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Author(s): Josef Lakonishok and Theo Vermaelen

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Anomalous Price Behavior Around Repurchase Tender Offers

JOSEF LAKONISHOK and THEO VERMAELEN*

ABSTRACT

This paper reports anomalous price behavior around repurchase tender offers. Buying shares before the expiration date of a repurchase tender offer and tendering to the firm produces, on average, abnormal returns of more than 9 percent over a period shorter than one week. In addition, we find that repurchasing companies experience economically and statistically significant abnormal returns in the two years after the repurchase. The upward price drift is mainly caused by the behavior of the small firms in the sample.

STOCK REPURCHASE TENDER OFFERS have been analyzed extensively by Dann (1981), Masulis (1980), Rosenfeld (1982), and Vermaelen (1981, 1984). These event studies focus on explaining the abnormal price increase around repurchase tender offer announcements. After testing for the relevance of (personal and corporate) tax savings and benefits arising from expropriation of creditors, Dann and Vermaelen conclude that the abnormal returns following the announcement are best explained by the information signalling hypothesis. Empirically, the signalling explanation seems to work well for relatively small firms. This is not surprising considering that small firms receive less attention from analysts and are more likely to be undervalued. However, casual empiricism suggests that, in recent years, repurchase tender offers have been made by much larger firms, often in the context of hostile takeover bids. Jensen (1986a) argues that these repurchases are an effective way to eliminate excess "free" cash flow that would otherwise be wasted by management. Stulz (1988) argues that repurchases consolidate voting power in the hands of management. This might benefit shareholders by forcing bidders, in successful bids, to pay a higher price for the

* College of Commerce and Business Administration, University of Illinois at Urbana-Champaign and INSEAD, respectively. Theo Vermaelen is also Hoogleraar at the University of Limburg. We are grateful to Peter Bossaerts, David Brown, Frank Buckley, Louis Chan, Harry DeAngelo, Steve Foerster, Paul Halpern, Pierre Hillion, Myron Gordon, David Ikenberry, Han Kim, Chuck Linke, René Stulz, Seymour Smidt, and an anonymous referee for their helpful comments and to Andy Chen and Mark Ready for research assistance. This paper has been presented at the Western Finance Association meetings in Seattle, at the European Finance Association meetings in Istanbul, at a conference on Reappraisal of the Efficiency of Financial Markets in Sesimbra, Portugal, at a conference on portfolio management at the European Institute for Advanced Studies in Management in Brussels, University of Arizona, University of Alberta, University of California, Irvine, Concordia University, INSEAD, University of Illinois at Urbana-Champaign, University of Toronto, Swedish School of Economics and Business Administration in Helsinki, University of Michigan, University of Western Ontario, UCLA, the London Business School, and the Stockholm School of Economics. We would like to thank the seminar participants for their comments.

target shares.¹ These theories imply that repurchase tender offers can increase real cash flows as opposed to the perceived cash flows of the signalling hypothesis.

While this paper sheds some light on the changing motivation behind buybacks, we are *mainly* concerned with the implications for investment management: is it possible to make abnormal returns by trading around repurchase tender offers? There are two reasons why buybacks provide an interesting setting in which to examine market efficiency; these reasons correspond to the two types of trading strategies we test. First, a repurchase tender offer creates substantial price uncertainty and therefore more opportunities for potential mispricing. In order to price securities properly during the tender offer period, investors have to estimate 1) the fraction of shares tendered, 2) the subsequent repurchase decisions by the management, and 3) the market price after the expiration of the offer. Hence, the first trading rule tests for profit opportunities during the offer period. Specifically, we test whether it is possible to make abnormal returns by buying shares before the expiration date and then tendering those shares to the company. This trading rule mimics the behavior of risk arbitrageurs who typically buy and tender during the offer period. For example, Weinstein (1984), a money manager, states that

the investor must keep accurate statistics of the daily trading volume from the time of the announcement of the self-tender until the early pro rata date or registration date of the offer as an indication of how many shares are likely to be tendered. Most of the stock will have been bought by arbitrageurs with the intention of tendering²

Larcker and Lys (1987) conclude that risk arbitrageurs earn substantial returns on their trading activities around mergers, intra-firm tender offers, and voluntary liquidations.³ They argue that risk arbitrageurs are able to generate private information regarding the success of corporate reorganizations. Alternatively, one could argue that these excess returns are fair compensation for the services that arbitrageurs provide in takeover bids (Jensen (1986b)). Arbitrageurs 1) help to evaluate alternative offers, 2) provide risk-bearing services for investors who would rather sell than bear the uncertainty surrounding the offer, and 3) resolve the free-rider problems of small, diffuse target shareholders who cannot organize to negotiate directly with the bidder. In the case of repurchase tender offers, mainly the second service is relevant.

The second reason for examining market efficiency follows from the results presented in previous studies. Vermaelen (1981) reports that, on average, tendering shareholders receive a premium of 23 percent, while nontendering shareholders obtain a rate of return of only 13 percent. The nontendering group includes the management of the company which implies that insiders apparently "give away" part of the firm to outsiders.

¹ The increase in the bid price decreases the probability of a successful bid, which could have a negative impact on firm value. Hence, according to Stulz, the repurchase might increase or decrease firm value, depending on which effect is more important. If managerial holdings are small, as is typical in larger firms, the bid price effect might dominate.

² See Weinstein (1984), p. 5.

³ At least part of the abnormal return can probably be attributed to illegal insider trading activity.

One explanation for this behavior is that there might be offsetting benefits for the management team to compensate for the expropriation of their personal holdings. For example, the repurchase may present an impediment for a potential takeover bid, thereby permitting managers to preserve their jobs (Bagwell (1988), Bagnoli, Gordon, and Lipman (1987), and Vermaelen (1984)). A further benefit to insiders might stem from buying shares before the announcement (Choi 1987)). An alternative to the offsetting benefit explanation is that the market does not fully adjust to the signal conveyed by the offer and therefore underestimates the “true” value of the shares. This implies that buying shares after a repurchase tender offer might be a profitable investment, especially in cases where the signalling hypothesis may be most relevant, such as in small firms.⁴ Hence, the second trading rule involves buying and holding shares *after* the expiration date of a repurchase tender offer. Interestingly, in a recent *Fortune* magazine article, Loomis (1986) argues that buying stocks after a repurchase announcement generated annual abnormal returns (over the S&P 500) of 8.5 percent in the period 1974–1983.

