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Market underreaction to open market share repurchases

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Abstract

We examine long-run firm performance following open market share repurchase announcements, 1980–1990. We find that the average abnormal four-year buy-and-hold return measured after the initial announcement is 12.1%. For 'value' stocks, companies more likely to be repurchasing shares because of undervaluation, the average abnormal return is 45.3%. For repurchases announced by 'glamour' stocks, where undervaluation is less likely to be an important motive, no positive drift in abnormal returns is observed. Thus, at least with respect to value stocks, the market errs in its initial response and appears to ignore much of the information conveyed through repurchase announcements.

Key words: Stock repurchase
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1. Introduction

Corporations distribute substantial sums of wealth to shareholde chasing their own stock. From 1980 to 1990, the aggregate val repurchased on the New York Stock Exchange (NYSE), the Ame Exchange (ASE), and the National Association of Securities Dealers Quotations (NASDAQ) was about one-third of the value distribu dividends. Toward the end of the 1980s, the dollars involved in r increased substantially, becoming nearly half the amount paid as casl Framed differently, the dollar value of stock repurchases announc 1985 and 1993 was nearly three times larger than that raised thr public offerings (IPOs).[1] In 1994, stock buybacks continued at a r more than $65 billion were announced. Firms can reacquire sh through tender offers or through open market transactions. Histori agers have chosen the latter approach by wide margins. For example, dollar value of all share repurchases announced between 1985 and to be completed through open market transactions. In this paper, v the long-run performance of firms that chose this approach for re shares.

The literature provides a lengthy list of motivations for why cc might repurchase their own shares: capital structure adjustment, ta fense, signaling, excess cash distribution, substitution for cash divi wealth expropriation from bondholders. While all of these reasons ar signaling has emerged as one of the most prevalent explanations (1981; Dann, 1981; Asquith and Mullins, 1986; Ofer and Thakor, 198 tinides and Grundy, 1989). The Traditional Signaling Hypothesis, motivated by asymmetric information between the marketplace a managers. If, in management's assessment, the firm is undervalued, choose to buy back stock. Making such an announcement is thus serving a valuable signal to a less informed marketplace. If marke efficiently, prices should adjust immediately in an unbiased manne equilibrium price should fully reflect the 'true' value of the new inforn no wealth transfer should occur between long-term shareholders selling shares to the firm.

When managers are asked why they repurchase shares on the op the most commonly cited reason is 'undervaluation' and that tl represent a 'good investment', two reasons seemingly consistent wit (Baker, Gallagher, and Morgan, 1981; Dann, 1983; Wansley, Lane, a

[1] From 1985 to 1993, the total value of all announced share repurchases recorded by S Company was $334 billion (excluding REITs and closed-end funds). The comparable d initial public offerings over the same period was $114 billion.

1989). Yet, paradoxically, if prices adjust instantaneously, how can the stock be a good investment for long-term shareholders? In an efficient market, the stock should no longer be undervalued after the announcement, thus eliminating the motivation to undertake the repurchase.

However, managers typically do not announce that they are canceling a repurchase program. This would suggest that the initial market reaction is too low. Given that the average market reaction is only on the order of 3%, this would indeed seem to be the case. It hardly seems plausible that managers would, first, have the ability to recognize such small valuation errors, and second, choose to react to such minor discrepancies. Placed in perspective, 3% is not that much greater than the daily standard deviation of returns for many stocks. If managers are reacquiring shares because of mispricing, it is likely that they perceive substantially greater valuation errors. For example, in October 1993, Midland Resources Inc., a U.S.-based oil and gas concern, announced an open market share repurchase for 5% of its shares. At the announcement, the chairman was quoted as saying: 'If you look at the amount of our reserves, we think (our stock) should be trading for about twice its current value. What it boils down to is, if you can buy a dollar for 50 cents, why not buy it?'

We hypothesize that the market treats repurchase announcements with skepticism, leading prices to adjust slowly over time. We refer to this as the Underreaction Hypothesis, or UH. Evidence consistent with this hypothesis has been documented in a study on fixed-price tender offer stock repurchases. Lakonishok and Vermaelen (1990) find that on average, prices remain at bargain levels for at least two years. Other examples of delayed market reactions include IPOs (Ritter, 1991), mergers (Agrawal, Jaffe, and Mandelker, 1992), proxy contests (Ikenberry and Lakonishok, 1993), and spinoffs (Cusatis, Miles, and Woolridge, 1993). In what is essentially the mirror image of a stock repurchase, Loughran and Ritter (1995) observe a sluggish response by the market to seasoned equity offerings.

Is it possible that the market fully incorporates the information conveyed through an open market repurchase? If so, we should observe that stock prices following the announcement are unbiased, and that long-run performance is not above average. Or, alternatively, do managers in fact really know what they are doing and are correct in their assessment that their stock is a good investment, even after the repurchase announcement? These fundamental questions motivate the remainder of this paper.

We examine a sample of 1,239 open market share repurchases announced between January 1980 and December 1990 by firms whose shares traded on the NYSE, ASE, or NASDAQ. Similar to the findings reported in earlier research, the average market response to the announcement of an open market share repurchase is 3.5%. Furthermore, this initial reaction is consistent with several predictions of the TSH. For example, the market reacts more favorably to

announcements made by low market capitalization firms and by firr
ing large repurchase programs.

The most striking finding of this paper is that the information c
open market share repurchases is largely ignored. Managers ol
repurchase their own shares appear to have been correct, on
assuming that they can buy shares at bargain prices to the ben
long-term shareholders. Beginning in the month following the rep
nouncement, the average buy-and-hold return over the next four y
than 12% above that of a control portfolio.

If undervaluation is an important motive overall, it should be
important for out-of-favor stocks, which tend to have high boo
ratios. Yet, surprisingly, the market reaction to repurchase ann
is similar across all book-to-market groups. Over the long run, h
largest abnormal returns following buyback announcements are
high book-to-market firms. The average return over the next fo
a buy-and-hold portfolio of these stocks is 45.3% above that c
portfolio of similar size and book-to-market firms. For low boo
firms, no abnormal performance is observed in long-run returns.

The remainder of the paper is organized as follows: In Section 2,
the data and our sample. Issues regarding performance measu
significance tests are discussed in Section 3. In Section 4, we ex
returns surrounding the announcement of open market share rep
Section 5, we examine long-run performance. In Section 6, we
determinants of long-run performance. In Section 7, we check the r
our findings. Conclusions are provided in Section 8.

2. Data

Our sample was formed by identifying all announcements reported
Street Journal from January 1980 through December 1990 that state
intended to repurchase its own common stock through open market t
We examine all open market share repurchase announcements witho
whether the programs were actually completed. We further requir
firms be included on the daily Center for Research in Security Pr
NYSE and ASE tapes or daily CRSP NASDAQ tapes, as well as
industrial Compustat file at the time of the announcement. For
analysis, we exclude all announcements made in the fourth quar
Following the 1987 crash, 777 NYSE, ASE, and NASDAQ firms
either new or increased share repurchase programs totalling over
largely in response to their low post-crash share prices. Although we
ined announcements made during this period, these cases are not inc
results we report in order to avoid having this unusual period domina

Table 1 shows the distribution of the repurchase announcements by year, the average percentage of shares repurchased, and the dollar value of the repurchase announcements. These repurchases, if fully completed, would have totalled $142 billion. Over the entire 11-year period, sample companies announced repurchases for, on average, 6.6% of their outstanding shares. This percentage generally rose over our sample period. Table 1 also shows the distribution of announcements according to firm size. Size deciles were determined in the month prior to the announcement, and were based on market equity value relative to the universe of all NYSE and ASE stocks covered by both CRSP and Compustat. Our sample has a bias favoring larger firms. Nearly one-third of our sample is ranked in the two largest size deciles.

