Targeted Repurchases and Common Stock Returns

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Abstract

This study provides new evidence on the stock price effects of targeted repurchases. We find a statistically significant average decline in the stock prices of repurchasing firms of -3.5% at the targeted repurchase announcement. But this decline is more than offset by stock price increases that are associated with the initial investment announcement and with other related intervening announcements. The average total abnormal return for our sample of 111 repurchasing firms is 7.4%. We also explore the cross-sectional behavior of the targeted repurchase stock returns and investigate subsequent control changes in repurchasing firms.
Targeted repurchases occur when a firm buys a block of its common stock held by a single shareholder or a group of shareholders. The repurchase is often at a premium over the market price of the firm's common stock and the repurchase offer is not extended to other stockholders. These transactions, popularly called greenmail, are often criticized as thwarting desirable takeovers and entrenching incumbent managers. Stock price declines in response to targeted repurchase announcements have been interpreted as evidence that these transactions harm non-participating stockholders. As a result of the objections raised and the empirical evidence, federal legislation has been proposed that requires stockholder approval of targeted repurchases under certain circumstances.¹/

The purpose of this paper is to provide new evidence on the stock price effects of targeted repurchases. Existing evidence consists primarily of average stock price effects for the repurchasing firms at the announcement of a targeted share repurchase. This study expands the measurement of stock price effects to include the period in which the eventual seller's investment position was first publicly disclosed as well as the dates of potentially important subsequent events that are related to the investment position. We also conduct a cross-sectional analysis of the stock returns at the targeted repurchase announcements and investigate control changes in repurchasing firms following the targeted repurchases.

The principal finding of this study is that stockholders of repurchasing
firms benefit from investments that conclude with a targeted repurchase. Consistent with the results of previous studies, we find a statistically significant average decline in the stock prices of repurchasing firms of -3.5% at the targeted repurchase announcement. But this decline is more than offset by stock price increases that are associated with the initial investment announcement and with other related intervening announcements. The average total abnormal return for our sample of 111 repurchasing firms is 7.4%.

The targeted repurchases are classified by whether they are preceded by a potential or actual control contest or are accompanied by a standstill agreement to limit future investments by the selling stockholder for a specified time period. The most pronounced decreases in share price at the targeted repurchase announcement are for repurchases associated with a standstill agreement. This decline completely offsets the stock price increases associated with the preceding announcement. Repurchases preceded by a potential or actual control contest also have a statistically significant decrease in share price. But the average decline in share price does not completely offset the positive stock price effects of preceding events. About one-half of the repurchases are not preceded by an indication of a control contest or accompanied by a standstill agreement. The average stock price effect of these repurchase announcements is statistically insignificant even though the preceding events associated with the investment have positive and significant stock price reactions on average.

We investigate two explanations of the stock price declines associated with targeted repurchase announcements. The premium effect relates the stock price declines at the targeted repurchase to the premium over market price paid to the selling stockholder. The information reversal effect relates the stock price declines to the reversal of favorable expectations formed prior to
the targeted repurchase announcement. In a more comprehensive study of investments in equity securities, Mikkelsen and Ruback (1985) show that a targeted repurchase is an unfavorable outcome relative to a takeover or to a sale of shares to a third party. Accordingly, the positive stock return for target firms at the initial investment announcement reflects a positive expected value of alternative outcomes. The negative return at a targeted repurchase represents the realization of a relatively unfavorable outcome for the repurchasing firm's stockholders and the reversal of the favorable information conveyed by the investment activity. The information reversal and premium effects are not mutually exclusive.

The premium effect does not appear to be important in explaining the targeted repurchase abnormal returns for repurchasing firms. However, the information reversal effect appears to explain part of the cross-sectional variation in the abnormal returns at the targeted repurchase announcement. This implies that the stock price reaction to a targeted repurchase cannot be interpreted in isolation of stock price effects of preceding investment activity. The negative stock price effects of a targeted repurchase may reflect the reversal of expectations about the outcome of an investment rather than an expropriation of the repurchasing firm's stockholders.

Within three years following the targeted repurchase, about 30% of the repurchasing firms were taken over, went private or experienced a change in control of the board of directors. The frequency of such changes in control for firms that did not engage in targeted repurchases during this period is about 10%. Therefore, consistent with the partial reversal of expectations, targeted repurchases do not eliminate the prospect of a takeover and may possibly raise the likelihood of a takeover by a third party.

In the next section, we describe the sample. Section 3 presents our
method of measuring abnormal stock returns. Section 4 contains evidence on average stock returns from the initial investment through the targeted repurchase. A cross-sectional analysis of the repurchasing firms' stock returns at the repurchase is presented in Section 5. Evidence on changes in control and stock price behavior following the targeted repurchases is also reported. Finally, our conclusions are presented in Section 6.

2. SAMPLE CHARACTERISTICS

2.1 Sample Design

Our sample of 111 targeted repurchases is derived from three sources. First, we use the sample of targeted repurchases examined in Mikkelson and Ruback (1985). Second, citations of stock repurchases are examined in the "reacquired shares" subject entry of The Wall Street Journal Index for the years 1980 through 1983. Third, we use listings of targeted repurchases compiled by two underwriting firms.

The sample of repurchases satisfies three requirements. First, the repurchasing firm was listed on the New York or American Stock Exchange at the time of the targeted repurchase announcement. Second, a published report of the targeted repurchase announcement appeared in The Wall Street Journal or The New York Times. Third, we could determine the date of the initial public disclosure that the investment position reached 5% or more of the repurchasing firm's outstanding shares and the repurchasing firm was listed on this date. This requirement is included so that the stock price effect can be measured from the initial disclosure of the investment position to the targeted repurchase announcement. A 5% level is used because the Williams Act requires stockholders to report this level of ownership in a schedule 13d filing within ten days of its attainment. The Wall Street Journal Index was examined back
through the 1975 volume for an initial 13d filing announcement for the investment position that was eventually repurchased. The SEC News Digest was searched around the time of an initial public disclosure in the The Wall Street Journal for the Schedule 13d filing date. We also searched issues of the Insiders Chronicle for the date on which a 5% or greater ownership position was first attained.3,4

2.2 Descriptive Statistics

The distributions by calendar years of the initial 13d filing and the targeted repurchase announcements are reported in Table 1. Our sample selection criteria restricts the announcements of targeted repurchases to the years 1978 through 1983. About two-thirds of the 111 targeted repurchase announcements occurred during or after 1980, the last year of the sample periods of the Dann and DeAngelo (1983) and Bradley and Wakeman (1983) studies. The average number of trading days between the initial 13d filing and the targeted repurchase announcement is 294 days, or approximately 15 months. There is substantial variation in the length of the intervening interval. The interval is less than 100 trading days in 34 cases, the shortest being 2 calendar days; the interval is more than 500 trading days (approximately two years) in 19 cases.

