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Long-Run Performance following Private Placements of Equity

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JAMES S. LINCK, and LYNN REES*

ABSTRACT

Public firms that place equity privately experience positive announcements effects, with negative post-announcement stock-price performance. This finding is inconsistent with the underreaction hypothesis. Instead, it suggests that investors are overoptimistic about the prospects of firms issuing equity, regardless of the method of issuance. Further, in contrast to public offerings, private issues follow periods of relatively poor operating performance. Thus, investor overoptimism at the time of private issues is not due to the behavioral tendency to overweight recent experience at the expense of long-term averages.

IT IS WELL ESTABLISHED that the stock market reacts negatively to announcements of seasoned equity issues.¹ Recently, Spiess and Affleck-Graves (1995) and Loughran and Ritter (1997) document that, in addition to the negative announcement period returns, issuing firms experience abnormally low stock returns over the five years following the issue announcement. One explanation of these findings is that managers time equity issues to take advantage of “windows of opportunity” to issue overvalued equity. This explanation requires not only that investors are overly optimistic about the issuing firms’ prospects at the time of the issue announcement, but also that investors underreact to information conveyed by the announcement. While Fama (1998) argues that the results reflect normal random variations that occur in efficient markets, the long-run post-announcement abnormal stock-price performance is widely viewed as presenting an important challenge to the traditional paradigm of market efficiency.

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¹ See, for example, Asquith and Mullins (1986), Masulis and Korwar (1986), and Mikkelsen and Partch (1986).

Providing an additional challenge to the traditional framework are behavioral theories that have been advanced to explain: (1) investor overoptimism at the time of the issue announcement, and (2) investor underreaction to information conveyed by the announcement. For example, Loughran and Ritter (1997) argue that investor overoptimism at the time of the issue may reflect the behavioral tendency, as observed in psychology studies, for humans to overweight recent experience at the expense of long-term averages.² They show that operating performance peaks at the time of the equity issue, and suggest that the post-announcement stock-price decline reflects overextrapolation by investors of the pre-issue trend in operating performance. Daniel, Hirshleifer, and Subrahmanyam (1998) formalize the underreaction hypothesis in a model where investors are overconfident and have biased self-attribution. Given these behavioral attributes, they show that the valuation effects of public news events will not be fully incorporated at the announcement, and that subsequent abnormal performance will continue in the same direction as the announcement period returns.³

In this study, we provide further evidence on investor behavior and expectations around equity issues by investigating the stock-price and operating performance of a sample of publicly traded firms conducting *private* equity issues. In contrast to public equity issues, which are underwritten, registered with the Securities and Exchange Commission, and sold to a large number of investors, private equity issues are typically negotiated directly with a single or small group of investors without SEC oversight. Our study is motivated, in part, by evidence that announcements of public and private equity issues are associated with *opposite* stock-price effects: While public issues, on average, are associated with negative stock-price effects, private issues are associated with positive stock-price effects. The positive stock-price response to the announcement of private equity issues sets the stage for an interesting experiment, since the underreaction hypothesis predicts continued positive stock-price performance following the announcement, whereas investor overoptimism associated with the “windows of opportunity” framework predicts long-run post-announcement underperformance.

For a sample of 619 publicly traded firms announcing private placements of equity during the 1980 to 1996 period, we find that positive announcement period returns are followed by abnormally low post-announcement stock-price performance. In our sample, the mean raw buy-and-hold return for the three-year period following private equity issue announcements is only 0.2 percent. Relative to a size-and-book-to-market matched sample of control firms, the mean three-year buy-and-hold abnormal return is -23.8 percent. This

² See, for example, Kahneman and Tversky (1982).

³ Appendix A in Daniel et al. (1998) lists a variety of settings in which evidence of underreaction has been documented. They state that the underreaction anomaly is “pervasive” with a pattern that “obtains for the great majority of event studies.” In contrast, Kang, Kim, and Stulz (1999) do not find evidence consistent with the underreaction hypothesis for Japanese equity issues.

level of underperformance is similar to that found for initial public offerings (e.g., Ritter (1991) and Loughran and Ritter (1995)) and seasoned equity offerings (e.g., Loughran and Ritter (1995, 1997) and Spiess and Affleck-Graves (1995)), and suggests that investors are overoptimistic about the prospects of firms that issue equity, regardless of the method of issuance. We do not find evidence consistent with the underreaction hypothesis. Instead, our evidence suggests that the *direction* of the average announcement effect is incorrect. We discuss the implications of this for earlier studies by Wruck (1989) and Hertz and Smith (1993) that offer explanations for the positive stock-price reaction to private placement announcements.

Given the evidence of investor overoptimism, we next investigate whether the behavioral explanation of investor overoptimism around public equity issues holds in the case of private equity issues. In sharp contrast to evidence that public equity issues tend to follow periods of above average operating performance, we find that private equity issues tend to follow periods of relatively *poor* operating performance. Thus, the behavioral tendency for humans to overweight recent experience cannot explain investor overoptimism around the time of private issue announcements. In fact, our results suggest that, if anything, investors put *insufficient* weight on recent performance, that is, investors appear to be overly optimistic that the poor current operating performance will improve in the future. Consistent with this, we find high market-to-book ratios and significant stock-price run-ups prior to private equity issues.

To further investigate the nature of investor overoptimism at the time of private issue announcements, we examine the pattern of capital and R&D expenditures in the periods surrounding the private issues in our sample. Loughran and Ritter (1997) find that firms that issue publicly tend to have above average capital expenditures both before and after the issue and view this as evidence that investors and managers may be too optimistic about the prospects of these new investments. We document a similar pattern for firms that issue equity privately, and suggest that investors may similarly be overoptimistic about the future growth opportunities of firms that issue equity privately.

In addition to the positive announcement period stock-price reaction, another interesting feature of private equity issues is that they are typically sold to investors at substantial discounts from current market value (16 percent, on average, for our sample). Prior literature suggests the discounts reflect compensation to private placement investors for expected monitoring services and expert advice (Wruck (1989)), illiquidity (Silber (1991)), and information production (Hertz and Smith (1993)). Our findings suggest another potential explanation, that is, the negative post-issue stock-price performance suggests that private placement discounts may reflect private investors' assessments of true (lower) firm value.⁴

⁴ This finding has potentially important implications for the widely used practice in the appraisal industry of relying on discounts from private placement studies as an estimate of the illiquidity discount used when valuing minority interests in private firms. See Koeplin, Sarin, and Shapiro (2000) and Bajaj et al. (2001) for recent discussions of this practice.