3. Methodology

3.1. Performance measurement

We examine both short-term returns surrounding the announcement and long-term performance following the announcement. Short-term performance is calculated over various windows from 20 days before to 10 days following the announcement. When abnormal returns are calculated over such short intervals, the results are not overly sensitive to the benchmark used. Thus, we report results using a straightforward approach, calculating abnormal returns in relation to the CRSP equal-weighted index of NYSE and ASE firms. We also calculated short-term performance relative to other benchmarks, including the CRSP value-weighted index as well as a size-based approach, but the results were essentially the same.

Care must be taken when calculating long-run performance, because the findings can be sensitive to the procedures used (see Chopra, Lakonishok, and Ritter, 1992). In this paper, we pursue two different approaches. The first is the more common technique based on cumulative abnormal returns (CARs) relative to some benchmark. The second approach calculates long-run abnormal performance assuming a buy-and-hold strategy. For both of these methods, abnormal returns are calculated relative to four benchmarks: the CRSP equal- and value-weighted indices of NYSE and ASE firms, a size-based benchmark, and a size- and book-to-market-based benchmark. This last benchmark is motivated by the recent work of Fama and French (1992, 1993) and Lakonishok, Shleifer, and Vishny (1994).[2]

[2]To distinguish 'value' stocks from 'glamour' stocks, a variety of ratios exist aside from book-to-market. From example, Lakonishok, Shleifer, and Vishny (1994) find that classifying stocks by cash-flow-to-price produces an even larger spread in returns than does sorting by book-to-market. However, sorting on the basis of cash-flow-to-price poses some difficulties when cash flow becomes negative. Hence, we classify firms using book-to-market ratios.

Table 1
Descriptive statistics for open market share repurchase announcements between January 1980 and December 1990

This table reports the number of open market share repurchases announced in the *Wall Street Journal* by year for ASE, NYSE, and NASDAQ firms, the dollar value of these announcements, the percent of shares announced for repurchase, and the size decile rank of the firms when the announcement was made. In some cases, firms did not state the number of shares they intended to repurchase. Size decile rankings are determined relative to all ASE and NYSE firms on the annual industrial Compustat tape in the month prior to the repurchase announcement, where the smallest firms are ranked in decile 1.

				Percent of shares announced for repurchase					Size decile rank at announcement				
Year	*n*	$ (billion)	Mean % of share announced	0 to 2.5%	2.5 to 5%	5 to 10%	Above 10%	Not stated	Small 1–2	3–4	5–6	7–8	Large 9–10
1980	86	1.429	4.73	31	20	27	6	2	9	15	16	18	28
1981	95	3.013	5.24	29	26	23	13	4	13	12	16	21	33
1982	128	3.106	5.74	25	38	42	18	5	22	14	35	21	33
1983	43	1.645	5.05	11	18	9	3	2	5	4	6	10	18
1984	203	10.105	5.57	34	78	53	24	14	35	39	50	28	51
1985	113	14.380	7.45	22	30	34	24	3	16	23	17	18	39
1986	145	17.189	7.12	30	36	37	33	9	17	27	26	29	46
1987	92	27.380	7.92	14	20	31	26	1	10	15	14	18	35
1988	121	14.967	7.15	20	30	38	26	7	17	15	23	24	42
1989	117	31.971	8.53	18	28	35	33	3	14	15	17	24	47
1990	96	17.403	7.84	10	28	37	21	0	14	18	15	18	31
All years	1239	142.587	6.64	244	352	366	227	50	172	197	235	229	406

3.1.1. The CAR approach

Under the CAR approach, abnormal returns are calculated each month relative to a benchmark, and then aggregated over time. This procedure assumes monthly rebalancing, with sample firms receiving equal portfolio weights each month. Furthermore, abnormal performance is not based on compounded returns. Although takeovers and bankruptcies reduce the number of firms in the sample as event-time progresses, these cases are not excluded from our analysis. Abnormal performance is measured using the returns to all companies existing in a given event month, even those that eventually depart the sample.

Calculating performance relative to the CRSP equal- and value-weighted indices is straightforward and requires no further discussion. To calculate abnormal returns adjusted for size, we form ten size-based portfolios at the end of April each year, using all NYSE and ASE firms on both CRSP and Compustat. Monthly returns are calculated for these ten portfolios over the next year, assuming equal weighting. These returns are then used as benchmarks to measure abnormal performance. Each month, abnormal returns are calculated for each repurchase firm relative to its respective size benchmark. CARs are then calculated by averaging across all repurchase firms each month, and summing over time.

To calculate abnormal returns controlling for both size and book-to-market, each of the ten size deciles discussed above is further sorted by book-to-market ratio into quintiles. Quintile 1 contains the 20% of all stocks in a given size decile with the lowest book-to-market ratios. At the other extreme are the 20% of firms within a given size decile with the highest ratios. This sorting results in 50 benchmark portfolios for each month (10 size deciles times 5 book-to-market quintiles). As is done when we adjust only for size, all firms are ranked at the end of each April for the following 12 months. We assume a four-month lag in reporting financial results to avoid any look-ahead bias. Thus, for companies whose fiscal year ends in December, the book equity value will be recent. For firms with fiscal year-ends following December but preceding April, we calculate book-to-market ratios using book equity values from the prior year. Abnormal performance for each of the repurchase firms is then calculated using the appropriate size and book-to-market benchmark.[3]

[3]As a check on the validity of this approach, we examined whether a randomly drawn sample with the same size and book-to-market characteristics would also produce abnormal performance. We did this by pooling the announcement dates of all repurchases firms along with their corresponding size and book-to-market rankings. We then formed a random sample by arbitrarily drawing from this pool 2,500 times and assigning the announcement date to a randomly chosen NYSE or ASE firm that had the same size and book-to-market ranking at that point in time. In each of the 48 months following the 'event' month, the cumulative abnormal return for this random sample was less than $\pm$ 1.5%, using the size and book-to-market approach, and was always within one standard error. When performance was measured using the CRSP equal- or value-weighted index of NYSE and ASE stocks, CARs were in excess of two standard errors in many cases.

3.1.2. The buy-and-hold approach

The results obtained using the CAR approach should be re descriptive in nature, since they do not represent a realistic investme However, our second approach presents a more feasible strategy. We equal-weighted buy-and-hold investment in all repurchase firms be the month following the announcement and continuing for 12 month year, the portfolio is rebalanced, thus reducing the possibility that a firms will dominate the return calculations. The multi-year total ret investment strategy is calculated by compounding average annual re time.