The remainder of this paper is organized as follows. In Section I we describe the data base. In Section II we test the first trading strategy: buying stocks before the expiration date whenever the market price is substantially below the tender price, tendering the shares to the firm, and selling the nonrepurchased shares in the market. This simple strategy generates economically and statistically significant abnormal returns of 9 percent on average over a period shorter than one week. In Section III we examine whether the abnormal returns can be explained by the behavior of management in oversubscribed offers. In Section IV we test the second trading strategy: buying shares after the expiration of the offer. This strategy, over a two-year period following the repurchase, outperforms the value-weighted index by 12 percent per year. After controlling for size and beta, the abnormal returns fall by more than half but are still significantly positive. Further investigation reveals that these abnormal returns are mainly caused by small firms. These firms were apparently able to buy back their shares at significant discounts from their “true” value. Section V summarizes our results.

I. Data

The data base consists of the announcement and expiration dates, the terms (fraction sought and tender price), and outcomes (fraction tendered and fraction purchased) of practically all 258 repurchase tender offers which occurred between 1962 and 1986 by firms traded on the NYSE, AMEX, and OTC.⁵ Data for the period 1962–1977 were adopted from Vermaelen (1981) and include 131 observations. Data for 1978 and 1979 were taken from the *Wall Street Journal Index*, which started summarizing repurchase announcements in 1978. From 1980 on we had access to all the 13-e4 filing and amendments made with the Security

⁴ We assume that, eventually, with disclosure of financial information about the firm, the market will be able to assess the “true” value of the shares.

⁵ A small number of companies were eliminated from the sample because of missing data, mainly announcement dates.

Table I
Descriptive Statistics of the Sample

Mean values (in percent) of the terms, the outcomes, returns to nontendering shareholders, and returns to all shareholders for a sample of repurchase tender offers. The premium (in percent) is defined as the tender offer price minus the price five days before the announcement, divided by the price five days before the announcement. The *CAR* (in percent) is computed from five days before the announcement until ten days after the expiration. The benchmark portfolio is the equally weighted market index. *TOTALR* is the weighted average abnormal return (in percent) where the weights are F_p for tendering shareholders and $(1 - F_p)$ for nontendering shareholders.

Period	1962–1986	1962–1979	1980–1986
No. of observations	221	131	90
Fraction of shares sought (F_s)	17.06	15.68	19.07
Fraction of shares purchased (F_p)	16.41	15.45	16.82
Fraction of shares purchased relative to shares tendered (F_p/F_t)	86.61	88.67	83.60
Premium	21.79	24.09	18.54
Cumulative abnormal return to non-tendering shareholders (<i>CAR</i>)	12.54	14.58	9.78
Cumulative abnormal return to tendering and non-tendering shareholders (<i>TOTALR</i>)	14.29	16.19	11.52

and Exchange Commission. These filings contain basic information about the offer and the outcome of the offer. We used the filing date to track the announcement date in the *Wall Street Journal*. If no record of announcement was found in the *Wall Street Journal*, a questionnaire was sent to the corporation. In these cases, we also searched for an advertisement of the offer in the *Wall Street Journal* and compared the announcement date to the filing date. Dutch auction repurchases, repurchases intended to reduce small shareholder servicing costs, or repurchases conditional on a minimum number of shares tendered were deleted from the sample.⁶ The source for daily stock returns for NYSE and AMEX stocks was the CRSP data base. Data on the daily trading volume for NYSE and AMEX stocks were obtained from the Cornell University Price and Volume File (CUPV). (For a more detailed description, see Lakonishok and Smidt (1984).) Data on the OTC stocks (including trading volume) were collected from the *Standard and Poor's Daily Stock Price Record*.

Table I provides a number of descriptive statistics for 221 observations for which all the data were available. On average, firms offered to buy back 17.06 percent of their shares at a premium of 21.79 percent above the market price five

⁶ During our sample period, we have very few cases in which the offer was conditional on a minimum number of shares tendered. Such offers might be perceived as more risky. Therefore, to control for risk of our trading strategy, these few cases were deleted.

days before the repurchase announcement. On average, 16.41 percent of the shares outstanding were purchased, but a much larger fraction (87 percent) of the shares tendered was purchased by the company. Apparently, many investors decided not to tender their shares. By tendering shares, investors realize capital gains which are substantial if the base price is low relative to the tender offer price. Therefore, tax considerations might explain why many investors do not tender. However, tax considerations are unlikely to provide a full explanation given the widespread ownership of shares by tax-exempt institutions.

We also computed the cumulative average abnormal return to the nontendering shareholders from five days before the announcement until ten days after the expiration date (*CAR*) and the weighted average abnormal return to the tendering and nontendering shareholders (*TOTALR*).⁷ On average, nontendering shareholders earn an abnormal return of 12.54 percent, which is significantly smaller than the 21.79 percent premium that the tendering shareholders receive. Because, on average, 16.41 percent of the outstanding shares are repurchased, the repurchase announcement increases the total value of the firm by 14.29 percent (*TOTALR*).

To test for the stability of the results, we divided the sample into two subperiods: 1) 1962–1979, which approximately corresponds to the period examined in past research, and 2) the more recent period, 1980–1986. Table I shows that, in the second subperiod, returns to both the tendering and nontendering shareholders became smaller. We elaborate on these results later.

II. Trading Rules Around the Expiration Date

A. Methodology

In a repurchase tender offer, firms offer to buy back a fraction of their shares at a tender price, P_T , before a specific date (the expiration date). The first trading rule consists of buying shares before the original expiration date⁸ and tendering to the firm. In order to compute the gains from such a strategy, it is important to keep in mind the rules governing the repurchase tender mechanism.

If the offer is undersubscribed (i.e., the fraction of shares tendered, F_T , is less than the fraction of shares sought), the firm will repurchase all shares tendered. This is true even when the offer is extended and becomes oversubscribed later on. If the offer is oversubscribed, the firm will either buy back all the shares tendered or allocate pro-rata so that each shareholder sells the fraction F_p/F_T of his or her shares to the company⁹ (where F_p is the fraction purchased).

Thus, the profit from buying a stock at a price P_B during the tender period and tendering it to the firm is equal to $P_T - P_B$ if the offer is undersubscribed at

⁷ The benchmark return used was based on the CRSP equally weighted market index. Because of the short period, the results are not sensitive to the various methods of computing abnormal returns.

⁸ An offer may be extended. In our sample, 99 of the 258 offers were undersubscribed at the initial expiration day; 43 were extended, and 11 of these became subsequently oversubscribed.

⁹ To reduce shareholder servicing costs, companies in many cases buy all the shares from the shareholders who tendered a small number of shares, typically 100 or less. However, this has a very small impact on the F_p/F_T ratio.

the *first* expiration date. For oversubscribed offers (at the first expiration date), the profit from the trading strategy is

$$P_T(F_p/F_T) + P_E (1 - F_p/F_T) - P_B, \quad (1)$$

where P_E is the price after the expiration day. In order to allow for transaction costs, no trading was undertaken in cases where $P_B > 0.97 P_T$. An investor who buys shares and tenders does not incur transaction costs on the repurchased shares. Therefore, the transaction costs of this strategy are less than the costs of a round-trip transaction.

