

# “Liquidity Costs and the Information Content of Calls of Warrants: Intra-Industry Evidence”

<b>AUTHORS</b>	Luis Garcia-Feijóo John S. Howe Randy D. Jorgensen
<b>ARTICLE INFO</b>	Luis Garcia-Feijóo, John S. Howe and Randy D. Jorgensen (2005). Liquidity Costs and the Information Content of Calls of Warrants: Intra-Industry Evidence. <i>Investment Management and Financial Innovations</i> , 2(1)
<b>RELEASED ON</b>	Wednesday, 23 March 2005
<b>JOURNAL</b>	"Investment Management and Financial Innovations"
<b>FOUNDER</b>	LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

0



NUMBER OF FIGURES

0



NUMBER OF TABLES

0

© The author(s) 2025. This publication is an open access article.

# Liquidity Costs and the Information Content of Calls of Warrants: Intra-Industry Evidence

Luis Garcia-Feijóo, John S. Howe, Randy D. Jorgensen

## Abstract

Calls of in-the-money warrants elicit a negative stock price reaction at the call announcement date and a positive price reaction at the completion date. We examine two theories that can explain this pattern of stock price behavior: liquidity costs and information effects. We find that calls that surprise the market result in a greater negative abnormal return at the call announcement date and a corresponding lower abnormal return from the call announcement to completion date. Thus, returns are associated with characteristics of the calling firms themselves. In addition, we find that industry rivals experience statistically significant negative abnormal returns around warrant calls. Overall, our evidence is inconsistent with liquidity costs as the sole explanation for the stock price reaction around calls of warrants and supports the notion that the call is an informative event.

**Key words:** Warrants, Calls, Liquidity Costs, Intra-Industry.

**JEL classification:** G32.

## I. Introduction

Calls of in-the-money warrants have been the subject of much research attention since Schultz (1993b) first reported evidence regarding returns around call announcement and completions. He found a negative abnormal return surrounding the announcement and a positive abnormal return surrounding the completion of the call of warrants. The negative return at the call date is consistent with stock market reactions to virtually all announcements of offerings of equity and is thus not unexpected. However, the positive reaction at the completion date represents a puzzle. Since the completion date is known in advance, one would not expect an abnormal return to be associated with it. Schultz concluded his results left a puzzle that remained to be explained.

The leading theories to explain this pricing behavior relate to liquidity costs and managerial discretion costs. These theories and the associated literature, discussed in greater detail in the next section, help explain the magnitude of the negative abnormal returns surrounding the call announcement but fall short of explaining conclusively the positive stock price reaction at the call completion date.

We examine calls of in-the-money warrants and make two contributions to the literature. First, we segregate our sample of warrant calls into those that could rationally be expected by the market and those that should come as a surprise. We find out that calls that surprise the market result in a much greater negative abnormal return at the call date and a corresponding lower abnormal return from the call announcement to completion date. In calls that the market would likely not be surprised by, the abnormal returns are generally positive from announcement to completion. Thus, consistent with Alderson and Betker (AB, 2003), returns are associated with characteristics of the calling firms themselves. Also consistent with AB, Schultz (1993b) and Fields and Moore (1995), we find only mixed support for liquidity effects.

Second, we examine industry-related effects of warrant calls. More specifically, to test the liquidity hypothesis, we investigate intra-industry information transfers of calls of warrants. We test the null hypothesis of no intra-industry equity price reaction to the announcement of forced warrant exercise. Rejection of the null hypothesis implies that a warrant call carries information about industry conditions, which is not predicted by the liquidity hypothesis. Intra-industry wealth effects can be expected if firms match the maturity of their investment and financing options, as predicted by the sequential-financing hypothesis (Schultz, 1993a; Mayers, 1998), and a warrant call signals the exercise of an investment opportunity by the calling firm. To the extent that the exercise of the investment option conveys information about the industry's investment opportunity set, rival firms' stock prices could react to the announcement of the warrant call.

We provide evidence that a warrant call is an informative event because it elicits a stock price reaction in industry rivals. To evaluate intra-industry wealth effects, we consider rivals' abnormal returns around announcement and completion dates as well as abnormal returns from call announcement to completion. We find out that industry competitors experience weakly statistically significant negative abnormal returns at the time of the call announcement. Additionally, rivals are significantly negatively affected by the call completion, and experience significantly negative abnormal returns from announcement to completion. We conclude that industry rivals react negatively to forced warrant exercise.

Overall, our results are inconsistent with liquidity costs as the sole explanation for the negative stock price reaction to in-the-money warrant calls. In contrast, they support the view that a warrant call is an informative event. To our knowledge, our study is the first to examine intra-industry wealth effect of calls of warrants or convertible securities<sup>1</sup>. If managers try to maximize shareholder wealth when making calls of convertible securities, our results for calls of warrants shed additional light on the information content of calls of convertible debt and preferred stock. Specifically, our findings imply that abnormal returns around call announcements are associated with characteristics of the calling firms themselves and that the nature of the information conveyed by calls of convertibles is industry-wide.