If a firms departs the sample prematurely, we assume the investmer the last available price on CRSP, and that the proceeds from th reinvested for the remainder of the year in that firm's benchmark p the end of the year, the portfolio is rebalanced, using only the survi Firms used to calculate benchmark returns were treated similarly.

To calculate abnormal performance, we form four benchmarks. similar in spirit to the four benchmarks created for the CAR app calculated in a manner consistent with the buy-and-hold investmer To save space, we report results only for the size and book-to-mar mark approach. To form the reference portfolio, all firms listed on and ASE and also carried on Compustat are sorted each month int size and book-to-market portfolios, as described earlier. Beginning month, the one-year buy-and-hold return is calculated for each firm portfolio. The equal-weighted average of all annual returns in a give is then used as a benchmark return for firms ranked in that particul book-to-market rank at that point in time. Thus, this procedure compute annual buy-and-hold returns for each of the 50 benchmark each calendar month.

In addition to annual returns, we also measure compounded performance for two, three, and four years following the repurchase ment. To calculate a two-year abnormal return, we take the differen the compounded two-year return to repurchase firms, assuming after the first year, and that of the reference portfolio.[4] Abnormal p in years three and four is treated similarly.

3.2. Significance testing

Significance levels are calculated for daily, monthly, and annual r daily cumulative abnormal returns, we use the event-time methodolo

[4]The size and book-to-market ranking of a particular firm may change from yea accommodate this, we also allow the benchmark used to compute abnormal performa over time.

by Brown and Warner (1985). Here, standard errors are estimated from the time series of daily portfolio abnormal returns calculated over days −250 to −21 relative to the repurchase announcement. Autocorrelation in daily abnormal returns in this study is low. Corrections we made for autocorrelation had essentially no impact on the results. Thus, we present t-tests that assume zero autocorrelation. To estimate significance levels for monthly CARs, we also use the event-time methodology described by Brown and Warner (1980). Standard errors are calculated in a similar fashion, using months −36 to +48 relative to the repurchase announcements. As before, we calculate t-tests assuming time independence, since corrections for autocorrelation had essentially no impact on the analysis.

For a variety of reasons, the approach described above is not appropriate when examining annual buy-and-hold or compounded multi-year returns. For example, estimating standard errors using an event-time approach requires a reasonable number of annual observations. Many firms simply do not have a long history of returns. Moreover, for those firms where the availability of returns is not an issue, it is questionable whether the return distribution is stable over such a long period of time. Further, since buy-and-hold returns are compounded rather than cumulated over time, multi-year standard errors cannot be simply inferred from annual standard errors. And finally, the skewness of long-run returns and the clustering of observations in time also pose problems for traditional significance tests.

Therefore, statistical inference of annual buy-and-hold and compounded multi-year returns is done via bootstrapping, as applied by Brock, Lakonishok, and LeBaron (1992) in their examination of technical trading strategies. Under this approach, we generate the empirical distribution of annual buy-and-hold and multi-year compounded abnormal returns under the null hypothesis. Specifically, for each repurchase announcement in our sample, we randomly select with replacement a firm listed on the NYSE or ASE that has the same size and book-to-market ranking at that point in time. We treat this randomly chosen company as if it had announced a repurchase on the same day as the corresponding repurchase firm. This matching process continues until each firm in our repurchase sample is represented in this pseudo-portfolio. This portfolio will have one randomly drawn firm for each actual repurchase firm, matched in time with similar size and book-to-market characteristics. After forming a single pseudo-portfolio, we estimate long-run performance in the same manner as we did for the repurchase sample. This yields one observation of the abnormal performance obtained from randomly forming a portfolio with the same characteristics as our repurchase sample. This entire process is repeated until we have 1,000 pseudo-portfolios, and thus 1,000 abnormal return observations. This provides us with an empirical approximation of the distribution of abnormal returns drawn under the null model specific to our sample. The null hypothesis is rejected at the α percent level if the abnormal return obtained from the

repurchase sample is greater than the $(1-\alpha)$ percentile abnormal served in the empirical distribution. The appeal of the bootstrap ε that it avoids many of the problems that plague t-tests regarding a over normality, stationarity, and time independence of observations. from these basic assumptions are especially worrisome for returns over long intervals, such as a year or more. To the extent that thes exist in long-run returns, they are also present in our pseudo-portfoli are controlled for in our tests.

We also examine long-run firm performance by time period as book-to-market ranking at the time of the repurchase announc associated p-values are estimated by repeating the entire bootstrap for each subsample. For example, when we report long-run perfo high book-to-market stocks announcing buybacks, the associated p derived from the distribution of abnormal returns obtained from 1,0 portfolios specifically matched to this particular subsample.

4. The market reaction to open market share repurchase announcem

Table 2 provides a comprehensive analysis of short-term abnor surrounding repurchase announcements in our sample. Looking at announcements overall, there are negative abnormal returns prior nouncement, measured from days -20 to -3, totalling -3.07%. T market reaction, measured from two days before through two day publication of the announcement in the *Wall Street Journal*, is 3.54' ing the announcement, returns appear on average to be quite similar the market. This evidence is similar to the findings reported by other examining repurchase announcements (for example, Vermae Comment and Jarrell, 1991).

The initial market reaction changes only slightly across subperio ing from 4.25% between 1980 and 1983 to 2.33% in the period 19 Consistent with the TSH, larger share repurchase programs are rec favorably by the market. For example, the mean announcement per mal return is 4.51% for programs which are for more than 10% of c shares. For those programs which are for less than 2.5% of outstanc the average market reaction is 2.58%.

Table 2 also reports short-term announcement returns accord reason provided in the abstract of the *Wall Street Journal Index*. So should be exercised here, since it is difficult to assess manager motivation for the repurchase by reading such abbreviated press Furthermore, no reason was mentioned in nearly 85% of the cases. few cases in which a reason was mentioned, undervaluation was a theme. For the 38 cases in which undervaluation was specifically

both the negative drift prior to the announcement (− 5.52%) and the market reaction at the announcement (5.31%) were comparatively large.

The size decile panel in Table 2 shows short-term performance by firm size. The market reaction shows clear differences across size groups. Firms ranked in the two smallest size deciles show the highest abnormal returns on average, 8.19%, more than double that observed overall. Those in the two largest size deciles exhibit an abnormal return of only 2.09%. If firm size is viewed as a proxy for information asymmetries, the observed relationship between size and abnormal returns is consistent with the TSH.

Separating the various motivations for undertaking an open market stock repurchase is difficult. One approach is to examine announcement returns in relation to book-to-market ratios. Firms with low book-to-market ratios are likely to repurchase shares for reasons other than undervaluation. At the other extreme, repurchases announced by firms with high book-to-market ratios, or value stocks, are more likely to have undervaluation as their primary motivation. However, we see in Table 2 that the market reaction to the repurchase announcement is similar across the five book-to-market quintiles. The average market reaction for firms in quintile 1 (glamour stocks) is 3.36%, while it is 3.56% for firms in quintile 5 (value stocks).

