

Market Reaction to Open Market Stock Repurchases and Industry Affiliation

Kartono Liano
Mississippi State University

Gow-cheng Huang
Alabama State University

Herman Manakyan*
Salisbury University

This study conducts an inter-industry comparison of open market common stock repurchases to identify the role of industry affiliation in the magnitude of the short- and long-term returns to firms following the repurchase announcements. Results indicate that stock repurchasing firms enjoy significant positive excess returns during the five-day announcement window, with significant differences across industry groups. Stock repurchasing firms overall do not outperform their industry peers in the long run, however, though firms from different industries exhibit differential long-term performance subsequent to the repurchase announcements. Consequently, industry affiliation is important in the analysis of stock buybacks.

Introduction

An open market stock repurchase program is a popular method used by management to increase value to stockholders. Management can buy back stock, raise dividends, increase capital spending, or make acquisitions to deploy the excess cash. In an *Institutional Investor* (August 1997, p. 31) survey of 1,600 chief financial officers on what they would most want to do with the excess cash, the most popular response (36.2 percent) is to buy back stock, while the least popular response (2.1 percent) is to raise dividends. In another survey by *Institutional Investor* (July 1998, p. 30) the most commonly cited motivation by CFOs for repurchasing stock was “to add value for shareholders.”

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Numerous studies have been conducted to examine the motives for stock repurchases,¹ and the signaling hypothesis has emerged as a common explanation for stock repurchases. According to the signaling hypothesis (Dann, 1981; Vermaelen, 1981), management uses stock buybacks to signal that the stock price is undervalued. Ikenberry, Lakonishok, and Vermaelen (1995) examine the short-term and long-term performance of open market stock repurchase announcements. In the short-term, they find negative abnormal returns 20 to three days prior to the repurchase announcements, positive abnormal returns two days before to two days following the announcements, and no abnormal returns three to ten days following the announcements. In the long term, Ikenberry, et al. find positive abnormal returns one year, two years, and three years following the repurchase announcements. In a later study using Canadian data, Ikenberry, Lakonishok, and Vermaelen (2000) find smaller announcement period returns, along with significant long-term abnormal performance following repurchase announcements. In both studies, Ikenberry et al. observe differences in both short- and long-term abnormal performance between value and growth (glamour) firms as well as small and large firms, announcing stock repurchases.

The effect of stock repurchases on rival firms (an intra-industry analysis) is inconclusive. Hertzal (1991) concludes that rival firms exhibit insignificant announcement period abnormal returns, while Erwin and Miller (1998) document that rival firms experience significant negative stock price reaction.

In addition, recent studies of stock repurchases have examined long-term performance of repurchasing firms in comparison to size and BE/ME matched peers. We would argue that industry affiliation is a more relevant factor in determining relative performance of stock repurchasing firms. Using the traditional capital asset pricing model (CAPM) to examine the beta of different industries, Fama and French (1997) find an average beta of 1.11, with telecommunications and utilities at the low end with a beta of 0.66 and healthcare at the high end with a beta of 1.56. The results reveal that each industry is associated with a unique beta and hence a unique cost of equity. In order to create value for shareholders, management must compare the benefit of buying back shares with the cost of equity. Because the cost of equity changes from one industry to another, the benefit of stock buybacks may vary from industry to industry. In addition, regulatory and other industry-specific factors may affect the impact of stock repurchases across different industries. The literature has yet to address whether the benefit of share-repurchase programs to investors is industry related over the short and long term.

Consequently, the objective of this paper is two-fold. First, as in Ikenberry et al. (1995), we examine the undervaluation or signaling explanation of stock repur-

¹ See Dittmar (2000) and Grullon and Ikenberry (2000) for a summary of hypothesized motives for stock repurchases.

chases. Ikenberry et al. (1995) argue that the announcement period returns following stock repurchase announcements are incomplete, and significant returns accrue to stock repurchasing firms in the three years subsequent to the repurchase announcement. We re-examine this conclusion with improved data and methodology.

Second, we conduct an inter-industry comparison of open market common stock repurchases, to examine whether the reaction to open market stock repurchase announcements is related to industry affiliation and extend the Ikenberry et al. (1995, 2000) studies by conducting an industry by industry analysis of the short- and long-term performance following the announcement of share repurchase plans.

Data and Methodology

The initial sample is identified from all open market common stock repurchase announcements reported in the *Wall Street Journal Index* from 1982 to 1997 by firms included in the CRSP NYSE/AMEX/Nasdaq daily returns file with no other concurrent announcements from two days before to two days after the announcement of share repurchases. Dutch-auction offers and tender offers are excluded from this study because open market repurchases are by far the most common and account for 90 percent of all share repurchases (Ikenberry, Lakonishok, and Vermaelen, 1995; Comment and Jarrell, 1991). Following Stephens and Weisbach (1998), Ikenberry, Lakonishok, and Vermaelen (1995), and Comment and Jarrell (1991), open market repurchase announcements made in the fourth quarter of 1987 are excluded from the sample. In the spirit of Comment and Jarrell (1991), Dann (1981), and Vermaelen (1981), open market repurchases from odd-lot holders are excluded from the sample. The sample also excludes firms announcing stock buybacks to repel takeover attempts. Finally, firms with stock prices under \$5 at the time of announcement are excluded from the sample to control for skewness problems discussed in Loughran and Ritter (1996). These criteria lead to 1,006 open market repurchase announcements from January 1982 to December 1997. These open market stock repurchase announcements are grouped into 17 industry categories based on two-digit SIC codes. Table 1a provides summary statistics of the sample, including market capitalization, beta, and average size of the announced buyback as a percentage of outstanding shares.

The average stock repurchase program proposed the repurchase of 7.21 percent of outstanding shares, with little variation across industries. The average β of stock repurchasing firms was 0.78, indicating stock repurchasing firms tend to have lower than average systematic risk, and hence lower cost of equity capital. This observation holds true with some variation across the different industry groups as well. The market capitalization of repurchasing firms vary widely among the industry groupings, with the largest mean market capitalization of \$6.814 billion in industrial mach-

Table 1a—Repurchase Announcements as a Proportion of Outstanding Shares, Beta, and Market Capitalization (\$, in million) of Repurchasing Firms by Industry

Industry	Number of Announcements	Repurchase Proportion	β	Market Capitalization			
				Mean	25 th Percentile	Median	75 th Percentile
Mining	36	7.27%	0.61	1,055.827	90.169	200.695	584.103
Construction & Contracting	22	6.02%	0.77	454.345	54.758	159.101	508.114
Food	48	6.78%	0.76	5,865.819	1,626.933	3,490.181	8,072.204
Textiles and Apparel	19	7.56%	0.81	765.733	55.193	262.221	1,060.857
Paper Products	38	6.07%	0.83	2,553.023	310.029	655.866	2,565.594
Chemical	103	7.49%	0.84	5,997.536	239.438	1,396.278	6,057.708
Primary & Fabricated Metals	31	8.54%	0.64	2,074.729	50.568	152.610	493.056
Industrial Machinery & Equipment	79	8.92%	1.04	6,814.763	117.684	313.605	2,213.334
Electrical Equipment	57	6.17%	0.88	459.615	42.424	125.195	335.230
Transportation Equipment	35	8.82%	0.93	6,127.342	274.675	2,413.345	8,093.038
Manufacturing	53	7.23%	0.88	815.647	56.082	236.531	1,213.953
Transportation	20	8.14%	0.73	1,714.086	70.506	549.120	2,480.443
Communication & Utilities	39	8.68%	0.65	4,680.562	221.117	1,446.250	8,788.658
Wholesale & Retail Trade	87	6.70%	0.83	1,349.155	67.564	229.086	1,013.852
Financial	228	6.21%	0.58	1,080.656	54.048	157.602	641.611
Services	97	7.75%	0.89	1,212.445	74.471	256.953	853.808
Other	14	8.43%	0.93	1,739.703	143.685	1,118.128	2,631.649
All Firms	1,006	7.21%	0.78	2,652.082	85.855	318.800	1,806.226