To test the sensitivity of the results to the timing of purchases and sales, different trading rules were examined. The first trading rule assumes buying and tendering on the expiration day and, if the offer is oversubscribed, selling the nonrepurchased shares two days after the expiration day. In the second trading rule, the purchase is made on the day before the expiration and the nonrepurchased shares are sold two days after the expiration. Finally, the third trading rule assumes that we buy on the day before the expiration day and sell four days after the expiration. In each case, results are provided for the total period and the two subperiods.

Note that the trading rule assumes that we can actually sell the shares two days after the expiration date. In general, a day after the offer expires, the company announces the outcome of the offer. If the offer is oversubscribed and the company decides not to buy all the shares, a preliminary pro-rata decision is announced. The preliminary pro-rata number is always very close to the final pro-rata allocation, which is announced within ten business days. However, an investor does not have to wait until the final pro-rata decision is made before selling the remaining shares.¹⁰

Under the usual settlement procedure, an investor who buys shares will officially become the owner of the stock after five business days. Hence, buying and tendering one day before the expiration day is not feasible. However, by following a cash-settlement procedure, it is possible to obtain title to the shares on the same day. Discussions with brokers revealed that cash settlement implies larger transaction costs for relatively small trades (i.e., a small investor cannot use discount brokers). Thus, we also tested the trading strategy by assuming that the stock was purchased six business days before the expiration day and the nonrepurchased shares are sold twelve business days after the expiration day. The long post-expiration period reflects the fact that the exact pro-rata decision is known within twelve business days.

B. Results

The results of the trading strategy are shown in Table II. The abnormal returns presented are adjusted for the market movement based on the CRSP equally

¹⁰ Shares are, in general, kept in the depository under the brokerage name and transferred to the corporation only upon the receipt of payment for the acquired shares. In essence, when shares are tendered, the brokerage house makes a commitment to have the tendered shares available. Because the preliminary pro-rata decision is very close to the final pro-rata allocation, the nonrepurchased shares are released by the brokerage house after the preliminary announcement.

Table II

Abnormal Returns from Buying and Tendering

Abnormal returns (in percent) from trading rule around expiration. According to the trading rule, shares are bought T_1 days prior to the expiration date whenever the market price is at least three percent below the tender offer price. In oversubscribed offers, shares not repurchased by the company are sold T_2 days after the expiration date.

	Mean	<i>t</i> -Value	Median	% Positive
Panel A: Total sample (1962–1986) (109 observations)				
Trading rule # 1 ($T_1 = 0, T_2 = 2$)	9.61	7.75	5.88	94.5
Trading rule # 2 ($T_1 = -1, T_2 = 2$)	9.46	7.76	5.52	97.2
Trading rule # 3 ($T_1 = -1, T_2 = 4$)	9.26	7.58	5.59	92.7
Panel B: First subperiod (1962–1979) (63 observations)				
Trading rule # 1 ($T_1 = 0, T_2 = 2$)	8.42	6.69	5.88	90.6
Trading rule # 2 ($T_1 = -1, T_2 = 2$)	8.01	7.58	5.42	95.4
Trading rule # 3 ($T_1 = -1, T_2 = 4$)	7.82	7.26	5.59	90.6
Panel C: Second subperiod (1980–1986) (46 observations)				
Trading rule # 1 ($T_1 = 0, T_2 = 2$)	11.26	4.71	5.48	100.0
Trading rule # 2 ($T_1 = -1, T_2 = 2$)	11.60	4.51	5.71	100.0
Trading rule # 3 ($T_1 = -1, T_2 = 4$)	11.39	4.44	5.33	95.5

weighted index. Because the holding period is short, the results are not sensitive to the assumption made about the process that generates returns. (See Brown and Warner (1985).) However, only expected nonrepurchased shares are affected by the market risk. As shown in Table I, the fraction of shares purchased relative to the shares tendered exceeds 80 percent, and therefore this strategy is less risky than the benchmark portfolio.

Panel A of the table (which covers the total sample period) shows that, in 109 of the 258 cases, the market price is at least three percent below the tender offer price before the expiration date. The trading rules generate a rather impressive abnormal return of more than nine percent on average (not annualized), with *t*-statistics larger than 7.5. The median value is smaller (5.5 percent), and at least 93 percent of the abnormal returns are positive. There seems to be no substantial difference among the various trading rules.

Panels B and C show similar results for the two subperiods. The difference in average abnormal returns over the two subperiods is not statistically significant, although the abnormal returns are higher in the second subperiod. The median abnormal returns are essentially the same across the two subperiods, around 5.5 percent. The persistence of abnormal returns is striking: for example, in the

second subperiod, for two out of the three trading rules, the abnormal returns are *always* positive.

The trading rule was repeated for cases where the market price was at least five percent below the tender offer price. The results (available from the authors) show that, while the number of observations falls by approximately 30 percent, the average and median abnormal returns from the trading strategy increase by about two percent relative to the results reported in Table II.

To test whether the results depend on the market price relative to the tender price, the following regression was run:

$$XRET_i = \alpha + \beta (P_{T,i} - P_{B,i})/P_{B,i} + e_i, \quad (2)$$

where $XRET_i$ is the abnormal return from the trading strategy for case i . All 193 cases in which the pre-expiration price was below the tender offer price are included in the sample.

Table III presents the regression coefficients and R^2 for the various trading rules.¹¹ The degree of underpricing (relative to the tender offer price) explains more than 75 percent of the variability of the returns generated by the trading strategy, and the slope coefficients are highly significant ($t > 23$). The slope coefficient of 0.85 implies that buying shares before the expiration date whenever the market price is x percent below the tender price results in abnormal returns of .85 x percent. Thus, the performance of the trading rule can be enhanced by focusing on cases where the pre-expiration price is substantially below the tender price. Note that this result is anomalous: in an efficient market, a low P_B relative to P_T would simply imply that the market expects a low P_E and/or a large oversubscription.

A closer examination of the regression results reveals four outlier observations.¹² Hence, a nonparametric Spearman rank correlation test was performed. The rank correlation coefficients for the three trading rules are 0.687, 0.667, and 0.685, respectively, and are statistically significant.

In Table IV results are presented for the trading strategy which assumes that stocks are purchased six trading days prior to the expiration of the offer if the market price is at least three percent below the tender offer price. The nonre-purchased shares are sold twelve trading days after the expiration of the offer.

The average and median abnormal returns are somewhat smaller than their corresponding values in Table II but are still substantial. On average, abnormal returns exceed 5.5 percent in all periods and are positive in about 90 percent of the cases. The trading strategy was repeated for cases where the market price was at least five percent below the tender offer price. This strategy increased the abnormal returns by about two percent relative to the results in Table IV.