To further clarify the nature of announcement returns, we regressed announcement returns on various firm characteristics. To control for the possibility that positive announcement returns reflect mean reversion arising from negative returns observed prior to the announcement, we also included in the regression the CAR from days − 20 to − 3. Although not reported here, the results are consistent with the evidence reported in Table 2, even after controlling for the impact of return reversals. As the percentage of shares announced for repurchase increases, the market reaction increases, and as firm size increases, announcement returns decline substantially. Yet, as before, the regression results provide no indication that the book-to-market ratio has any impact on the market reaction to repurchase announcements.

5. The long-term performance of firms repurchasing their own shares

Fig. 1 plots CARs up to 48 months following a repurchase announcement, using four different benchmarks. These CARs are calculated beginning in month 1, and thus exclude the initial market reaction to the announcement. The picture that emerges is that firms that announce an open market stock repurchase tend to perform abnormally well in the long run. Focusing on size-adjusted returns, the CAR from month 1 to 36 is 8.69% ($t = 2.50$). Following month 36, abnormal returns are close to zero. This positive drift cannot be explained by the book-to-market effect. When returns are adjusted for both size and book-to-market, the CAR from month 1 to 36 is nearly the same, 8.17% ($t = 2.37$). Focusing only on

Table 2

Abnormal returns on and around the announcement of open market share repurchases, 1980 to 1990

The table reports abnormal returns (in percent) measured with respect to the CRSP equal-weighted index over days −20 to −3, −2 to +2, and +3 to +10 relative to the announcement of an open market share repurchase made during the period January 1980 through December 1990 (*t*-statistics reported in parentheses). Abnormal returns are reported for all sample firms and by time period, the percentage of shares announced for repurchase, the reason stated by the company for the repurchase (if any), the size decile rank, and the book-to-market quintile rank in the month prior to announcement.

		Days relative to repurchase announcement		
	n	−20 to −3	−2 to +2	+3 to +10
All firms	1239	−3.07 (−9.91)	3.54 (21.72)	0.21 (1.00)
Time period				
1980 to 1983	352	−3.59 (−6.40)	4.25 (14.37)	0.91 (2.42)
1984 to 1986	461	−2.86 (−6.47)	4.12 (17.71)	−0.03 (−0.09)
1987 to 1990	426	−2.86 (−5.79)	2.33 (8.94)	−0.12 (−0.36)
Percent intended to repurchase				

Stated reason							
Undervalued	38	− 5.52	(− 3.38)	5.31	(6.17)	− 1.29	(− 1.18)
Anti-takeover	7	6.79	(2.09)	5.50	(3.21)	3.76	(1.74)
ESOP or stock option	82	− 1.69	(− 1.70)	3.00	(5.71)	0.24	(0.36)
Acquisition	9	− 3.87	(− 1.39)	2.56	(1.75)	1.49	(0.80)
General corp. purposes	16	− 1.32	(− 0.67)	1.83	(1.77)	2.27	(1.73)
Other	27	− 2.79	(− 1.73)	2.52	(2.98)	− 1.19	(− 1.11)
Not disclosed	1060	− 3.18	(− 9.57)	3.57	(20.40)	0.23	(1.03)
Size decile							
1–2 (small firms)	172	− 3.91	(− 3.12)	8.19	(12.41)	0.70	(0.83)
3–4	197	− 5.71	(− 6.62)	4.67	(10.27)	− 0.76	(− 1.32)
5–6	235	−2.99	(−4.50)	3.08	(8.79)	0.20	(0.46)
7–8	229	− 3.53	(− 6.08)	2.13	(6.96)	0.70	(1.80)
9–10 (large firms)	406	− 1.21	(− 3.61)	2.09	(11.84)	0.19	(0.86)
Book-to-market quintile							
1 (glamour stocks)	201	− 3.53	(− 3.78)	3.36	(6.84)	0.11	(0.18)
2	260	− 4.30	(− 6.72)	3.14	(9.32)	0.48	(1.12)
3	276	− 2.72	(− 4.50)	4.07	(12.80)	0.15	(0.37)
4	230	− 2.54	(− 4.06)	3.46	(10.51)	0.21	(0.49)
5 (value stocks)	241	− 2.17	(− 3.76)	3.56	(11.71)	0.07	(0.18)

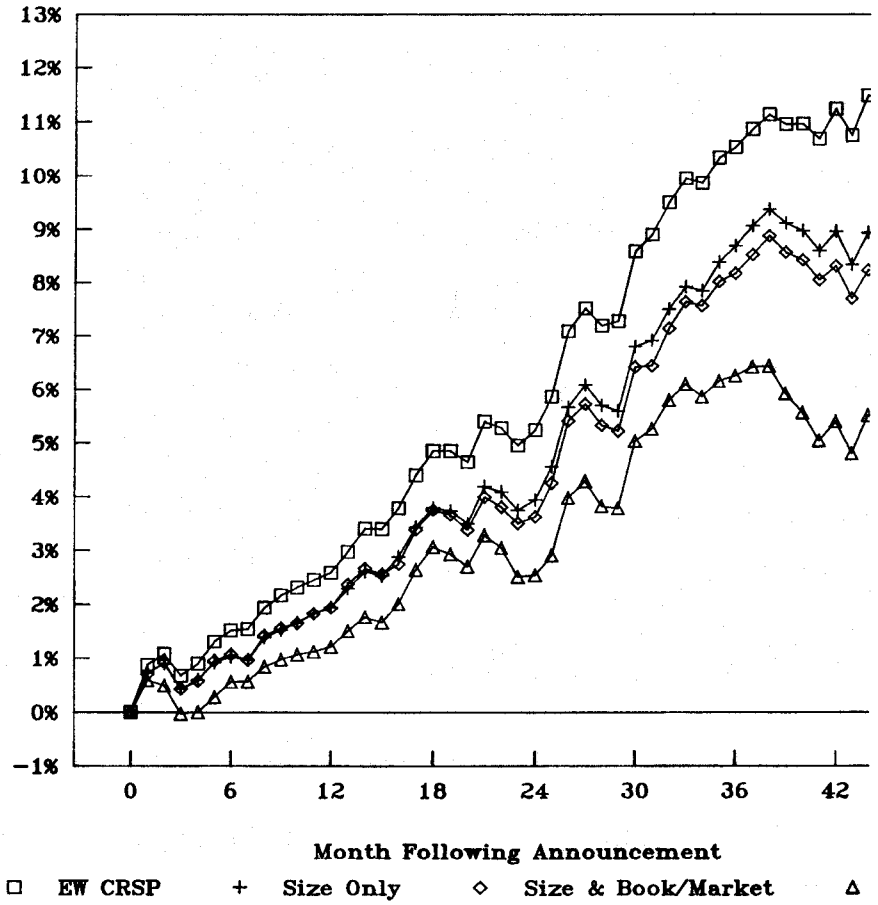

Fig. 1. Comparative monthly cumulative abnormal returns following open market chase announcements, 1980–1990.

This figure plots the cumulative abnormal return (CAR) up to 48 months following th ment of an open market share repurchase. Abnormal returns are calculated using f methods; market-adjusted returns using the CRSP equal-weighted index of ASE and (EW CRSP), size-adjusted returns using equal-weighted portfolio returns of NYSE ar from the same size decile (Size Only), size and book-to-market adjusted returns using eq portfolio returns of NYSE and ASE firms from the same size decile and book-to-ma (Size & Book/Market), and market-adjusted returns using the CRSP value-weighted in and ASE firms (VW CRSP).

the initial market reaction (3.5%), about 70% of the total valuation ignored.