In addition to the initial 13d filing and targeted repurchase announcements, we also collected the date of The Wall Street Journal reports of related events that occurred between the initial and targeted repurchase announcements. Seventy-eight observations have such related intervening announcements. The related events include purchases of additional shares, changes in investment plans by the acquiring party, takeover attempts or proxy contests, opposition to the investment by the target company,
### Table 1

#### Distribution by Calendar Years of Initial 13d Filing and Targeted Repurchase Announcements

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Initial 13d Filing Announcements&lt;sup&gt;a/&lt;/sup&gt;</th>
<th>Number of Targeted Repurchase Announcements&lt;sup&gt;b/&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1977</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>1978</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>1979</td>
<td>19</td>
<td>8</td>
</tr>
<tr>
<td>1980</td>
<td>27</td>
<td>21</td>
</tr>
<tr>
<td>1981</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>1982</td>
<td>17</td>
<td>26</td>
</tr>
<tr>
<td>1983</td>
<td>5</td>
<td>27</td>
</tr>
<tr>
<td>1976-83</td>
<td>111</td>
<td>111</td>
</tr>
</tbody>
</table>

<sup>a/</sup> The initial 13d filing announcements include a Wall Street Journal article if available or a report of a Schedule 13D filing in either the SEC News Digest or the Insiders Chronicle.

<sup>b/</sup> The announcements were reported in The Wall Street Journal or The New York Times.
developments in a lawsuit, and third-party attempts to acquire control. There is at least one intervening report that additional shares were acquired for 56 observations. There was an intervening announcement of a tender offer or merger proposal by the acquiring firm in only three cases. In another twelve instances, the acquiring firm or individual(s) sought board representation.

Table 2 presents selected summary statistics for the investments in common stock that culminated in a targeted repurchase. Based on average sample values, the size of the investment position in common stock increases substantially from the initial 13d filing to the targeted repurchase announcement. The average percentage ownership stake increases from 7.6% to 12.9%. The average dollar value of the initial investment position is $14.5 million.

The premiums paid in targeted repurchases are economically significant. The average value of the repurchase transaction is $31 million. The average premium paid over market value at the time of the targeted repurchases is 19.5%, or $4.7 million. On average, the premium paid in the targeted repurchase is 2.8% of the value of the repurchasing firm's common stock measured two days before the targeted repurchase announcement.

Each targeted repurchase is classified by whether there was an indication of the possibility of a control contest at any time prior to the repurchase announcement and by whether the repurchase was accompanied by a standstill agreement. The first row of Table 3 indicates that 33 repurchases, or 30% of the sample, are associated with a prior control contest. We include an observation in the prior control contest category when, according to reports in The Wall Street Journal, the acquiring firm or investor sought board representation or control, or considered seeking board representation or control. Only five of the targeted repurchases were preceded by an actual
The per share repurchase premium is the repurchase price minus the market price two days before the repurchase announcement. Calculations exclude observations without repurchase price data. The total repurchase premium is the number of shares repurchased times the difference between the repurchase price and the market price two days prior to the repurchase announcement. Percentages are calculated by dividing the total repurchase premium by the closing market value of the firm's equity two days before the repurchase announcement.

<table>
<thead>
<tr>
<th>No. of Observations</th>
<th>19.9</th>
<th>18.4</th>
<th>16.2</th>
<th>12.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>66</td>
<td>4.8</td>
<td>9.4</td>
<td>31.5</td>
<td>14.2</td>
</tr>
<tr>
<td>66</td>
<td>9.9</td>
<td>56.5</td>
<td>111</td>
<td>28.7</td>
</tr>
<tr>
<td>110</td>
<td>5.6</td>
<td>28.2</td>
<td>110</td>
<td>4.6</td>
</tr>
</tbody>
</table>

The table shows the mean, median, standard deviation, and samples for the dollar values in millions and percentage of the repurchasing firm's summary statistics for targeted repurchases during the period 1978-83.
Table 3

**Number of Targeted Repurchases Preceded by a Control Contest or Associated With A Standstill Agreement**
The sample period for targeted repurchase announcements is 1978-83.

<table>
<thead>
<tr>
<th>Type of Targeted Repurchase</th>
<th>Number of Observations</th>
<th>Proportion of Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior Control Contest</td>
<td>33</td>
<td>.30</td>
</tr>
<tr>
<td>Takeover Attempt</td>
<td>5</td>
<td>.05</td>
</tr>
<tr>
<td>Considered a Takeover Attempt</td>
<td>10</td>
<td>.09</td>
</tr>
<tr>
<td>Sought Board Representation</td>
<td>14</td>
<td>.13</td>
</tr>
<tr>
<td>Considered Seeking Board Representation</td>
<td>4</td>
<td>.04</td>
</tr>
<tr>
<td>Standstill Agreement</td>
<td>39</td>
<td>.35</td>
</tr>
<tr>
<td>Prior Control Contest and Standstill Agreement</td>
<td>15</td>
<td>.14</td>
</tr>
<tr>
<td><strong>Total Number of Repurchases</strong></td>
<td><strong>111</strong></td>
<td><strong>1.00</strong></td>
</tr>
</tbody>
</table>
tender offer for control or a merger proposal. A takeover attempt was reportedly considered prior to another ten repurchases. In fourteen cases, board representation was sought. In ten of these cases, a proxy contest ensued. Plans to seek representation on the target firm's board occurred prior to another four repurchases. This summary of actions that preceded targeted repurchases does not support the popular view that targeted repurchases generally thwart an outstanding takeover attempt by the selling stockholder.

A standstill agreement accompanied the targeted repurchase in 39 cases. Fifteen targeted repurchases were associated with both a prior control contest and a standstill agreement.

Only one repurchasing firm (Zapata Corp.) appears more than once in the sample of targeted repurchases. However, there are several firms that appear more than once in the sample as the seller in a targeted repurchase transaction. The most frequently represented selling firms are Gulf and Western (9 repurchases), Crane Corp. (4 repurchases), and Walco National (4 repurchases). In addition, firms controlled by Victor Posner are associated with 8 targeted repurchases in the sample. Carl Icahn and the Belzburgs are each associated with 3 repurchases.

3. METHOD OF MEASURING ABNORMAL RETURNS

The event study method pioneered by Fama, Fisher, Jensen, and Roll (1969) is used to measure the price effects of the initial investment, intermediate events, and the targeted repurchase. Since most stocks tend to move up or down with the market, the realized stock returns are adjusted for market-wide movements to isolate the component of the returns due to events related to the investment. This adjustment is accomplished using linear regression to estimate the following market model:

\[
\tilde{R}_{jt} = \alpha_j + \beta_j \tilde{R}_{mt} + \epsilon_{jt} \quad (1)
\]
The parameter $\beta_j$ measures the sensitivity of the jth firm's return ($\tilde{R}_{jt}$) to movements in the market index ($R_{mt}$). The term $\beta_j R_{mt}$ in equation (1) is the portion of the return to security j that is due to market-wide factors. The parameter $\alpha_j$ measures that part of the average return of the stock which is not due to market movements. Lastly, $\epsilon_j$ measures that part of the return to the firm which is not due to movements in the market or the firm's average return.