In this and all following tables, the categories include these SIC codes: Mining SIC Codes 10-14; Construction & Contracting SIC Codes 15-17, 24-25; Food SIC Code 20; Textiles and Apparel SIC Codes 22-23; Paper Products SIC Codes 26-27; Chemical SIC Codes 28-30; Primary & Fabricated Metals SIC Codes 33-34; Industrial Machinery & Equipment SIC Code 35; Electrical Equipment SIC Code 36; Transportation Equipment SIC Code 37; Manufacturing SIC Codes 38-39; Transportation SIC Codes 40-47; Communication & Utilities SIC Codes 48-49; Wholesale & Retail Trade SIC Codes 50-59; Financial SIC Codes 60-69; Services SIC Codes 70-89

inery and equipment firms, and the smallest mean market capitalization of \$454.345 million in construction and contracting industry.

Table 1b provides the distribution of repurchase announcements by year and industry. The largest numbers of repurchase announcements were made in 1984 (119), and fewest repurchase announcements were made in 1991 (19). No apparent time-dependent pattern of repurchase announcements is observed. Financial firms are the most active repurchasers, with 228 announcements over the study period, with chemical (103), services (97), wholesale and retail trade (87), and industrial machinery and equipment (79) industries also exhibiting above average repurchase activity.

Calculating Excess Returns Short-Term Excess Returns

Following a methodology similar to Ikenberry, Lakonishok, and Vermaelen (1995),² the market reaction to the repurchase announcements are estimated using the market-adjusted returns model, expressed as:

$$AR_{ijt} = R_{ijt} - R_{mt}, j = 1 \text{ to } 17 \quad (1)$$

where:

AR_{ijt} = The daily market-adjusted abnormal return for security i in industry j on day t ;

R_{ijt} = The daily return for security i in industry j on day t ; and

R_{mt} = The daily return on the CRSP value-weighted index on day t .

The cumulative average abnormal return for industry j ($CAAR_{jT}$) is calculated up to T days around the announcement as:

$$CAAR_{jT} = \sum_{t=1}^T \frac{1}{N_j} \left[\sum_{i=1}^{N_j} AR_{ijt} \right] \quad (2)$$

where T = Day -20 to day -3 , day -2 to day $+2$, and day $+3$ to day $+10$ around the buyback announcements. The relevant t -statistic is

$$t - \text{test} = \frac{CAAR_{jT}}{\sqrt{\frac{T * \left[\sum_{i=1}^{N_j} \left(AR_{ijt} - \left(\frac{1}{N_j} \sum_{i=1}^{N_j} AR_{ijt} \right) \right)^2 \right]}{N_j}}} \quad (3)$$

² Ikenberry, Lakonishok, and Vermaelen (1995) use the CRSP equal-weighted index to calculate the market-adjusted abnormal return. Due to the findings in Canina, Michaely, Thaler, and Womack (1998), we use the CRSP value-weighted index to calculate the market-adjusted abnormal returns.

Table 1b—Repurchase Announcements by Year and Industry

Industry	Announcement Year																Total
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
Mining	8	0	8	1	0	0	2	0	0	3	3	2	2	1	2	4	36
Construction & Contracting	3	1	4	0	2	0	3	1	0	0	0	0	4	1	2	1	22
Food	1	6	6	1	2	4	6	2	1	1	3	2	4	3	2	4	48
Textiles and Apparel	2	3	2	2	2	1	0	1	1	0	1	0	2	0	0	2	19
Paper Products	5	0	6	3	4	0	2	3	1	1	0	3	3	1	2	4	38
Chemical	12	2	11	16	10	6	4	7	6	0	2	4	6	5	5	7	103
Primary & Fabricated Metals	1	1	4	2	2	1	3	2	2	1	2	0	3	4	2	1	31
Industrial Machinery & Equipment	0	0	10	4	8	7	4	7	7	4	1	3	4	5	4	11	79
Electrical Equipment	3	1	8	2	9	1	7	3	5	1	3	4	5	1	3	1	57
Transportation Equipment	3	0	4	4	5	3	3	2	2	0	0	0	2	3	3	1	35
Manufacturing	4	0	7	4	4	1	1	5	6	2	3	3	7	2	4	0	53
Transportation	1	0	1	2	3	1	4	1	1	0	0	0	2	0	1	3	20
Communication & Utilities	1	1	5	3	1	1	8	2	6	1	3	0	2	1	2	2	39
Wholesale & Retail Trade	1	1	10	8	11	4	9	7	5	1	9	6	4	4	5	2	87
Financial	21	3	18	9	11	13	20	20	18	2	8	9	22	19	16	19	228
Services	1	1	10	3	8	5	4	6	7	2	10	7	11	7	6	9	97
Other	0	0	5	1	4	1	0	1	0	0	0	0	1	0	1	0	14
All Firms	67	20	119	65	86	49	80	70	68	19	48	43	84	57	60	71	1,006

The standard errors are calculated from day -250 to day -21 relative to the open market repurchase announcements.

To measure excess returns in comparison to peer firms, the short-term abnormal returns for the firms announcing stock repurchases are calculated from 20 days before to ten days after the announcement relative to a value-weighted industry index constructed from all firms in each of 17 industry groups (reference portfolios) with daily returns reported in CRSP.

Long-Term Excess Returns

The long-term performance of stock-repurchasing firms is calculated using the buy-and-hold approach, the cumulative excess return approach, and the Fama-French (1993) three-factor model. In each case, in addition to the CRSP value-weighted index, the industry matched value-weighted index is used as the reference portfolio to compare performance to peer firms.

Following Ikenberry et al. (1995), the buy-and-hold annual return for security i in year 1, year 2, and year 3 after the announcement of stock buybacks is calculated as:

$$BHAR_{jt} = \frac{1}{N_j} \sum_{i=1}^{N_j} \left[\prod_{t=1}^{T+249} (1 + R_{ijt}) - \prod_{t=1}^{T+249} (1 + R_{mt}) \right] \quad (4)$$

where:

$T = 1, 251$, and 501 trading days after the buyback announcements in year 1, year 2, and year 3, respectively.

Due to the biases in the buy-and-hold approach (Mitchell and Stafford, 2000), Fama (1998) suggests the use of the cumulative excess return approach. The long-term cumulative average excess return ($CAAR_{jt}$) in year 1, year 2, and year 3 following the buyback announcements is calculated as:

$$CAAR_{jt} = \sum_{t=1}^{T+249} \frac{1}{N_j} \left[\sum_{i=1}^{N_j} AR_{ijt} \right] \quad (5)$$

Furthermore, the long-term excess return in year 1, year 2, and year 3 after the announcement of stock buybacks is calculated using the Fama and French (1993) three-factor model:³

$$R_{ijt} - r_{ft} = a + b(R_{mt} - r_{ft}) + sSMB + hHML, j = 1 \text{ to } 17 \quad (6)$$

where SMB is the difference between returns on portfolios of small and big stocks and HML is the difference between returns of high BE/ME and low BE/ME stocks.

