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I. Introduction

Negative average common stock price reactions to conversion-forcing calls of convertible bonds and preferred stocks are well documented (see Mikkelson 1981 and Mais, Moore, and Rogers 1989 for evidence on calls of convertible bonds and preferred stocks, respectively). Possible explanations for the adverse price reactions are numerous, but negative information is one of the most prominent (e.g., Harris and Raviv 1985). Mazzeo and Moore (1992), however, present evidence of price recovery immediately following call announcements, thus casting doubt on negative information as the exclusive cause.

In this study, we confirm and extend the finding by Mazzeo and Moore (1992) that the announcement effect is transitory, and we employ an information measure to investigate whether the announcement effect is driven by negative information. We show that, on average, prices recover more than 100% of the loss in value suffered at announcement by the end of the conversion period. Although adverse changes in profitability are not the only possible reason for

Negative stock price reactions to conversion-forcing calls of convertible bonds and preferred stocks are re-examined, and most of the sample firms are shown to exhibit full price recovery by the end of the conversion period. In addition, analysts' earnings forecasts, both short-term and long-term, are found to be revised upward following call announcements for convertible bonds and preferred stocks. The combined findings cast doubt on the established belief that such capital structure decisions signal negative information about firm value.

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negative wealth effects, they figure prominently in the information-signaling literature (e.g., Harris and Raviv 1985). Thus, the responses of securities analysts to these events merit examination in order to pin down the nature of the information effect. Contrary to predictions implied in information signaling models, we find that *Value Line* analysts revise long-range and short-range earnings forecasts *upward* following call announcements.

In Section II we review the literature documenting and explaining negative call announcement effects. We then describe our sample and confirm that there are negative average call announcement effects for our convertible bonds (-1.168%) and convertible preferred stocks (-1.435%). Next we examine common stock prices before call announcements and compare them with prices at the end of conversion to determine how much of the announcement effect is transitory. The results show that all of the announcement effect is transitory for most of the firms in the sample. In Section III, we show that, on average, the short-term and long-term *Value Line* forecasts are revised upward following calls. The findings are summarized in Section IV.

II. Convertible Security Calls—Theory and Evidence

A. *The Evidence and Explanations*

Leverage-reducing decisions such as conversion-forcing calls of convertible securities may convey low confidence in future earnings (see Ross 1977; and Harris and Raviv 1985).¹ Consistent with this explanation, conversion-forcing calls of convertible bonds are found by Mikkelson (1981) to produce a significant negative average price effect (-2.13%), and convertible preferred stock calls are reported by Mais, Moore, and Rogers (1989) to produce a significant negative average price reaction (-1.60%).² Consistent with the explanation based on impending earnings deterioration, Ofer and Natarajan (1987) report an average earnings decline subsequent to convertible bond calls based on a simple extrapolative model of earnings expectations.

Mazzeo and Moore (1992) show that at least some of the negative announcement effect is transitory, consistent with a short-term liquid-

1. Constantinides and Grundy (1987) and Asquith and Mullins (1991) refine the Harris and Raviv (1985) argument to include the relative cash outflows (dividends and coupon payments) on the common stock and the convertibles as conditioning variables. Singh, Cowan, and Nayar (1991) refine the argument to include as a conditioning variable the decision to engage an underwriter.

2. Subsequent studies corroborate the negative wealth effects of both types of convertible calls. Ofer and Natarajan (1987), Campbell, Ederington, and Vankudre (1991), Singh, Cowan, and Nayar (1991), Mazzeo and Moore (1992), and Byrd and Moore (1994) find significant negative average effects for convertible bond calls. Cowan, Nayar, and Singh (1992), Mazzeo and Moore (1992), and Byrd and Moore (1994) report significant average price reductions due to convertible preferred calls.

ity effect, and the finding holds for calls of convertible bonds and convertible preferred stocks. They suggest that the negative price reaction is a temporary price reduction caused by selling pressure rather than negative information. Specifically, securities dealers respond to call announcements by lowering quoted bid and asked prices in an attempt to balance buy and sell orders as investors convert and sell their new shares. Also, Campbell, Ederington, and Vankudre (1991), after correcting for an inherent bias in preannouncement earnings growth rates examined in Ofer and Natarajan (1987), show that earnings growth rates do not decline after calls. While the presence of a transitory component in the announcement return does not exclude a long-term information effect, it does raise the intriguing possibility that the information effect is not the dominant force. In addition, Asquith (1995) shows that almost all “in-the-money” convertible bonds in his sample are called quickly, which argues against an information-signaling explanation.