Two sets of coefficients are estimated for each firm to incorporate potential changes in the market model parameters. Coefficients before the initial announcement, $\alpha^B$ and $\beta^B$, are estimated using daily returns beginning 260 trading days before the initial 13d filing and ending 61 days before the filing announcement. Similarly, coefficients after the targeted repurchase announcement are estimated over the period beginning 61 days after the announcement (if returns are available) through 260 days after the announcement. In those cases in which 100 days of data are not available to estimate either the before or after coefficients, returns before the initial 13d filing and after the targeted repurchase are combined to estimate the coefficients. In all cases, returns for the 60 days before the initial 13d filing announcement through 60 days following the targeted repurchase announcement are excluded from the estimation period.

Prediction errors are calculated for each firm for 60 days prior to the initial 13d filing announcement through 60 days after the targeted repurchase announcement according to the following expression:

$$
PE_{jt} = \begin{cases} 
R_{jt} - (\hat{\alpha}_j + \hat{\beta}_j R_{mt}) & \text{for } t < \text{initial 13d filing} \\
R_{jt} - (\hat{\alpha}_j + \hat{\beta}_j R_{mt}) & \text{for } t \geq \text{initial 13d filing}
\end{cases}
$$

(2)
The prediction errors equal the deviation of the daily returns from their estimated normal relation with the market and represent abnormal returns. The average abnormal return over an interval of days defined relative to an event date is calculated by summing the prediction errors over the holding period for each firm and then averaging across firms.  

To test the statistical significance of the abnormal returns, we compute the following t-statistic:

$$t = \frac{1}{\sqrt{J}} \sum_{j=1}^{J} \left[ \frac{\tau_2^2}{\tau=\tau_1} \text{PE}_{jt} \right] \sqrt{\text{Var}\left( \sum_{\tau=\tau_1}^{\tau_2} \text{PE}_{j\tau} \right)}$$

where \( \tau_1 \) and \( \tau_2 \) are the first and last days of the interval, \( J \) is the number of observations, and \( \text{Var}\left( \sum_{\tau=\tau_1}^{\tau_2} \text{PE}_{j\tau} \right) \) is the variance of the sum of prediction errors. The variance of the sum of prediction errors is:

$$\text{Var}\left( \sum_{\tau=\tau_1}^{\tau_2} \text{PE}_{j\tau} \right) = S_j^2 \left(T + \frac{T^2}{N} + \frac{\tau_2}{\sum_{\tau=\tau_1}^{\tau_2} (R_{m\tau} - \bar{R}_m)^2} \right)$$

In (4) \( S_j^2 \) is the residual variance from the market model regression, \( T \) is the number of days in the cumulation interval, \( \bar{R}_m \) is the average market return over the estimation interval, and \( N \) is the number of days used to estimate the market model. The t-statistic adjusts for heteroscedasticity in the prediction errors by standardizing the cumulative prediction error for each firm by its standard deviation. This standardization gives less weight to the prediction errors with more volatility.
4. COMMON STOCK RETURNS

4.1 Abnormal Returns Prior to and at the Initial 13d Filing Announcement

Panel A of Table 4 presents the average prediction errors for repurchasing and selling firms for selected holding periods prior to and at the initial 13d filing announcement. The initial 13d filing announcement appears to increase the stock prices of both repurchasing and selling firms. The average prediction error for the day before and the day of the initial 13d filing announcement (IF-1 to IF) is 3.68% for repurchasing firms. This is statistically significant with a t-statistic of 13.00, and 72% of the 111 individual two-day prediction errors are positive. For selling firms, the average prediction error over the two-day initial investment period is 0.75%, with a t-statistic of 2.09. These significant positive prediction errors at the 13d filing are similar to those reported in Mikkelson and Ruback (1985) for all filings by listed firms that occurred during 1978 through 1980 that were not associated with an outstanding takeover proposal. Therefore, the positive abnormal returns associated with the initial investment announcements are not peculiar to investments that terminate in a targeted repurchase.

Table 4 also indicates that repurchasing firms realize positive abnormal returns in each holding period prior to the initial 13d filing announcement. Only the average prediction error in the period IF-60 to IF-41 is not statistically significant. The largest average prediction error for repurchasing firms occurs over the period that begins on the purchase date (PD), which is the day that the selling firm first obtained a 5% position in the purchasing firm, and ends two days prior to the initial 13d investment (IF-2). In contrast, there are no significant abnormal returns for selling firms prior to the initial 13d filing.
Table 4

Percentage Prediction Errors for 60 Days Prior to the Initial 13d Filing Announcement through 60 Days Following the Targeted Repurchase

The sample period for targeted repurchase announcements is 1978-1983; t-statistic, percent positive, and sample size are in parentheses.

<table>
<thead>
<tr>
<th>Holding Period§/</th>
<th>Repurchasing Firms</th>
<th>Selling Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A:</strong> before and at the initial 13d filing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IF-60 to IF-41</td>
<td>0.74% (1.21,53,111)</td>
<td>0.86% (0.69,46,50)</td>
</tr>
<tr>
<td>IF-40 to IF-21</td>
<td>3.50 (3.26,57,111)</td>
<td>-2.46 (-1.37,40,50)</td>
</tr>
<tr>
<td>IF-20 to PD-1</td>
<td>2.57 (3.71,53,111)</td>
<td>-1.21 (-1.10,34,50)</td>
</tr>
<tr>
<td>PD to IF-2</td>
<td>5.24 (8.45,70,101)</td>
<td>0.54 (0.84,46,46)</td>
</tr>
<tr>
<td>IF-1 to IF</td>
<td>3.68 (13.00,72,111)</td>
<td>0.75 (2.09,54,50)</td>
</tr>
<tr>
<td><strong>Panel B:</strong> between the 13d filing and the targeted repurchase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IF+1 to TR-2</td>
<td>-11.14 (-1.75,43,109)</td>
<td>(-0.20,41,49)</td>
</tr>
<tr>
<td><strong>Panel C:</strong> at and after the targeted repurchase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TR-1 to TR</td>
<td>-3.24 (-10.42,35,111)</td>
<td>1.98 (6.11,66,50)</td>
</tr>
<tr>
<td>TR+1 to TR+10</td>
<td>-0.90 (2.56,46,111)</td>
<td>(-0.96,36,50)</td>
</tr>
<tr>
<td>TR+11 to TR+20</td>
<td>-1.19 (-1.67,36,111)</td>
<td>0.14 (0.28,48,50)</td>
</tr>
<tr>
<td>TR+21 to TR+40</td>
<td>2.48 (3.42,57,111)</td>
<td>2.01 (1.65,56,50)</td>
</tr>
<tr>
<td>TR+41 to TR+60</td>
<td>-0.43 (-0.88,42,110)</td>
<td>-0.26 (-0.27,52,50)</td>
</tr>
</tbody>
</table>