³ The factors for the model are downloaded from Kenneth French's website.

Results

The results of the examination of short-term market reaction to stock buybacks are summarized in Table 2a. Consistent with Ikenberry et al. (1995), for the entire sample of firms announcing open-market stock repurchases over the 1982-1997 period, the pre-announcement returns (days -20 to -3) are negative and significant, and the announcement period returns (days -2 to +2) are positive and significant, with approximately 3 percent excess return over the five-day announcement window. The post-announcement returns (days +3 to +10) are not significant.⁴ The results are similar whether the CRSP value-weighted index (Table 2a) or the reference portfolios (Table 2b) are employed as the benchmark.

Using the CRSP value-weighted index as the benchmark, when the sample is stratified by industry affiliation, the significant negative pre-announcement returns are evident in ten of the 17 industry groups. No significant post-announcement returns are observed for any of the industry segments. All industry segments experience significant positive excess returns during the five-day announcement period. Construction and contracting companies exhibit the largest and food companies exhibit the smallest market reaction to buyback announcements, with five-day excess returns of approximately 6.2 percent and 1.3 percent, respectively. Interestingly, these two industry segments have almost identical betas and hence similar cost of capital. The differential market reaction in this case may be explained by the large difference in market capitalization between the samples of repurchasing firms from the two industries, a result consistent with the observation in Ikenberry et al. (1995) that repurchase announcements by smallest firms elicit the largest announcement period excess returns. Clearly, markets interpret stock repurchase announcements as favorable news for all industry segments. As indicated by the significant F-statistic and K-W statistic, however, the market reaction to stock repurchase announcements differs significantly across industries.

It is also of interest to examine the long-term performance of firms announcing stock repurchases, to determine if the market's interpretation of stock repurchases as favorable news is justified. If stock repurchases truly signal favorable prospects for the firm, we would expect to observe positive excess returns for the firm in the long run, following the buyback announcements.

Table 3a summarizes the annual buy-and-hold excess returns in comparison to the CRSP value-weighted index for firms announcing stock repurchases for each of the three years following the announcement. For the full sample of firms announcing stock repurchases, the excess return during the year following the announcement is positive and significant. The excess return of approximately 2.8 percent is similar in magnitude to the one-year excess return documented by Ikenberry et al. (1995).

⁴ Results for the entire sample are almost identical when the CRSP equal-weighted index is used as the benchmark to replicate Ikenberry et al. (1995).

Table 2a—Market-Adjusted Cumulative Average Abnormal Returns (CAAR_{IT}) Relative to the CRSP Value-Weighted Index on and around Repurchase Announcements

Industry	N	Days Relative to Announcement					
		-20 to -3		-2 to +2		+3 to +10	
All Firms	1,006	-0.0307	(-8.32) ^a	0.0296	(15.20) ^a	0.0012	(0.48)
Mining	36	-0.0230	(-1.07)	0.0434	(3.81) ^a	-0.0077	(-0.54)
Construction & Contracting	22	-0.0802	(-3.37) ^a	0.0618	(4.92) ^a	-0.0001	(-0.01)
Food	48	-0.0046	(-0.48)	0.0128	(2.53) ^b	0.0076	(1.20)
Textiles and Apparel	19	-0.0438	(-2.01) ^c	0.0252	(2.20) ^b	0.0010	(0.07)
Paper Products	38	-0.0192	(-1.50)	0.0242	(3.58) ^a	0.0022	(0.25)
Chemical	103	-0.0114	(-1.36)	0.0220	(4.96) ^a	-0.0014	(-0.25)
Primary & Fabricated Metals	31	-0.0240	(-1.30)	0.0261	(2.68) ^b	-0.0046	(-0.37)
Industrial Machinery & Equipment	79	-0.0534	(-4.00) ^a	0.0343	(4.88) ^a	0.0047	(0.52)
Electrical Equipment	57	-0.0472	(-2.72) ^a	0.0196	(2.14) ^b	0.0154	(1.33)
Transportation Equipment	35	-0.0098	(-0.82)	0.0404	(6.43) ^a	-0.0032	(-0.41)
Manufacturing	53	-0.0482	(-3.45) ^a	0.0165	(2.24) ^b	0.0095	(1.02)
Transportation	20	-0.0673	(-3.25) ^a	0.0327	(3.00) ^a	0.0149	(1.08)
Communication & Utilities	39	-0.0278	(-2.11) ^b	0.0237	(3.40) ^a	-0.0088	(-1.00)
Wholesale & Retail Trade	87	-0.0385	(-3.59) ^a	0.0320	(5.69) ^a	-0.0113	(-1.58)
Financial	228	-0.0196	(-3.08) ^a	0.0292	(8.71) ^a	0.0017	(0.41)
Services	97	-0.0487	(-3.89) ^a	0.0429	(6.49) ^a	0.0007	(0.08)
Other	14	0.0094	(0.40)	0.0352	(2.88) ^b	0.0155	(1.00)
	F-value	2.23 ^a		1.32		1.00	
	K-W	34.34 ^a		24.22 ^c		17.50	

^aSignificant at the 1% level^bSignificant at the 5% level^cSignificant at the 10% level

Table 2b—Market-Adjusted Cumulative Average Abnormal Returns (CAAR_{IT}) Relative to the Industry Value-Weighted Index on and around Repurchase Announcements

Industry	N	Days Relative to Announcement			
		-20 to -3		-2 to +2	+3 to +10
All Firms	1,006	-0.0306	(-8.22) ^a	0.0302 (15.38) ^a	0.0006 (0.26)
Mining	36	-0.0139	(-0.65)	0.0491 (4.33) ^a	-0.0061 (-0.43)
Construction & Contracting	22	-0.0783	(-3.36) ^a	0.0614 (5.00) ^a	-0.0008 (-0.05)
Food	48	-0.0092	(-0.92)	0.0129 (2.45) ^b	0.0081 (1.22)
Textiles and Apparel	19	-0.0437	(-2.07) ^c	0.0231 (2.07) ^c	-0.0059 (-0.42)
Paper Products	38	-0.0220	(-1.72) ^c	0.0256 (3.79) ^a	0.0019 (0.22)
Chemical	103	-0.0098	(-1.17)	0.0235 (5.33) ^a	-0.0046 (-0.82)
Primary & Fabricated Metals	31	-0.0207	(-1.10)	0.0281 (2.85) ^a	-0.0032 (-0.26)
Industrial Machinery & Equipment	79	-0.0561	(-4.18) ^a	0.0337 (4.76) ^a	0.0032 (0.36)
Electrical Equipment	57	-0.0399	(-2.28) ^b	0.0232 (2.52) ^b	0.0162 (1.39)
Transportation Equipment	35	-0.0093	(-0.78)	0.0393 (6.31) ^a	-0.0008 (-0.10)
Manufacturing	53	-0.0483	(-3.51) ^a	0.0160 (2.20) ^b	0.0058 (0.63)
Transportation	20	-0.0673	(-3.22) ^a	0.0286 (2.60) ^b	0.0207 (1.48)
Communication & Utilities	39	-0.0320	(-2.39) ^b	0.0218 (3.08) ^a	-0.0094 (-1.05)
Wholesale & Retail Trade	87	-0.0391	(-3.61) ^a	0.0324 (5.69) ^a	-0.0125 (-1.73) ^c
Financial	228	-0.0222	(-3.52) ^a	0.0288 (8.67) ^a	0.0027 (0.64)
Services	97	-0.0452	(-3.69) ^a	0.0449 (6.96) ^a	-0.0019 (-0.23)
Other	14	0.0133	(0.56)	0.0410 (3.29) ^a	0.0188 (1.19)
	F-value	2.19 ^a		1.47	1.26
	K-W	33.22 ^a		29.63 ^b	24.10 ^c

