relative to Call	Mean $AFR_{i,t}$	*t*-Value
−6	.096	3.37*
−5	.094	4.57**
−4	.084	3.87**
−3	.092	3.74**
−2	.082	3.36**
−1	.083	2.84**
Call month	.103	3.03**
1	.061	2.52*
2	.093	5.36**
3	.016	.47
4	.101	4.60**
5	.077	3.28**
6	.039	.99
Number of observations	266–78	249–65

NOTE.—The mean over all calling firms i of the abnormal, or surprise, forecast revisions, $AFR_{i,t} = FR_{i,t} - E(FR_{i,t}|FR_{i,t-j}, j = 1,6)$ is reported. $FR_{i,t}$ is the revision in analysts' forecasts for firm i measured as: $FR_{i,t} = [(F_{i,t}\text{-}F_{i,t-1})/P_i^*]^*100$, where $F_{i,t}$ is the median analyst forecast in month t of earnings per share for the current fiscal year, and P_i^* is the price per share 1 month prior to the call date. $E(FR_{i,t}|FR_{i,t-j}, j = 1,6)$ is the expected forecast revision in month t based on a 6-month distributed lag of past forecast revisions.

* Significantly different from zero at the .05 level in two-tailed tests.

** Significantly different from zero at the .01 level in two-tailed tests.

in Ofer and Natarajan (1985) and provides a more direct test of the signaling hypothesis than either.

VI. Conclusions

Like many previous studies, we find that an announcement of a conversion-forcing call of a firm's convertible bonds is accompanied by a small decline in the price of the firm's common equity. The widely accepted explanation for this phenomenon is that market participants interpret a conversion-forcing call as signaling that the firm's management views a future decline in the value of the firm as likely and want to force bondholders to share in this decline.

Our evidence contradicts this explanation in that we find no evidence that managers of calling firms view the firms' future prospects negatively (indeed, we find exactly the opposite) and no evidence that a conversion-forcing call is interpreted as bad news by outside professionals. Before, during, and after conversion-forcing calls, the firm's managers are active purchasers of stock for their own portfolios. Indeed, they purchase more stock than normal in the months before and after conversion-forcing convertible bond calls. We also find no evidence that a call is interpreted negatively by those outsiders who follow the firm most closely, its analysts. In particular, there is no evidence that they lower their earnings forecasts following conversion-forcing calls as they do after other announcements such as new issue announcements and bond downgrades. In fact, we find evidence of small positive surprise revisions in analysts' earnings forecasts. Thus, our evidence supports the hypothesis of

Mazzeo and Moore (1992) and Byrd and Moore (1996) that the price decline following conversion-forcing calls is a liquidity-induced transitory decline that is quickly and totally reversed—a reversal that we also document.

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