In order to test the relationship between the degree of underpricing and trading abnormal returns, we run the regression in equation (2). The results are consistent with the findings in Table III: $\alpha = -0.02$ ($t = 3.62$), $\beta = 0.86$ ($t = 18.85$), and R^2

¹¹ Regression results for the 109 cases where the market price was at least three percent below the tender price are similar to those reported in Table III.

¹² We reran the regressions without the four outliers. The R^2 for the three regressions in Table IV are equal to 0.58, 0.51, and 0.47, respectively. In each case, the independent variable was highly significant ($t > 12$) and the regression coefficient was larger than .54.

Table III
The Relationship Between Abnormal Returns
and the Discount of the Market Price Relative
to the Tender Price

Results from the following regression are presented: $XRET_i = \alpha + \beta(P_{T_i} - P_{B,i})/P_{B,i} + e_i$, where $XRET$ is the abnormal return from buying shares T_1 days before expiration and selling the nonrepurchased shares T_2 days after the expiration, P_T is the tender offer price, and P_B is the price T_1 days prior to the expiration.

	α	β	R^2
$T_1 = 0, T_2 = 2$	-0.008 (-1.81) ^a	0.860 (24.82)	0.76
$T_1 = -1, T_2 = 2$	-0.008 (-1.79)	0.847 (25.42)	0.80
$T_1 = -1, T_2 = 4$	-0.011 (-2.28)	0.845 (23.84)	0.78

^a t -Statistics are in parentheses.

Table IV
Abnormal Returns (in Percent) from Buying on Day -6
and Tendering

According to the trading rule, shares are bought whenever the market price is at least three percent below the tender offer price. In oversubscribed offers, shares not repurchased by the company are sold 12 days after the expiration date.

	Mean	t -Value	Median	% Positive
1962-1986 (110 observations)	6.18	4.95	4.64	89.1
1962-1979 (62 observations)	5.59	4.57	5.38	88.7
1980-1986 (48 observations)	6.94	2.90	3.15	89.6

= 0.65. The Spearman rank correlation coefficient between the two variables is 0.46 and is significant at the 1 percent level.

In summary, the results show that 1) investors can obtain positive abnormal returns by purchasing shares that are trading at a discount from the tender price and tendering them to the firm; 2) the profits from the strategy are a function of the size of the discount; 3) the returns realized from the trading rule seem too large to be explained as compensation for risk bearing, especially considering that the strategy is less risky than an average investment in common stock; and 4) it is unlikely that the returns can be explained as a fair compensation for costly information acquisition (as argued by Larcker and Lys (1987)) because the trading strategy in a tender offer stock repurchase requires no sophisticated analysis.

III. Possible Explanations

A. Trading Profits and Repurchase Decisions

The reason why risk arbitrageurs do not compete the anomaly away may be related to the fact that, at least in oversubscribed offers, the firm's management

ultimately determines the magnitude of the trading profits. Recall that, when an offer is oversubscribed, the managers may buy back only the originally stated target number of shares and allocate pro-rata or may purchase more. If managers systematically buy all shares tendered when the stock is selling at a large discount from the tender price prior to expiration but allocate pro-rata otherwise, the arbitrageurs face a dilemma. If they drive up the price close to the tender price, the management will allocate pro-rata, but, in this case, if the price after the expiration date should fall below the tender price, the arbitrageurs will lose on the nonrepurchased shares. Conversely, if the price prior to expiration remains below the tender price, arbitrage profits will increase if (as assumed) the management decides to buy all the tendered shares. In other words, because in oversubscribed offers the management ultimately decides on the arbitrage profits, equilibrium no-arbitrage prices may not exist.

Why would management behave in such a way? If the purpose of the offer is to increase stock prices in order to correct mispricing but, for some reason, the market does not react enthusiastically enough to the signal (i.e., P_B is substantially below P_T), the management can strengthen the signal ex-post by purchasing more shares than originally intended.¹³

The reasoning implies (see Vermaelen (1981)) that, in a typical, *rationed*, oversubscribed offer, the price after the expiration will fall. At the same time, if management purchased more than the original number of shares sought, the market will react positively. Consistent with this hypothesis, we find a statistically significant (at the one percent level) decline of 1.2 percent in stock prices on the day following the expiration of 121 oversubscribed offers. In the 52 cases where the firm buys more shares than originally sought (by at least 20 percent), the price declines on the day after the expiration by 0.70 percent (t -statistic of 1.79). However, when the market learns that the company bought more shares, the price increases by 1.23 percent (t -statistic of 2.98) on the second day following the expiration, which is the typical announcement date for the repurchase decision.

This argument assumes that management will be influenced by the price behavior prior to the expiration date: if the price prior to expiration is significantly below the tender price, management might decide to buy more shares than originally sought. This hypothesis was tested by regressing, for all oversubscribed offers, the relative discount from the tender price (P_B/P_T) against F_P/F_T . The results provide mild support for the hypothesis. The coefficient on P_B/P_T has the expected sign but is not significantly different from zero. (The coefficient is -0.45 , and the t -statistic is -1.59 .)¹⁴

¹³ A classic example of this behavior is the repurchase offer made by Teledyne on September 15, 1972 for 1,000,000 shares at a price of \$20 per share. On the announcement date the stock price rose from \$16.50 to \$17 7/8 and remained relatively constant until the expiration date, when it fell to \$17.50. Eight million shares were tendered, and, on October 18, Teledyne decided to borrow \$140 million to buy back all shares tendered. On that day, the stock rose to \$20.20. For more details, see the Harvard Business School case, "Synerdyne".

¹⁴ An argument can be made that the alternative hypothesis is a positive rather than a zero correlation between P_B/P_T and F_P/F_T and that therefore the results might be more than marginally significant. Indeed, rewriting equation (1), $P_B/P_T = F_P/F_T + (1 - F_P/F_T) P_E/P_T$. Hence, without strategic planning, $\partial(P_B/P_T)/\partial(F_T)$ is generally positive as P_E is (in general) less than P_T . This explanation was suggested to us by David Brown.

B. Liquidity

One possible explanation for the persistent underpricing of P_B is that following the announcement there is a substantial reduction in trading volume and the low liquidity discourages arbitrageurs from trading the anomaly away. In order to test this hypothesis, a measure of “normal” trading volume was estimated as the average number of shares traded per day in the period from 50 days to 25 days prior to the announcement. A similar procedure was used by Lakonishok and Vermaelen (1986). The volume data for NYSE and AMEX stocks (CUPV file) cover the period from January 1, 1970 to December 31, 1985, and therefore these tests are based on the subset of observations from this time period. The ratio of trading volume relative to estimates of “normal” volume was computed for each firm in the sample and then averaged across firms for two event dates: 1) from twenty days before the announcement day until twenty days after and 2) from ten days before the expiration date until ten days after. The results for the total period are presented in Table V. (The results for the two subperiods are in general similar.)