^aSignificant at the 1% level^bSignificant at the 5% level^cSignificant at the 10% level

Table 3a—Annual Buy-and-Hold Abnormal Returns (BHAR_{it}) Relative to the CRSP Value-Weighted Index Following Repurchase Announcements

Industry	N	Year 1		Year 2		Year 3	
All Firms	1,006	0.0280	(1.64) ^c	-0.0274	(-2.19) ^b	0.0181	(1.29)
Mining	36	-0.1845	(-3.58) ^a	-0.2132	(-4.12) ^a	-0.0779	(-1.31)
Construction & Contracting	22	0.0473	(0.40)	0.0622	(0.60)	-0.0472	(-0.47)
Food	48	0.0562	(1.61)	0.0221	(0.51)	0.0281	(0.74)
Textiles and Apparel	19	0.0837	(0.74)	-0.0252	(-0.27)	0.0513	(0.45)
Paper Products	38	0.1376	(1.80) ^c	-0.0063	(-0.16)	0.1226	(1.95) ^c
Chemical	103	-0.0197	(-0.67)	0.0123	(0.38)	0.0652	(1.43)
Primary & Fabricated Metals	31	-0.1877	(-3.78) ^a	-0.0152	(-0.22)	-0.0745	(-1.42)
Industrial Machinery & Equipment	79	0.0526	(0.77)	-0.0730	(-1.48)	-0.0353	(-0.66)
Electrical Equipment	57	0.1513	(1.58)	-0.0982	(-1.97) ^c	-0.0269	(-0.40)
Transportation Equipment	35	0.0260	(0.50)	-0.0053	(-0.14)	0.0027	(0.06)
Manufacturing	53	0.0733	(1.16)	-0.0087	(-0.18)	0.0233	(0.36)
Transportation	20	-0.1278	(-1.70)	-0.0077	(-0.06)	0.0670	(0.95)
Communication & Utilities	39	-0.0055	(-0.12)	-0.0056	(-0.10)	0.0129	(0.20)
Wholesale & Retail Trade	87	-0.0427	(-1.02)	-0.1011	(-2.29) ^b	0.0049	(0.09)
Financial	228	0.0689	(1.55)	-0.0097	(-0.41)	0.0596	(2.03) ^b
Services	97	0.0457	(0.59)	0.0058	(0.09)	-0.0050	(-0.09)
Other	14	0.0634	(0.55)	0.0293	(0.42)	-0.1268	(-1.51)
F-value		1.35		1.16		0.80	
K-W		38.16 ^a		31.80 ^b		22.44	

^aSignificant at the 1% level^bSignificant at the 5% level^cSignificant at the 10% level

While Ikenberry et al. find positive excess returns in years 2 and 3, however, our results indicate a significant negative excess return of approximately 2.7 percent during year 2 and a statistically insignificant excess return of 1.8 percent in year 3. The observed difference in long-term performance may be explained by the potential upward bias in Ikenberry et al. resulting from the compounding of equally weighted portfolio returns as explained by Canina et al. (1998).

When the long-term excess returns of repurchasing firms is examined by industry, significant differences among the long-term performance across industry groups is evident and is confirmed by the significant K-W statistic. It appears that the significant positive excess returns are limited to paper products and financial companies. Mining, primary and fabricated metals, electrical equipment, and wholesale and retail trade firms exhibit significant negative excess returns in comparison to the CRSP value-weighted index in the long run, following stock repurchase announcements.

In Table 3b, the holding period returns for stock repurchasing firms in excess of the returns of industry-matched value weighted reference portfolios are presented. Interestingly, the excess returns in each of the three years following the repurchase announcement are significant and negative for the entire sample of stock repurchasing firms. When the sample is stratified by industry affiliation, results remain consistent. The only statistically significant results indicate that stock repurchasing firms in 12 of the 17 industry segments suffer significant negative excess returns in comparison to their industry peers in at least one of the three post-announcement years. The F and K-W statistics indicate significant differences in annual returns to stock repurchasing firms across different industry groups.

We find that while stock repurchasing firms in some industries outperform the CRSP value-weighted index in the years following the repurchase announcement, they significantly underperform their industry peers. One possible explanation is that stock repurchases are commonly announced by firms during periods in which their industry segments outperform the market overall, though the stock repurchases do not turn out to be favorable signals for the repurchasing firms.

When long-term excess returns for stock repurchasing firms are estimated using the cumulative average abnormal returns (CAAR) method using the CRSP value-weighted index as the benchmark, similar, but somewhat conflicting results emerge.

As reported in Table 4b for the entire sample, year 1 excess returns are 2.7 percent as before, though not statistically significant. However, year 2 excess returns are around zero, and in year 3, significant excess returns of 6.7 percent are observed. When the sample is stratified by industries, electrical equipment companies exhibit significant positive abnormal returns in year 1. Paper products and financial firms show excess returns in years 1 and 3, and chemical, wholesale/retail trade and

Table 3b—Annual Buy-and-Hold Abnormal Returns (BHAR_{1T}) Relative to the Industry Value-Weighted Index Following Repurchase Announcements

Industry	N	Year 1		Year 2		Year 3	
All Firms	1,006	-0.0672	(-3.87) ^a	-0.1283	(-9.75) ^a	-0.1081	(-7.58) ^a
Mining	36	-0.2533	(-3.23) ^a	-0.3046	(-4.53) ^a	-0.2713	(-4.70) ^a
Construction & Contracting	22	-0.0183	(-0.18)	0.0311	(0.31)	-0.0700	(-0.75)
Food	48	-0.0134	(-0.36)	-0.0378	(-0.82)	-0.0186	(-0.51)
Textiles and Apparel	19	0.0036	(0.04)	-0.0860	(-1.06)	0.0151	(0.15)
Paper Products	38	0.0379	(0.53)	-0.0620	(-1.57)	0.0805	(1.23)
Chemical	103	-0.1343	(-4.31) ^a	-0.0912	(-2.44) ^b	-0.0577	(-1.27)
Primary & Fabricated Metals	31	-0.2092	(-4.55) ^a	-0.0970	(-1.47)	-0.1493	(-3.10) ^a
Industrial Machinery & Equipment	79	-0.0060	(-0.08)	-0.2213	(-3.94) ^a	-0.2266	(-4.08) ^a
Electrical Equipment	57	0.0261	(0.30)	-0.1975	(-3.86) ^a	-0.2542	(-3.43) ^a
Transportation Equipment	35	0.0016	(0.03)	-0.0486	(-1.09)	-0.0314	(-0.76)
Manufacturing	53	-0.1556	(-1.97) ^c	-0.2669	(-4.32) ^a	-0.1711	(-2.48) ^b
Transportation	20	-0.1717	(-2.42) ^b	-0.0156	(-0.14)	-0.0047	(-0.07)
Communication & Utilities	39	-0.0853	(-1.77) ^c	-0.0873	(-1.48)	-0.0954	(-1.46)
Wholesale & Retail Trade	87	-0.1057	(-2.33) ^b	-0.1653	(-3.64) ^a	-0.0995	(-1.89) ^c
Financial	228	-0.0031	(-0.07)	-0.0937	(-4.23) ^a	-0.0390	(-1.54)
Services	97	-0.1682	(-2.05) ^b	-0.1751	(-2.72) ^a	-0.2414	(-3.82) ^a
Other	14	0.1069	(0.89)	0.0289	(0.39)	-0.1413	(-1.77) ^c
	F-value	1.48 ^c		2.16 ^a		2.87 ^a	
	K-W	39.23 ^a		45.69 ^a		57.49 ^a	