The remainder of our paper is organized as follows. In Section I, we describe our data and research methods. In Section II, we provide evidence on post-announcement stock-price performance and tests of the underreaction hypothesis. Section III examines the operating performance and capital expenditures of our sample firms and explores sources of overoptimism at the time of the issue. Section IV discusses the implications of our findings for prior studies that have been advanced to explain positive announcement effects and the sizable discounts at which shares are issued to private placement investors. Section V concludes.

I. Data and Research Methodology

A. Sample Description

Through *Dow Jones News Retrieval Service* searches, we identify 952 announcements of equity private placements from the 1980 to 1996 period by firms that existed on the Center for Research in Security Prices (CRSP) NYSE/AMEX/Nasdaq monthly stock files at the year-end prior to the private placement announcement.⁵ To avoid potential problems with low-price stocks (Ball, Kothari, and Shanken (1995)), we exclude 209 firms with a price less than two dollars at the time of the private placement announcement. We also eliminate 124 firms that had completed a private placement within the preceding three years (the firm's first private placement is included in the sample), leaving us a final sample of 619 equity private placements.

The private placements in our sample are most heavily concentrated in the periods 1985 to 1987 and 1991 to 1993. Firms traded on Nasdaq comprise 79 percent of the sample. By comparison, 50 percent of the public offerings in the Spiess and Affleck-Graves (1995) sample are Nasdaq firms. Aggregate proceeds raised from the private placements in our sample is \$9.1 billion (in 1996 dollars), \$5.6 billion of which is raised by Nasdaq firms.

Panel A of Table I shows that the sample spans a large number of industries. However, some clustering is evident, with just under 55 percent of the sample belonging to six industry groups (chemicals and allied products, electric and electronic equipment, holding and other investment offices, instruments and related products, industrial machinery and equipment, and business services). To address this issue, we control for industry effects in our empirical analysis. Panel B indicates that the average proceeds raised from the private placements in our sample is \$12.7 million, and that the mean number of new shares issued as a percentage of total shares outstanding after the issue is 21.2 percent. In contrast, Krishnamurthy et al. (1999) report, over a similar time period, average proceeds of \$48.8

⁵ Our sample period ends in 1996 because we need at least three years of post-announcement data for most of our analyses.

Table I
Sample Characteristics of Equity Private Placements
from 1980 to 1996

Through Dow Jones News Retrieval Service searches, we identified 952 announcements of equity private placements over the 1980 to 1996 period for firms covered on the CRSP monthly stock files (NYSE/AMEX/Nasdaq) at the year-end prior to the private placement announcement. We eliminated observations with a price less than two dollars at the time of the announcement, and those where the firm had a previous private placement in the last three years, leaving a sample of 619 private placement announcements from 1980 to 1996. Panel A reports the distribution of sample firms across two-digit SIC codes, and Panel B reports various sample characteristics of the private placement and the private placement firms. Significance of the announcement period return is based on the market model standardized residual method with Scholes–Williams (1977) betas.

Panel A: Distribution of Sample Firms across Two-Digit SIC Codes			
	SIC Code	N	% of Sample
Chemicals and allied products	28	88	14.2
Electric and electronic equipment	36	60	9.7
Holding and other investment offices	67	59	9.5
Instruments and related products	38	49	7.9
Industrial machinery and equipment	35	47	7.6
Business services	73	37	6.0
Health services	80	30	4.8
Oil and gas extraction	13	21	3.4
Communication	48	20	3.2
Banking	60	20	3.2
Engineering and management services	87	14	2.3
Motion pictures	78	13	2.1
Wholesale trade–durable goods	50	12	1.9
Other		149	24.2
Total		619	100.0

Panel B: Sample Characteristics of Equity Private Placements			
	N ^b	Mean	Median
Dollar proceeds (millions)	581	\$12.7	\$4.5
Fraction placed (% of shares after private placement)	493	21.2%	13.9%
Market value of equity (millions)	619	\$188.6	\$31.9
Book-to-market	591	0.43	0.26
Discount (% of market price at month-end prior to event)	404	16.5%	13.4%
Announcement period abnormal return: Days –3 to 0 ^a	619	2.4%	0.7%
Discount adjusted ann. period abnormal return: Days –3 to 0 ^a	398	15.2%	3.7%

^a Announcement period return significantly different from zero at the one percent level. Significance based on the market model standardized residual method with Scholes–Williams (1977) betas.

^b Number of observations varies across statistics due to differing disclosures in the private placement announcements. Number of “discount adjusted ann. period abnormal return” observations is lower than the number of discount observations because insufficient data was available to calculate the fraction placed.

million for public issues, representing 17.4 percent of total shares outstanding after the issue. Thus, although private placements are of significantly smaller dollar value, the fraction of shares sold is slightly larger than that in a typical seasoned public issue. The mean (median) market value of equity of our sample firms is \$188.6 (\$31.9) million. The mean (median) book-to-market ratio is 0.43 (0.26).⁶ Thus, the sample is skewed towards small, low book-to-market firms. We control for size and book-to-market effects in our empirical analysis.

The private placements in our sample are sold at a mean (median) discount of 16.5 percent (13.4 percent), measured relative to the share price at the end of the month prior to the announcement date.⁷ The table also reports that the mean four-day $\{-3,0\}$ announcement period return is 2.4 percent, significant at the one percent level.⁸ This translates to a four-day *discount-adjusted* abnormal return of 15.2 percent, significant at the one percent level.⁹ These findings are consistent with previous studies of private placements, which also find that private placements are associated with positive announcement period returns and are issued at substantial discounts.

B. Measurement of Long-Run Abnormal Stock-Price Performance

We adopt two basic approaches to measure long-run abnormal stock-price performance following private placements of equity. First, we follow the approach of Barber and Lyon (1997) and benchmark performance by using an appropriately selected single control firm for each sample firm (buy-and-hold abnormal return method). However, as pointed out by Fama (1998) and Mitchell and Stafford (2000), this methodology may be problematic because it does not adequately account for potential cross-sectional dependence in returns. To address this possibility, we also estimate abnormal returns using the calendar-time portfolio approach used by Mitchell and Stafford. The calendar-time portfolio approach was first used by Jaffe (1974) and Mandelker (1974). We describe our methodology in more detail below.

⁶ We define the book-to-market ratio as the firm's book value of equity divided by its market value of equity, measured at the fiscal year end prior to the equity issue announcement. We hand-collected the book equity from *Moody's Manuals* for 66 of our sample firms that did not have sufficient information on COMPUSTAT.

⁷ When the discount is measured as of the month-end after the private placement announcement, the mean (median) discount is 16.9 percent (15.9 percent).