B. Sample Selection

Our sample of convertible bond call announcements for 1975–90 is identified in Standard & Poor’s Bond Guide; convertible preferred calls are determined for the same period from Moody’s Dividend Record. We require that all sample calls have announcements published in the *Wall Street Journal* and that no other news stories pertaining to the calling firm appear in the *Wall Street Journal* within 2 days before or after the announcement date. We further require that all calls in the final sample be announced while in-the-money, that is, conversion value exceeds call price. Finally, all calls in the final sample have common stock returns recorded in the Center for Research in Security Prices (CRSP) daily return files (including NASDAQ). Eliminating calls that fail to meet these criteria resulted in samples of 148 convertible bond calls and 52 convertible preferred calls.

Next we require that sample firms have earnings forecasts supplied by *Value Line*. Short-term (current year) forecasts were found for 90 of the 148 firms calling convertible bonds and 36 of the 52 firms calling convertible preferreds. Long-term forecasts (3–5 years ahead) were available for 69 of the firms calling bonds and 27 firms calling preferreds.³

Employing the market model and test statistics used by Mikkelsen and Partch (1988), we confirm negative average announcement effects for our sample. The 2-day announcement period is the publication date and the trading day immediately before ($t = -1, 0$). For the sample of 90 in-the-money calls of convertible bonds, the average abnormal

3. These screens, particularly the requirement of coverage by *Value Line*, may rule out analysis of smaller firms; thus, our findings may not generalize to the full population.

2-day announcement return is -1.168% , significant at the .001 level (test-statistic $[Z] = -4.239$). For the 36 preferred call announcements, the average abnormal return is -1.435% , also significant at the .001 level ($Z = -3.304$). The results are nearly the same when abnormal returns are based on the mean-adjusted returns model estimated over the 120-day period following the end of the conversion period. Results of both return-generating models are nearly the same when parameters are estimated over the 120-day preevent period.⁴

C. Price Recovery

Given that our sample calls exhibit negative announcement effects, we now turn to the question of price recovery, namely, is the price decline permanent? The median number of calendar days in the conversion period (from the call announcement to the last day in which issues may be converted) is 31 for convertible bonds and 32 for convertible preferred stocks. A complete common stock price recovery over this period would support a short-term liquidity explanation and cast doubt on the validity of a negative information effect. The average price recovery can be examined by the ratio (P_{CEi}/P_{-2i}) , where P_{CEi} is the common stock price for the i th firm at the conversion expiration date, and P_{-2i} is the common stock price for the i th firm 2 days before the call announcement is published in the financial press. If this ratio, on average, is greater than or equal to one, evidence is provided that common stock prices recover fully by the end of the conversion period.

These tests include the firms in the sample that do not experience stock splits from 10 days before the announcement to the effective call date. Meeting these criteria are 33 of the 36 firms calling convertible preferred stocks and 75 of the 90 firms calling convertible bonds. Results of the analysis of the ratios are reported in table 1.

For the convertible bond sample, the mean ratio is 1.02834, significantly greater than 1.0 ($t = 2.62$) at the 5% level. The mean ratio, for the preferred sample is 1.03743, also significantly greater than 1.0 ($t = 2.47$) at the 5% level.⁵ These values indicate that the average announcement effect is erased by the end of the conversion period. In addition, of the 75 price ratios for convertible bond calls, 44 (59%) exceed one. The binomial probability, with equal probabilities for price ratios greater than or less than one, of drawing such a sample is .0827. Of the 33 convertible preferred calls, 23 (70%) of the price ratios ex-

4. See Byrd and Moore (1994) for a discussion of preevent estimation versus post-event estimation in computing the stock price reaction to convertible call announcements.

5. Normal theory confidence intervals for the 95% level lie above one. As a robustness check, we employ Efron's (1979) bootstrap using 1,000 iterations to establish a 95% confidence interval for the median price ratio. For convertible bond calls the interval for the median is [1.0070, 1.0196], and for convertible preferred calls it is [1.0000, 1.0159].