^aSignificant at the 1% level^bSignificant at the 5% level^cSignificant at the 10% level

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communication/utilities companies show positive excess returns in year 3. The F and K-W tests confirm industry differences in year 1 only.

In Table 4b CAARs for stock repurchasing firms in comparison to industry value-weighted indices are presented. As with the buy-and-hold results, the excess returns in each of the three years following the repurchase announcement are negative, with significant results for years 1 and 2 for the entire sample of stock repurchasing firms. When the sample is stratified by industry affiliation, results remain consistent. The results indicate that stock repurchasing firms in 7 of the 17 industry segments suffer significant negative excess returns in at least one of the three post announcement years in comparison to their industry peers. Only paper products firms exhibit positive CAAR in year 3. These results confirm earlier findings that stock repurchasing firms underperform their industry peers in the long run. The F and K-W statistics indicate significant differences in annual CAARs to stock repurchasing firms across different industry groups.

Finally, the long-term excess return in year 1, year 2, and year 3 after the announcement of stock buybacks is calculated using the Fama and French (1993) three-factor model, with results reported in Tables 5a and 5b.

When the CRSP value-weighted index is used as the market benchmark, the entire sample of stock repurchasing firms exhibits no statistically significant excess returns. Paper products and financial firms exhibit positive excess returns in years 1 and 3, while food and electrical equipment firms exhibit positive excess returns in year 1 only. As would be expected, in all three years following the stock repurchase announcement, the coefficient of the market excess returns is positive and significant for all industry groups. Clearly, the market excess return is the most significant determinant of security excess returns, across all industries.

The coefficient of the size factor is positive and significant for the entire sample in year 2, and positive and significant for 6 of 17 industry groups in year 1, 8 of 17 industry groups in year 2, and 3 of 17 industry groups in year 3. Results indicate an impact on excess returns from the size factor consistent with Ikenberry et al. (2000), but for only some of the industry groups. The BE/ME (value-growth) factor is not significant for the entire sample in any of the three years following the repurchase announcement, also consistent with Ikenberry et al. Significant coefficients for this factor are observed for only one industry group in years 1 and 2, and for two industry groups in year 3.

Results confirm that stock repurchases do not result in long-term excess returns for the entire sample of stock repurchasing firms. However, even after controlling for size and BE/ME factors, paper products and financial industries exhibit significant excess returns in years 1 and 3, and food and electrical equipment industries exhibit significant excess returns in year 1, providing evidence of an industry effect.

When the industry-matched value weighted reference portfolios are used as the market benchmark, the positive excess returns mostly disappear. The entire sample

Table 4a—Annual Cumulative Average Abnormal Returns (CAAR_{IT}) Relative to the CRSP Value-Weighted Index Following Repurchase Announcements

Industry	N	Year 1		Year 2		Year 3	
All Firms	1,006	0.0270	(1.55)	0.0014	(0.08)	0.0670	(3.85) ^a
Mining	36	-0.1103	(-1.29)	-0.1250	(-1.46)	0.0279	(0.33)
Construction & Contracting	22	0.0350	(0.38)	0.0356	(0.39)	-0.0378	(-0.42)
Food	48	0.0524	(1.40)	0.0059	(0.16)	0.0336	(0.90)
Textiles and Apparel	19	0.0278	(0.31)	-0.0232	(-0.26)	0.0345	(0.38)
Paper Products	38	0.0839	(1.71) ^c	0.0086	(0.17)	0.1146	(2.34) ^b
Chemical	103	-0.0051	(-0.14)	0.0315	(0.85)	0.0740	(2.01) ^b
Primary & Fabricated Metals	31	-0.1355	(-1.89) ^c	0.0000	(0.00)	-0.0106	(-0.15)
Industrial Machinery & Equipment	79	0.0551	(0.90)	-0.0175	(-0.29)	0.0638	(1.04)
Electrical Equipment	57	0.1270	(1.92) ^c	-0.0476	(-0.72)	0.0388	(0.59)
Transportation Equipment	35	0.0282	(0.51)	0.0240	(0.43)	0.0504	(0.91)
Manufacturing	53	0.0809	(1.35)	0.0287	(0.48)	0.0254	(0.42)
Transportation	20	-0.0970	(-1.14)	-0.0274	(-0.32)	0.0959	(1.12)
Communication & Utilities	39	-0.0208	(-0.25)	0.0802	(0.97)	0.1654	(2.00) ^c
Wholesale & Retail Trade	87	-0.0280	(-0.56)	-0.0581	(-1.17)	0.0895	(1.80) ^c
Financial	228	0.0497	(1.70) ^c	0.0116	(0.40)	0.1037	(3.56) ^a
Services	97	0.0513	(0.92)	0.0216	(0.39)	0.0429	(0.77)
Other	14	0.0644	(0.69)	0.0811	(0.87)	-0.0839	(-0.91)
	F-value	1.92 ^b		0.81		0.58	
	K-W	31.93 ^b		19.44		11.07	

^aSignificant at the 1% level^bSignificant at the 5% level^cSignificant at the 10% level

Table 4b—Annual Cumulative Average Abnormal Returns (CAAR_{IT}) Relative to the Industry Value-Weighted Index Following Repurchase Announcements