⁸ Abnormal returns are measured using residuals from the market model with Scholes-Williams (1977) betas estimated over the period beginning 200 days and ending 51 days prior to the announcement.

⁹ As recognized by Wruck (1989), the observed announcement effect is a measure of the information effect net of placement costs. We follow Wruck's procedure, as developed from Bradley and Wakeman (1983) and calculate the information effect (the discount-adjusted abnormal return) as $AR^{NPV} = [1/(1 - \alpha)][AR] + [\alpha/(1 - \alpha)][(P_0 - P_b)/P_b]$, where AR is the abnormal stock return, α is the ratio of shares placed to shares outstanding after the placement, P_b is the market price at the end of the day prior to the event window, and P_0 is the placement price.

B.1. Buy-and-Hold Abnormal Returns

The buy-and-hold abnormal return (*BHAR*) for stock i over the period from time a to time b is defined as

$$BHAR_{i,a:b} = BHR_{i,a:b} - BHR_{comp_i,a:b}, \quad (1)$$

where $BHR_{i,a:b}$ is the buy-and-hold return of the sample firm and $BHR_{comp_i,a:b}$ is the buy-and-hold return of the control firm over the same time period. We compute buy-and-hold abnormal returns for our sample firms beginning the month after the private placement announcement through the end of the three-year period following the announcement or until either the sample or control firm delists, whichever is sooner.¹⁰ The average buy-and-hold abnormal return is

$$BHAR_{a:b} = \left(\frac{1}{n} \right) \sum_{i=1}^n BHAR_{i,a:b}, \quad (2)$$

where n is the number of firms in the sample.

In calculating the buy-and-hold abnormal returns, we consider three benchmarks of post-announcement performance: (1) a size-matched sample, (2) an industry- and size-matched sample, and (3) a book-to-market- and size-matched sample. To assess the statistical significance of the abnormal returns calculated with this method, we utilize a bootstrapping procedure as suggested in Kothari and Warner (1997). Additional details of our method for selecting control firms and of the bootstrapping procedure are provided in the Appendix.

B.2. Calendar-Time Abnormal Returns

For each calendar month in our sample period, we form a portfolio of all sample firms that have announced a private placement in the previous three years. We then regress the portfolio excess return on the three Fama and French (1993) factors as follows:

$$R_{pt} - R_{ft} = \alpha + \beta_m(R_{mt} - R_{ft}) + \beta_s SMB_t + \beta_h HML_t + \varepsilon_t, \quad (3)$$

where R_{pt} is the portfolio return for month t , R_{ft} is the risk-free interest rate, $(R_{mt} - R_{ft})$ is the excess return on the market, SMB_t is the difference in returns between a portfolio of “small” and “big” stocks, and HML_t is the difference in returns between a portfolio of “high” and “low” book-to-market

¹⁰ Studies of public issues begin measuring returns after the issue date. In the case of private placements, we measure performance beginning at the announcement date because the completion date is often not reported. In many cases, the private placements have already been completed at the time of the announcement.

stocks. If the model adequately describes returns, then the expected value of the intercept, α , which measures the monthly abnormal return, is zero under the null hypothesis of no abnormal performance. As shown by Fama and French, however, the three-factor model is unable to completely describe the cross section of expected returns, particularly for small, low book-to-market stocks (which comprise a large part of our sample). Thus, we follow Mitchell and Stafford (2000) and also estimate the intercept relative to the *expected* intercept. The *expected* intercept is computed as the average intercept obtained from 1,000 calendar-time portfolio regressions for random portfolios with the same size and book-to-market composition as the sample firm portfolios.¹¹ The test statistic is then estimated as follows:

$$t = \frac{\hat{\alpha} - E(\hat{\alpha})}{se}, \quad (4)$$

where $\hat{\alpha}$ is the intercept for the sample firm calendar-time portfolios, $E(\hat{\alpha})$ is the average intercept from 1,000 calendar-time portfolio regressions for the random portfolios, and se is the estimated standard error of the intercept from the regression in equation (3). We estimate the calendar-time portfolio intercept and adjusted intercept for both equal- and value-weighted portfolios.

II. Post-Announcement Stock Returns

A. Buy-and-Hold Abnormal Returns

Table II reports the cumulative raw returns of our sample firms, and buy-and-hold and calendar-time abnormal returns over the three-year period following the private placement announcements. The results show negative long-run abnormal performance following private equity announcements, regardless of the benchmark. As shown in Panel A, the mean three-year buy-and-hold abnormal returns for the size-matched, size- and industry-matched, and size- and book-to-market-matched control portfolios are -45.15 percent, -38.18 percent, and -23.78 percent, respectively. Both the cross-sectional t -statistics and the bootstrap p -values indicate that all of these abnormal returns are statistically significant at the one percent level. Additionally, the mean three-year buy-and-hold raw return is 0.21 percent. These returns are lower than those reported following public issues. For example, Spiess and Affleck-Graves (1995) report mean three-year buy-and-hold raw returns of 34.11 percent and abnormal returns relative to a size- and industry-matched benchmark of -22.84 percent following public equity issues. Both the median abnormal returns and the corresponding five-year abnormal returns

¹¹ The specific criterion for mimicking the size and book-to-market characteristics of the sample portfolio is to choose nonevent firms in the same size and book-to-market quintiles as the sample firms, based on NYSE breakpoints.

Table II
Long-Run Returns Following Private Placements to Investors
Not Participating in the Private Placement

Through Dow Jones News Retrieval Service searches, we identified 952 announcements of equity private placements over the 1980 to 1996 period for firms covered on the CRSP monthly stock files (NYSE/AMEX/Nasdaq) at the year-end prior to the private placement announcement. We eliminated observations with a price less than two dollars at the time of the announcement, and those where the firm had a previous private placement in the last three years, leaving a sample of 619 private placement announcements from 1980 to 1996. Panel A reports buy-and-hold returns for the sample firms, and buy-and-hold adjusted returns for the sample firms relative to control firms, for the three-year period following the private placement announcement. The buy-and-hold return (BHR) is the BHR for the firm (sample or control) beginning the month after the private placement announcement through the end of the three-year period following the announcement, or until either the sample or match firm delists, whichever is sooner. The buy-and-hold adjusted return (BHAR) is the difference between the BHR on the sample firm and that of the control firm (and relative to investing in, and rolling over, Treasury bills). Cross-sectional *t*-statistics are reported in brackets. The *p*-values (reported in parentheses) are based on bootstrap procedures and represent the percentile ranks of the mean return for the issuing firms relative to the 1,000 mean returns from randomly selected matched portfolios. Panel B reports results from calendar-time portfolio regressions where the dependent variables are event portfolio returns, R_{pt} , in excess of the Treasury bill rate, R_{ft} . Each month, we form portfolios of all sample firms that have announced a private placement in the previous three years. The three factors, from Fama and French (1993), are the excess return on the market ($R_m - R_{ft}$), the return difference between a portfolio of “small” and “big” stocks (*SMB*), and the return difference between a portfolio of “high” and “low” book-to-market stocks (*HML*). The intercept (α) measures the monthly abnormal return, given the model. The adjusted intercept (*Adj* α) measures the difference between the event portfolio intercept and the average intercept from 1,000 random samples of nonevent firms in the same size and book-to-market quintiles as the sample firms, based on NYSE breakpoints. Calendar months with less than 10 observations in the event portfolio are excluded. The *t*-statistics are reported in brackets, and the number of monthly observations is reported in parentheses. The Implied 3-year AR [(1 + Intercept)³⁶ – 1] is the estimated average buy-and-hold return from earning the intercept return every month for 36 months.