## II. Warrant Calls and Associated Hypotheses

Calls of warrants represent an increase in outstanding equity and an inflow of cash for the calling firm. The market reaction to announcements of issuances of equity, (i.e., seasoned equity offerings) is well documented in the literature on finance; these announcements are met almost universally by negative abnormal returns. Schultz (1993b) was the first to report results of in-the-money warrant calls. He examined warrant calls between 1983 and 1989 and found warrants were typically called as soon as possible by the calling firm. He found the call resulted in a negative abnormal return of 3% at the call announcement and a positive abnormal return of 7% at the completion of the call, with a total positive return of 4% over the entire period. He noted the pricing pattern might be due to selling pressure by market makers at the call announcement followed by price recovery upon completion but his tests failed to support this explanation.

Fields and Moore (FM, 1995) examine in-the-money warrant calls between 1980 and 1989, focusing on returns around the call date and the twenty days following the call announcement. They find that firms calling warrants are typically smaller and have higher increases in equity as a result of the call than firms considered in previous research related to equity-increasing events. In addition, these firms are growth firms with rapid increases in assets before and after the call. Their management typically owns much of the equity prior to call and this proportion decreases after the call, Fields and Moore also find negative abnormal announcement returns similar to Schultz (1993b). The negative return is more pronounced (a) the higher the cash proceeds (consistent with the free cash flow arguments of Jensen (1986)), and (b) the larger the increase in shares in firms with low management voting power prior to call (consistent with Stulz (1988) and Morck, Shleifer, and Vishny (1988)). They find a negative statistical relationship between abnormal returns and decreases in leverage. Smith (1986) points out leverage-increasing capital structure changes typically have positive equity valuation effects, and vice versa. To the extent financial distress is an unimportant factor, exercise-forcing calls of warrants are leverage-reducing events and should result in a negative price reaction. FM find mixed evidence of a liquidity effect.

Alderson and Betker (AB, 2003) examine in-the-money warrant calls between 1982 and 1997. They find a negative abnormal return of 3% at call announcement and a positive 2% at completion. They also note that there is a significant run-up in price prior to the call and that calling firms underperform firms matched on size and book-to-market for the three years after the call.

<sup>1</sup> Researchers have examined the intra-industry wealth effects of earnings announcements (Foster, 1981), dividend changes, including initiations and omissions (Howe and Shen, 1998; Laux, Starks, and Yoon, 1998; Firth 1996; Caton, Goh, and Kohers, 2003), going-private transactions (Slovin, Sushka, and Bendeck, 1991), bankruptcy announcements (Lang and Stulz, 1992; Ferris, Jayaraman, and Makhija, 1997), security offerings (Szewczyk, 1992; Slovin, Sushka, and Polonchek, 1992), and tender-offer stock repurchases (Hertzel, 1991).

AB examine the negative returns associated with call announcement by focusing on the agency costs of managerial discretion. They note firms with good investment opportunities and no debt capacity should call warrants as soon as possible. Firms with poor opportunities or possessing debt capacity should delay calls. Managerial discretion costs (i.e., overinvestment in value-destroying projects) will be higher in (1) inefficient firms, (2) firms with low leverage prior to call, and (3) firms that reduce industry-adjusted leverage as a result of warrant exercise. They find the negative price reaction at call is concentrated among inefficient firms with low leverage prior to the call. They also find a higher negative price reaction in firms with high leverage the more they reduce their leverage in the year following the call. They test for liquidity effects and find that such effects cannot fully explain the price decline at call and subsequent recovery at completion of the call.

While these studies suggest reasons for the magnitude of the negative return at call announcement, to date none explain satisfactorily the stock price rebound at the completion date. The most plausible explanation for positive abnormal returns at the completion date, liquidity effects related to portfolio rebalancings, receive only mixed support and fail to completely explain this pattern.

We provide evidence on the information content of forced warrant exercise. First, we investigate if the stock price reaction to the call announcement is different for expected and unexpected calls. The liquidity-costs hypothesis does not predict any differences but if the call announcement is an informative event, such differences might be expected. Second, to more specifically test the liquidity-costs hypothesis, we investigate intra-industry information transfers of calls of warrants. We test the null hypothesis of no intra-industry equity price reaction to the announcement of forced warrant exercise. Rejection of the null hypothesis implies that a warrant call carries information about industry conditions, which is not predicted by the liquidity-costs hypothesis.

The alternative hypothesis is two-sided. The existing literature suggests that the industry stock price reaction could be of the same sign (i.e., a contagion effect) or opposite sign (i.e., a competitive effect) as the abnormal return experienced by calling firms (Lang and Stulz, 1992). The finding of no intra-industry abnormal returns however would be consistent with both liquidity costs and a situation in which the information conveyed by the call is firm specific.