Panel A shows the results around the repurchase announcement. Prior to the announcement, trading volume never increases by more than 100 percent of the normal trading volume. Jarrell and Poulsen (1988) report that trading volume before inter-firm tender offers is at least twice what it was over a control period as early as ten days prior to the announcement date. This might be because repurchase tender offers are more unexpected events than takeover bids. Perhaps, because fewer parties are involved in structuring such transactions, less information leaks to the market and there are fewer insiders trading.¹⁵ On the other hand, the results reveal a substantial increase in trading activity following the announcement. For example, for a period of ten days after the announcement, the level of trading activity is at least 300 percent of the normal level.

The results in Panel B (which center around the expiration date) show that, on average, the trading volume was at least twice as large as normal in each of the ten days prior to and including the expiration day. Two days after the expiration, the trading volume is not different from normal.

The results for the median and “percentage larger than 1” statistics are also reported in Table V and confirm the results presented for the mean statistic. However, the median statistic is substantially less than the mean value. During non-event periods, the median statistic is around 0.6 to 0.7. The highly skewed (to the right) distribution of the trading volume measure causes the median to fall substantially below the mean. This also explains why, during “normal” trading periods, the percentage of cases above one is substantially less than fifty percent. Note that the median trading volume ratio for every day from +3 through +10 following expiration is lower than the lowest figure from the pre-announcement period. This suggests a decline in trading volume following completion of the tender offer.

In summary, the results reveal a liquid market. The abnormally large trading volume may reflect the willingness of investors to sell their shares at a discount

¹⁵ Choi (1987) examines the Official summary of the Insider Transactions around repurchase tender offer announcements and does not report any abnormal insider transaction behavior in the 12 months preceding the repurchase.

Table V
Abnormal Trading Volume Around Repurchase Tender Offers

Trading volume (number of shares traded) around the announcement and expiration of the offer relative to normal trading volume, where normal trading volume is the average daily trading volume computed from days -50 to -25 relative to the announcement. Under the null hypothesis, the mean ratio is one. Note that the median ratio for normal periods is less than one, and the percentage of positive cases is less than 50 percent. This is caused by the highly skewed (to the right) distribution of the trading ratio.

Panel A: Trading around the announcement of the offer (171 observations)													
day	-20	-19	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	
Mean	1.07	1.22	1.30	1.27	1.55 ^b	1.19	1.41 ^b	1.26	1.53 ^b	1.86 ^b	1.56 ^b	6.78 ^a	
Median	0.70	0.78	0.77	0.90	0.97	0.85	0.83	0.77	0.92	0.98	0.92	2.87	
% > 1	38	37	38	46	49	40	42	40	49	49	45	76	
day	0	1	2	3	4	5	6	7	8	9	10	19	20
Mean	8.89 ^a	5.77 ^a	3.80 ^a	3.71 ^a	4.52 ^a	3.19 ^a	3.04 ^a	3.58 ^a	3.79 ^a	3.76 ^a	3.19 ^a	1.41	1.32
Median	4.63	3.03	2.21	2.06	1.93	1.62	1.56	1.32	1.51	1.50	1.25	0.75	0.68
% > 1	83	79	74	71	68	65	65	64	61	63	58	39	34
Panel B: Trading around the expiration of the offer (140 observations)													
day	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1			
Mean	5.40 ^a	4.22 ^a	5.21 ^a	3.53 ^a	2.72 ^a	3.40 ^a	3.18 ^a	2.32 ^a	3.38 ^a	2.50 ^a			
Median	1.67	1.48	1.52	1.36	1.54	1.36	1.27	1.13	1.19	1.03			
% > 1	67	66	66	64	58	61	58	55	52	51			
day	0	1	2	3	4	5	6	7	8	9	10		
Mean	2.65 ^a	2.06 ^a	1.42	1.06	1.36	1.22	0.92	1.07	0.98	1.02	1.36		
Median	1.38	1.15	0.89	0.61	0.65	0.68	0.53	0.68	0.55	0.58	0.67		
% > 1	58	58	48	32	29	33	28	33	33	28	30		

^a Significantly different from one at the one percent level (two-tailed test).

^b Significantly different from one at the five percent level (two-tailed test).

to arbitrageurs in order to avoid the uncertainty surrounding the event. On the other hand, if the large trading volume reflects the activity of professional arbitrageurs who buy and tender (as suggested by Weinstein (1984)), it is puzzling why they have not arbitrated the abnormal profits away. The market apparently underestimates F_P/F_T and/or P_E . With respect to the first variable, as we discussed earlier, a very large percentage (87 percent) of all shares tendered were actually repurchased by the firms.

IV. Trading Rules after the Expiration Date

As shown in Table I, tender offer premiums exceed abnormal returns to nontendering shareholders by almost ten percent. If the market price fully incorporates the information conveyed by the repurchase announcement, then the managers/insiders of the corporation (who do not tender) incur a significant signalling cost. (See Vermaelen (1984) for a formal discussion.)¹⁶

Alternatively, the market may systematically underestimate the value of information. Hence, the “true” signalling costs are smaller. This implies that buying stocks after the expiration date and holding them until the “true” value of the firm is revealed (e.g., through earnings reports) should generate positive abnormal returns.

A. Computing Abnormal Returns

To study the long-term price behavior of repurchasing firms following the announcement, we adopted the methodology proposed by Dimson and Marsh (1986) in their study of UK press recommendations. The abnormal return for security i in period t is computed in four different ways: by subtracting an equally weighted index and a value-weighted index, by adjusting for size, and by adjusting for size and beta.

According to the first two procedures, we define the abnormal return for security i in period t as

$$e_{it} = R_{it} - R_{vt} \quad (3)$$

or as

$$e_{it} = R_{it} - R_{et}, \quad (4)$$

where R_{vt} and R_{et} are the value-weighted and equally weighted CRSP indices, respectively.

To implement the third procedure, market values of equity of all firms on the NYSE and AMEX on the last trading day of each year (starting in 1962 and ending in 1986) are computed. Stocks are ranked each year according to market value of equity, and 10 size-based portfolios are formed. The size-adjusted abnormal return in period t for security i is then computed as

$$e_{it} = R_{it} - R_{stb} \quad (5)$$

¹⁶ Managers might have offsetting benefits such as preserving their positions if the repurchase deterred a raider.

where R_{st} is the return on a control portfolio represented by the size decile which includes firms with approximately the same size as firm i .