TABLE 1 **Stock Price Recovery Following Call Announcements for 75 Convertible Bonds and 33 Convertible Preferred Stocks**

	Price Ratio*
Convertible bond calls ($N = 75$):	
Greater than 1/less than 1	44/31†
Mean	1.02834
Test-statistic (t)	2.6214‡
Convertible preferred stock calls ($N = 33$):	
Greater than 1/less than 1	23/10§
Mean	1.03743
Test-statistic (t)	2.4724

* The price ratio is the closing common stock price on the day conversion ends (P_{CE}) divided by the closing price 2 days before call (P_{-2}).

† The probability of drawing 44 or more ratios greater than one is .0827 under the binomial distribution, with $p = .5$.

‡ The null hypothesis is that the ratio is less than or equal to one.

§ The binomial probability of 23 or more of 33 ratios greater than one is .0175.

ceed one. The binomial probability of drawing such a sample is .0175 given equal probabilities. The findings are consistent with those of Mazzeo and Moore (1992) who report announcement period abnormal returns of -1.2% and -1.5% for calls of convertible bonds ($N = 111$) and convertible preferred stocks ($N = 58$), respectively, each followed by a 2.2% average cumulative abnormal return during the respective conversion periods.

In figure 1, we give frequency histograms for the price ratios for the combined sample of 108 convertible calls (panel 1a), then convertible bond and preferred calls separately (panels 1b and 1c). The essence of the numerical values in table 1 is made even more apparent in figure 1a for the full sample. For reference, a normal density with mean 1.0311 is superimposed on the figure. From inspection of figures 1b (mean = 1.0283) and 1c (mean = 1.0374), it is clear that the bulk of the distribution for each type of security call lies at or above one, indicating that the majority of negative price reactions at announcement are short-lived.

III. Earnings Forecast Revisions and Convertible Calls

The evidence that for most firms the announcement effect is transitory casts doubt on information signaling as the principal explanation. This finding suggests the need for an analysis aimed directly at detection of a signaling effect. Any change in financial policy that conveys information about firm value should be of interest to financial analysts. Therefore, if a conversion-forcing call announcement conveys negative information concerning the calling firm's future earnings, analysts should revise their earnings forecasts downward for that firm following the call announcement.

FIG. 1.—Frequency histograms of ratios of prices following conversion (P_{CE}) to prices 2 days before call announcements (P_{-2}) for calls of 75 convertible bonds and 33 convertible preferred stocks. *a*, Convertible bonds and preferred stocks combined ($N = 108$); *b*, convertible bond calls only ($N = 75$); *c*, convertible preferred stock calls only ($N = 33$).

Following Ofer and Siegel (1987) and Israel, Ofer, and Siegel (1989), who develop and extend an innovative test for changes in analyst forecasts, we measure the relative change in expected net operating income (NOI) as follows:

$$\frac{\Delta \text{NOI}^e}{\text{NOI}^e} = \frac{\text{NOI}_a^e - \text{NOI}_b^e}{\text{NOI}_b^e}. \quad (1)$$

The numerator is the difference between the last *Value Line* forecast of net operating income before the call announcement (at time *b*) and the first forecast after the announcement (time *a*). We calculate NOI^e following Israel, Ofer, and Siegel (1989) as the product of the operating margin and sales forecasts published by *Value Line*. The numerator of (1) is divided by the earnings forecast (NOI^e) published at time *b*.

Change in share price due to the call announcement is measured as follows:

$$\frac{\Delta P}{P} = \frac{P_{t+1} - P_{t-2}}{P_{t-2}}. \quad (2)$$

In (2), P_{t+1} is the closing price per share 1 day after the *Wall Street Journal* announcement date, and P_{t-2} is the closing price immediately preceding the 2-day announcement period.

The price change in (2) is the same as that used by Israel, Ofer, and Siegel (1989). We also perform the analysis employing a market-

adjusted measure, namely, the 3-day cumulative abnormal return (CAR) from the market model, over the same time period (from $t = -2$ to $t = +1$).

We test the relationship between revisions in NOI forecasts subsequent to call announcements and changes in share price by estimating the parameters of the model (3) below:

$$\Delta \text{NOI}_i^e / \text{NOI}_i^e = \beta_0 + \beta_1 \Delta P_i / P_i + \epsilon_i. \quad (3)$$

Equation (3) is also estimated with CAR_i substituted for $\Delta P_i / P_i$. The analysis is done separately for changes in short-term (i.e., current year) and long-term forecasts (3–5 years ahead).