§/ IF is the initial 13d filing announcement date, which is the date of a Wall Street Journal report or the date of a Schedule 13d filing with the SEC. PD, the purchase date, is the date a 5% position in the target firm is attained. When the purchase date cannot be determined, PD is defined as 10 days prior to the date of the 13d filing. TR is the date of the targeted repurchase announcement.
The 13d filing date can occur up to ten days following the attainment of a 5% stake and the acquiring individual or firm can add to the ownership stake during this period. The statistically insignificant average abnormal return during the period PD to IF-2 for the selling firms suggests that the market reacts to the increased trading activity in the repurchasing firm's shares prior to the disclosure of the filing firm's identity. Since the filing firm may have spread its purchases over several weeks prior to obtaining a 5% position, the positive abnormal returns for repurchasing firms that precede the purchase date may also reflect the increased trading activity in the repurchasing firm's shares.

4.2 Abnormal Returns Between The Initial 13d Filing and Targeted Repurchase Announcements

Panel B of Table 4 presents the cumulative prediction errors over the period beginning on the day after the initial 13d filing and ending two days before the targeted repurchase announcement. These cumulative returns are statistically insignificant for both repurchasing and selling firms. An important difficulty with this measure is that the time interval between the initial 13d filing and the targeted repurchase is about 15 months so that the power of the tests of significance is low.

As an alternative to the cumulative returns, we aggregate the abnormal returns on the day before and the day of relevant Wall Street Journal announcements that occurred between the initial 13d filing and the targeted repurchase. The advantage of this method is that we exclude extraneous events and their effects on stock price. Excluding returns from non-event days increases the power of our tests by substantially reducing the variance of the total abnormal returns. For repurchasing firms, the cumulative prediction error on event days only is 3.10% with a t-statistic of 4.32 and the cumulative prediction errors are positive for 67% of the 78 observations with
intermediate events. For selling firms the cumulative prediction error on event days only is statistically insignificant.

4.3 Abnormal Returns At and After the Targeted Repurchase Announcement

The average prediction error in Panel C of Table 4 for the day before and the day of the targeted repurchase announcement (TR-1 to TR) is -3.24% for repurchasing firms, with a t-statistic of -10.42, and 65% of the individual two-day prediction errors are negative. In contrast, the average prediction error over the same two-day period is 1.98% for selling firms, with a t-statistic of 6.11, and 66% of the individual two-day prediction errors are positive. These results indicate that targeted repurchase announcements decrease the stock prices of repurchasing firms and increase the stock prices of selling firms.

There are no significant abnormal returns for selling firms in any of the holding periods following the repurchase announcement. There are significant abnormal returns in selected periods following the repurchase announcement for repurchasing firms. The average prediction error over the period beginning on the day after and ending ten days after the repurchase announcement (TR+1 to TR+10), which is an equally weighted average of the sum of the adjusted prediction errors for the 111 observations during this period, is -0.39%. But the t-statistic, which weights the adjusted prediction error by their standard deviation, is 2.56. Thus, the assessment of the abnormal returns in this holding period depends on the weighting of individual observations. In the period TR+11 to TR+20, average abnormal return is -1.19%, with a t-statistic of -1.67. The average prediction error over the next twenty days, TR+21 to TR+40, is positive, with a t-statistic of 3.43. Finally, the average prediction error over the period TR+41 to TR+60 is -0.34%, which is not
statistically significant. The offsetting positive and negative average prediction errors in the intervals following the repurchase announcement suggest that the two-day average prediction error at the repurchase announcement is an unbiased estimate of the valuation effects of the announcement.

4.4 Total Stock Price Effects

To measure the total valuation effect of investments that terminate in a targeted repurchase, we aggregate the abnormal returns from the beginning of the investment through its conclusion. We define the beginning of the investment as the day the selling firm attained a 5% position in the repurchasing firm, which is the purchase date. The beginning of the investment could alternately be defined as either the initial 13d filing announcement, which follows the purchase date, or the day prior to the purchase date. The significant abnormal return for repurchasing firms over the purchase interval indicates that the market reacts to the increased trading activity in the shares of the repurchasing firm prior to the initial 13d filing. Since the increased trading activity is associated with the investment, these abnormal returns should be included in the measure of the valuation consequences of the investment. In many cases, the beginning of the investment occurs prior to purchase date. But we choose the purchase date because it is the first date that we can identify that the selling firm obtained shares of the repurchasing firm; the dates of purchases prior to the attainment of a 5% block are unavailable. The conclusion of the investment is the date on which the targeted repurchase is announced. The total valuation effect of the investment also includes the abnormal returns on the day before and the day of relevant Wall Street Journal announcements that occurred between the initial investment and the targeted repurchase.
To compute the total valuation effect of the investment, we do not simply sum the series of two-day prediction errors. Instead, we first compute the abnormal price changes over the four stages of the investment: (1) the interval from the purchase date to two days before the initial 13d filing announcement; (2) the initial 13d filing announcement; (3) the intermediate events; and (4) the targeted repurchase announcement. These abnormal price changes are divided by the firm's share price on the day before the purchase date to obtain a measure in return form, which we define as the adjusted prediction errors. The total abnormal return for the investment, or total adjusted prediction error, is calculated by summing the adjusted prediction errors for each of the four stages of the investment.\(^{12}\) The total adjusted prediction error measures the cumulative dollar effect of a series of events relative to the value of shares at the purchase date.

Table 5 presents the average adjusted prediction errors for repurchasing and selling firms over the four stages of the investment and for the entire investment. For repurchasing firms, the average adjusted prediction errors are positive and statistically significant in the purchase, initial 13d filing, and intermediate holding periods. On the day before and the day of the targeted repurchase announcement, the average adjusted prediction error for repurchasing firms is negative and statistically significant. The average total adjusted prediction error, which is the average sum of the adjusted prediction errors in each stage of the investment, measures the valuation consequences of the entire set of events associated with the investment. The average total adjusted prediction error for repurchasing firms is 7.37%, with a t-statistic of 7.88, and 69% of the 111 individual total adjusted prediction errors are positive.
Table 5

**Average Total and Holding Period Adjusted Prediction Errors**

The sample period for targeted repurchase announcements is 1978-1983; t-statistic, percent positive, and sample size are in parentheses.