### III. Data

Our initial sample consists of 162 warrant calls obtained by a keyword search using the Dow Jones News Retrieval service over the period of 1982-1998. We eliminate some events in order to include only warrants that are in-the-money at the time of the call. In addition, we require firms have return data available in the Center for Research in Security Prices (CRSP) Daily Returns File. We also require that there are no other significant firm-specific announcements in the three days surrounding the call announcement day. The final sample consists of 117 calls made by 116 firms.

Consistent with Schultz (1993a), there is some concentration in the high-tech and service industries. Although the sample covers thirty-three different two-digit sic codes, thirteen calls (11.3%) were made by firms in the Chemicals and Allied Products, thirteen – by firms in Business Services, twelve (10.43%) – in Industrial and Computer Equipment, and eleven (9.57%) – in Health Services. Additionally, 86% of the sample calls occur between 1991 and 1998.

Table 1 displays financial characteristics of the sample firms at the close of the fiscal year prior to the year of the call. The average (median) market value of equity is \$48.5 (\$29.1) million, while mean (median) assets are \$38.6 (\$11.3) million. In addition, the average (median) ratio of long-term debt divided by assets is 14% (5%) and the average (median) ratio of short-term debt divided by assets is 9% (3%). Thus, calling firms are small and use very little debt.

Table 1

## Financial Characteristics of Calling Firms

Variable	Mean	Median	Std Dev	N
MVE	48.54	29.06	64.12	106
TA	38.61	11.27	105.23	113
LTD/TA	0.14	0.05	0.20	113
LTD/MVE	0.88	0.02	7.03	105
STD/TA	0.09	0.03	0.15	113
MTBE	6.68	4.39	7.75	100
R&D/Sales	0.13	0.02	0.37	54
Intangibles/TA	0.08	0.01	0.13	97
Income /Sales	-0.10	0.03	0.50	93

Note: All variables are measured at the end of the fiscal year prior to the call announcement year. MVE and TA are in millions. MVE equals market value of equity (price times shares outstanding), TA total assets, LTD long term debt, STD short term debt, MTBE the ratio of MVE by book value of equity (only firms with positive book values are included), and Income equals operating income. Data are derived from COMPUSTAT.

Furthermore, sample firms show characteristics of growth stocks with ample investment opportunities. The average (median) market-to-book equity ratio is 6.68 (4.39). The average (median) ratio of R&D expenses to sales is 0.13 (0.02) and the average (median) value of intangible assets relative to total assets is 0.08 (0.01). Additionally, the average (median) operating income divided by sales is -0.10 (0.03).

Table 2 reports characteristics of the warrants being called. The average (median) ratio of the stock price the day before the call divided by the exercise price is 1.87 (1.62). Moreover, seventy-two warrants (62%) contain a price condition that has to be met before a call is possible. The stock price must be an average (median) of 54% (42%) above the exercise price for 20 days before the warrants can be called. Therefore, the warrants are deep in-the-money at the time of the call. In more than half of the sample, warrants have been in-the-money for at least twenty days before the call announcement. That is, some of the warrant calls must be at least partially anticipated.

Table 2

## Characteristics of Called Warrants

Variable	Mean	Median	Min	Max	Std Dev	N
Stock Price/Strike	1.87	1.62	1.10	7.93	0.84	117
Notice period	35.93	33.00	14	84	11.04	112
Price condition	1.54	1.42	0.83	5.62	0.61	72
Condition length (days)	19.24	20.0	5.0	30.0	7.30	72
Years since issuance	1.80	1.61	0.14	6.54	1.19	91
Original Life	4.14	5.00	0.91	7.00	1.25	88
Warrants Outstanding (%)	92.5	100	27	100	18.29	67
Proceeds (\$ million)	9.18	6.70	0.60	53.4	8.76	90
Proceeds/TA	1.02	0.73	0.04	7.80	1.21	87
Proceeds/MVE	0.47	0.24	0.02	12.15	1.36	80
Shares change (-1, 0)	0.64	0.39	0.01	17.08	1.61	111

Note: Stock Price is the closing price on the day before the call announcement day. Strike is the warrant exercise price at the time of the call. Proceeds are net proceeds from call. TA (MVE) is book value of assets (market value of equity) at the end of the fiscal year prior to that of call announcement. Share change is

the increase in shares outstanding from one year before to the year of the call. TA and MVE are from Compustat. The remaining data are collected from annual reports, call announcement news, and warrant offering prospectuses.

Warrant holders have an average (median) of 36 (33) days to exercise their warrants before the end of the notice period. Additionally, warrants have been outstanding for an average (median) of 1.80 (1.61) years at the time of the call. The average (median) warrant life at issuance is 4.14 (5) years. Furthermore, the average (median) company has 92.5% (100%) of the issued warrants still outstanding at the time of the call. Thus, consistent with Schultz (1993b), warrants are called optimally, as soon as exercise can be forced.

