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Stock-Repurchase Announcements and Insider Transactions After the October 1987 Stock Market Crash

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■ The stock market crash on Monday, October 19, 1987 ignited an unprecedented rush by firms to announce open-market stock-repurchase programs. During the two weeks following the crash, almost 600 publicly traded firms announced these programs. In contrast, only 350 firms had announced open-market

repurchase programs from January 1, 1987 to the crash date, while 250 firms announced stock-repurchase programs in November 1987 [6].

This study examines the stock-price movements of firms that announced repurchases in the two-week period immediately after the crash. The empirical results show that the stock prices of these firms had declined abnormally during the crash period prior to their repurchase announcements. The repurchase announcements generated stock-price rebounds in the period following the announcement. Overall, the results support the argument that the repurchase announcements had a positive impact on the stock market, consistent with the findings on the effects of stock-repurchase announcements in the Division of Market Regulation SEC Report [6].¹

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During the same two-week period, 1,913 officers and directors of NYSE, AMEX, and OTC firms purchased stock in their respective companies (the market value of the purchases was \$183 million), while 256 officers and directors of NYSE, AMEX, and OTC firms sold stock in their respective companies (the market value of the sales was \$130 million). In contrast, from January 1 to October 19, 1987, more than twice as many officers and directors sold than bought stock in their companies.

Examination of insider transactions reveals that, even in the highly uncertain time around the crash, insiders were able to determine whether their firms' stock prices were undervalued or overvalued relative to the risk-adjusted relationship with the market. In turn, insiders capitalized on their knowledge. Insiders purchased stock after negative abnormal price performance during the crash period and sold stock after positive abnormal stock-price performance. Further, stock prices increased significantly after insiders purchased stock and stock prices remained constant or declined after insiders sold stock.

I. Open-Market Stock Repurchases Programs

A. Common Explanations and Prior Findings

In a typical open-market repurchase program, a firm announces that it will repurchase some of its shares on the open market, frequently accomplished by the intermittent purchases of small amounts of stock.² The firm does not have to publicly announce when it is actually in the market repurchasing the shares and there is no

¹According to the Division of Market Regulation SEC Report [6], the SEC counseled issuers and broker-dealers at the time of the crash on repurchases and how to operate within the parameters of SEC regulations of open-market repurchases. See Dorfman [7].

²Companies instituting open-market repurchase programs may comply with Rule 10b-18 under the Exchange Act (codified at 17 CFR Sec. 240.10b-18), a safe harbor rule. Rule 10b-18 sets out conditions in four areas (volume, timing, price, and manner of purchase) that, if followed, ensure that a repurchase will not incur liability under the anti-manipulation procedures of the Federal securities laws. For example, the volume limitation is to prevent a firm from manipulating the market for its stock through substantial trading. During a given day, a repurchasing firm may purchase only 25% of its average daily trading volume the prior four weeks, although purchases of blocks are exempted from this condition. In regards to the other three areas, companies cannot buy stock at the open or during the last half hour of trading, companies cannot repurchase shares at a price that leads the market, and all purchases on any given day must be made through the same broker.

statutory period in which the firm must repurchase the number of shares promised at the announcement. Many times the process can take several years to complete and there is no mandated requirement that a firm actually repurchase any shares, but the announcement, at the time it is made, cannot be false. (According to Dann [5], the average number of shares in the announced repurchase programs is about 5% of shares outstanding.)

There is no universally accepted theory of why companies institute open-market repurchase programs. Common explanations for repurchases include: (i) to increase earnings per share, (ii) a desire to increase leverage because of management's favorable outlook for the company, (iii) personal tax savings from substituting repurchases for dividends, and (iv) a signaling device whereby management can inform investors that the firm's stock is undervalued.³

The first two explanations are not consistent with finance theory. Earnings per share will not increase with a reduction in shares outstanding. Since the firm must pay out assets to finance the repurchase (unless new debt finances the stock repurchase), the size of the firm (and thus earnings) will decline with a decrease in shares outstanding. The second explanation is valid only if the firm has decided to simultaneously increase leverage and decrease the size of the firm. In contrast, a firm will issue new debt if it decides to simultaneously increase leverage and the size of the firm, and will offer a debt-for-equity exchange (in which the increase in debt is equal to the decrease in equity) if the objective is to maintain the current size of the firm.