Industry	N	Year 1		Year 2		Year 3	
All Firms	1,006	-0.0321	(-1.84) ^c	-0.0638	(-3.65) ^a	-0.0190	(-1.09)
Mining	36	-0.1201	(-1.45)	-0.1323	(-1.60)	-0.0958	(-1.16)
Construction & Contracting	22	0.0179	(0.20)	0.0247	(0.28)	-0.0489	(-0.55)
Food	48	-0.0004	(-0.01)	-0.0368	(-0.96)	-0.0008	(-0.02)
Textiles and Apparel	19	-0.0054	(-0.06)	-0.0560	(-0.62)	0.0281	(0.31)
Paper Products	38	0.0236	(0.48)	-0.0306	(-0.62)	0.0824	(1.68) ^c
Chemical	103	-0.0803	(-2.20) ^b	-0.0369	(-1.01)	-0.0140	(-0.38)
Primary & Fabricated Metals	31	-0.1413	(-1.96) ^c	-0.0572	(-0.80)	-0.0619	(-0.86)
Industrial Machinery & Equipment	79	0.0189	(0.31)	-0.1195	(-1.93) ^c	-0.0793	(-1.28)
Electrical Equipment	57	0.0535	(0.81)	-0.1083	(-1.64)	-0.1139	(-1.73) ^c
Transportation Equipment	35	0.0217	(0.38)	-0.0034	(-0.06)	0.0326	(0.58)
Manufacturing	53	-0.0716	(-1.20)	-0.1408	(-2.36) ^b	-0.1163	(-1.95) ^c
Transportation	20	-0.1239	(-1.46)	-0.0299	(-0.35)	0.0384	(0.45)
Communication & Utilities	39	-0.0801	(-0.97)	0.0211	(0.25)	0.0867	(1.04)
Wholesale & Retail Trade	87	-0.0680	(-1.37)	-0.1021	(-2.05) ^b	0.0186	(0.37)
Financial	228	0.0059	(0.20)	-0.0395	(-1.38)	0.0437	(1.52)
Services	97	-0.0954	(-1.71) ^c	-0.1100	(-1.98) ^b	-0.1261	(-2.27) ^b
Other	14	0.1025	(1.08)	0.0821	(0.86)	-0.0899	(-0.95)
	F-value	1.81 ^b		1.17		1.36	
	K-W	30.74 ^b		24.62 ^c		34.75 ^a	

^aSignificant at the 1% level^bSignificant at the 5% level^cSignificant at the 10% level

exhibits negative excess returns in year 2, and only paper products firms exhibit positive excess returns in year 3. Electrical equipment and wholesale and retail trade firms suffer negative excess returns in year 2, and services firms exhibit negative excess returns in year 3. Results confirm that stock repurchasing firms do not outperform their peers in the long term.

Summary and Conclusions

Open market stock repurchase programs are popular outlets for excess cash. Managers often indicate that they use stock repurchases to increase value to stockholders. Previous studies have used the signaling hypothesis as a common explanation for stock repurchases. According to the signaling hypothesis [Dann (1981) and Vermaelen (1981)], managers use stock buybacks to signal that the stock price is undervalued. Our short-term results support the signaling hypothesis, as firms announcing stock repurchases earn significant excess returns of approximately 3 percent during the announcement period, indicating investors interpret stock repurchase announcements as a favorable signal. However, the long-term results are not consistent with the undervaluation or signaling hypothesis, contrary to earlier research by Ikenberry et al. (1995, 2000). We find that after controlling for size and BE/ME, stock-repurchasing firms do not outperform their industry peers in the long term. Hence, the evidence contradicts the notion that firms announcing stock repurchases are significantly undervalued at the time of the repurchase announcement. In addition, the results of our analysis indicate that investors interpret such signals differently for firms from different industries, with significant differences in the event period excess returns as well as in long-term performance across industries. Interestingly, stock repurchasing firms tend to underperform their industry peers in the long run.

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Table 5a—Excess Returns (a) Using the Fama and French (1993) Three-Factor Model Relative to the CRSP Value-Weighted Index Following Repurchase Announcements

$R_{ijt} - r_{ft} = a + b(R_{mt} - r_{ft}) + sSMB + hHML, j = 1 \text{ to } 17$								
Industry	a	t-stat	b	t-stat	s	t-stat	h	t-stat
Panel A: Year 1								
All Firms	0.0002	(1.29)	0.8333	(2.92) ^a	-0.0578	(-0.15)	-0.4307	(-0.78)
Mining	0.0001	(0.14)	0.4332	(1.23)	0.4374	(0.91)	-0.5582	(-0.95)
Construction & Contracting	0.0000	(0.06)	1.1341	(3.67) ^a	0.4150	(1.01)	0.5088	(0.90)
Food	0.0003	(1.77) ^c	0.6700	(3.85) ^a	-0.2007	(-0.93)	-0.0634	(-0.21)
Textiles and Apparel	0.0000	(0.00)	1.2248	(4.45) ^a	0.6625	(1.80) ^c	0.2081	(0.41)
Paper Products	0.0005	(1.99) ^b	0.7727	(3.35) ^a	-0.1363	(-0.44)	0.0099	(0.02)
Chemical	0.0000	(-0.13)	1.1251	(4.50) ^a	0.6884	(2.09) ^b	0.1164	(0.24)
Primary & Fabricated Metals	-0.0004	(-1.08)	0.8880	(2.85) ^a	0.3804	(1.00)	-0.1253	(-0.21)
Industrial Machinery & Equipment	0.0002	(0.81)	1.4588	(4.69) ^a	0.8023	(1.86) ^c	0.1293	(0.19)
Electrical Equipment	0.0006	(1.89) ^c	1.0103	(3.05) ^a	0.4995	(1.10)	-0.3339	(-0.52)
Transportation Equipment	0.0002	(0.69)	0.8718	(4.24) ^a	-0.1236	(-0.45)	0.0578	(0.15)
Manufacturing	0.0004	(1.27)	1.0785	(3.37) ^a	0.6752	(1.45)	-0.3310	(-0.52)
Transportation	-0.0001	(-0.33)	0.9356	(3.58) ^a	1.0124	(3.30) ^a	-0.1876	(-0.34)
Communication & Utilities	0.0001	(0.28)	0.6340	(2.43) ^b	0.0036	(0.01)	0.2586	(0.51)
Wholesale & Retail Trade	0.0001	(0.35)	0.8736	(3.25) ^a	0.0657	(0.18)	-0.9165	(-1.69) ^c
Financial	0.0005	(3.20) ^a	0.6528	(2.78) ^a	1.1509	(3.74) ^a	-0.3778	(-0.71)
Services	0.0003	(1.17)	0.9061	(2.50) ^a	0.1691	(0.37)	-0.5571	(-0.92)
Other	0.0001	(0.24)	1.6945	(7.68) ^a	0.9045	(3.00) ^a	-0.0708	(-0.15)

^aSignificant at the 1% level^bSignificant at the 5% level^cSignificant at the 10% level

Table 5a (cont.)—Excess Returns (a) Using the Fama and French (1993) Three-Factor Model Relative to the CRSP Value-Weighted Index Following Repurchase Announcements

$$R_{ijt} - r_{ft} = a + b(R_{mt} - r_{ft}) + sSMB + hHML, j = 1 \text{ to } 17$$