The table also shows that average (median) net proceeds are \$9.18 (\$6.70) million. On average, warrant proceeds equal the firm size of the calling firms in terms of total assets (the median value is 73%), and nearly half of their market value of equity (the median value is 24%). Shares outstanding increase by an average (median) of 64% (39%) in the year of the call. Thus, an exercise-forcing call of warrants is a significant financing event for the calling firms.

The evidence in these tables suggests forced warrant exercises must be at least partially anticipated. Most warrants are deep-in-the-money at the time of the call announcement. Furthermore, warrants are called promptly. Calling firms are small and have good investment opportunities but negative operating income, and proceeds from warrant exercise nearly double the size of the firms. The evidence also suggests that given the time that elapses between call announcement and completion there may be considerable uncertainty regarding the successful completion of the call. Consequently, to understand the wealth effects of calls of warrants it is necessary to inspect not only the abnormal returns at announcement but also abnormal returns at call completion as well as from announcement to completion.

#### IV. Methods

We use event-study methods to measure the common stock price reaction to call announcements and completions. Abnormal returns are calculated as the prediction errors from a single-factor market model. Market model parameters are estimated by using 250 trading days beginning 91 (31) trading days after the call announcement (completion) date. The estimation period begins 91 days after the call announcement because the maximum notice period in our sample is 84 days. We use a post-call estimation period because calls of in-the-money convertibles and warrants follow a period of positive returns. Thus, using a pre-call estimation period can bias results (Campbell, Ederington, Vankudre, 1991; Cowan, Nayar, and Singh, 1990). We include firms that have a minimum of 40 non-missing returns in the estimation period.

To test whether the cumulative abnormal return is significantly different from zero, we use the standardized cross-sectional method of Boehmer, Musumeci, and Poulsen (1991), which allows for event-induced variance changes. The test-statistics is also adjusted for the serial correlation of abnormal returns within the event window (Mikkelson and Partch, 1988; Mais, Moore, and Rogers, 1989). In addition, market model parameter estimates are adjusted for infrequent trading following Scholes and Williams (1977). Although we present results using the equally weighted CRSP market index, results are similar when we use the value weighted CRSP market index or the Nasdaq Composite Index. Results are also insensitive to the adjustment for infrequent trading.

Following Cowan, Nayar, and Singh (1990), we also employ a generalized sign test, which differs from the simple sign test in that the fractions of positive and negative returns under the null hypothesis are determined by the fractions observed in the estimation period rather than fixed at 0.5.

Table 3 displays abnormal returns for the calling firms around the call announcement and completion days. Warrant calls typically follow a period of stock price increases. The cumulative abnormal return over the period (-20, -2) relative to the call announcement day is 6.01%, which is significant at the 1% level ( $z$ -stat is 3.922). Consistent with previous literature, the abnormal return on the call announcement day is -1.64%. Similarly, the ratio of 40 positive to 75 negative abnormal returns is significantly lower than the ratio observed during the estimation period. Both are significant at the 1% level.

Table 3

## Average Abnormal Returns at Announcement and Completion of Exercise-forcing Calls of Warrants

Day zero is announcement date n = 115				
Event Day or Window	Mean Excess Return	z-stat	Pos	z-stat
-3	-0.24	0.019	56	0.416
-2	-0.06	-0.272	50	-0.706
-1	0.10	0.038	54	0.042
0	-1.64	-3.315***	40	-2.575**
1	0.59	-1.059	49	-0.893
2	0.50	1.927*	63	1.724*
3	0.61	2.143**	63	1.724*
(-20, -2)	6.01	3.922***	72	3.406***
(-1, 0)	-1.53	-2.562**	41	-2.388**
(1, 20)	0.64	1.008	61	1.350
Day zero is completion date n = 106				
Event Day or Window	Mean Excess Return	z-stat	Pos	z-stat
-3	0.05	-0.059	41	-1.795*
-2	0.81	2.166**	57	1.317
-1	1.15	2.745***	60	1.901*
0	1.42	3.016***	64	2.679***
1	0.64	1.466	58	1.512
2	0.40	0.806	48	-0.433
3	0.30	0.524	52	0.345
(-20, -2)	-1.52	-0.653	47	-0.628
(-1, 0)	2.56	4.370***	74	4.624***
(1, 20)	0.91	1.124	57	1.317
(A, C)	-0.97	0.281	56	1.347

Note: Average abnormal returns are estimated based on the market model using 250 daily returns from day +91 relative to call announcement (A) and day +31 relative to completion (C). Only firms with a minimum of 40 non-missing returns in the estimation period are included in the sample. "Pos" equals the number of positive returns.