The picture is slightly different when the CRSP value-weighted inc as a benchmark. Although post-announcement abnormal returns ar they are lower than when either the size-only or size and book-

benchmarks are used, and are about half that observed using the CRSP equal-weighted index. This occurs because large firms substantially outperformed smaller firms during the latter portion of our sample period.

Although the CAR approach is straightforward, the analysis is best regarded as descriptive in nature. A more appealing approach is the buy-and-hold procedure described earlier. The results using such an approach are reported in Table 3.[5] The left-hand side of Table 3 shows mean annual returns from buying an equal-weighted portfolio of repurchasing firms, beginning in the month following the announcement and for the subsequent four years. To the right of this column are returns to the reference portfolio, calculated using the size and book-to-market benchmarks corresponding to the repurchase sample. The right side of Table 3 reports total compounded buy-and-hold returns up to four years, allowing for annual rebalancing. Results are also presented for two subperiods; announcements made in years 1980 to 1985 and those made in years 1986 to 1990.

The average return in the first year following the repurchase announcement is 20.80%, 2.04% more than the reference portfolio. This difference in annual returns increases to 2.31% and 4.59% in years 2 and 3, respectively. As we observed in Fig. 1, the phenomenon appears to dissipate by year 4, when the difference is close to zero. Although not reported in the tables, we also examined performance in year 5 and again found abnormal returns close to zero (-0.13%).

Turning to compounded returns, the difference in performance after four years is substantial, 12.14%. The p-value associated with this abnormal return is 0.012. In Fig. 2, we plot the empirical distribution of four-year compounded abnormal returns under the null hypothesis based on our bootstrapping procedure, using 1,000 replications. From this figure, we see that the probability that a random portfolio will exhibit abnormal performance as high as our repurchase sample is remote. In our case, only 12 of the 1,000 pseudo-portfolios demonstrated compounded abnormal returns higher than 12.14% after four years. Focusing on year 3, the difference in compounded returns between the repurchase and the reference portfolio is 12.60% with a corresponding p-value of 0.000, meaning that none of the 1,000 pseudo-portfolios performed as well. Apparently, investing in companies that announce buybacks is a profitable long-run strategy, at least over the decade of the 1980s.

When we turn our attention to the two subperiods, we observe some differences in long-run performance. In the early subperiod, 1980–1985, the compounded abnormal return is 16.02% in year 3. This value decreases slightly to

[5]Because book-equity values were not available for some firms, the number of firms in this table differs slightly from that reported in Table 2.

Table 3
Annual buy-and-hold returns following open market share repurchase announcements, 1980 to 1990

This table reports annual and compounded buy-and-hold returns (in percent) following open market share repurchase announcements for up to four years. Equal-weighted portfolios are formed for all announcements between 1980 and 1990, and for two subperiods, 1980 through 1985 and 1986 through 1990. The reference portfolio is formed using benchmark returns corresponding to the repurchase sample, matched on the basis of size and book-to-market ranking. Compounded holding-period returns assume annual rebalancing. Significance levels are determined via bootstrapping.

		Annual buy-and-hold returns				Compounded holding-period returns			
	n	Repurchase firms	Reference portfolio	Diff.	*p*-value	Repurchase firms	Reference portfolio	Diff.	*p*-value
All firms									
Year 1	1208	20.80	18.76	2.04	0.064	20.80	18.76	2.04	0.064
Year 2	1188	18.12	15.81	2.31	0.098	42.69	37.53	5.16	0.011
Year 3	1047	21.77	17.18	4.59	0.002	73.75	61.15	12.60	0.000
Year 4	893	8.56	9.51	−0.96	0.892	88.62	76.48	12.14	0.012
1980 to 1985									
Year 1	646	32.36	28.89	3.47	0.029	32.36	28.89	3.47	0.029
Year 2	637	25.23	21.76	3.47	0.017	65.75	56.93	8.82	0.002
Year 3	615	21.79	18.43	3.36	0.035	101.87	85.85	16.02	0.000
Year 4	583	10.38	12.07	−1.68	0.938	122.83	108.28	14.55	0.024
1986 to 1990									
Year 1	562	7.52	7.11	0.41	0.444	7.52	7.11	0.41	0.444
Year 2	551	9.91	8.93	0.97	0.338	18.17	16.68	1.49	0.349

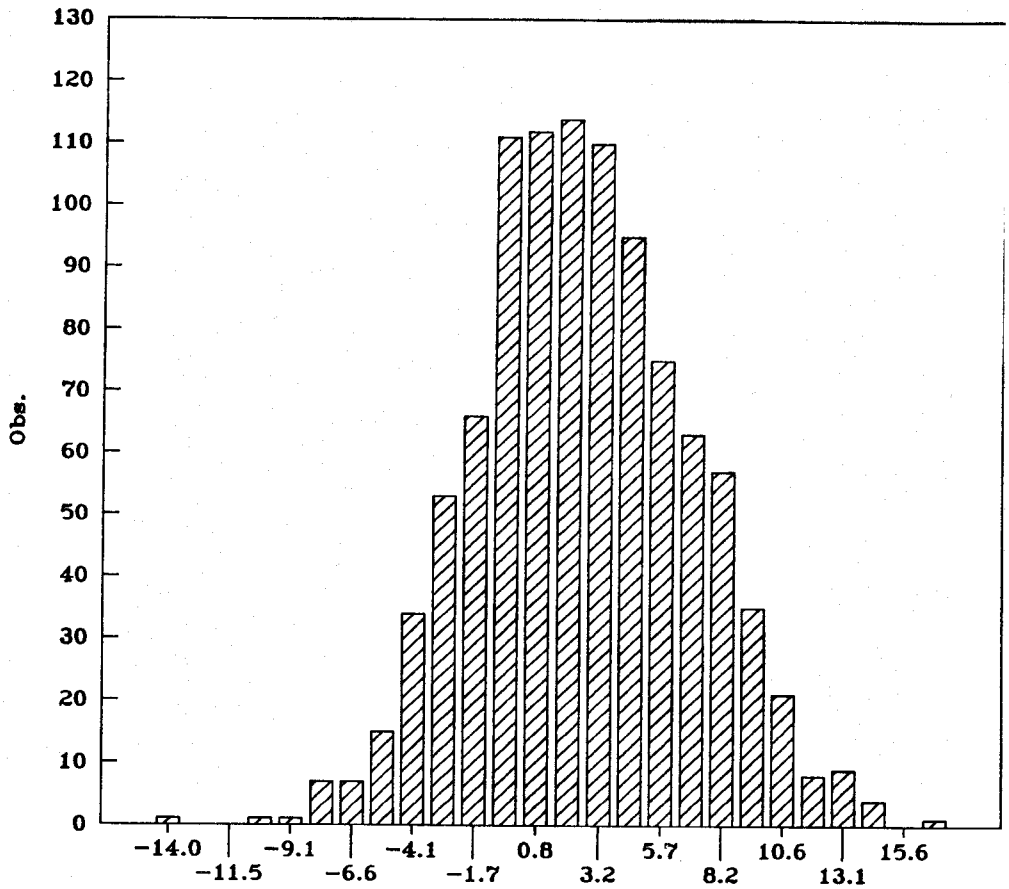

Fig. 2. Compounded four-year abnormal performance (in percent) adjusted for size and book-to-market under the null hypothesis for open market share repurchase announcements between January 1980 and December 1990.