Panel A: Three-Year Buy-and-Hold Returns (%)						
	Raw Return	BHAR (in Percent)				
	Private Placement	Size Matched	Size/Ind Matched	Size/BM Matched	T-bill Adjusted	
<i>N</i>	619	619	619	591	619	
Mean	0.21	−45.15	−38.18	−23.78	−14.73	
Median	−27.27	−41.13	−30.44	−19.99	−44.05	
<i>t</i> -statistic	[0.05]	[−5.83] ^a	[−6.94] ^a	[−4.68] ^a	[−3.41] ^a	
Bootstrapped <i>p</i> -value		(<0.01)	(<0.01)	(<0.01)		
Panel B: Calendar-Time Portfolios: $R_{pt} - R_{ft} = \alpha + \beta_m(R_{mt} - R_{ft}) + \beta_sSMB_t + \beta_hHML_t + \varepsilon_t$						
	Equal-Weighted			Value-Weighted		
	α [<i>t</i> -stat.]	<i>Adj</i> α [<i>t</i> -stat.]	<i>Adj. R</i> ² (<i>N</i> Obs.)	α [<i>t</i> -stat.]	<i>Adj</i> α [<i>t</i> -stat.]	<i>Adj. R</i> ² (<i>N</i> Obs.)
Full sample (<i>N</i> = 619)	−1.18 ^a −[5.11]	−1.03 ^a −[4.44]	0.773 (223)	−1.23 ^a −[4.11]	−1.18 ^a −[3.97]	0.592 (223)
Implied 3-year AR (%)	−34.82	−31.04		−35.85	−34.83	

^a The *t*-statistic is significantly different from zero at the one percent level.

(not reported) yield similar inferences. Finally, the table also shows that the sample firms returned less than a contemporaneous investment in Treasury bills.

B. Calendar-Time Abnormal Returns

Panel B of Table II reports equal- and value-weighted calendar-time portfolio abnormal returns. The calendar-time portfolios include all sample firms issuing equity privately in the previous three years. For the equal-weighted portfolio, the regression intercept (α) indicates that the private placement firms exhibit average abnormal returns of -1.18 percent per month over the 36-month period following the private placement announcement, which is statistically significant at the one percent level (t -statistic = -5.11). The average abnormal performance based on the adjusted intercept ($Adj \alpha$) is slightly smaller in absolute value, averaging -1.03 percent per month (t -statistic = -4.44). This translates to a three-year return of approximately -31.04 percent $[(1 - 0.0103)^{36} - 1]$, which is similar to the underperformance reported based on the control-firm approach. Results for the value-weighted portfolio are similar to those of the equal-weighted portfolio. The unadjusted intercept for the value-weighted portfolio indicates an average abnormal return of -1.23 percent per month (t -statistic = -4.11) for the three-year period following the private placement announcement; the adjusted intercept indicates an average monthly abnormal return of -1.18 percent (t -statistic = -3.97). In both cases, the abnormal performance is statistically significant at the one percent level.

C. Cross-sectional Patterns of Post-Announcement Stock-Price Performance

We partition our sample in several ways to examine whether the long-run underperformance is correlated with observable characteristics and to assess the robustness of our results. We find no statistically significant differences in the level of underperformance across subsamples segmented on firm size, book-to-market, the listing date of the firm, industry classification, and various characteristics of the private placements. For brevity, the results are not reported in a table, but are described below.

C.1. Firm Size

In each quartile of firm size, the sample firms significantly underperform their benchmarks. The mean three-year buy-and-hold abnormal returns relative to the size- and book-to-market-matched control firms in each size quartile (smallest to largest) are -34.63 percent, -20.71 percent, -20.42 percent, and -19.46 percent; all significantly different from zero at the five percent level. An F -test cannot reject the hypothesis that the abnormal returns are equal across the size quartiles.

C.2. Book-to-Market

There is some evidence that the magnitude of underperformance is lower for firms in the highest quartile of book-to-market. The mean three-year buy-and-hold abnormal returns relative to the size- and book-to-market-matched control firms in each book-to-market quartile (lowest to highest) are -36.36 percent, -21.80 percent, -22.18 percent, and -14.86 percent, significantly different from zero at the five percent level in all but the highest book-to-market quartile. However, an *F*-test cannot reject the hypothesis that the abnormal returns are equal across the book-to-market quartiles. Our finding that high book-to-market issuers appear to have slightly less underperformance is consistent with similar results documented for public issuers by Spiess and Affleck-Graves (1995).

C.3. Newly Listed Firms

We also examine the possibility that the poor long-run stock-price performance is driven by the underperformance of newly listed firms (e.g., Ritter (1991)). We define newly listed firms as those listed on CRSP for less than three years as of the event date (we also use a five-year cutoff and obtain similar results). Using this definition, approximately 38 percent of our sample firms are newly listed. In both subsamples (newly listed and established), private equity issuers significantly underperform their benchmarks. For example, relative to the size- and book-to-market-matched control firms, the mean three-year buy-and-hold abnormal returns for the newly listed and established firms are -32.29 percent and -18.58 percent, respectively, both significantly different from zero at the one percent level. An *F*-test cannot reject the hypothesis that the abnormal returns are equal across the two subsamples.

To provide additional evidence on the performance of the newly listed firms in our sample, we also estimate abnormal returns (using the calendar-time portfolio approach) from the *CRSP listing date* through the date of the private placement. In this model, the adjusted intercept in the equal-weighted calendar-time portfolio method is 0.11 percent, not significantly different from zero, indicating that the newly listed firms do not underperform over the period between the listing date and the date of the private equity issue. Taken together, these findings indicate that the poor long-run stock-price performance following private equity issues is not simply a manifestation of Ritter's (1991) IPO results.