\*\*\* Significant at the 1% level.

\*\* Significant at the 5% level.

\* Significant at the 10% level.

Table 3 also reports abnormal returns around the completion day. Consistent with Schultz (1993b), returns become positive a few days before completion. The abnormal stock return over days (-1, 0) is 2.56%, which is significant at the 1% level. The ratio of positive to negative abnormal returns over days (-1, 0) is significantly higher than the ratio over the estimation period according to the generalized sign test. Schultz (1993b) argues that these positive abnormal returns are not consistent with market efficiency because the completion day is known at the time of the call. Also consistent with Schultz (1993b), the abnormal return from announcement to completion is statistically insignificant -0.97%. Thus, the negative stock price reaction to call announcement appears to be temporary (Mazzeo and Moore, 1992).

## V. Wealth Effects Depending on the Timing of the Call

Table 4 displays abnormal returns for firms classified by whether warrants include a price condition that must be met before a call is possible. Sixteen firms call warrants even though the price condition has not been satisfied. These firms are analyzed separately. According to the table, only firms with warrants that include a price condition that is met experience a price run-up before the call. Additionally, the announcement-day abnormal return for firms that include a price condition is -1.42%, which is significant at the 5% level. The nonparametric test confirms this result. The abnormal return for firms with warrants that do not include a price condition is -1.86%, which is also significant at the 5% level. The abnormal return for firms with warrants that do not meet the price condition at the time of the call is -3.42%, which is significantly different from zero at the 5% level. As argued earlier, of the three categories, calls of warrants with a price condition that must be met should be the least surprising and calls of warrants where the price condition is not met should be the most surprising. The market reaction to these calls suggests this as well.

Table 4

Average Abnormal Returns for Calling Firms According to whether Warrants include a Price Condition or not

	Price Condition n = 54		No Price Condition n = 45		Condition not met n = 16	
(A-20, A-1)	12.15*** (4.004)	38:16*** (3.490)	0.65 (0.589)	19:26 (-0.600)	-6.36 (-1.498)	6:10 (-0.752)
(A, A)	-1.42** (-2.212)	17:37** (-2.238)	-1.86** (-2.042)	16:29 (-1.496)	-3.42** (-2.231)	5:11 (-1.252)
(A+1, A+20)	1.64 (0.341)	27:27 (0.490)	1.65 (1.049)	24:21 (0.894)	-7.05 (-1.371)	7:9 (-0.251)
(C-20, C-4)	-2.48 (-1.400)	21:28 (-0.612)	-3.56 (-1.355)	17:24 (-0.701)	-7.80* (-1.821)	7:9 (-0.267)
(C-3, C)	4.71*** (4.309)	35:14*** (3.394)	2.78** (2.301)	23:18 (1.177)	2.98 (1.482)	10:6 (1.236)
(C, C)	2.18*** (3.208)	33:16*** (2.822)	0.40 (0.492)	21:20 (0.551)	2.35** (2.087)	9:7 (0.735)
(C+1, 20)	2.06 (0.809)	29:20* (1.677)	0.15 (0.817)	22:19 (0.864)	3.50 (1.022)	7:9 (-0.267)
(A, C)	1.47 (0.919)	29:20* 1.812	-4.77 (-0.889)	19:22 (0.128)	-5.32 (-1.127)	8:8 (0.208)

Note: "A" is the announcement date and "C" is the conversion completion date. Price conditions are collected from annual reports, call announcement news and warrant offering prospectuses. Average abnormal returns are estimated based on the market model using 250 daily returns from day +91 relative to call announcement (A) and day +31 relative to completion (C). Only firms with a minimum of 40 non-missing returns in the estimation period are included in the sample.

\*\*\* Significant at the 1% level.

\*\* Significant at the 5% level.

\* Significant at the 10% level.

The abnormal returns at the completion date appear to be associated to the inclusion of a price condition in the warrant agreement. The completion-day abnormal return for firms that include a price condition that is met before the call is 2.18%, which is significantly different from zero at the 1% level. The nonparametric test confirms this result. In contrast, the abnormal return at the completion day for firms without a price condition in their warrants is 0.40%, which is indistinguishable from zero. Surprisingly, the abnormal return at the completion day for firms that call warrants without having met the price condition is 2.35%, which is significantly different from zero at the 5%

level. However, this result is not confirmed by the nonparametric test and the sample size is only sixteen. The abnormal return from announcement to completion (A,C) for firms with a price condition is 1.47%, for those with no price condition is -4.77%, and for those with a price condition that is not met is -5.32%. These abnormal returns are generally not significantly different from zero. Overall, only firms that have a price condition that must be met fully recover stock price declines

This evidence suggests investors react differently, both at the call announcement and completion, depending on whether warrants include a price condition, and on whether that price condition is met or not before the call. This finding is not consistent with the liquidity-costs hypothesis, which does not predict a different market reaction to a warrant call depending on whether warrants include a price condition or not, or whether that price condition has been met before the call.