This histogram plots the empirical distribution of four-year compounded abnormal returns for 1000 bootstrap portfolios specific to our sample of repurchase announcements. Each portfolio is formed by taking the post-announcement returns for a given sample firm and replacing them with the returns to a firm randomly chosen from the NYSE or ASE with the same size and book-to-market classification at that point in time. This is done for each firm in the sample, thus forming a single portfolio. This entire process is then repeated until 1000 such portfolios are formed. The compounded abnormal performance from these randomly formed portfolios provides us with an empirical estimate of the distribution relevant to the entire sample of repurchase announcements in our study. The empirical distributions for subsamples are unique and are therefore estimated separately.

14.55% in year 4. In both years, abnormal performance is statistically significant at traditional confidence levels. In the later subperiod, 1986–1990, compounded abnormal performance after year 3 is 9.21% and is highly significant. In year 4, compounded abnormal performance increases slightly to 10.24%, but is only

marginally significant. Of course, some variation from one subperiod t is to be expected. Yet the impact of year 3 in the later subperiod and th our study on the 1980s may give some cause for concern regarding ro Nevertheless, the results overall are significant. Moreover, we can look related papers which report evidence consistent with our findings. For Nelson (1994) uses CRSP data from 1926 to 1985 to examine firms t substantial changes in the number of shares outstanding. He reports long-run performance for companies that decrease shares outstandin which occurs prior to year 4. He also finds inferior long-run perforn firms that increase shares. In the context of tender offer rep Lakonishok and Vermaelen (1990) also report evidence of a prolonge drift for announcements made between 1962 and 1986.

6. Undervaluation as a motive for open market share repurchases

6.1. Long-term performance by book-to-market quintile

Undervaluation appears to be an important factor motivating com repurchase shares. However, a variety of other motives also exist. An i question is whether the excess long-run performance we observe overa pronounced in those cases that are more clearly motivated by under Identifying such firms *ex ante* is, of course, a challenge. One possibilit is to examine long-run performance conditional on book-to-market

Several recent studies report that firms with high book-to-market ra substantially higher returns than those with low book-to-mark Lakonishok, Shleifer, and Vishny (1994) find that this difference c explained by risk, but is instead due to behavioral and institutional ations. Many underpriced stocks have high book-to-market ratios. I pensity to repurchase shares is related to the degree of underpricing, o expect the most undervalued firms among those with high book-t ratios to be active in buybacks. If the market underreacts to buyback a ments, high book-to-market firms announcing buybacks should not perform the overall market, but also outperform a benchmark that a book-to-market. To some degree, this argument parallels that of La Shleifer, and Vishny (1994). They observe that not all high book-t stocks are truly out-of-favor. Using a variety of two-way classificati find differences in the stock returns of high book-to-market firms. For high book-to-market stocks that performed well in the past substantia perform high book-to-market stocks with poor past performance, or might be considered truly out-of-favor.

On the other hand, if managers in low book-to-market firms have ability to recognize undervaluation, they too will tend to announce

when their stock is undervalued. However, Lakonishok, Shleifer, and Vishny (1994) suggest that few of these stocks are truly underpriced. If underpricing were the only motive for repurchasing shares, one would expect few low book-to-market companies to be involved in buybacks. Yet the evidence in Table 2 shows that the propensity for low book-to-market firms to announce buybacks is nearly the same as for high book-to-market firms. Thus, for these firms, the motivation for repurchasing shares would not seem to be dominated by undervaluation. For example, managers in low book-to-market firms may view buybacks as a way to artificially support prices that have typically risen dramatically in the recent past. In addition, executives in low book-to-market firms are more likely than executives in high book-to-market firms to take advantage of prior stock performance by exercising options. As these options are exercised, many firms choose to repurchase shares to avoid dilution in ownership. And finally, given the relatively superior past performance of low book-to-market companies, managers in these firms may be more prone to hubris, and thus repurchase shares that are not underpriced. Thus, for firms with low book-to-market ratios, true undervaluation would not appear to be as important a motive for repurchasing shares as it would be for firms at the other end of the spectrum.

In Table 4, we report long-run performance by book-to-market ranking at the time of the repurchase announcement. Focusing on high book-to-market (or value) stocks in quintile 5, the results are striking. Here, the compounded four-year buy-and-hold return is 135.91%, 45.29% above the reference portfolio return of similar size and book-to-market companies. The associated p-value here is 0.000, meaning that none of the 1,000 pseudo-portfolios specifically formed for this subsample performed as well.[6] This extraordinary performance is not limited to a small number of cases. Value stocks comprise 26.2% of the sample measured on a dollar-weighted basis. To check the robustness of our findings for value stocks, we also calculated long-run performance for this group on a year-by-year basis. In each case, four-year compounded abnormal returns were positive.[7]

[6]As we observed overall, the positive drift observed in value stocks repurchasing shares is generally confined to the first three years. By year 4, the difference between this portfolio and its respective benchmark, though positive (3.23%), is not significant using traditional confidence levels. As a check, we also examined performance in year 5, and found that the difference narrows further to 2.06%.

[7]Four-year compounded abnormal returns can be computed for those announcements made prior to 1989. The aveage four-year compounded abnormal return on a year-by-year basis is as follows: 1980, 57.1%; 1981, 23.5%; 1982, 213.1%; 1983, 25.5%; 1984, 13.0%; 1985, 72.6%; 1986, 15.0%; 1987, 15.4%; 1988, 32.4%.

Table 4
Annual and compounded buy-and-hold returns by book-to-market quintile following open market share repurchase announcements, 1980 to 1990

This table reports annual and compounded buy-and-hold returns (in percent) for equal-weighted portfolios of firms announcing open market share repurchases, for up to four years following an open market share repurchase announcement by book-to-market quintile ranking. Ranks are determined by sorting into size deciles all NYSE and ASE firms on the annual industrial Compustat tape. Each decile is further sorted into quintiles on the basis of book-to-market, with the lowest ratios assigned to quintile 1. Firms that could not be ranked at the time of the announcement are excluded. The reference portfolio comprises benchmark returns matched to the repurchase sample on the basis of size and book-to-market. Compounded holding-period returns assume annual rebalancing. Significance levels are determined via bootstrapping.