<table>
<thead>
<tr>
<th>Announcement Period</th>
<th>Repurchasing Firms</th>
<th>Selling Firms</th>
<th>Matched Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase Interval(^a/)</td>
<td>5.34% (7.91,69,101)</td>
<td>0.52% (0.62,43,46)</td>
<td>1.63% (2.70,65,46)</td>
</tr>
<tr>
<td>Initial 13d filing(^b/)</td>
<td>3.68 (12.51,72,111)</td>
<td>0.78 (2.00,53,50)</td>
<td>2.10 (6.68,70,50)</td>
</tr>
<tr>
<td>Intermediate(^b/)</td>
<td>3.33 (4.32,67,78)</td>
<td>0.21 (-0.79,53,34)</td>
<td>0.84 (0.34,53,34)</td>
</tr>
<tr>
<td>Targeted Repurchase(^b/)</td>
<td>-3.52 (-10.57,33,111)</td>
<td>2.01 (6.03,66,50)</td>
<td>-0.44 (-0.78,50,50)</td>
</tr>
</tbody>
</table>

| Total\(^c/\) | 7.37% (7.88,69,111) | 3.40% (3.28,66,50) | 3.73% (4.15,62,50) |

\(^a/\) The purchase interval is from the purchase date through two days before the initial 13d filing announcement.

\(^b/\) Includes the day before and day of the announcement.

\(^c/\) The total average adjusted prediction error is the average sum of the adjusted prediction errors over the purchase interval, the initial investment announcement, the intermediate announcements, and the targeted repurchase announcement.

\(^d/\) Statistics in this column are for a sample of 50 observations in which data are available for both repurchasing and selling firms. Adjusted prediction errors for each matched observation are calculated as the value-weighted average of the prediction errors for the repurchasing and selling firms, where the value weights equal the equity value of the firms. The variance of the matched observations is the sum equity of the squared value times the variance of the adjusted prediction errors for repurchasing and selling firms divided by the square sum of the values.
Our measure of the total valuation effect indicates that, on average, stockholders of repurchasing firms benefit from investments that result in a targeted repurchase. The data are consistent with the hypothesis that the stock price of target firms rises at the time of the initial announcement of the investment position in anticipation of a favorable outcome, such as a takeover. The increase in stock price at the initial investment announcement, and at subsequent events, more than offsets the decline in stock price at the targeted repurchase. There are two possible components of the negative abnormal return at the repurchase announcement: the reversal of expectations formed earlier and the premium paid to the selling stockholder.

The stockholders of selling firms also benefit from these transactions. The average adjusted prediction errors for selling firms are positive during the four stages of the investment process. The average total adjusted abnormal return is 3.40%, with a t-statistic of 3.28, and 66% of the 50 individual adjusted prediction errors are positive.

Table 5 also presents the average adjusted prediction errors for 50 observations with available return data for both the repurchasing and selling firms. The prediction errors for these matched observations are calculated as the value-weighted average of the adjusted prediction errors for the repurchasing and selling firms. The value weight for the selling firm is the market value of its common stock on the day before the purchase date. To avoid double counting, the value weight for the repurchasing firm is the value of common stock that is not held by the selling firm on the day before the purchase date. 13

The combined average adjusted prediction error on the day before and the day of the targeted repurchase announcement is -0.44%, which is statistically
insignificant. This suggests that the significant average adjusted prediction errors of -3.52\% for repurchasing firms and 2.01\% for selling firms reflect a wealth transfer from the shareholders of the repurchasing firms to the shareholders of the selling firms. However, the combined average total adjusted prediction error is 3.73\% with a t-statistic of 4.15, and 62\% of the combined observations are positive. This result and the statistically significant average total adjusted prediction errors for the samples of repurchasing and selling firms indicate that these investments, on average, increase the value of both of the firms.

5. CROSS SECTIONAL ANALYSIS OF ABNORMAL RETURNS FOR REPURCHASING FIRMS

Panel A of Table 6 presents the average adjusted prediction errors for the 99 repurchasing firms with information on the repurchase premium and for four subsamples of repurchasing firms: (i) 11 targeted repurchases preceeded by a control contest and accompanied by a standstill agreement; (ii) 18 targeted repurchases preceeded by a control contest that are not accompanied by a standstill agreement; (iii) 20 targeted repurchases accompanied by standstill agreements that are not preceeded by a control contest; and (iv) 50 targeted repurchases that are not accompanied by a standstill and are not preceeded by a control contest.

The first row of panel A of Table 6 contains the pre-targeted repurchase adjusted prediction error, which the sum of the prediction errors over the purchase period, the initial 13d filing, and the intermediate events. For all observations, the pre-targeted repurchase prediction error is 10.82\% with a t-statistic of 12.19 and 86\% of the individual prediction errors are positive. Across the four subsamples, the pre-targeted repurchase abnormal returns appear to be larger for the subsamples that involve prior control contests. These higher abnormal returns could reflect announcements that
Table 6
Cross-Sectional Tests of the Premium and Information Reversal Effects for Repurchasing Firms

The sample period for targeted repurchase announcements is 1978-83.

<table>
<thead>
<tr>
<th>Panel A: Sample Averages</th>
<th>All Observations</th>
<th>Prior Control Contests and Standstills</th>
<th>Prior Control Contests Only</th>
<th>Standstill Agreements Only</th>
<th>No Standstill Agreements or Control Contests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Observations</td>
<td>99</td>
<td>11</td>
<td>18</td>
<td>20</td>
<td>50</td>
</tr>
</tbody>
</table>

Pre-targeted Repurchase adjusted prediction error\(^a/\)

- 10.82% 14.52% 15.35% 7.80% 9.59%

Targeted Repurchase Adjusted Prediction Error

- 3.39 -9.02 -2.61 -7.12 -0.95

Premium as a Percent Initial Equity Value \(^b/\)

- 4.70 9.07 7.07 2.27 3.86

Panel B: Regression Estimates \(^c/\)

\[ \Delta S_{tr,j} = \alpha_0 + \alpha_1 \text{PREMIUM}_j + \epsilon_j \] Standard errors are in parentheses

<table>
<thead>
<tr>
<th>( \hat{\alpha}_0 )</th>
<th>199.22</th>
<th>-257.87</th>
<th>-124.05</th>
<th>-870.68</th>
<th>288.85</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(124.36)</td>
<td>(777.61)</td>
<td>(344.32)</td>
<td>(527.19)</td>
<td>(116.81)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>( \hat{\alpha}_1 )</th>
<th>-0.18</th>
<th>-0.13</th>
<th>0.17</th>
<th>-1.31</th>
<th>-0.08</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(0.13)</td>
<td>(0.34)</td>
<td>(0.29)</td>
<td>(0.51)</td>
<td>(0.16)</td>
</tr>
</tbody>
</table>

Panel C: Regression Estimates \(^c/\)

\[ \Delta S_{tr,j} = \gamma_0 + \gamma_1 \text{PREMIUM}_j + \gamma_2 \Delta S_{pretr,j} + \epsilon_j \] Standard errors are in parentheses

<table>
<thead>
<tr>
<th>( \hat{\gamma}_0 )</th>
<th>263.10</th>
<th>-223.78</th>
<th>-30.08</th>
<th>-836.40</th>
<th>351.39</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(111.22)</td>
<td>(741.23)</td>
<td>(329.31)</td>
<td>(556.44)</td>
<td>(107.47)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>( \hat{\gamma}_1 )</th>
<th>0.01</th>
<th>-0.09</th>
<th>0.25</th>
<th>-1.21</th>
<th>0.02</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(0.12)</td>
<td>(0.36)</td>
<td>(0.28)</td>
<td>(0.65)</td>
<td>(0.15)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>( \hat{\gamma}_2 )</th>
<th>-0.20</th>
<th>-0.22</th>
<th>-0.15</th>
<th>-0.02</th>
<th>-0.19</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.16)</td>
<td>(0.09)</td>
<td>(0.09)</td>
<td>(0.06)</td>
</tr>
</tbody>
</table>

\(^a/\) Pre-targeted repurchase adjusted prediction errors are the average sum of the adjusted prediction errors over the purchase interval, initial 13d filing, and intermediate events.