In Table 5, firms with warrants that include a price condition are further classified depending on whether the call is made soon after the condition is met (e.g., within 30 days)<sup>1</sup>. We focus on firms with warrants that include a price condition because warrants that do not include a price condition are typically called late, a median of 124 days after the first possible day (e.g., when first in-the-money), compared to a median of 7 days for warrants that include a price condition. The table shows that only firms that call “soon” experience a statistically significant negative market reaction. The abnormal return is -1.36%, which is significant at the 10% level. The non-parametric test confirms this result at the 5% level. In contrast, firms that wait more than 30 days before the call is made do not experience an abnormal return significantly different from zero. Both subsamples experience significantly positive abnormal returns around the completion date.

Table 5

Average Abnormal Returns for Firms According to the Timing of the Warrant Call for Warrants including a Price Condition

	Call soon (less than 30 days) n = 37		Call late (more than 30 days ) n = 17	
	(A-20, A-1)	18.38*** (4.672)	30:7*** (4.276)	-1.42 (0.007)
(A, A)	-1.36* (-1.884)	10:27** (-2.321)	-1.55 (-1.133)	7:10 (-0.567)
(A+1, A+20)	2.73 (0.371)	19:18 (0.648)	-0.75 (0.063)	8:9 (-0.082)
(C-20, C-4)	-1.74 (-1.059)	13:19 (-0.680)	-3.88 (-0.918)	8:9 (-0.107)
(C-3, C)	3.83*** (3.394)	23:9*** (2.863)	6.36*** (2.594)	12:5* (1.835)
(C, C)	1.55** (2.129)	23:9*** (2.863)	3.37** (2.460)	10:7 (0.864)
(C+1, C+20)	3.08 (1.158)	20:12* (1.800)	0.14 (-0.324)	9:8 (0.379)
(A, C)	2.13 (0.709)	18:14 (1.177)	0.23 (0.568)	11:6 (1.462)

Note: “A” is the announcement date and “C” is the conversion completion date. Average abnormal returns are estimated based on the market model using 250 daily returns from day +91 relative to call announcement (A) and day +31 relative to completion (C). Only firms with a minimum of 40 non-missing returns in the estimation period are included in the sample.

\*\*\* Significant at the 1% level.

\*\* Significant at the 5% level.

\* Significant at the 10% level.

<sup>1</sup> Results are similar for calls made within 20 or 15 days.

The results in this section confirm published empirical results. Firms that call warrants experience negative abnormal returns at the announcement and positive abnormal returns at the completion date. However, we find that the market appears to react differently to firms for which a price condition must be met prior to call as opposed to those that do not have to meet a price condition. The market does not appear to differentiate between those firms that call optimally versus those that do not. These results do not support the liquidity hypothesis explaining the positive abnormal return at the completion date. In the next section, we examine abnormal returns more closely by relating them to the stock price behavior of industry rivals.

## VI. Intra-Industry Wealth Effects

In this section we examine the stock price reaction of industry rivals when firms call and force exercise of outstanding warrants. We use two different definitions of rival firms. First, we consider all rivals in the same four-digit sic code as each of the calling firms. Second, we find, for each of the calling firms, the industry competitor that is the closest in terms of total assets at the end of the fiscal year prior to the year of the call<sup>1</sup>.

Rivals' abnormal returns are computed following Szewczyk (1992). Specifically, for each calling firm, industry rivals' returns are combined into an equally weighted portfolio and event tests are performed by using portfolio returns. This procedure accounts for potential cross-correlation of returns induced by a clustering of industry observations in calendar time.

Table 6 reports abnormal returns for industry competitors in the same four-digit sic code as each of the calling firms. Although the abnormal stock return over days (-1, 0) is statistically insignificant -0.09%, the cumulative abnormal return from announcement to completion is -1.17%, which is significant at the 5% level. However, the generalized sign test fails to reject the null hypothesis that the ratio of positive to negative abnormal returns over days (-1, 0) is significantly different than the ratio observed during the estimation period. Additionally, cumulative abnormal returns prior to the completion day are negative and significant. The cumulative abnormal return over days (-20, -2) relative to completion is -0.81%, which is significant at the 5% level. The generalized sign test confirms this result.

Table 6

Average Abnormal Returns for Rival Firms in the same Four-digit SIC Code as each of the Warrant Calling Firms

Event Window	Day zero is announcement date n = 112				Day zero is completion date n = 104			
	Excess Return	z-stat	Positive	z-stat	Excess Return	z-stat	Positive	z-stat
(-20, -2)	0.14	-0.337	57	-0.042	-0.81	-2.420**	45	-1.703*
(-1, 0)	-0.09	-0.433	60	0.525	-0.22	-0.413	47	-1.311
(1, 20)	-0.56	-1.242	51	-1.176	-0.16	0.166	52	-0.330
(A, C)					-1.17	-2.143**	49	-0.826

Note: Average abnormal returns are estimated based on the market model using 250 daily returns from day +91 relative to call announcement (A) and day +31 relative to completion (C). Only firms with a minimum of 40 non-missing returns in the estimation period are included.