	Annual buy-and-hold returns				Compounded holding-period returns			
n	Repurchase firms	Reference portfolio	Diff.	*p*-value	Repurchase firms	Reference portfolio	Diff.	*p*-value
Book-to-market quintile 1 (glamour stocks)								

Book-to-market quintile 2									
Year 1	260	20.59	18.43	2.16	0.206	20.59	18.43	2.16	0.206
Year 2	250	12.34	15.07	− 2.73	0.487	35.47	36.28	− 0.81	0.625
Year 3	223	22.39	17.29	5.10	0.070	65.80	59.84	5.96	0.220
Year 4	191	3.20	6.99	− 3.79	0.668	71.10	71.02	0.08	0.498
Book-to-market quintile 3									
Year 1	276	19.49	16.46	3.03	0.087	19.49	16.46	3.03	0.087
Year 2	268	18.23	17.33	0.90	0.487	41.27	36.64	4.63	0.174
Year 3	225	20.77	16.57	4.20	0.070	70.61	59.29	11.32	0.058
Year 4	184	7.45	10.35	− 2.90	0.635	83.32	75.78	7.54	0.308
Book-to-market quintile 4									
Year 1	230	23.43	22.84	0.59	0.374	23.43	22.84	0.59	0.374
Year 2	228	15.16	12.73	2.43	0.178	42.14	38.48	3.66	0.197
Year 3	198	24.05	18.32	5.73	0.067	76.32	63.85	12.47	0.058
Year 4	172	12.44	11.06	1.38	0.567	98.24	81.97	16.27	0.144
Book-to-market quintile 5 (value stocks)									
Year 1	241	24.15	19.49	4.66	0.054	24.15	19.49	4.66	0.054
Year 2	234	26.01	17.23	8.78	0.003	56.44	40.08	6.36	0.003
Year 3	199	29.81	20.49	9.32	0.013	103.07	68.78	34.29	0.000
Year 4	169	16.17	12.94	3.23	0.389	135.91	90.62	45.29	0.000

Although we might expect the quintile 5 stocks in our sample to be undervalued at the time of the announcement, long-run abnormal perf is not exclusive to this subset. For example, firms in quintile 4, which c 21.3% of our sample when measured on a dollar-weighted basis, show abnormal performance of 12.47% after year 3 with an associated p- 0.058. As we move from value stocks toward glamour stocks, long-ru mance declines. For example, the mean four-year compounded abnorm for glamour stocks in quintile 1 is slightly negative, −4.31%.

To investigate further the impact of the book-to-market variable, we the determinants of long-run performance following announcements. W by estimating a cross-sectional regression where the four-year com abnormal return is the dependent variable. If a firm leaves the sample through the four-year period, we assume that the stock is sold and proceeds are reinvested in the reference portfolio so that four-year perf is available for all companies in our sample. The independent variable book-to-market quintile ranking, the size decile ranking, the fraction they intend to repurchase, and the three-year abnormal return pric repurchase to control for mean reversion in returns. Although we do n these results here, book-to-market is by far the strongest variable r long-run performance.

7. Robustness

In this section, we examine the robustness of our findings, especi respect to repurchases announced by value stocks where abnormal re particularly high. Specifically, we explore three issues: the impact of t performance measurement, and multiple announcements.

7.1. The impact of takeovers

It is possible that the abnormal performance observed for firms repu shares is caused by an unusually high incidence of takeovers. To the ex this is not anticipated by the market, the upward drift may be a consec takeover premiums. This might be a particularly relevant issue for valu whose relatively low prices may have been attractive to bidding f investigate this possibility, we compared long-run performance overall observed for only those firms that survived at least four years follo announcement. Three-year compounded abnormal performance for a ments made between 1980 and 1988 is 13.0%. Of this group, 84.4% Focusing only on survivors, the three-year compounded abnormal r minishes to 6.7%, though still significant.

For repurchase firms ranked in the highest book-to-market quintile, returns also diminish when we focus on survivors, yet abnormal performance is still extremely positive. Here, compounded three-year abnormal performance falls from 39.7% using all eligible firms to 31.6% when only survivors are examined. The survival rate in this group (86.2%) differs little from that observed overall. Thus, the presence of takeovers in our sample does not appear to explain the abnormal returns of firms that repurchase shares, particularly in those cases in which book-to-market ratios are high and long-run performance is so positive.

7.2. *Performance measurement*

Fama and French (1993) suggest a three-factor model to measure abnormal performance. The first factor is the excess return to a value-weighted portfolio of NYSE, ASE, and NASDAQ stocks. The second and third factors represent size and book-to-market factors. These two factors are formed by sorting NYSE, ASE, and NASDAQ stocks on the basis of market equity into either a small-cap or large-cap portfolio measured relative to the median NYSE stock at the end of each June. These same stocks are also independently sorted on the basis of book-to-market into one of three portfolios. Those whose low book-to-market ratios rank them in the bottom 30% of all NYSE stocks are sorted into the first portfolio. Those with ratio values among the middle 40% of all NYSE stocks are included in the second portfolio, while the third portfolio contains those stocks with high book-to-market ratios that rank them among the top 30% of NYSE stocks. Value-weighted returns are calculated on a monthly basis for six portfolios defined from the intersection of the two size portfolios and three book-to-market portfolios. The size factor in the Fama–French three-factor model is then calculated monthly by taking the difference in the average return between the three small-cap portfolios and the three large-cap portfolios. The book-to-market factor is calculated similarly, taking the difference in the average return between the two high book-to-market portfolios and the two low book-to-market portfolios.

To use this procedure, we form a time series of monthly returns in calendar time. Specifically, we buy companies at the end of the month in which a repurchase announcement is made and keep them for 36 months. The composition of the portfolio changes over time. Each month, the portfolio is rebalanced, new firms are added as they make announcements, and old firms are removed. This results in a time series of monthly returns for announcements between 1980 and 1990. The main puzzle is the extraordinary performance obtained for value stocks. Thus, we again form portfolios based on book-to-market rankings at the time of the repurchase announcement. Excess monthly returns are then regressed on the three Fama–French factors. We exclude from our analysis returns during the first six months of 1980. In these initial months, the number of firms in each portfolio is small. The alpha from each regression is a monthly estimate

of abnormal performance similar in spirit to Jensen's alpha, but contrc and book-to-market factors in addition to the overall market.

This approach differs from the buy-and-hold procedure in several First, returns are rebalanced monthly, thus the abnormal performar ured under this approach is less representative of a realistic investmen Second, this procedure assumes that the coefficients are stable over tir implies that the characteristics of the portfolios are not changing.

The results are reported in Table 5. The alpha obtained in the first r using book-to-market quintile 1 stocks (glamour stocks) is −0.30% p though not significant from zero at traditional confidence levels. T obtained using book-to-market quintile 5 stocks (value stocks) is 0 month and is highly significant. The spread in performance between low book-to-market firms repurchasing their shares is 0.73% per r 8.76% per year, and is consistent with our earlier findings. Gibbons, Shanken (1989) suggest an F-statistic to test more formally whether t produced in these regressions are jointly equal to zero. The F-statistic a with our analysis is 2.624, with an associated probability level of 0. rejecting the hypothesis that the alphas are jointly equal to zero.[8]

Although not reported here, we also applied the Fama–French th model in a Returns Across Time and Securities (RATS) framework, wh returns in event time. This approach relaxes assumptions regarding p stability. Thus, alphas are calculated monthly for 36 months follc repurchase announcement. The difference in alphas between high book-to-market stocks averages 0.69% per month, a result simil calendar-time approach.