C.4. Industry and Private Placement Characteristics

The mean three-year buy-and-hold abnormal returns relative to the size- and book-to-market-matched control firms are negative in 12 of the 14 industry groups defined in Table I; an *F*-test cannot reject the hypothesis that the long-run abnormal performance is equal across industries. We also cannot reject the hypothesis that the level of long-run abnormal performance is

Table III
Association between Announcement Period Return
and Long-Run Returns following Private Placements
of Equity from 1980 to 1996

The table reports the Spearman rank correlations between the announcement period returns and the three-year buy-and-hold raw returns and abnormal returns. The buy-and-hold adjusted return (*BHAR*) is the difference between the buy-and-hold return on the sample firm and that of the control firm based on size- and industry-matched control firms. The discount-adjusted announcement period return = $[1/(1 - \alpha)][AR] + [\alpha/(1 - \alpha)][(P_b - P_0)/P_b]$, where *AR* is the announcement period abnormal stock return (day -3 to day 0) based on market model residuals, α is the ratio of shares placed to shares outstanding after the placement, P_b is the market price at the end of the month prior to the event, and P_0 is the placement price. The *p*-values are reported in parentheses.

	Announcement Period Return	Discount-Adjusted Announcement Period Return
Buy-and-hold raw return	-0.08 (0.04)	-0.19 (0.00)
Buy-and-hold adjusted return		
Size and industry benchmark	0.01 (0.82)	-0.03 (0.58)
Size benchmark	0.00 (0.91)	-0.08 (0.12)
Size and book-to-market benchmark	-0.01 (0.75)	-0.02 (0.72)

equal across quartiles of the fraction of shares placed or by whether the private placement was issued at a discount or a premium from the current market price.

D. The Underreaction Hypothesis

Given the positive mean stock-price reaction at the announcement, our evidence of negative post-announcement abnormal stock-price performance is inconsistent with the underreaction hypothesis. To investigate further, we more directly test the underreaction hypothesis using the approach of Kang et al. (1999). In particular, we test whether the announcement period return is a constant fraction of the long-run return. If this is the case, then a firm's announcement period abnormal return should be positively correlated with its long-run abnormal return. The results, presented in Table III, show that all of the correlations between the announcement period returns and the long-run post-announcement returns are small in absolute magnitude, and six of the eight correlation coefficients are negative. The only positive correlations are small in magnitude and statistically insignificant. These findings are similar to those reported in Kang et al. for Japanese equity issues and are not consistent with the predictions of the specific version of the underreaction hypothesis tested.

While our results are inconsistent with the underreaction hypothesis, we know of no alternative behavioral theory that can explain why investors would systematically react in the wrong direction to an announcement as we have documented here. In Section IV, we discuss our findings in the context of earlier studies that attempt to explain positive private placement announcement effects. Although we offer possible explanations of where investors may have gone wrong, these are only meant as a possible starting point for further investigation. We do not resolve the issue in this study.

The puzzling announcement effect notwithstanding, the negative post-announcement stock-price performance we document is consistent with the view that, at the time of the private issue announcement, investors are overoptimistic about the prospects of the issuing firms. Given similar findings for initial public offerings and seasoned equity offerings, our results suggest that long-run underperformance is a phenomenon associated with the issuance of equity independent of the placement method. In the next section, we examine the operating performance of our sample firms in the years surrounding the private equity issue in an attempt to better understand the potential sources of investor overoptimism.

III. Investor Overoptimism, Operating Performance, and Capital Expenditures

In their investigation of investor overoptimism following public equity issues, Loughran and Ritter (1997) report that the operating performance of issuing firms is better than that of a control group just prior to the issue, but deteriorates afterwards. They view this evidence as consistent with the hypothesis that the poor post-offer stock-price performance reflects investor disappointment that the favorable trend in earnings prior to the issue does not continue after the issue. This explanation is based on the behavioral observation that humans tend to overweight (overreact to) recent experience at the expense of long-term averages (see Kahneman and Tversky (1982)). We consider whether a similar behavioral explanation can account for investor overoptimism at the time of private equity issues.

To gauge the operating performance of our sample firms, we compute the ratio of operating income to total assets (OIBD/assets) and the ratio of net income to total assets (ROA) for the years surrounding the private equity issues.¹² We define operating income as operating income before depreciation, amortization, and taxes, plus interest income. We follow Loughran and

¹² The ratio of operating income to total assets is computed as (COMPUSTAT item #13 + COMPUSTAT item #62)/(COMPUSTAT item #6). The ratio of net income to total assets is computed as (COMPUSTAT item #172)/(COMPUSTAT item #6). Table IV also reports the market-to-book equity ratio, computed as (COMPUSTAT item #25 * COMPUSTAT item #199)/(COMPUSTAT item #60), and the ratio of capital and R&D expenditures to total assets, computed as (COMPUSTAT item #128 + COMPUSTAT item #46)/(COMPUSTAT item #6). Only 511 of our 619 sample and control firms have complete data on COMPUSTAT for sales, assets, and operating income in the year prior to the private placement announcement.

Table IV
Operating Performance around Private Placements
from 1980 to 1996

Panel A reports median operating performance for the sample firms and Panel B reports the samples' median industry-adjusted operating performance (defined as the sample median less the median for the sample firms' industries). Year represents the firm's fiscal year relative to the year of the private placement (year 0 is the year of the private placement). N is the number of observations with available COMPUSTAT data. $OIBD/assets$ is operating income before depreciation (COMPUSTAT item #13) plus interest income (COMPUSTAT item #62) deflated by fiscal year-end total assets (COMPUSTAT item #6). ROA is net income (COMPUSTAT item #172) divided by fiscal year-end total assets. $CE + RD/assets$ is capital expenditures (COMPUSTAT item #128) + research and development expenditures (COMPUSTAT item #46) divided by total assets. If CE or RD is missing from COMPUSTAT, their values are set equal to 0. M/B , market-to-book, is the number of shares outstanding (COMPUSTAT item #25) multiplied by fiscal year-end price (COMPUSTAT item #199) divided by book value of equity (COMPUSTAT item #60). Sample firms are those that privately placed equity from 1980 to 1996.