\*\*\* Significant at the 1% level.

\*\* Significant at the 5% level.

\* Significant at the 10% level.

Table 7 reports results for the size-matched industry sample<sup>2</sup>. Because calling firms are typically small, statistical tests using the sample of size-matched rivals should be more powerful.

<sup>1</sup> SIC codes are obtained from CRSP.

<sup>2</sup> Control firms have total assets that are within 25% in absolute value of calling firms' total assets.

Industry rivals experience an abnormal return of  $-1.40\%$  on the call announcement day that is significant at the 10% level. In addition, they experience a cumulative abnormal return of  $-9.58\%$  from announcement to completion. This abnormal return is significant at the 1% level. The median CAR (not reported) is  $-8.34\%$ . Furthermore, the generalized sign test shows that the ratio of 20 positive to 58 negative abnormal returns is significantly lower than the ratio over the estimation period. Thus the call announcement has a negative impact on the common stock of size-matched industry rivals.

Table 7

Average Abnormal Returns for Size-matched Rival Firms in the same Four-digit SIC Code as each of the Warrant Calling Firms

Event Window	Day zero is announcement date n = 80				Day zero is completion date n = 78			
	Excess Return	z-stat	Pos	z-stat	Excess Return	z-stat	Pos	z-stat
-2	-0.61	-1.168	29	-1.339	-0.59	-1.012	36	0.438
-1	0.86	1.051	41	1.366	-0.76	-1.087	36	0.438
0	-1.40	-1.862*	30	-1.114	-0.63	-1.708*	30	-0.932
1	0.01	0.556	38	0.690	0.37	0.37	33	-0.247
2	-0.64	-0.952	33	-0.438	0.33	0.33	35	0.209
(-20, -2)	-2.10	-0.687	33	-0.438	-6.98	-2.564***	24	-2.302**
(-1, 0)	-0.54	-0.711	38	0.690	-1.39	-2.034**	35	0.209
(1, 20)	-5.91	-2.605***	27	-1.790*	0.40	0.591	38	0.894
(A, C)					-9.58	-3.268***	20	-2.601***

Note: Average abnormal returns are estimated based on the market model using 250 daily returns from day +91 relative to call announcement (A) and day +31 relative to completion (C). Only firms with a minimum of 40 non-missing returns in the estimation period are included.

\*\*\* Significant at the 1% level.

\*\* Significant at the 5% level.

\* Significant at the 10% level.

Industry competitors also experience an abnormal return of  $-1.39\%$  over days  $(-1, 0)$  relative to the completion day. This abnormal return is significant at the 5% level. The cumulative abnormal returns over days  $(-20, -2)$  relative to completion day are also negative and significant at the 1% level. We conclude that industry rivals experience negative wealth effects to the announcement and subsequent completion of the warrant call.

Overall, the evidence suggests that rivals are negatively affected by both the announcement and completion of warrant calls. Therefore, warrant calls appear to convey industry-wide information. Attempts to explain the negative returns associated with size-matched rivals via cross-sectional regressions generally revealed no statistical relationships to explain the returns. We related the returns to the number of firms in the industry, the size of the firm relative to the industry, and the Herfindahl index, among other variables, with no statistically significant results. However, we found a strong statistical correlation between both the completion day and the announcement-to-completion abnormal returns of the calling firms and the industry rivals. This further supports our conclusion that liquidity costs cannot be the sole explanation for the wealth effects of calls of warrants. In contrast, it appears that a warrant call is an informative event that has a significant impact upon the firm as well as upon its industry rivals.

## VII. Conclusions

We examine the stock market reaction to calls of in-the-money warrants. In accordance with previous research, we find a negative abnormal return around the announcement date of the call and a positive abnormal return around the completion date. In a departure from previous re-

search, we segregate our sample into calls that are reasonably anticipated by the markets as opposed to calls that should come as a surprise. We find that calls that surprise the market result in a much greater negative abnormal return at the call date and a corresponding lower abnormal return from the call announcement to completion date. In calls that the market would likely not be surprised by, the abnormal returns are generally positive from announcement to completion. Thus, according to Alderson and Betker (2003), returns are associated with characteristics of the calling firms themselves.

In addition, we hypothesize that the price reactions observed surrounding warrant calls represent an informational event important to the firm's industry. To test this conjecture, we examine industry-related effects of warrant calls. We find that industry competitors experience weakly statistically significant negative abnormal returns at the time of the call announcement. Furthermore, rivals are significantly negatively affected by the call completion, and experience significantly negative abnormal returns from announcement to completion that are correlated with the returns of calling firms. We conclude that industry rivals react negatively to forced warrant exercise.