7.3. *Multiple announcements*

Nearly one-fourth of our cases are firms that had a repurchase anno in the prior three years. We examined whether these cases were affecting our results. Firms making repeat repurchase announcement strong performance. Compounded abnormal performance after three these firms is 15.0%. Yet, repeat announcements cannot explain the performance we observe overall. Focusing on those firms that a buybacks for the first time, or those that have not made an announ

[8]Based on our early approach, we have interpreted the long run to be either three o Here, we report analysis for a 36-month holding period. However, our results are not ove to the holding period assumed. When we extend the holding period to 48 months, the alpha between quintile 1 and quantile 5 is essentially the same as before (0.74% per associated F-statistics is 2.308 with a probability level of 0.952, which again rejects th that the alphas from the five regressions are jointly equal to zero.

Table 5
Fama–French three-factor model regression coefficients

Below are coefficients obtained from regressing excess monthly portfolio returns on the following three-factor model, as suggested by Fama and French (1993):

$$r_{p,t} - r_{f,t} = \alpha + \beta_m(r_{m,t} - r_{f,t}) + \beta_s(r_{\text{small},t} - r_{\text{large},t}) + \beta_{bm}(r_{\text{high},t} - r_{\text{low},t}) + \varepsilon_t,$$

where $r_{p,} - r_{f,t}$ is the excess portfolio return in month t, $(r_{m,t} - r_{f,t})$ is an overall market factor formed by calculating the excess portfolio return to a value- weighted portfolio of NYSE, ASE, and NASDAQ firms. $r_{\text{small},t} - r_{\text{large},t}$ is a size factor and $r_{\text{high},t} - r_{\text{low},t}$ is a book-to-market factor. These two factors are calculated by first identifying NYSE, ASE, and NASDAQ stocks as either 'small' or 'large' relative to the median market equity value of NYSE stocks at the end of each June. These same stocks are independently sorted into one of three portfolios on the basis of their book-to-market ratio. These three portfolios are defined as those with low book-to-market ratios among the bottom 30% of all NYSE stocks, those with ratio values among the middle 40% of NYSE stocks and, finally, those with high book-to-market ratio values among the top 30% of NYSE stocks. Value-weighted returns are calculated on a monthly basis for six portfolios defined from the intersection of the two size portfolios and three book-to-market portfolios. The size factor is then calculated monthly by taking the difference in the average return between the three small-cap portfolios and three large-cap portfolios. The book-to-market factor is calculated by taking the difference in the average monthly return between the two high book-to-market portfolios and the two low book-to-market portfolios. Portfolio returns for the repurchase sample are formed in calendar time. We assume that sample firms are bought at the end of the month in which an open market repurchase announcement is made. New firms are added each month as announcements occur and are removed 36 months following the announcement. Portfolios are formed by book-to-market rank at the time of the announcement for repurchase announcements between 1980 and 1990. Because of small samples during the initial months, portfolio returns obtained for the first six months of 1980 are ignored.

Book-to-market rank	α	β_m	β_s	β_{bm}	R^2
1 (glamour stocks)	− 0.30 (t = − 1.23)	1.04	0.86	0.02	80.3
2	0.07 (t = 0.45)	1.06	0.59	0.00	90.3
3	0.12 (t = 0.93)	1.03	0.67	0.28	92.3
4	0.13 (t = 0.97)	1.00	0.62	0.34	90.3
5 (value stocks)	0.43 (t = 3.30)	1.08	0.62	0.42	92.1

three years, compounded three-year abnormal performance is still impressive, 11.3%.

This finding is also true of high book-to-market stocks. Here, firms making their first repurchase announcement in three years show compounded abnormal performance three years after the announcement of 26.3%. High book-to-

market stocks making a repeat announcement have compounded
performance after three years of 56.4%. If managers seek to acquire sl
the market at bargain prices, rather than announce one large share r
they might instead opt for a series of smaller announcements stret
several years. Furthermore, if the market underreacts to the first anno
managers with strong conviction that their shares remain underv
choose to make additional announcements.

8. Conclusions

The literature is rich with reasons for why companies repurchase
stock, ranging from signaling to being a substitute for cash divid
managers rarely mention these reasons. Instead, they frequently clair
are repurchasing shares because prevailing market prices 'undervalue
and that it is a 'good investment'. Despite this public endorsement, tl
market response to the news of an open market share repurchase is
Such a small reaction seems inconsistent with the undervaluation the
by managers. Either the market ignores a substantial portion of this u
ation signal, or managers are overly optimistic about their firm's va

We find that on average, the market underreacts to open mar
repurchase announcements. Using a buy-and-hold strategy, four-year
performance following the announcement is more than 12%. Whe
nouncement and long-run returns are combined, the magnitude of
undervaluation is about 15%, a level more consistent with manager's
mispricing.

Undervaluation is an important reason motivating share repurc
other reasons also exist. To distinguish undervaluation from these oth
tions, we sort firms on the basis of book-to-market ratios. Underva
more likely to drive repurchases by high book-to-market companies, w
reasons may motivate repurchases announced by companies with l
For those cases in which undervaluation is the dominant reasor
substantial post-announcement drift might be expected, even after c
for overall book-to-market effects in stock returns. For example, La
Shleifer, and Vishny (1994) show that not all high book-to-market
true out-of-favor stocks. True out-of-favor stocks will show higher retu
future compared with high book-to-market stocks in general. High
market firms that announce stock buybacks seem more likely to
out-of-favor. This indeed appears to be the case. Firms ranked i
book-to-market quintile have four-year abnormal performance of 45.3
ing the repurchase announcement. This occurs using a benchmark that
controls for size and book-to-market effects in stock returns. This i
performance cannot be explained by an abnormally high incidence of

Firms in the bottom two book-to-market quintiles exhibit abnormal returns close to zero or slightly negative, suggesting that true undervaluation was not a primary motive in these cases. Although book-to-market is closely associated with long-run performance, the initial market reaction to repurchase announcements is surprisingly similar across all book-to-market groups.

This evidence is consistent with other studies that find that managers have market-timing ability. A recent paper by Loughran and Ritter (1994) examines the long-run performance of seasoned equity offerings, a corporate action that is the antithesis of a share repurchase. They find evidence of timing ability by observing that managers tend to issue shares when stock prices are high, and that the worst long-run performance occurs following periods of heavy offering activity. Seyhun (1990) finds that managers successfully timed trades of shares in their own firms following the 1987 crash. We find further evidence that managers possess timing abilities. For some reason, the initial market reaction to management's decision to either issue or remove shares is largely ignored by investors in the short run.

This paper adds to a growing body of literature that finds that the market reaction to news is not always completed over short time periods, an assumption made in many event studies. The full impact of corporate announcements can extend over several years. Other examples of such protracted adjustments include initial as well as seasoned equity offerings, mergers, spinoffs, proxy contests, and, in a related context, fixed-price repurchase tender offers. Given the diverse settings of this research, serious concerns should be raised as to the appropriateness of measuring abnormal performance over short windows to assess the economic impact of corporate decisions. Why the market reaction extends over such long periods of time is an intriguing issue that requires further work. Some answers to this puzzle are provided by Shleifer and Vishny (1990), who discuss how market inefficiencies can occur in investments with long horizons.

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