Industry	a	t-stat	b	t-stat	s	t-stat	h	t-stat
Panel B: Year 2								
All Firms	0.00002	(0.20)	1.2401	(4.96) ^a	0.8684	(2.61) ^a	0.5688	(1.07)
Mining	-0.0006	(-1.44)	1.2088	(2.82) ^a	1.0070	(1.85) ^c	1.2191	(1.94) ^c
Construction & Contracting	0.0003	(0.78)	1.4639	(4.47) ^a	1.6851	(4.11) ^a	0.5311	(0.88)
Food	-0.0001	(-0.46)	1.0904	(5.90) ^a	-0.2195	(-0.85)	0.7070	(2.09)
Textiles and Apparel	-0.0001	(-0.22)	1.0893	(3.54) ^a	0.4407	(1.16)	0.3186	(0.52)
Paper Products	0.0001	(0.36)	1.1702	(6.52) ^a	0.5313	(2.22) ^b	0.1719	(0.49)
Chemical	0.0001	(0.60)	1.3697	(6.36) ^a	0.9148	(3.04) ^a	0.4075	(0.93)
Primary & Fabricated Metals	0.0002	(0.58)	0.4194	(1.81) ^c	-0.1599	(-0.55)	0.0244	(0.06)
Industrial Machinery & Equipment	0.0001	(0.22)	0.8172	(2.70) ^a	0.2480	(0.60)	0.4518	(0.81)
Electrical Equipment	-0.0002	(-0.85)	1.6523	(5.78) ^a	1.4060	(3.69) ^a	0.8272	(1.45)
Transportation Equipment	0.0000	(-0.17)	1.0998	(6.05) ^a	-0.1919	(-0.79)	0.3772	(0.93)
Manufacturing	0.0002	(0.68)	1.0950	(3.44) ^a	0.7664	(1.77) ^c	-0.3997	(-0.61)
Transportation	-0.0001	(-0.20)	1.5227	(7.54) ^a	0.5648	(2.23) ^b	0.3049	(0.69)
Communication & Utilities	0.0004	(1.27)	0.7444	(1.90) ^c	0.1159	(0.22)	0.2806	(0.39)
Wholesale & Retail Trade	0.0000	(-0.18)	0.8801	(3.13) ^a	0.7312	(2.01) ^b	-0.3338	(-0.55)
Financial	0.0003	(1.60)	0.5483	(1.87) ^c	0.3091	(0.89)	0.1288	(0.23)
Services	0.0002	(0.90)	0.9642	(2.90) ^a	0.6262	(1.41)	-0.2589	(-0.38)
Other	0.0004	(0.89)	1.2128	(6.03) ^a	0.3319	(1.16)	-0.4711	(-1.02)

^aSignificant at the 1% level^bSignificant at the 5% level^cSignificant at the 10% level

Table 5a (cont.)—Excess Returns (a) Using the Fama and French (1993) Three-Factor Model Relative to the CRSP Value-Weighted Index Following Repurchase Announcements

$$R_{ijt} - r_{ft} = a + b(R_{mt} - r_{ft}) + sSMB + hHML, j = 1 \text{ to } 17$$

Industry	a	t-stat	b	t-stat	s	t-stat	h	t-stat
Panel C: Year 3								
All Firms	0.0001	(0.42)	1.3478	(4.57) ^a	0.1233	(0.34)	0.7840	(1.45)
Mining	0.0002	(0.55)	0.6949	(1.84) ^c	0.1622	(0.35)	0.6044	(0.94)
Construction & Contracting	-0.0002	(-0.42)	1.2606	(3.86) ^a	0.4864	(1.27)	1.6075	(3.09) ^a
Food	0.0002	(1.42)	0.7140	(3.72) ^a	-0.1314	(-0.55)	0.1783	(0.54)
Textiles and Apparel	0.0000	(-0.13)	1.4142	(5.43) ^a	0.6496	(1.88) ^c	1.5717	(3.14) ^a
Paper Products	0.0006	(2.37) ^b	0.7657	(4.04) ^a	0.2299	(1.02)	-0.0594	(-0.16)
Chemical	0.0003	(1.49)	0.8299	(3.41) ^a	0.1298	(0.43)	0.5088	(1.02)
Primary & Fabricated Metals	0.0001	(0.19)	0.7942	(2.89) ^a	0.3083	(0.90)	0.4363	(0.83)
Industrial Machinery & Equipment	0.0002	(0.47)	1.2360	(2.73) ^a	0.2561	(0.44)	0.1764	(0.22)
Electrical Equipment	0.0005	(1.46)	0.4526	(1.24)	0.1613	(0.32)	-0.6376	(-1.04)
Transportation Equipment	-0.0002	(-0.82)	1.8517	(6.45) ^a	0.7202	(1.92) ^c	1.5578	(3.07)
Manufacturing	0.0002	(0.53)	1.3967	(5.32) ^a	1.3119	(3.80) ^a	0.0777	(0.15)
Transportation	0.0005	(1.42)	0.6907	(2.70) ^a	0.0939	(0.36)	0.5418	(1.30)
Communication & Utilities	0.0006	(1.02)	0.7009	(1.56)	-1.3313	(-2.18) ^b	0.9520	(1.01)
Wholesale & Retail Trade	0.0003	(1.15)	1.1034	(3.03) ^a	0.4187	(0.93)	0.2192	(0.30)
Financial	0.0004	(1.79) ^c	0.9723	(2.72) ^a	0.4276	(1.01)	0.8676	(1.42)
Services	0.0000	(0.10)	1.3340	(3.12) ^a	0.4514	(0.83)	0.2825	(0.38)
Other	-0.0003	(-0.90)	1.0326	(4.96) ^a	0.0120	(0.04)	-0.1512	(-0.32)

^aSignificant at the 1% level^bSignificant at the 5% level^cSignificant at the 10% level

Table 5b—Excess Returns (a) Using the Fama and French (1993) Three-Factor Model Relative to the Industry Value-Weighted Index Following Repurchase Announcements

$$R_{ijt} - r_{ft} = a + b(R_{mt} - r_{ft}) + sSMB + hHML, j = 1 \text{ to } 17$$

Industry	a	t-stat	b	t-stat	s	t-stat	h	t-stat
Panel A: Year 1								
All Firms	0.0002	(0.66)	0.6341	(2.39) ^b	-0.7272	(-2.21) ^b	-0.9624	(-2.03) ^b
Mining	-0.0003	(-0.81)	0.8810	(4.33) ^a	0.0673	(0.19)	-0.4754	(-1.04)
Construction & Contracting	-0.0002	(-0.43)	1.2656	(5.04) ^a	-0.5451	(-1.71) ^c	0.0701	(0.15)
Food	0.0002	(1.03)	0.6253	(3.78) ^a	-0.6449	(-3.78) ^a	-0.3892	(-1.55)
Textiles and Apparel	0.0003	(0.83)	0.6140	(2.60) ^a	-0.3665	(-1.18)	-0.8498	(-1.99) ^b
Paper Products	0.0002	(0.68)	0.8544	(3.47) ^a	-0.6771	(-2.80) ^a	-0.2506	(-0.71)
Chemical	-0.0003	(-1.11)	0.9518	(4.61) ^a	-0.2497	(-0.92)	-0.1380	(-0.30)
Primary & Fabricated Metals	-0.0003	(-0.92)	0.6767	(2.37) ^b	-0.2801	(-0.96)	-0.7152	(-1.39)
Industrial Machinery & Equipment	-0.0001	(-0.44)	1.2011	(4.44) ^a	-0.4826	(-1.28)	-0.1243	(-0.19)
Electrical Equipment	0.0003	(0.77)	0.8807	(2.99) ^a	-0.3854	(-1.04)	-0.3443	(-0.53)
Transportation Equipment	0.0001	(0.36)	0.8160	(4.35) ^a	-0.8103	(-3.927) ^a	-0.1388	(-0.39)
Manufacturing	-0.0001	(-0.24)	0.8300	(2.88) ^a	-0.3208	(-0.78)	-0.7958	(-1.35)
Transportation	-0.0004	(-0.98)	0.9189	(4.04) ^a	0.2948	(1.18)	-0.4769	(-1.02)
Communication & Utilities	-0.0004	(-1.20)	0.9389	(3.15) ^a	-0.4489	(-1.74) ^c	0.1638	(0.37)
Wholesale & Retail Trade	-0.0002	(-0.57)	0.8964	(3.26) ^a	-0.7567	(-2.47) ^b	-1.1334	(-2.26) ^b
Financial	0.0004	(1.40)	0.7258	(2.28) ^b	0.6778	(2.52) ^b	-0.9121	(-2.05) ^b
Services	-0.0002	(-0.45)	0.8472	(2.54) ^b	-0.7275	(-1.87) ^c	-0.6414	(-1.11)
Other	0.0002	(0.62)	1.5775	(7.21) ^a	-0.4826	(-1.99) ^b	-0.6316	(-1.45)