If security calls portend bad news about firms' earnings, we expect the mean of $\Delta \text{NOI}_i^e / \text{NOI}_i^e$ to be negative, and we expect β_1 in (3) to be positive for changes in long-term and short-term forecasts. In table 2 we present average long- and short-term NOI forecasts before and after calls of convertible bonds and preferred stocks and measure changes in these forecasts three ways: change in dollar forecast, percentage change in forecast, and the numbers of positive and negative revisions. The estimated mean change in NOI forecast is *positive* for long- and short-term forecasts following calls of convertible bonds and preferred stocks. The differences in means are statistically significant at the .05 level for changes in long-term forecasts following convertible bond calls (mean change = \$17.79 million, $t = 4.172$), and for changes in short-term forecasts (mean = \$5.99 million, $t = 2.035$). Average long-term forecast revisions pursuant to calls of convertible preferred stocks are also positive and significant at the .05 level (mean = \$16.543 million, $t = 2.222$). Average differences in short-term forecasts are also positive (mean = \$5.33 million), but significant at only the .10 level ($t = 1.772$). We conclude that the average earnings forecast is revised *upward* following convertible security calls, and the positive revision applies to both short-term and long-term forecasts of NOI.

Mean percentage changes in earnings forecasts are also reported in table 2, and these may be more illuminating than the dollar changes. Short-term forecasts are revised upward an average of over 4% for both types of calls (4.23% for bonds and 4.60% for preferreds).⁶

Average percentage changes in long-term forecasts are substantially larger for both types of security calls. The mean percentage revision for bond calls is 7.91%; the 95% confidence interval is (.0434, .1148).

6. Normal theory confidence intervals (95%) are [.0130, .0715] for convertible bond calls and [−.0021, .0941] for convertible preferred calls. The data appear to be normal according to the Shapiro-Wilk (1965) statistic: .9515 for bonds and .9711 for preferreds. The statistic has an upper bound of 1.0. Efron's (1979) bootstrap estimates of the 95% confidence intervals for the median percentage changes are [.0044, .0535] and [.0000, .0602] for calls of convertible bonds and preferred stocks, respectively.

TABLE 2 Analysis of Changes in *Value Line* Forecasts of Short-Term and Long-Term Net Operating Income (NOI) Following Call Announcements for Convertible Bonds and Preferred Stocks

	Convertible Bond Calls		Convertible Preferred Calls	
	Short-Term	Long-Term	Short-Term	Long-Term
<i>N</i>	90	69	36	27
Mean NOI forecast before call (\$millions)	191.41	359.77	224.87	298.52
Mean NOI forecast after call (\$millions)	197.40	377.56	230.20	315.07
Mean change in NOI forecast (\$millions) (<i>t</i> -statistic) ^a	5.99 (2.035)*	17.79 (4.172)*	5.33 (1.772)**	16.54 (2.222)*
Mean percentage change in NOI forecast (in %)	4.23	7.91	4.60	6.55
Number of negative revisions in NOI forecast	26/90	9/69	12/36	5/27
Number of negative revisions in sales forecasts	22/90	4/69	10/36	4/27
Number of negative revisions in operating margin forecasts	23/90	12/69	7/36	5/27

^a The null hypothesis is that the change is less than zero.
* Significant at the .05 level.
** Significant at the .10 level.

For preferred calls the mean is 6.55%; the 95% confidence interval is (.0030, .1241).⁷

The numbers of negative revisions in forecasts of NOI, sales, and operating margins are reported in the last three rows of table 2. The number of negative revisions in long-term NOI is very small for convertible bond calls (9/69) and convertible preferred calls (5/27). It is interesting to note that the NOI revisions are not driven exclusively by either sales or margin forecast changes, as indicated in the last two rows of table 2. In the majority of cases for both types of securities revisions of NOI, sales and operating margin are nonnegative.

In figure 2, we give frequency histograms for percentage changes in NOI^e (eq. [1]) for long- and short-term, for combined samples of both types of securities with normal densities superimposed. In panels 2*a* and 2*b*, we depict the histograms for convertible security calls, short-term (*N* = 126) and long-term (*N* = 96), respectively. For short-term NOI forecasts (panel 2*a*), only 38 of 126 (30%) are revised downward, while 88 (70%) are unchanged or revised upward. In panel 2*b*, long-

7. The Shapiro-Wilk (1965) statistic is .8985 for bond calls and .9639 for preferred calls. Efron's (1979) bootstrap method with 1,000 iterations corroborates the finding for 95% confidence intervals for median percentage changes: [.0440, .1180] for bond calls and [.0129, .1305] for preferred calls.

a

b

FIG. 2.—Frequency histograms of percentage changes in short-term and long-term net operating income (NOI) forecasts around calls of convertible bonds and preferred stocks. *a*, Revisions in short-term NOI forecasts for calls of convertible bonds and preferred stocks ($N = 126$); *b*, revisions in long-term NOI forecasts for calls of convertible bonds and preferred stocks ($N = 96$).

term forecasts, we see that only 17 of 96 are revised downward, while 79 of 96 (82%) are revised upward or remain unchanged.