In explaining the motivation for repurchases, academics have compared the use of dividends and repurchases since they are similar payout mechanisms.⁴ A major difference between dividends and repurchases is that at least before the Tax Reform Act of 1986, cash distributions from repurchases were taxed at the lower capital gains rate. Debate has centered on the extent

³These suggested explanations also apply to issuer self-tender repurchase programs. The present study focuses solely on open-market repurchase programs since virtually all of the repurchase programs announced after the market crash were of that type.

⁴Dividends and repurchases are the two most common forms of cash distribution to shareholders. Data from Barclay and Smith [3] show that during 1983–1986, open-market repurchases accounted for 20.5% of total payout by NYSE firms, whereas regular cash dividends accounted for 71.72%. Targeted share repurchases, self-tender offers, and special dividends accounted for the remaining 7.78% of distributions to shareholders.

and importance of these tax differences between repurchases and dividends (see Miller and Scholes [15], Feenberg [8], and Peterson, Peterson, and Ang [17]). While most of the comparisons between dividends and repurchases have concentrated on tax considerations, some researchers have examined other differences between repurchases and dividends (see Barclay and Smith [3], for example).

The most widely cited motive for open-market repurchases, especially by firms announcing repurchase programs, is to signal undervaluation of the firm's stock. Management's willingness to invest funds in the firm's stock provides credible support for their claim that their stock is worth more than the current market value. Vermaelen [20] provides results consistent with this hypothesis in an examination of 243 open-market repurchase announcements by NYSE-listed firms during 1970–1978. He finds that repurchases follow a period of significant abnormal stock-price decline of about 7% over the preceding three months. The repurchase announcement itself generates a significant abnormal stock-price gain of 3%. Additionally, it does not appear that the market believes that management is engaging in false signaling since most of the announcement stock-price effect remains in the following three months. Dann [5] finds similar results for 121 open-market repurchase announcements made during 1962–1976 and Comment and Jarrell [4] document similar results for repurchase announcements from 1984–1988. Consistent with the hypothesis that repurchases (cash outflows) are a positive signal are the findings by Asquith and Mullins [1] that there is a negative stock-price reaction to the announcement of new equity issues (cash inflows).

B. Open-Market Repurchase Programs Announced After the Crash

Given the uncertainty about the motivation for repurchases, the stock market crash of 1987 provides a unique opportunity to study repurchase announcements. The motivation is identifiable and relatively constant among firms for the announcement of share-repurchase programs made immediately after the 1987 stock market crash. Presumably, firms announced these repurchase programs for the same reason—the extraordinary decline in stock prices on October 19. (The stock market crash began in the market decline of over 10% during the three trading days immediately preceding the crash, the largest three-day decline in over 40 years; see Mitchell and Netter [16].) Moreover, firms an-

nounced repurchase programs to signal that their stock prices had declined below their true risk adjusted values.

Stocks can be mispriced, at least temporarily, because the acquisition of information is costly. The increased volatility in the stock market after the crash increased the potential for mispricing. Due to uncertainty about the cause of the market decline, investors were unclear about the appropriate level of the market as well as individual stock prices. While managers had no better information about the overall market decline than other investors, they may have had better information of whether the performance of their stocks reflected true risk adjusted market values. Managers that believed their stocks were undervalued could attempt to signal the undervaluation with an announcement of a repurchase program. Given the uncertainty at the time, the signal could have reflected management's willingness to help support their firms' stock price if the market continued downward. Managers of many firms stated that their share-repurchase announcements were a means to bolster investor confidence in their firm, maintaining that their shares were undervalued and the repurchase would help drive share prices back to their "true value."