Year	N	$OIBD/Assets$ (%)	ROA (%)	$CE+RD/Assets$ (%)	M/B
Panel A: Sample Firm Medians					
-3	343	2.25	0.44	13.26	2.30
-2	430	1.73	-3.25	13.47	2.54
-1	511	-1.53	-9.34	15.92	3.33
0	477	-1.86	-10.97	15.72	3.11
1	375	-1.01	-9.01	13.92	2.64
2	292	1.18	-8.81	12.77	2.67
3	234	1.80	-7.38	12.49	2.38
Panel B: Industry-Adjusted Performance (Sample Median - Industry Median)					
-3	343	-8.88 ^a	-2.98 ^a	3.55 ^a	0.74 ^a
-2	430	-8.62 ^a	-6.03 ^a	3.54 ^a	0.82 ^a
-1	511	-11.92 ^a	-11.93 ^a	5.41 ^a	1.49 ^a
0	477	-11.93 ^a	-13.41 ^a	5.16 ^a	1.07
1	375	-10.72 ^a	-11.06 ^a	3.24 ^b	0.49
2	292	-8.58 ^a	-10.48 ^a	1.76 ^a	0.59
3	234	-7.60 ^a	-9.06 ^a	1.97 ^a	0.17

^{a,b} Significantly different from zero at the one percent and five percent levels, respectively, based on Wilcoxon rank sums test (two-sided).

Ritter (1997), and include interest income because many issuers temporarily invest some of the proceeds in interest-earning instruments prior to investing in operating assets.

In sharp contrast to public issues, Table IV shows that private equity issues tend to follow periods of relatively *poor* operating performance. Panel A shows that operating performance of firms issuing equity privately declines over the four-year period leading up to and including the year of issue. Also noteworthy is evidence that the median sample firm has a *negative* ROA in

the two years prior to the issue and the year of the issue. Panel B presents industry-adjusted performance relative to the median firm in the same two-digit SIC industry and shows that both OIBD/Assets and ROA for the median issuer are substantially lower than the industry median in each of the three years prior to the issue and in the year of the issue. Taken together, these results rule out the behavioral explanation that the poor post-announcement stock-price performance reflects the tendency for investors to overweight recent operating performance in forming expectations of future performance. Rather than overweighting the recent poor performance, our evidence suggests that investors may be too optimistic about the potential that operating performance will improve in the future.

The post-issue operating performance is consistent with this view. Table IV shows that operating performance remains weak after the private equity issue. Both OIBD/assets and ROA for the median issuer are substantially lower than the industry median in each of the three years after the issue. To provide additional evidence on the post-issue operating performance, we follow Barber and Lyon (1996) and match each sample firm to a control firm on the basis of industry (two-digit SIC), total assets, and operating performance (OIBD/assets) at the end of the year preceding the private placement.¹³ The results (not presented in a table) further support the view that the poor post-issue stock-price performance reflects investor disappointment about the failure to reverse the poor operating performance prior to the issue. Specifically, OIBD/assets for the median issuer is lower than that of the median control firm in the year of and the years following the private placement announcement. The differences are statistically significant in years 0, 1, and 2 relative to the year of the private equity issue. The results are similar for the return on assets (ROA) measure.¹⁴

Loughran and Ritter (1997) report that public equity issues are preceded by a positive and significant stock-price run-up, and that issuing firms have higher than average market-to-book ratios at the time of issuance. This evidence suggests that the ex post operating performance deterioration is not impounded into market prices at the time of issuance. To shed light on the

¹³ Specifically, for each sample firm, we find the set of COMPUSTAT firms with the same two-digit SIC as the sample firm, that have stock prices greater than two dollars, and have total assets between 25 percent and 200 percent of the sample firm. If no firms meet the above criteria, control firms are selected from the set of firms with total assets between 90 percent and 110 percent of the sample firm without regard to industry. From the resulting set of firms, we select the firm that has the closest operating performance to that of the sample firm in the year prior to the private placement announcement. We also matched on one-digit SIC code with similar results.

¹⁴ We also checked whether the poor operating performance was driven by newly listed firms that have yet to report positive earnings as discussed in Section II.C. Although we find that newly listed firms do have lower operating performance relative to their industries than do the established firms, both subsamples (newly listed and established) show similar patterns in operating performance: Both groups perform significantly worse than their industries and their Barber and Lyon (1996) matched counterparts before and after the private placement announcement.

nature of investor expectations at the time of private equity issues, we investigate whether pre-issue market-to-book ratios and stock-price performance provide similar indications of investor overoptimism.

Similar to the results for public equity issues, we find high market-to-book ratios and significant stock-price run-ups prior to private equity issues. Table IV shows that the issuing firms have higher market-to-book ratios (M/B) than the control firms in the years prior to the issue. The differences are significant in the three prior years. Table V shows that over the one-year period ending one month prior to the month preceding the private placement, issuing firms have a mean raw buy-and-hold return of 52.8 percent, significantly higher than the mean contemporaneous buy-and-hold returns for the size, size and industry, and size and book-to-market control firm benchmarks. The calendar-time portfolio methodology confirms these findings.

Given the relatively poor pre-issue operating performance of our sample firms, the stock-price run-ups and high market-to-book ratios we document are consistent with the view that, prior to the issue, investors are anticipating an improvement in future operating performance. One possibility is that investors are anticipating a turnaround in the performance of the firms' existing assets in place. Another possibility is that investors are overoptimistic about the future payoffs from the firms' current investments and growth opportunities. We find some evidence of this latter possibility in the data. Table IV shows that the ratio of capital and R&D expenditures to total assets (CE + RD/assets) for the issuing firms is significantly higher than that of the industry median firm in the years surrounding the private placement.¹⁵ We also examine the extent to which pre-issue operating performance and pre-issue capital expenditures explain the stock-price run-up (not reported in a table). Although we find some evidence that larger capital expenditures are associated with higher pre-announcement performance, the results are statistically weak. Loughran and Ritter (1997) also find high levels of capital expenditures prior to public issues and similarly conclude that investors (and managers) may be too optimistic about the firms' growth prospects.¹⁶

In summary, firms that issue equity privately have higher than average market-to-book ratios, positive stock-price run-ups, and post-announcement stock-price underperformance that is similar to that found in firms making public equity offerings. In sharp contrast to public issues, however, firms making private placements of equity have poor operating performance in

¹⁵ The capital expenditure results are also consistent with the idea that managers invest in negative NPV projects to increase the size of the organization under their control (Jensen and Meckling (1976)). This argument, however, cannot explain the stock-price run-up prior to the issue unless the market incorrectly views these as profitable investments.

¹⁶ We also examine whether corporate control activity in these firms can explain the pre-issue stock-price run-up. Only 12 of our 619 sample firms experience any corporate control activity over the year preceding the private equity issue. We find that the pre-issue run-up remains even after removing these firms from the sample, indicating that control activity cannot explain the pre-issue run-up of these firms.