\(^b/\) Premium as a percent of initial equity value is calculated by dividing the dollar premium paid to the selling firm by the equity value of non-participating shares of the repurchasing firm on the day before the purchase date, which is the day the seller attained 5% or more of the repurchasing firm's equity.

\(^c/\) \( \Delta S_{tr,j} \) is the equity value change (adjusted for market-wide effects) for non-participating shareholders at the time of the targeted repurchase announcement; \( \text{PREMIUM}_j \) is the dollar premium paid to the selling firm; \( \Delta S_{pretr,j} \) is the equity value change prior to the targeted repurchase announcement. The regressions are estimated using weighted least squares, where the weights equal the inverse of the standard deviation of the dependent variable. Standard errors are in parentheses.
raise the likelihood of an attempt to acquire control or seek board representation. But the differences in the pre-targeted repurchase average adjusted prediction errors are not statistically significant.

The average abnormal returns associated with the targeted repurchase announcement differ across the four subsamples of targeted repurchases. For the 50 repurchases without standstill agreements or prior control contests, the abnormal return is -0.95%, which is not significantly different from zero with a t-statistic of -1.40. The investments that terminate with repurchases without standstill agreements or prior control contests, therefore, appear to increase the wealth of the repurchasing firms' shareholders; there are significant positive abnormal returns prior to the targeted repurchase and no significant negative returns at the time of the targeted repurchase announcement. The total abnormal return from this subsample, which represents about one half of the sample, is 8.64% with a t-statistic of 6.93 and 82% of the individual observations are positive.

In contrast, the abnormal returns for targeted repurchase announcements with standstill agreements and prior control contests is -9.02%, which is statistically significant with a t-statistic of -8.09% and 82% of the individual observations are negative. A comparison of the abnormal returns for subsamples of repurchases with prior control contests only (-2.61%, t-statistic = -2.16) and standstill agreements only (-7.12%, t-statistic = -11.57), suggests that much of the cross-sectional difference between the abnormal returns is due to standstill agreements. To separate the effects of prior control contests and standstill agreements on the abnormal returns at the time of the targeted repurchase announcement, we estimated the
regression:\(^{14}\)

\[
APE_j = -0.002 - 0.221 D_{1j} - 0.047 D_{2j} + 0.003 D_{1j}^D2_j + \epsilon_j
\]


t-statistics are in parentheses. The coefficient for the standstill binary variable \((D_{2j})\) is statistically significant, whereas the coefficients for the prior control contest and interaction binary variables are not statistically significant. This implies that the abnormal returns for repurchasing firms at the targeted repurchase announcement are affected by the presence of a standstill agreement and are not affected by the termination of a control contest.

We examine two explanations for the negative abnormal returns for repurchasing firms at the targeted repurchase announcement: the **premium effect** and the **information reversal effect**. The premium effect is the reduction in the stock prices of the repurchasing firm that is associated with repurchasing common stock at a premium above its market price. The information reversal effect is the reduction in stock prices that is associated with the reversal of favorable expectations formed prior to the repurchase announcement.

Mikkelson and Ruback (1985) find that the stock price rise at the initial 13d filing announcement appears to be due to the expectation of a favorable outcome, such as a takeover bid. When investments terminate in a targeted repurchase, these favorable expectations are, at least in part, reversed.
To calculate the premium effect, we assume that the targeted repurchase is simply a wealth transfer between the non-participating shareholders of the repurchasing firm and the selling shareholders. This implies that the equity value of the repurchasing firm prior to the repurchase announcement, \( N_0 P_0 \), equals the equity value of the firm after the repurchase, \( (N_0 - N_b)P_e \) plus the premium paid to the seller, \( N_b P_b \):

\[
N_0 P_0 = (N_0 - N_b)P_e + N_b P_b , \tag{5}
\]

where \( P_0 \) is the stock price immediately prior to the targeted repurchase announcement; \( P_b \) is the repurchase price; \( P_e \) is the stock price after the repurchase announcement; \( N_0 \) is the number of shares outstanding prior to the repurchase; and \( N_b \) is the number of shares repurchased. Rearranging (5) provides an expression for the change in equity value associated with the targeted repurchase:

\[
(N_0 - N_b) (P_e - P_0) = -N_b (P_b - P_0). \tag{6}
\]

We divide both sides of (6) by the equity value of the non-participating shares on the day before the purchase date (\( P_{bd} \)):

\[
\frac{P_e - P_0}{P_{bd}} = \frac{-N_b (P_b - P_0)}{(N_0 - N_b)P_{bd}} . \tag{7}
\]

The left-hand side of (7) is the relative price change due to the targeted repurchase announcement, which is comparable to the adjusted prediction error at the repurchase announcement. The right-hand side of (7) is the dollar value of the premium as a percentage of the initial equity value, which is
presented in the third row of Panel A of table 6. For all observations, the average premium is 4.70% which is greater than the absolute value of targeted repurchase abnormal return. This indicates that, on average, stock prices fall less than the amount implied by the premium effect.

The comparison of average values ignores the cross-sectional variation in the data and therefore is a relatively weak test of the premium effect. To provide a more powerful test of the premium effect, we estimate the following regression:

$$\Delta S_{tr,j} = \alpha_0 + \alpha_1 \text{PREMIUM}_j + \epsilon_j \quad (8)$$

where $\Delta S_{tr,j}$ is the change in equity value for the non-participating shares associated with the repurchase and $\text{PREMIUM}_j$ is the dollar value of the premium paid to the seller. The constant term, $\alpha_0$, captures the average information reversal effect. The premium effect implies that the slope coefficient, $\alpha_1$, equals -1.0. Since the dollar equity value changes are heteroscedastic, we use weighted least squares, where the weights equal the inverse of the standard deviation of the dollar equity value change associated with the targeted repurchase.