If mispricing of stocks motivated the open-market repurchase announcements, firms that announced a repurchase are hypothesized to have suffered negative abnormal stock market performance during the crash period prior to the stock-repurchase program announcement. Similarly these firms are hypothesized to have exhibited positive abnormal stock-price performance contemporaneous with and after the repurchase announcement.⁵

C. Description of Stock Repurchase Data and Methodology

The stock-repurchase announcement data for this study were provided by the Division of Market Regula-

⁵The hypothesis assumes that a negative abnormal return indicates a stock is underpriced relative to management's view of its true value and vice versa. This is a strong assumption since a stock could be underpriced (overpriced) even if it had earned positive (negative) abnormal returns. This assumption is frequently made in the literature, however. Mikkelson and Partch [13] justify this interpretation of abnormal returns by assuming that a market-adjusted return is the sum of two independent components—the manager's assessment of the correct return and a pricing error. Both of these components are assumed to have a symmetrical distribution with a mean equal to zero. Therefore, when an abnormal return is positive (negative) there is a greater than 50% chance that the error component is positive (negative).

Exhibit 1. Summary Statistics for Firms Announcing Open-Market Stock Repurchase Programs During October 19–30, 1987

	NYSE and AMEX Firms	OTC Firms	NYSE, AMEX, and OTC Firms
Number of Firms Announcing Open-Market Stock Repurchase Programs	350	248	598
Total Number of Listed Firms	2,302	4,093	6,395
Percent of Firms Announcing Open-Market Stock-Repurchase Programs	15.20%	6.06%	9.35%
Number of Shares Outstanding for Firms Announcing Open-Market Stock-Repurchase Programs	13,877,033,000	2,456,678,000	16,333,711,000
Number of Shares Outstanding for All Listed Firms	73,417,419,000	36,878,761,000	110,296,180,000
Shares Outstanding for Firms Announcing Open-Market Stock-Repurchase Programs as Percent of Shares Outstanding in All Listed Firms	18.90%	6.66%	14.81%
Number of Shares Announced in Open-Market Stock-Repurchase Programs	781,581,273	172,484,755	954,066,028
Number of Shares Announced in Open-Market Stock-Repurchase Programs as Percent of Shares Outstanding in Firms Announcing Programs	5.63%	7.02%	5.84%
Number of Shares Announced in Open-Market Stock-Repurchase Programs as Percent of Shares Outstanding in All Listed Firms	1.06%	0.47%	0.87%

Data Source: SEC and Securities Industry Automation Corporation price volume tapes.

tion of the SEC. The data used in this study include the dates of open-market stock-repurchase program announcements by NYSE, AMEX, and OTC companies during October 19–30, 1987, and the amount of shares in each repurchase program. Exhibit 1 displays summary statistics for the firms announcing repurchases. The data show a higher proportion of announcements by NYSE and AMEX firms than OTC firms. Approximately 15.2% of NYSE and AMEX firms announced open-market repurchase programs, whereas 6.06% of OTC firms announced repurchase programs. The average proportion of shares outstanding announced in the repurchase programs is 5.63 for NYSE and AMEX

firms and 7.02 for OTC firms. If the firms that had announced repurchase programs had bought back all the shares in the announced programs, the number of shares outstanding of all publicly traded firms would have declined by 0.87%.

This study examines the abnormal stock market performance for the firms which announced an open-market stock repurchase in the two weeks immediately after the crash. A crucial assumption in analyzing the statistical significance of average abnormal returns is that the abnormal return for each firm is independent and identically distributed from that of every other firm. For this study, however, the abnormal returns will

Exhibit 2. Abnormal Returns (AR) and Cumulative Abnormal Returns (CAR) for Portfolios of NYSE/AMEX Firms Announcing a Stock-Repurchase Program Between October 19–30, 1987 for Various Windows Around the Announcement¹