^aSignificant at the 1% level^bSignificant at the 5% level^cSignificant at the 10% level

Table 5b—Excess Returns (a) Using the Fama and French (1993) Three-Factor Model Relative to the Industry Value-Weighted Index Following Repurchase Announcements

$$R_{ijt} - r_{ft} = a + b(R_{mt} - r_{ft}) + sSMB + hHML, j = 1 \text{ to } 17$$

Industry	a	t-stat	b	t-stat	s	t-stat	h	t-stat
Panel B: Year 2								
All Firms	-0.0005	(-2.47) ^b	1.2906	(5.57) ^a	-0.1450	(-0.51)	0.1367	(0.30)
Mining	-0.0006	(-1.59)	1.0028	(4.23) ^a	-0.0979	(-0.21)	0.2605	(0.57)
Construction & Contracting	0.0003	(0.69)	1.0612	(4.21) ^a	0.5046	(1.42)	-0.5710	(-1.22)
Food	-0.0003	(-1.36)	0.9134	(4.79) ^a	-0.9632	(-4.58) ^a	-0.0343	(-0.12)
Textiles and Apparel	-0.0003	(-0.80)	1.1588	(4.96) ^a	-0.4878	(-1.64) ^c	-0.2302	(-0.49)
Paper Products	-0.0003	(-1.26)	1.2071	(7.00) ^a	-0.3347	(-1.73) ^c	-0.3467	(-1.18)
Chemical	-0.0004	(-1.63)	1.2480	(6.90) ^a	-0.1996	(-0.75)	0.1550	(0.39)
Primary & Fabricated Metals	0.0002	(0.52)	0.2589	(1.18)	-0.4868	(-2.03) ^b	-0.3146	(-0.88)
Industrial Machinery & Equipment	-0.0003	(-0.79)	0.6684	(2.59) ^b	-0.4467	(-1.31)	0.1600	(0.32)
Electrical Equipment	-0.0007	(-2.10) ^b	1.2806	(4.99) ^a	-0.0707	(-0.23)	0.5605	(0.97)
Transportation Equipment	-0.0002	(-0.87)	0.9868	(6.12) ^a	-0.9691	(-4.65) ^a	-0.1168	(-0.33)
Manufacturing	-0.0001	(-0.28)	0.7366	(2.54) ^b	-0.1364	(-0.38)	-0.9853	(-1.62)
Transportation	-0.0003	(-0.78)	1.1488	(7.13) ^a	-0.5958	(-2.65) ^a	-0.7465	(-2.06) ^b
Communication & Utilities	0.0000	(0.00)	1.0479	(2.46) ^b	-0.3938	(-0.91)	0.0784	(0.13)
Wholesale & Retail Trade	-0.0004	(-1.66) ^c	1.0327	(3.79) ^a	-0.0711	(-0.25)	-0.3587	(-0.65)
Financial	0.0000	(-0.12)	0.7787	(1.96) ^c	-0.0872	(-0.30)	-0.1743	(-0.39)
Services	-0.0003	(-0.73)	0.8265	(2.73) ^a	-0.2938	(-0.77)	-0.4992	(-0.77)
Other	0.0001	(0.23)	1.2696	(6.65) ^a	-0.6744	(-2.83) ^a	-0.9637	(-2.39) ^b

^aSignificant at the 1% level^bSignificant at the 5% level^cSignificant at the 10% level

Table 5b (cont.)—Excess Returns (a) Using the Fama and French (1993) Three-Factor Model Relative to the Industry Value-Weighted Index Following Repurchase Announcements

$$R_{ijt} - r_{ft} = a + b(R_{mt} - r_{ft}) + sSMB + hHML, j = 1 \text{ to } 17$$

Industry	a	t-stat	b	t-stat	s	t-stat	h	t-stat
Panel C: Year 3								
All Firms	-0.0002	(-0.82)	1.0583	(3.99) ^a	-0.8990	(-2.91) ^a	-0.1916	(-0.45)
Mining	-0.0005	(-1.00)	1.0161	(3.71) ^a	-0.5906	(-1.55)	-0.1249	(-0.30)
Construction & Contracting	-0.0001	(-0.20)	0.7602	(3.12) ^a	-0.4589	(-1.53)	0.6205	(1.60)
Food	0.0000	(0.11)	0.8402	(4.68) ^a	-0.5027	(-2.56) ^b	-0.2488	(-1.00)
Textiles and Apparel	0.0002	(0.51)	0.7408	(3.47) ^a	-0.5000	(-1.78) ^c	0.2948	(0.70)
Paper Products	0.0005	(1.99) ^b	0.7837	(4.29) ^a	-0.1785	(-0.91)	-0.5150	(-1.73)
Chemical	0.0000	(0.12)	0.7695	(3.99) ^a	-0.5565	(-2.18) ^b	0.2339	(0.55)
Primary & Fabricated Metals	-0.0001	(-0.20)	0.7411	(3.13) ^a	-0.2802	(-0.95)	-0.1373	(-0.34)
Industrial Machinery & Equipment	-0.0003	(-0.65)	0.9777	(2.52) ^b	-0.6970	(-1.44)	-0.4287	(-0.64)
Electrical Equipment	0.0003	(0.67)	0.3685	(1.23)	-0.2510	(-0.59)	-0.7312	(-1.28)
Transportation Equipment	0.0000	(-0.15)	1.1235	(4.76) ^a	-0.7826	(-2.54) ^b	0.1635	(0.39)
Manufacturing	-0.0005	(-1.19)	1.1172	(4.62) ^a	0.0009	(0.00)	-0.5629	(-1.21)
Transportation	0.0004	(1.05)	0.6219	(2.82) ^a	-0.3115	(-1.40)	-0.0188	(-0.07)
Communication & Utilities	0.0004	(0.60)	0.6669	(1.38)	-1.8173	(-3.52) ^a	0.5423	(0.67)
Wholesale & Retail Trade	0.0000	(0.11)	0.9916	(2.80) ^a	-0.4657	(-1.24)	-0.3789	(-0.61)
Financial	0.0000	(-0.11)	1.2556	(2.69) ^a	-0.1342	(-0.36)	0.1671	(0.37)
Services	-0.0010	(-1.83) ^c	1.3229	(3.50) ^a	-0.8024	(-1.83) ^c	0.1926	(0.28)
Other	-0.0004	(-1.10)	0.8367	(4.32) ^a	-0.8127	(-3.42) ^a	-0.7929	(-1.89) ^c

^aSignificant at the 1% level^bSignificant at the 5% level^cSignificant at the 10% level

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