These findings present a puzzle to those who argue that negative stock price reactions to convertible security calls are driven by an information mechanism involving operating income deterioration. All three of our measures indicate that analysts interpret convertible calls as positive information. We next test for a positive link between earnings forecast revisions and the price reaction to call announcements by estimating equation (3) by ordinary least squares.⁸ The results are reported in table 3. For convertible bond calls (panel A) there is evidence that short-term forecast revisions are positively related to equity value changes measured as $\Delta P/P$ in equation (2) ($t = 2.157$). However, the evidence is substantially weaker when CARs are used to gauge the price reaction ($t = 1.383$). Changes in long-term forecasts, however, are not reliably related to price reactions ($t = 1.337$ for $\Delta P/P$, and $t = .755$ for CAR).

For convertible preferred calls (panel B), none of the estimated slope coefficients (β_1) is significantly different from zero. This is true regardless of whether $\Delta P/P$ or CAR is used as the independent variable. We conclude that the data reveal no consistent and reliable relationship between *Value Line* forecast revisions and price reactions to call announcements, inconsistent with an information effect.

IV. Summary and Conclusions

We find that for most calls of convertible bonds and convertible preferred stocks in our sample, stock prices recover fully by the end of the conversion period. Thus, the widely documented negative announcement effect is transitory for most firms, inconsistent with an explanation based on information signaling.

Also, forecasts of net operating income produced by *Value Line* analysts are found to be revised upward, on average, following calls of convertible bonds and preferred stocks. The average positive revision is exhibited for both short-term and long-term forecasts. The findings are also counter to what would be expected according to a variety of information-based stories linking firms' profitability and call strategies. Our regression results indicate that a positive relation between price effects and NOI forecast revisions is exhibited in only a subset of the data using ordinary least squares, and then only marginally so.

But the market *does* react negatively to such call announcements. Mazzeo and Moore (1992) conclude that the average price reaction has

8. White's (1980) test for heteroscedasticity indicates that ordinary least squares is appropriate.

TABLE 3 **Results of Ordinary Least Squares Estimation of the Model**
 $\Delta \text{NOI}^e / \text{NOI}^e = \beta_0 + \beta_1 \Delta P/P + \epsilon$

	<i>N</i>	$\hat{\beta}$	$\hat{\beta}$
A. Convertible bond calls:			
Short-term forecasts:			
$\Delta P/P$	90	.0465 (3.190)	.7131 (2.157)
CAR	90	.0498 (3.183)	.4481 (1.383)
Long-term forecasts:			
$\Delta P/P$	69	.0824 (4.588)	.6102 (1.337)
CAR	69	.0843 (4.388)	.3319 (.755)
B. Convertible preferred calls:			
Short-term forecasts:			
$\Delta P/P$	36	.0474 (1.947)	.2299 (.340)
CAR	36	.0489 (1.938)	.1899 (.370)
Long-term forecasts:			
$\Delta P/P$	27	.0613 (1.980)	.9433 (.876)
CAR	27	.0699 (2.225)	.4650 (.676)

NOTE.—Values in parentheses are *t*-statistics for respective coefficient estimates. $\Delta P/P$ = percentage change in closing price per share from day $t = -2$ to day $t = +1$; CAR = cumulative abnormal return for 3-day announcement period, $t = -2, +1$.

a temporary component consistent with their market microstructure explanation. Our findings of no reliable linkage between earnings forecasts and price reactions are consistent with an explanation such as that of Mazzeo and Moore (1992). While our findings may shed some light on the nature of call announcements, they also raise a prominent question. If earnings forecasts are elevated following calls, why does the market react negatively to the announcements? We speculate that the announcement effect may be due exclusively to a short-term phenomenon such as liquidity demand; that is, there may be *no* bad news associated with conversion-forcing calls.

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