Date of Announcement (N)	Oct. 19– Day -1	(-1)	(0)	(0, 1)	(0, 40)	(2, 40)
Oct. 19 (N = 9)		-0.67 (-0.99)	0.52 (0.37)	5.92 (5.00) ^c	7.02 (1.34)	1.10 (0.25)
Oct. 20 (N = 51)	-1.90 (-2.52) ^b	-1.90 (-2.52) ^b	8.65 (20.02) ^c	6.46 (11.17) ^c	11.61 (4.36) ^c	5.15 (1.78) ^a
Oct. 21 (N = 72)	-1.95 (-3.11) ^c	-1.38 (-3.55) ^c	3.52 (7.52) ^c	2.60 (3.34) ^c	11.95 (5.76) ^c	9.35 (5.14) ^c
Oct. 22 (N = 39)	-1.15 (0.12)	-2.44 (-4.38) ^c	2.63 (6.71) ^c	3.28 (6.10) ^c	11.44 (5.00) ^c	8.16 (3.75) ^c
Oct. 23 (N = 27)	-4.17 (-2.02) ^b	-0.05 (-0.10)	2.00 (4.83) ^c	3.63 (5.14) ^c	11.72 (4.21) ^c	8.09 (3.15) ^c
Oct. 26 (N = 33)	-0.36 (0.08)	0.30 (0.81)	2.10 (3.53) ^c	2.95 (4.16) ^c	7.41 (2.84) ^c	4.46 (1.97) ^b
Oct. 27 (N = 35)	4.44 (3.82) ^c	1.30 (2.29) ^b	-0.79 (-2.28) ^b	2.72 (5.40) ^c	4.26 (2.00) ^b	1.54 (0.83)
Oct. 28 (N = 32)	-2.85 (-2.82) ^c	-1.90 (-5.89) ^c	0.65 (1.96) ^b	0.30 (0.71)	0.73 (0.30)	0.43 (0.14)
Oct. 29 (N = 22)	-7.54 (-4.28) ^c	-1.76 (-3.52) ^c	2.74 (5.02) ^c	5.67 (6.83) ^c	10.17 (5.68) ^c	4.50 (4.28) ^c
Oct. 30 (N = 26)	-5.80 (-4.44) ^c	1.16 (2.60) ^c	3.49 (6.79) ^c	3.59 (4.99) ^c	10.17 (3.62) ^c	6.58 (2.59) ^c
All Firms Oct 20–30 (337)	-2.36 (-5.05) ^c	-0.74 (-4.75) ^c	2.78 (18.03) ^c	3.45 (15.95) ^c	5.36 (11.25) ^c	3.45 (7.88) ^c

¹The ARs and CARs are calculated using the CRSP Equally Weighted Index as the market index. Standardized prediction errors are in parentheses.

^aSignificant at the 0.10 level.

^bSignificant at the 0.05 level.

^cSignificant at the 0.01 level.

not be independent because of the extreme event-date clustering of the stock-repurchase announcements. Since the motivation for the announcements is presumably the same for all firms in the sample, the cross-sectional dependence will be positive; failure to adjust for this

dependence results in too many rejections of the null hypothesis of zero abnormal stock market performance.

To circumvent the cross-sectional dependence problem, portfolios are constructed for each day of the two-week period (October 19–30) consisting of firms

that announced repurchases on each day. NYSE and AMEX stocks are examined separately from OTC stocks by creating separate portfolios for these two groups on each day.

The abnormal return to each open-market stock-repurchase portfolio on each day is:

$$AR_{it} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt}, \quad (1)$$

where:

i = NYSE and AMEX stock-repurchase portfolio or OTC stock-repurchase portfolio;

AR_{it} = abnormal return to stock-repurchase portfolio i on day t ;

R_{it} = continuously compounded return to stock-repurchase portfolio i on day t ;

$\hat{\alpha}_i, \hat{\beta}_i$ = market model parameter estimates from 170 to 21 trading days prior to the announcement day; and

R_{mt} = continuously compounded return to market portfolio on day t (for exchange firms, the Center for Research in Securities Prices, CRSP, equally weighted NYSE and AMEX index; for OTC firms, the CRSP equally-weighted NASDAQ index).

Abnormal returns over various event windows are cumulated to create cumulative abnormal returns (CAR). To assess the statistical significance of the abnormal returns, we divide the AR by the square root of its estimated forecast variance:

$$\sigma_{ar} = \left\{ \sigma^2 \left[1 + \frac{1}{N} + \frac{(R_{mt} - R_m)^2}{CSSR_m} \right] \right\}^{1/2}, \quad (2)$$

where

σ^2 = the estimated residual variance for the estimation period;

N = the number of observations in the estimation period;

R_m = the estimation period mean of the market return; and

$CSSR_m$ = the corrected sum of squares of the market return during the event window.

to form a standardized abnormal return, $SAR_{it} = AR_{it} / \sigma_{ar}$. The test statistic for the CAR is $(1/\sqrt{T}) \sum SAR_{it}$ where T is the length of the event window.