Panel B of Table 6 presents the regression estimates of (8) for the whole sample and for each subsample. Each of the estimated coefficients on $\text{PREMIUM}$, $\hat{\alpha}_1$, is negative. With the exception of the standstill agreement only subsample, the hypothesis that these slope coefficients equal -1.0, as predicted by the premium effect, is rejected and each of these slope coefficients is not statistically different from zero. For the standstill agreement only subsample, the coefficient on $\text{PREMIUM}$ is -1.21 which is not statistically different from -1.0 and is statistically different from zero. Thus, the results are consistent
with the premium effect for the subsample of 20 targeted repurchases in the standstill agreement only subsample. For the 79 repurchases in the remaining three subsamples, the results are inconsistent with the premium effect and suggest that the price effects of targeted repurchases are not explained as wealth transfers from the non-participating shareholders of the repurchasing firm to the selling shareholder(s).

Two previous studies of targeted repurchases, Dann and DeAngelo (1983) and Bradley and Wakeman (1983), present conflicting evidence on the premium effect. Dann and DeAngelo report in a footnote (page 297) that no significant relationship exists between the change in equity value at the repurchase announcement and the premium, a result which is consistent with our findings. Bradley and Wakeman present regression results for a model which is similar to (8). They report (Table 6, page 320) a coefficient on the premium of -1.013, which is consistent with the premium effect. The differences in the results appear to be related to the specification of the regression equations. Dann and DeAngelo estimate their equation in return form; they divide both sides of (8) by the equity value of the repurchasing firm prior to the targeted repurchase announcement. In contrast, Bradley and Wakeman estimate their equation in unweighted dollar values.

To test the information reversal effect, we estimate the following regression equation:

$$\Delta S_{tr,j} = \gamma_0 + \gamma_1 \text{PREMIUM}_j + \gamma_2 \Delta S_{\text{pretr},j} + \epsilon_j$$

where $\Delta S_{\text{pretr},j}$ is the change in equity value from the purchase date through the intermediate events. This is calculated by summing the adjusted prediction errors during the initial purchase interval, at the initial
investment announcement, and at announcements of intermediate events, and multiplying this sum by the equity value of the repurchasing firm on the day before the purchase date. The information reversal effect implies that $\gamma_2$ is negative.

Panel C of Table 6 presents the regression tests of the information reversal effect. Each of the estimated coefficients on the change in equity value prior to the targeted repurchase, $\hat{\gamma}_2$, is negative. The coefficient $\hat{\gamma}_2$ equals $-0.20$ for the whole sample, which has a t-statistic of $-5.13$. The $\hat{\gamma}_2$ coefficient is also statistically significant for the subsample of 50 repurchases with no standstill agreements or control contests. These results suggest that the information reversal effect is an important factor in explaining the cross-sectional variation of the stock price effects of targeted repurchase announcements. However, the hypothesis that the coefficient equals $-1.0$ can be rejected for the sample as a whole and for each subsample. This implies that the information reversal is not complete and is consistent with the positive and statistically significant average total prediction error for repurchasing firms.

5.3 Information Reversal and Subsequent Events

The positive total prediction errors and the partial reversal of the positive returns prior to the repurchase announcement may indicate that the investment increases the probability of a takeover attempt by another investor. Even though a substantial investment has been repurchased, the investment activity and the firm's willingness to repurchase shares at a premium may induce other investors to consider an attempt to acquire control. For example, Shleifer and Vishny (1986) present a model in which a targeted repurchase conveys unfavorable news about the repurchasing firm, but also raises the prospect of a takeover bid by a third party.

We examine the plausibility of this explanation by investigating
control related events reported in *The Wall Street Journal* that involve the repurchasing firm in the three years immediately following the targeted repurchase. Control changes occurred for 32 of the 111 repurchasing firms. These control changes include 24 completed takeovers, 6 going private transactions, and 2 board changes. Data provided by Mikkelson and Partch (1986) indicate that the comparable frequency of such control transactions in a random sample of listed firms during our sample period is about 10%. The frequency of control related transactions following targeted repurchases is, therefore, about three times larger than the unconditional frequency.

Figure 1 plots the average cumulative adjusted prediction errors for the portfolio of 32 repurchasing firms with control changes and the portfolio comprised of the remaining 79 repurchasing firms without control changes. The cumulations for both portfolios begin on the day after the targeted repurchase announcement. The last cumulation day is the announcement of the completed control transaction for firms with such announcements and the trading day three years after the targeted repurchase announcement for firms without a subsequent control change.

The post-targeted repurchase abnormal returns are 17.5% (t-statistic=2.70) for repurchasing firms with subsequent control contests and -33.6% (t-statistic = -2.28) for repurchasing firms without subsequent control changes. The t-statistic for the difference between the average cumulative adjusted prediction errors for the two portfolios is 2.91. Consistent with the efficient market hypothesis, the return over the cumulation interval for all targeted repurchases is -18.9% which is statistically insignificant with a t-statistic of -0.47.

We also compare the cumulative abnormal returns subsequent to the targeted
The sample period for targeted repurchase announcements is 1978-83. The cumulative adjusted prediction errors begin on the day following the targeted repurchase announcements. The cumulations end on the day of a control change for the 32 observations with control changes and three years after the targeted repurchase announcement for the 79 observations without subsequent control changes.
repurchase for the subsamples of repurchases with and without standstill agreement. One explanation for the larger stock price declines associated with targeted repurchases with standstills is that these agreements reduce the probability of a subsequent control change. But the proportions of repurchasing firms with a subsequent control change are virtually the same in the two subsamples, 28%. Also, when no subsequent control change occurs within three years of the repurchase, the average accumulated return is -24.9% for repurchases with a standstill and is -38.4% for repurchases without a standstill. Therefore, it does not appear that a standstill agreement affects the likelihood of being taken over following a targeted repurchase nor that the repurchasing firm's stock price performance is less favorable when no control change occurs following a repurchase associated with a standstill.

These data are difficult to interpret. The stock price patterns observed may simply reflect an ex-post selection bias. For example, a similar pattern would be expected if a random sample of firms is divided into portfolios according to whether they experienced a control change in a three year period. Of course, such a finding would not have any information about the economic forces underlying targeted repurchases. Thus, the increase in value for firms experiencing a control change after a targeted repurchase and the decrease in value for firms without such changes does not imply that the stock price behavior associated with investments that lead to targeted repurchases is related to changes in the probability of corporate control transfers. However, the relatively high frequency of control changes for repurchasing firms does indicate that these firms are more likely to experience a change in control and may explain our finding of positive total abnormal returns from the initial investment announcement through the targeted repurchase announcement.
6. CONCLUSIONS

This study presents new evidence about investments in common stock that result in a targeted repurchase. First, for most investments, the total stock price effect on the repurchasing firm is positive. Stockholders typically benefit from the series of events that begin with the initial investment and end with the targeted repurchase. Second, the stock price decline for targeted repurchase announcements that are not accompanied by a standstill agreement or proceeded by a control contest is negligible and statistically insignificant. This group contains about half of the 111 targeted repurchases in our sample. Third, the stock price declines at the targeted repurchases are related to the positive stock returns prior to the repurchases and are not related to the premiums paid in repurchases. The fall in stock price at the targeted repurchase does not seem to reflect a wealth transfer to the selling stockholder.