Finally, betas of repurchasing firms and their control portfolios are computed by regressing stock returns against the value-weighted market index using 36 monthly observations before the repurchase month.¹⁷ The size and beta adjusted abnormal return is then computed as

$$e_{et} = R_{it} - R_{st} - (\beta_i - \beta_s) (R_{mt} - R_{ft}), \quad (6)$$

where R_{ft} is the Treasury bill return and β_i and β_s are the beta coefficients of the repurchasing firm and its control portfolio, respectively.

Average abnormal returns and cumulative average abnormal returns are computed for all firms in the sample for a period of 24 months starting from two days before the announcement.

B. Results

The results using the four different benchmarks for the total period and the two subperiods are reported in Tables VI and VII, respectively. The announcement-period rate of return for the total period is 13.57 percent, based on the equally weighted index benchmark. (Other benchmarks produce similar results.) The announcement had a more pronounced effect before 1980 (15.75 percent) than after 1980 (10.34 percent) in spite of the fact that the premiums and fraction purchased are similar in the two subperiods.

A number of explanations can be proposed for this difference (which is statistically significant at the 5 percent level). First, because repurchases have in general become more popular, they are less unexpected than in the past. Second, managerial incentives to signal may actually have increased in recent periods. Vermaelen (1984) finds evidence that firms tend to make repurchase tender offers during periods of hectic takeover activity. This suggests that firms may want to signal in order to prevent being taken over at too "low" a stock price. Hence, the merger and takeover wave of the eighties may have encouraged managers to offer large premiums for the company's shares, even if these offers entailed a reduction in the value of their personal holdings. Third, the repurchase tender offer has perhaps become a less convincing signal today than it has been in the past because the typical firm is larger and is less controlled by insiders. Lower insider holdings imply lower costs of "false" signalling (see Vermaelen (1984)) and therefore lower credibility. Finally, the difference in announcement returns may reflect different time-specific motivations behind the repurchase activity, as argued by Jensen (1986a) and Stulz (1988). For example, if the repurchase affects *real* rather than *perceived* cash flows, managers may be willing

¹⁷ We also computed betas utilizing a period of 36 months after the repurchase. The average beta after the repurchase was 1.18, while before the repurchase the average beta was 1.33. This result may seem counterintuitive considering that a repurchase reduces the equity base, increases leverage, and therefore should increase beta. However, although financial leverage increases in terms of *book* values, it is not obvious that the *market* value-based leverage goes up. While, on average, companies buy back 16.41 percent of their shares, the market value of the remaining nonrepurchased shares increases by 12.54 percent (and possibly even more at a later date, as the subsequent results in the paper demonstrate).

Table VI
Announcement and Post-Announcement Abnormal Returns
of Repurchasing Firms (1962–1986)

Cumulative abnormal returns (in percent) from the announcement month until 24 months following the announcement, for alternative benchmarks. The benchmarks are the value-weighted index, the equally weighted index, a portfolio with approximately the same size as the repurchasing firm, and a portfolio with approximately the same size and beta.

Month	Value-Weighted Index (VW)	Equally Weighted Index (EW)	Size Benchmark	Size and Beta Benchmark
0	13.82	13.57	13.62	13.89
1	12.58	11.74	11.41	11.79
2	13.16	11.83	11.49	12.12
3	13.15	11.28	10.76	11.60
4	14.69	12.37	11.71	12.57
5	15.14	12.72	12.25	13.25
6	14.79	12.06	11.48	12.45
7	16.31	13.12	11.99	13.37
8	17.02	13.25	11.93	13.43
9	18.94	14.46	13.01	14.62
10	19.85	14.84	12.99	14.19
11	21.99	16.69	14.80	15.99
12	21.75	16.24	14.51	15.88
16	25.87	18.20	15.53	16.95
20	32.98	22.88	18.90	20.49
24	36.27	24.17	20.06	20.88
(24 – 3) ^a	23.11	12.34	8.57	8.76
<i>t</i> (24 – 3) ^b	6.92	3.78	2.61	2.70

^a Cumulative abnormal return (in percent) from month 3 until month 24. This measures the performance after the expiration of the offer.

^b *t*-Statistics for the null hypothesis that the cumulative abnormal return from month 3 until month 24 (post-expiration period) is zero.

to pay a premium if the repurchase is the most effective way to realize the value change.

When examining the long run performance of the trading rule, the first column of Table VI shows that, for the total period, from the beginning of the third month after the announcement (post-expiration period) until 24 months after the announcement, repurchasing stocks outperform the value-weighted index by 23.11 percent (or 1.05 percent per month, *t*-statistic of 6.92). Table VII shows that this effect is more pronounced in the first subperiod: 1.40 percent per month before 1980 (*t* = 6.16) versus 0.47 percent per month in the second subperiod (*t* = 1.97). These results are comparable to the ones reported in the *Fortune* article (Loomis (1986)) that reports an excess return of 8.5 percent per year over the S&P 500 index.

The results in Tables VI and VII are sensitive to the benchmark used. When the equally weighted index is used as a benchmark, the abnormal performance in the post-expiration period is much smaller. From three months after the announcement until 24 months after the announcement, repurchasing firms had

Table VII
Announcement and Post-Announcement Abnormal Returns of Repurchasing Firms, for Two Subperiods

Cumulative abnormal returns (in percent) from the announcement month until 24 months following the announcement, for alternative benchmarks. The benchmarks are the value-weighted index, the equally weighted index, a portfolio with approximately the same size as the repurchasing firm, and a portfolio with approximately the same size and beta.

Month	Panel A: First Subperiod, 1962-1979					Panel B: Second Subperiod, 1980-1986				
	Value- Weighted Index (VW)	Equally Weighted Index (EW)	Size Benchmark	Size and Beta Benchmark		Value- Weighted Index (VW)	Equally Weighted Index (EW)	Size Benchmark	Size and Beta Benchmark	
0	16.04	15.75	15.78	16.03		10.34	10.34	10.44	10.72	
1	14.55	13.66	14.77	13.32		9.66	8.90	8.84	9.54	
2	14.78	13.31	13.15	13.58		10.77	9.64	9.29	9.96	
3	15.01	12.94	12.43	13.15		10.39	8.81	8.45	9.32	
4	16.84	14.24	13.50	14.51		11.45	9.59	9.06	9.68	
5	17.29	14.61	14.21	15.26		11.95	9.91	9.33	10.24	
6	16.97	14.02	13.57	14.47		11.55	9.14	8.37	9.44	
7	19.75	16.18	15.00	16.27		11.11	8.52	7.46	9.02	
8	19.94	15.72	14.21	15.48		12.63	9.55	8.52	10.38	
9	23.02	17.82	15.98	17.32		12.76	10.41	8.54	10.57	
10	23.61	17.92	15.58	16.52		14.12	10.21	9.11	10.72	
11	25.65	19.53	17.13	18.04		16.47	12.43	11.34	12.95	
12	25.41	19.26	16.89	17.99		16.22	11.78	10.94	12.73	
16	31.68	22.57	18.79	19.89		17.00	11.57	10.63	12.52	
20	40.42	27.90	22.07	22.87		21.35	15.14	14.65	17.01	
24	45.64	30.11	23.59	23.60		21.03	14.69	14.53	16.73	
(24 - 3) ^a	30.31	16.80	10.44	10.02		10.26	5.05	5.24	6.77	
<i>t</i> (24 - 3) ^b	6.16	3.66	2.29	2.23		1.97	1.00	1.08	1.41	

^a Cumulative abnormal return (in percent) from month 3 until month 24. This measures the performance after the expiration of the offer.