Table V
Pre-Announcement Period Returns to Investors
Not Participating in the Private Placement

Panel A reports the buy-and-hold return for the sample firms, and the buy-and-hold adjusted returns for the sample firms relative to control firms, for the one-year period ending the month prior to the month preceding the private placement (e.g., month -13 through month -2). Panel B reports the same for the two-year period ending the month prior to the month preceding the private placement (e.g., month -25 through month -2). The buy-and-hold adjusted return (*BHAR*) is the difference between the *BHR* on the sample firm and that of the control firm. Cross-sectional *t*-statistics are reported in brackets. Wilcoxon *p*-values are reported in parentheses. Panel C reports results from calendar-time portfolio regressions where the dependent variables are event portfolio returns, R_p , in excess of the Treasury bill rate, R_f . Each month, we form portfolios of all sample firms that announce a private placement within the following year (excluding the current and next month). The three factors, from Fama and French (1993), are the excess return on the market ($R_m - R_f$), the return difference between a portfolio of “small” and “big” stocks (*SMB*), and the return difference between a portfolio of “high” and “low” book-to-market stocks (*HML*). The intercept (α) measures the monthly abnormal return, given the model. The adjusted intercept (*Adj* α) measures the difference between the event portfolio intercept and the average intercept from 1,000 random samples of nonevent firms in the same size and book-to-market quintiles as the sample firms, based on NYSE breakpoints. Calendar months with less than 10 observations in the event portfolio are excluded. The *t*-statistics are reported in brackets, and the number of monthly observations is reported in parentheses. The implied 1-year *AR* $[(1 + \text{Intercept})^{12} - 1]$ is the total buy-and-hold return from earning the intercept return every month for 12 months.

	Raw Return	BHAR (in Percent)				
	Private Placement	Size Matched	Size/Ind Matched	Size/BM Matched		
Panel A: Returns Prior to Private Placement Announcement (Month -13 through Month -2, in %)						
<i>N</i>	619	619	619	591		
Mean	52.78 ^a	33.82 ^a	28.61 ^a	17.26 ^b		
<i>t</i> -statistic	[7.70]	[4.98]	[3.93]	[2.43]		
Median	17.67	9.89	8.31	5.16		
Wilcoxon <i>p</i> -value	(<0.01)	(<0.01)	(0.03)	(0.09)		
Panel B: Returns Prior to Private Placement Announcement (Month -25 through Month -2, in %)						
<i>N</i>	619	619	619	591		
Mean	61.06 ^a	18.28 ^b	13.15	-19.14 ^b		
<i>t</i> -statistic	[9.48]	[2.08]	[1.54]	-[1.98]		
Median	22.22	4.55	8.57	-7.46		
Wilcoxon <i>p</i> -value	(<0.01)	(0.52)	(0.01)	(0.08)		
Panel C: Calendar-Time Portfolios (Months -13 through -2): $R_{pt} - R_{ft} = \alpha + \beta_m(R_{mt} - R_{ft}) + \beta_sSMB_t + \beta_hHML_t + \varepsilon_t$						
	Equal-Weighted			Value-Weighted		
	α [<i>t</i> -stat.]	<i>Adj</i> α [<i>t</i> -stat.]	<i>Adj. R</i> ² (<i>N</i> Obs.)	α [<i>t</i> -stat.]	<i>Adj</i> α [<i>t</i> -stat.]	<i>Adj. R</i> ² (<i>N</i> Obs.)
Full sample (<i>N</i> = 619)	1.79 ^a [5.03]	1.58 ^a [4.44]	0.633 (196)	1.79 ^a [4.87]	1.19 ^a [3.25]	0.563 (196)
Implied 1-year <i>AR</i> (%)	23.70	20.65		23.73	15.31	

^{a,b} Significantly different from zero at the one percent and five percent levels, respectively.

the period prior to the issue and improved, albeit weak, performance following the issue. These results are consistent with the idea that investors are disappointed when performance does not improve significantly following the equity issue. Our results suggest that the source of investor over-optimism may be related to expectations about the payoffs from the firms' current and future investments. Consistent with this, we find that issuing firms have high levels of capital expenditures in the years preceding the equity issue.

IV. Positive Announcement Effects, Private Placement Discounts, and the "Windows of Opportunity" Hypothesis

Evidence of long-run abnormal stock-price performance following corporate announcements raises concerns as to how to interpret event-study results based on announcement period returns. To the extent that investors underreact to corporate announcements, announcement period returns underestimate, but correctly show the direction of, valuation effects. Our findings are more troubling since they suggest that the direction of the initial valuation effect is incorrect. This section begins with a discussion of the implications of our findings for earlier studies that attempt to explain the positive stock-price reaction to private placement announcements. Although we offer alternative explanations for positive announcement effects, we acknowledge at the outset that these are necessarily ad hoc and we cannot discriminate among them based on long-run stock-price performance. We conclude with a discussion of private placement discounts and the "windows of opportunity" hypothesis.

Wruck (1989) attributes the positive announcement effect to an improvement in the ownership structure of the firm, that is, firm value increases because the resulting increase in ownership concentration is expected to align incentives and/or the new blockholder is expected to provide value-enhancing monitoring and/or expert advice. One interpretation of the reversal of the announcement period value gains is that the market was overoptimistic about the monitoring/incentive alignment effects of the private placements. However, the continued long-run negative stock-price performance, after the reversal of the announcement period value gains, suggests that the ultimate valuation effects of private placements are negative. This suggests, in Wruck's framework, that although investors appear to have expected improvements in ownership structure, the private placements ultimately served to entrench management. Given that public equity issues do not result in similar ownership structure changes, this "entrenchment explanation" suggests that there are very different factors behind the negative stock-price performance following public and private issues.¹⁷

¹⁷ See Barclay, Holderness, and Sheehan (2001) for an investigation of the entrenchment hypothesis.

Hertzel and Smith (1993) provide an information-signaling explanation of the value gains associated with private placement announcements. In their model, managers of a firm with undervalued assets, who in a Myers and Majluf (1984) world would decline to issue publicly, may choose to negotiate a private placement with a single or small group of investors rather than forgo a profitable investment opportunity. In their analysis, the willingness of private placement investors to commit funds to the firm, together with management's decision to forgo public issue, conveys to the market management's *belief* that the firm is undervalued. Clearly, our evidence suggests that on average firms are *overvalued* at the time of the private placements. A possible explanation for a positive announcement effect in this framework is that managers may be overly optimistic about the firm's prospects and that investors (including the private placement investors), who look to managers and managerial decisions for signals of inside information, do not recognize that managers are overoptimistic.¹⁸ We note that managerial overoptimism, and the failure of the market to recognize such, has been similarly suggested as an explanation for the stock-price behavior around public equity issues (see Loughran and Ritter (1997)).