All in all, our results are inconsistent with liquidity costs as the sole explanation for the negative stock price reaction to in-the-money warrant calls. In contrast, they support the view that a warrant call is an informative event.

## References

1. Alderson, M.J., B.L. Betker. Managerial discretion costs and the acquisition of capital: Evidence from forced warrant exercise // *Financial Management*, 2003.– N 32. – pp.109-126.
2. Boehmer, E., J. Musumeci, A. Poulsen. Event-study methodology under conditions of event-induced variance // *Journal of Financial Economics*, 1991. – N 30. – pp. 253-272.
3. Campbell, C.J., Ederington, L., P. Vankudre. Tax shields, sample selection bias, and the information content of convertible bond calls // *Journal of Finance*, 1991. – N 46. – pp. 1291-1324.
4. Caton, G.L., J. Goh, N. Kohers. Dividend omissions and intraindustry information transfers // *Journal of Financial Research*, 2003. – N 26. – pp. 51-64.
5. Cowan, A.R., N. Nayar, A. K. Singh. Stock returns before and after calls of convertible bonds // *Journal of Financial and Quantitative Analysis*, 1990. – N 4. - pp. 549-554.
6. Ferris, S.P., N. Jayaraman, A. K. Makhija. The response of competitors to announcements of bankruptcy: An empirical examination of contagion and competitive effects // *Journal of Corporate Finance*, 1997. – N 3. – pp. 367-395.
7. Fields, L.P., W.T. Moore. Equity valuation effects of forced warrant exercise. // *Journal of Financial Research*, 1995. – N 18. – pp. 157-170.
8. Firth, M. Dividend changes, abnormal returns, and intra-industry firm valuations // *Journal of Financial and Quantitative Analysis*, 1996. – N 31. – pp. 189-211.
9. Foster, G. Intra-industry information transfers associated with earnings releases // *Journal of Accounting and Economics*, 1981. – N 3. – pp. 201-232.
10. Hertzfel, M.G. The effects of stock repurchases on rival firms // *Journal of Finance*, 1991. – N 46.– pp. 707-716.
11. Howe, J.S., Y.P. Shen. Information associated with dividend initiations: Firm-specific or industry-wide? // *Financial Management*, 1998. – N 27. – pp. 17-26
12. Jensen, M. Agency costs of free cash flow, corporate finance, and takeovers // *American Economic Review*, 1986. – N 76. – pp. 323-329.
13. Laux, P., L.T. Starks, P. S. Yoon. The relative importance of competition and contagion in intra-industry transfers: An investigation of dividend announcements // *Financial Management*, 1998. – N 27. – pp. 5-16.
14. Mais, E., W.T. Moore, R. Rogers. A re-examination of shareholder wealth effects of calls of convertible preferred stock // *Journal of Finance*, 1989. – N 44. – pp. 1401-1410.

15. Mazzeo, M.A., W.T. Moore. Liquidity costs and stock price response to convertible security calls // *Journal of Business*, 1992. – N 65. – pp. 353-369.
16. Mikkelsen, W. H., M. M. Partch. Withdrawn security offerings // *Journal of Financial and Quantitative Analysis*, 1988. – N 23. – pp. 119-134.
17. Lang, L.H.P, R. M. Stulz. Contagion and competitive intra-industry effects of bankruptcy announcements // *Journal of Financial Economics*, 1992. – N 32. – pp. 45-60.
18. Scholes, M, J. Williams. Estimating betas from nonsynchronous data // *Journal of Financial Economics*, 1977. – N 5. – pp. 309-328.
19. Schultz, P. Unit initial public offerings: A form of staged financing // *Journal of Financial Economics*, 1993a. – N 34. – pp. 199-229.
20. Schultz, P. Calls of warrants: timing and market reaction // *Journal of Finance*, 1993b. – N 2. – pp. 681-696.
21. Singh, A. K., A. R. Cowan, N. Nayar. Underwritten calls of convertible bonds // *Journal of Financial Economics*, 1991. – N 1. – pp. 173-196.
22. Slovin, M. B., M.E., Sushka, Y. M. Bendeck. The intra-industry effects of going-private transactions // *Journal of Finance*, 1991. – N 4. – pp. 1537-1550.
23. Slovin, M. B., M.E., Sushka, J. A. Polonchek. Informational externalities of seasoned equity issues: Differences between banks and industrial firms // *Journal of Financial Economics*, 1992. – N 1. – pp. 87-101.
24. Szewczyk, S. H. The intra-industry transfer of information inferred from announcements of corporate security offerings // *Journal of Finance*, 1992. – N 47. – pp. 1935-1945.