^b *t*-Statistics for the null hypothesis that the cumulative abnormal return from month 3 until month 24 (post-expiration period) is zero.

Table VIII
Size Distribution of the Sample

Number of firms in the sample falling in each size (market value of equity) decile for the total period and the two subperiods. The universe is NYSE and AMEX stocks.

Decile	Total Period, 1962–1986	First Subperiod, 1962–1979	Second Subperiod, 1980–1986
1 (smallest)	14	8	6
2	28	17	11
3	39	27	12
4	25	18	7
5	25	17	8
6	26	17	9
7	25	18	7
8	22	10	12
9	30	16	14
10 (largest)	27	7	20
Total	258	153	105

abnormal returns of 0.56 percent per month in the total period ($t = 3.78$), 0.76 percent per month in the first subperiod ($t = 3.66$), and 0.23 percent per month in the second subperiod ($t = 1.00$).

The difference in results between the first and second column can be explained by the “size effect”.¹⁸ Table VIII shows that, although for the total period repurchasing firms are approximately evenly distributed across different size groups, an increase in firm size is observed in the recent subperiod. For example, in the first period, 4.5 percent of the repurchasing firms are in the largest size decile (group 10), while the corresponding number in the second subperiod is 19.0 percent.

The last two columns in Tables VI and VII present the cumulative average abnormal returns adjusted for size and adjusted for size and beta. The two columns are almost identical, and therefore the discussion will focus on the results adjusted for size and beta. The results for the total period show that stock prices increase (from month 3 to month 24 following the announcement) by 0.40 percent per month ($t = 2.70$). However, the results are only statistically significant in the first subperiod, when the monthly abnormal return was 0.46 percent per month ($t = 2.23$).

In order to test whether the price behavior was also different in the period *prior* to the announcement date, the cumulative abnormal return (adjusted for beta and size) in the 40 months prior to the repurchase was computed. In the first subperiod, the abnormal return was -11.40 percent ($t = 2.08$), whereas, in the second subperiod, repurchasing firms had a positive abnormal return of 15.10 percent ($t = 2.51$). These results are consistent with the hypothesis that after

¹⁸ For a similar explanation of abnormal performance after analyst recommendations, see Dimson and Marsh (1986): a value-weighted index will mainly reflect the performance of the largest firms. Historically, small firms have outperformed large firms. (See Banz (1981).)

1980 many of the firms engaged in stock repurchases performed relatively well and accumulated excess cash (as argued by Jensen (1986a)).¹⁹

The results show that firms that offer to repurchase their shares at a premium experience abnormal returns not only around the announcement but also after the expiration date. The increase after the expiration date is such that firms (or, more specifically, nontendering shareholders), on average, did not “overpay” when they offered premiums of 22 percent: the cumulative average abnormal return of 20.88 percent (Table VI, adjustment for size and beta) 24 months after the announcement date (including the announcement effect) is not significantly different from the average premium. If one accepts “signalling” as the main incentive for repurchases, these results imply that, ex-post, managers/insiders (who do not tender their shares) did not incur significant signalling costs (because they did not overpay for the tendered shares). Nevertheless, this also means that the signal was not fully revealing around the announcement date (i.e., the market did not fully incorporate the good news conveyed by the repurchase).²⁰

C. Effect of Firm Size on Abnormal Returns

The results in the previous section show that stock prices of repurchasing firms behaved differently in the two subperiods. To test whether this difference is related to the size of the repurchasing firms, the analysis was replicated for five size-based portfolios. The cumulative average abnormal returns, based on adjustment for size and beta, in the 40-month period prior to the repurchase (CAR (−40, −1)), in the announcement period (CAR 0, 1)), and in the 22 months after the expiration (CAR (3, 24)), are presented in Table IX. For each portfolio we also show the average fraction sought (F_S), the fraction purchased (F_P), the fraction purchased relative to fraction tendered (F_P/F_T), and the premium offered.

The findings reveal that the smaller the firm, the larger the announcement-period returns, a result also observed by Vermaelen (1981): 24.31 percent for the smallest firms versus 8.3 percent for the largest firms. Only the smallest firms (quintile 1) experience significant negative abnormal returns of −35.2 percent ($t = 3.33$) in the 40 months prior to the announcement and significant positive abnormal (adjusted for beta and size) returns of 24.2 percent ($t = 2.20$) in the 22 months after the expiration. A similar but less pronounced pattern is observed in the second quintile. The pattern for larger firms (quintiles 3 through 5) is different: large firms experience positive rather than negative abnormal returns prior to the repurchase, and, after the expiration of the offer, abnormal returns are not significantly different from zero.

We conclude that the post-expiration positive drift in security prices is mainly

¹⁹ It is unlikely that this result is caused by the stock price reactions to earlier tender offers by the few firms that are repeat repurchases in the 1980's.

²⁰ Of course, this reasoning assumes that, two years after the repurchase, the true value of the shares is revealed. An alternative scenario, also consistent with the evidence, is that share prices two years later are upward biased. However, the first scenario seems more plausible considering that it is based on the (reasonable) joint assumption that 1) the management has superior information and 2) management does not overpay for the shares. The second scenario assumes that managers overpay, but for some reason two years later the stock is overvalued.

Table IX
Abnormal Returns and Firm Size (1962–1986)

Cumulative abnormal returns (adjusted for beta and size), in percentages, for five size-based portfolios computed from month t_1 until month t_2 relative to the announcement month and offer characteristics for the total period. t -Statistics are in parentheses. F_s is the average fraction sought, F_p is the average fraction purchased, F_p/F_t is the average fraction of the tendered shares purchased, and $PREMIUM$ is the average premium offered to tendering shareholders. All variables are expressed in percentages.