Our findings also raise related questions about the nature of private placement discounts. Earlier studies have characterized discounts as a way of providing *compensation* to private placement investors for expected monitoring services and expert advice (Wruck (1989)), lack of liquidity (Silber (1991)), and/or the costs of due diligence (Hertzel and Smith (1993)). In the Wruck and Hertzel and Smith frameworks, positive announcement effects reflect the market's expectation that the gains associated with the private placement outweigh the costs of compensating the private placement investors via the discount. However, our evidence of post-announcement underperformance raises an alternative possibility that private placement discounts reflect informed investors' assessments of true (lower) firm value. This possibility is particularly troubling for the efficient markets view since, in our sample, the discounts are known at the time of the issue announcement. Thus, the obvious challenge for the *information* view of the discount is to explain why public investors would systematically ignore the negative information in the discount.¹⁹

¹⁸ In the two-state Myers and Majluf (1984) framework employed by Hertzel and Smith (1993), managerial overoptimism might be thought of as managers *incorrectly* determining that they are in the good state.

¹⁹ For completeness, we note that, when measured relative to the discounted price at which they purchase shares, private placement investors earn normal returns in the three-year post-announcement period. Unfortunately, this finding is not conclusive. On the one hand, it can be interpreted as evidence that discounts reflect true value. Alternatively, it may be the case that private placement investors do require compensation (and build such into the discount) but they too, as may be the case for outside investors and managers, are overoptimistic about the future prospects of the firm. In this scenario, evidence that private placement investors only earn normal post-announcement returns suggests that they have overpriced the issue.

Finally, the uncertainties about the nature of private placement discounts and announcement effects make it more difficult to understand private placements in the “windows of opportunity” framework. The negative post-issue stock-price performance we document suggests that private placements of equity, like public equity issues, take place when investors appear willing to overpay for the firms’ equity. However, the positive stock-price response to private placement announcements suggests that investors do not recognize the timing motivation for the case of private placements. Furthermore, the fact that private placements are sold at substantial discounts raises the question of whether managers take advantage, or are able to take advantage, of the apparent “windows of opportunity” to issue overvalued equity. We suggest that a more definitive investigation of this issue will require a measure of the private placement investors’ holding periods and well-specified models of private placement discounts and the choice between public and private issue.²⁰

V. Conclusion

We examine post-announcement stock-price performance for a sample of firms that sell equity through private placements. We find that, despite having a positive stock-price reaction at the announcement, firms that issue equity privately significantly underperform relative to several benchmarks over the three-year period following the offering. This finding is inconsistent with the underreaction hypothesis. Furthermore, we know of no behavioral theory that can explain why investors would systematically react in the wrong direction to an announcement as we have documented here.

The negative post-announcement performance we document for private placements is similar to the long-run underperformance documented for initial public offerings and seasoned equity offerings (Ritter (1991), Loughran and Ritter (1995), and Spiess and Affleck-Graves (1995)). Taken together, the evidence suggests that investors are too optimistic about the prospects of firms that issue equity, regardless of the form of issuance (IPO, seasoned, or private placement).

Private equity issues tend to follow periods of poor operating performance. Thus, our evidence is not consistent with the behavioral explanation that the poor long-run performance results from the tendency of investors to overweight recent experience when forming expectations. Firms that issue equity privately tend to invest more than a control group, both before and after the issue. This evidence suggests that managers and investors may be too optimistic about the investment opportunities of firms that issue equity privately.

²⁰ See Sheehan and Swisher (1998) for an investigation of the returns earned by different types of private placement investors and Krishnamurthy et al. (1999) for some evidence of factors that influence the choice between a public and a private equity issue.

Finally, our results are inconsistent with theories that have been advanced previously to explain the positive stock-price reaction to private placement announcements. Our results also provide a challenge for earlier explanations of private placement discounts. We leave the puzzling announcement effect and uncertain nature of private placement discounts for future study.

Appendix: Measurement of Long-Run Stock-Price Performance

A. Selection of Control Firms

The procedure for identifying control firms is similar to that used by Spiess and Affleck-Graves (1995), and is summarized as follows. At each year-end, we segment, by exchange (NYSE/AMEX/Nasdaq), all CRSP-listed firms, excluding all firms that previously issued private equity. From this population, we select a single control firm within the same exchange group for each sample firm as of the year-end prior to the private placement for each of our benchmarks. For the size-matched benchmark, we select the firm with the market value closest to, but larger than, the sample firm. If the sample firm is the largest firm, we choose the second largest firm as the control firm. For the industry- and size-matched sample, we also require that each control firm have the same two-digit SIC code as the sample firm. For the book-to-market- and size-matched benchmark, we select the control firm that minimizes the sum of the absolute percentage difference between the sizes and the book-to-market ratios of each offering and control firm.

B. Bootstrapping Procedure

To measure the statistical significance of the buy-and-hold abnormal returns, we follow Barber and Lyon (1997) and report *t*-statistics from a cross-sectional *t*-test. However, because the post-announcement periods overlap across firms and the distribution of buy-and-hold returns is skewed, inferences made from cross-sectional *t*-statistics may be inappropriate. To address this concern, we combine our control firm approach with a bootstrapping procedure similar to that used by Ikenberry, Lakonishok, and Vermaelen (1995), except that we couple our bootstrapping procedures with the matched control firm approach consistent with our abnormal return calculations. Specifically, for each sample firm, we compute the three- and five-year buy-and-hold return beginning the month after the private placement announcement. We then randomly select with replacement a control firm that is in the same size decile at the year-end prior to the private placement announcement. After forming our first matched portfolio, we estimate the three- and five-year buy-and-hold returns for each firm, and use the cross-sectional mean (median) of these returns as our first return observation. We repeat this procedure 1,000 times to obtain 1,000 matched-portfolio return observations. This procedure yields empirical distributions of returns (one for three-year and one for five-year holding periods) under the null hypothesis of no

abnormal performance. The null hypothesis is rejected at the α percent level if the mean return for our sample firms is less than the $(1 - \alpha)$ percentile return of the matched-portfolio empirical distribution. We repeat this process for our size- and industry-matched and size- and book-to-market-matched controls, respectively, by (1) randomly selecting control firms that are in the same size decile and have the same two-digit SIC code, and (2) randomly selecting control firms that have the same quintile ranking on both size and book-to-market.

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