Our evidence suggests that investments leading to a targeted repurchase should be viewed as part of an investment process that includes various outcomes. In addition to repurchases, the possible outcomes include successful takeovers and third-party bids for control which substantially increase the target firm's share price. Accordingly, the positive stock price effect of the initial investment reflects a positive expected valuation effect of the possible outcomes, and the negative price effect of a repurchase reflects a relatively unfavorable outcome for the repurchasing firm's stockholders.

We conclude that it is misleading to interpret the stock price reaction to a repurchase in isolation of the favorable stock price effects of earlier investment activity. For example, it is possible that a targeted repurchase
reflects management's assessment that ownership of a substantial block of shares by a particular individual is not in the stockholders' interests. In this case, a repurchase is a value-maximizing action, but the stock price falls because the market reduces its assessment of the probability of a lucrative takeover attempt.

Our evidence suggests that it may be costly to restrict or prohibit targeted repurchases. The pattern of stock returns we find suggests that targeted repurchases are related to more favorable outcomes, such as a takeover. For investors who acquire substantial ownership stakes, the possibility of a repurchase can increase their expected payoffs in the event that a takeover attempt or a third-party bid for shares does not materialize. As a consequence, any attempt to discourage targeted repurchases through regulation may reduce investment activity in general, and not just those investments that end in a targeted repurchase. That is, a potential hidden cost of discouraging targeted repurchases is a reduction in the amount of investment activity that leads to desirable takeovers or closer monitoring of managers. It may not be possible to remove any undesirable effects of targeted repurchases without losing the benefits of these transactions.
FOOTNOTES

1. Articles by Kirkland (1984) and Boland (1984) are examples of discussions of the greenmail debate in the financial press. Dees (1985) reports that the pending targeted repurchase legislation in the 99th Congress, includes S286, S420, S276, and HR1003. Dees discusses the ethical issues associated with targeted repurchases.

2. We exclude seven targeted repurchases included in the Mikkelson and Ruback (1985) sample because the target firm was not listed on the American or New York Stock Exchange.

3. The SEC News Digest ceased reporting the 13d filing date in May, 1982, and began reporting the date on which a 5% ownership position was reached.

4. The final sample does not include repurchases from a current or former officer of the repurchasing firm. Our requirement of identifying an "initial date" for the investment eliminated targeted repurchases from these individuals. Bradley and Wakeman (1983) report the price effects of targeted repurchases from insiders of the repurchasing firm.

5. Fama (1976) describes the market model in detail.

6. When there are missing stock returns within a holding period, the normal return is cumulated over the days in which there are missing stock returns. This cumulative normal return is subtracted from the next observed stock return to calculate the abnormal return.

7. This formula includes the covariance between prediction errors and differs from previous formulas from the variance of a sum of prediction errors which ignored this covariance (see, for example, Mikkelson and Ruback (1985)). To derive this formula, define:

$$ R^*_j = \sum_{\tau=\tau_1}^{\tau_2} R_{jt} $$

and

$$ R^*_m = \sum_{\tau=\tau_1}^{\tau_2} R_{mt} $$

The forecast error is:

$$ R^*_j - \hat{R}^*_j = \sum_{\tau=\tau_1}^{\tau_2} \varepsilon_{jt} $$

where $\hat{R}^*_j$ is the forecasted value and $\hat{\alpha}$ and $\hat{\beta}$ are regression estimates. The
FOOTNOTES (continued)

variance of the forecast error is:

\[ E(R_j^* - R_j)^2 = T \text{Var}(\hat{\alpha}) + \text{Var}(\hat{\beta}) + T\sigma^2 + 2TR_m \text{Cov}(\hat{\alpha}, \hat{\beta}) \]

Substituting the value for the variance and covariance of the ordinary least squares coefficients provides Equation 4. We are indebted to Craig Ansley for pointing this out.

8. The average abnormal return and the t-statistic can differ in sign because the former assigns uniform weights to each observation whereas the latter assigns non-uniform weights (equal to the inverse standard deviation) to each observation.

9. For 13d filings that are not associated with outstanding takeover proposals, Mikkelson and Ruback (1985) report average prediction errors of 2.88% for target firms and 1.17% for firms that acquired 5% or more of the target firm.

10. In many cases, we identified the filing date of Schedule 13d, but not the date the 5% ownership position was attained. Since regulations require a filing of Schedule 13d within ten days after reaching the 5% level, we chose to define the purchase date as ten days before the filing date. In a few cases, there is no purchase date in advance of the earliest public disclosure, because The Wall Street Journal reported plans to purchase shares more than ten days in advance of a filing with the Securities and Exchange Commission.

11. The cumulative prediction errors for repurchasing firms on non-event days during the intermediate period is -13.4% with a t-statistic of -2.39. This significant cumulative abnormal return may reflect the gradual reduction in the probability of a favorable outcome of the investment. We doubt this explanation because the result is not robust with respect to the method of calculating prediction errors. For example, when the abnormal return is defined as the difference between the firm's return and the market return, the event days only return is 3.6% with a t-statistic of 4.68%, which is similar to the market model results reported in the text. However, the market adjusted cumulative returns for the non-event days is 4.7% with a t-statistic of 0.21.

12. For each of computation, we do not use the actual stock prices of the firm. Instead, we define a price index which equals one, the day before the date and on each succeeding day equals the compound value of $1 that was invested in the stock day before the purchase date.

\[ P_{t-1} = \prod_{t=-1}^{\tau-1} (1 + R_{jt}) \]

where \( P_{t-1} \) is the price index on day \( \tau \) and \( R_{jt} \) is the stock return of firm \( j \) on day \( t \). The adjusted prediction error, \( APE_{jt} \), each day is calculated as:

\[ APE_{jt} = (PE_{jt})P_{t-1} \]
where PE_{jt} is the prediction error on day \( t \). Thus, if the share price is higher after the purchase date, an adjusted prediction error after the purchase date is greater in absolute value than an unadjusted prediction error.

13. The number of shares not held by the selling firm is calculated as the number of shares outstanding on the day before the purchase date minus the number of shares repurchased.

14. The regression is estimated using weighted least squares where the weights equal the inverse of standard deviation of the targeted repurchase adjusted prediction errors.

15. \( \Delta S_{trj} \) is calculated for each observation by multiplying the adjusted prediction error for the targeted repurchase announcement by the equity value of the non-participating shares on the day prior to the purchase date. PREMIUM_j is calculated by multiplying the number of shares repurchased by the difference between the offer price and the market price two days prior to the repurchase.

16. To increase the precision of the cumulative adjusted prediction errors, the market model is re-estimated every 200 trading days.
REFERENCES