Size Quintile	CAR (-40, -1)	CAR (0, 1)	CAR (3, 24)	Offer Characteristics			
				F_s	F_p	F_p/F_t	$PREMIUM$
1 (smallest)	-35.2 (-3.33)	24.3 (9.01)	24.2 (2.02)	21.96	15.80	97.41	35.63
2	-10.6 (-1.13)	16.8 (8.15)	13.9 (1.45)	20.90	19.62	95.10	25.50
3	2.5 (0.1)	11.2 (6.13)	0.8 (0.04)	14.74	14.52	88.30	14.15
4	24.03 (1.62)	10.5 (4.72)	-0.1 (-0.06)	14.64	15.69	84.63	18.83
5 (largest)	9.9 (0.9)	8.3 (5.10)	7.40 (1.78)	14.01	15.89	73.43	16.62

due to the price behavior of small firms whose stock prices had substantially decreased prior to the repurchase. For these firms, the repurchase announcement signalled improved future performance. However, the market apparently underestimated the extent of the "good" news. As a result, investors could have earned significant abnormal returns by buying after the expiration date. Large firms, on the other hand, were performing relatively well prior to the repurchase and as a result may have accumulated excess cash. Hence, the repurchase may have been less motivated by "signalling" explanations and therefore might have generated smaller abnormal returns.

The analysis is consistent with the conjecture that the market is not efficient in adjusting to information contained in repurchase announcements, especially for small firms.²¹ To test whether the market has learned from past experience, in Table X we provide results for the two subperiods. The results do not provide evidence that in the second subperiod the post-expiration abnormal returns of the smallest firms decreased relative to the first subperiod. Table X also shows that, after 1979, repurchases of the larger firms were typically preceded by substantial excess returns, which is consistent with the conjecture that, in recent years, buyouts were driven by corporate restructuring activities aimed at eliminating excess "free" cash flows.

For the total period, small firms (quintile 1) from the month prior to the repurchase until 24 months afterwards experienced abnormal returns of 47.02 percent. The corresponding number for the large firms (quintile 5) is 15.18 percent. This implies that, on average, small firms paid a premium which was 11.39 percent *below* the risk-adjusted price two years after the repurchase. In these cases, nontendering shareholders (including management whose holdings in small firms are substantial) bought shares from tendering shareholders at prices below the "true" market price. This explains why small firms repurchased 97.41 percent of all shares tendered. Evidently, informed shareholders could tender their shares (if the market price were below the tender price), keep the nonrepurchased shares, and buy additional shares after the expiration of the offer. Considering that tendering shareholders could follow this strategy, the results do not imply that the typical tendering stockholder gets an unfair deal. The only clear losers are the shareholders who sell their stock (rather than tender) in the open market during and immediately after the offer. For large firms, the premiums are, on average, larger than the long-run abnormal returns. This is especially evident in the second subperiod, where the premium exceeds long-run abnormal returns (period from 0 to 24) by about 17 percent and 10 percent for groups 4 and 5, respectively. This difference in behavior of small and large firms may reflect the difference in motivation for the repurchase. It is possible that small firms buy back shares because typically management believes that its stock is undervalued. In large firms, the repurchase might be part of a restructuring activity (see Jensen (1986a) and Stulz (1988)) which affects *real* cash flows (as opposed to perceived cash flows), and, in these circumstances, the

²¹ Small firms are much less followed by financial analysts than large firms. In addition, small firms are characterized by relatively low liquidity, which poses difficulties for institutional investors to exploit any abnormal returns.

Table X
Abnormal Returns and Firm Size for Two Subperiods

Cumulative abnormal returns (adjusted for beta and size), in percentages, for five size-based portfolios computed from month t_1 until month t_2 relative to the announcement month and offer characteristics for the two subperiods. t -Statistics are in parentheses. F_s is the average fraction sought, F_p is the average fraction purchased, F_p/F_s is the average fraction of the tendered shares purchased, and $PREMIUM$ is the average premium offered to tendering shareholders. All variables are expressed in percentages.

Size Quintile	CAR (-40, -1)	CAR (0, 1)	CAR (3, 24)	Offer Characteristics			
				F _s	F _p	F _p /F _i	PREMIUM
Panel A: 1962-1979							
1 (smallest)	-46.76 (-3.47)	27.88 (7.43)	22.27 (0.76)	19.81	16.45	96.83	44.11
2	-19.17 (-2.48)	18.45 (7.27)	13.00 (1.00)	20.19	19.20	94.41	24.48
3	-3.22 (-0.35)	11.92 (6.13)	-1.57 (-0.19)	13.95	14.88	87.27	17.09
4	12.40 (0.61)	12.10 (3.83)	3.63 (0.07)	13.85	13.52	86.57	19.00
5 (largest)	0.20 (0.74)	9.06 (4.55)	17.04 (2.27)	8.19	10.16	74.58	15.52
Panel B: 1980-1986							
1 (smallest)	-14.36 (-1.52)	18.76 (5.60)	26.82 (1.77)	26.05	14.55	98.51	19.44
2	9.84 (0.08)	12.71 (3.79)	18.32 (0.52)	22.81	20.75	96.41	28.23
3	13.08 (0.53)	9.88 (3.79)	5.2 (0.44)	16.21	13.86	90.23	8.69
4	42.67 (1.35)	8.06 (2.80)	-6.98 (-0.85)	15.88	19.10	81.53	18.57
5 (largest)	16.23 (1.66)	7.78 (3.25)	0.34 (0.40)	17.65	19.47	72.71	16.15

management might be willing to “overpay” the tendering shareholders (e.g., in order to compensate for capital gains taxes).

V. Conclusion

The results of this paper indicate that, by following a simple trading strategy around repurchase tender offers, it was possible to generate abnormal returns of more than 9 percent in a period of less than one week. Further research is necessary to analyze 1) why these trading profits are not eliminated by risk arbitrageurs and 2) whether developing a model to forecast shareholder and managerial behavior around repurchase tender offers can improve the trading strategy. Even without such a model, we are able to explain 75 percent of the variability of the trading profits on the basis of one variable: the market price before the expiration day divided by the tender offer price. Because the trading strategy entails very little risk and does not require any sophisticated analysis, its performance is inconsistent with market efficiency and therefore properly characterized as an “anomaly”. One reason why this anomaly could have persisted for such a long period is that repurchase tender offers are relatively rare events.

The results also show that a portfolio of repurchasing companies earns significant positive abnormal returns after the repurchase. This effect is mainly caused by the behavior of small firms that earn abnormal returns of 24 percent in the 22 months after the expiration of the offer. The results are consistent with the hypothesis that, on average, the market had underestimated the value of the information signalled through the repurchase announcement and that these firms have repurchased their shares at a price below the “true” value. The price behavior for larger firms is different: in contrast to small firms that experience negative abnormal returns prior to the repurchase and positive abnormal returns afterwards, large firms experience positive abnormal returns before the repurchase and essentially zero abnormal returns afterwards. This suggests that tender offer stock repurchases by large firms may be part of a corporate restructuring activity rather than an attempt to signal underevaluation of the firm.

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