D. Abnormal Stock-Price Performance Associated With Repurchase Portfolios

CRSP stock returns data are available for 346 of the 350 NYSE and AMEX firms announcing repurchases and for 184 of the 248 OTC firms. Exhibit 2 reports the portfolio abnormal returns associated with the 346 NYSE/AMEX firms, while Exhibit 3 reports the portfolio abnormal returns for the 184 OTC firms.

The abnormal price performance prior to the repurchase announcements is measured in two ways and reported in Columns 2 and 3 of Exhibits 2 and 3. Column 2 shows the abnormal performance during the period from October 19 through the day prior to the repurchase announcement. The length of this event window increases the longer the repurchase announcement is after October 19. For example, this event window is one day for repurchase announcements on October 20, two days for repurchase announcements on October 21, and so forth. Column 3 displays the abnormal returns for the day prior to the repurchase announcement.

This analysis focuses on the stock-price performance of firms that announced repurchases from October 20–30, although results are also reported for firms that announced repurchases on October 19. October 19 announcements are excluded from the average portfolio results since the assumption behind the analysis is that the crash motivated the repurchase announcements and thus one cannot unambiguously predict stock-price reactions to announcements on October 19.

Eight of the nine NYSE/AMEX portfolios exhibited negative abnormal stock-price performance (six significantly) from October 19 through the day prior to the repurchase announcement. The NYSE/AMEX abnormal return averaged across the nine portfolios is -2.36% and significant at the 0.01 level. Unlike the NYSE/AMEX portfolios, the OTC portfolio results do not indicate a negative stock-price performance during this period. Only four of the nine OTC portfolios exhibited abnormal stock-price declines during this period (one significantly). The average OTC portfolio abnormal return is -0.96% and statistically insignificant.

On day (-1), six of the nine NYSE/AMEX portfolios declined in value (five significantly). The average NYSE/AMEX portfolio return for the day prior to the repurchase announcement is -0.74% and significant at the 0.01 level. Five of the OTC portfolios declined in value (three significantly) on day (-1). The average OTC port-

Exhibit 3. Abnormal Returns (AR) and Cumulative Abnormal Returns (CAR) for Portfolios of OTC Firms Announcing a Stock-Repurchase Program Between October 19–30, 1987 for Various Windows Around the Announcement¹

Date of Announcement (<i>N</i>)	Oct. 19– Day -1	(-1)	(0)	(0, 1)	(0, 40)	(2, 40)
Oct. 19 (<i>N</i> = 3)		-3.22 (-1.42)	-4.29 (-1.02)	5.08 (0.82)	44.31 (3.02) ^c	39.23 (2.91) ^c
Oct. 20 (<i>N</i> = 13)	2.92 (1.65) ^a	2.92 (1.65) ^a	8.16 (4.53) ^c	8.69 (3.51) ^c	30.87 (4.41) ^c	22.18 (3.73) ^c
Oct. 21 (<i>N</i> = 29)	1.64 (0.99)	-0.40 (-0.33)	7.50 (9.22) ^c	8.65 (7.73) ^c	27.67 (4.70) ^c	19.02 (5.11) ^c
Oct. 22 (<i>N</i> = 20)	-0.80 (-0.63)	-1.38 (-1.53)	4.96 (6.63) ^c	5.38 (5.13) ^c	18.36 (4.00) ^c	12.99 (2.94) ^c
Oct. 23 (<i>N</i> = 17)	0.96 (-0.29)	-3.39 (-4.67) ^c	2.13 (3.31) ^c	6.09 (4.86) ^c	14.00 (3.08) ^c	7.91 (2.06) ^b
Oct. 26 (<i>N</i> = 33)	-1.05 (-0.91)	-1.11 (-1.77) ^a	3.02 (2.80) ^c	6.52 (6.02) ^c	15.81 (3.76) ^c	9.29 (2.49) ^b
Oct. 27 (<i>N</i> = 26)	-12.12 (-6.14) ^c	-5.62 (-6.02) ^c	2.73 (5.14) ^c	5.62 (7.13) ^c	19.34 (5.51) ^c	13.72 (4.04) ^c
Oct. 28 (<i>N</i> = 15)	-4.28 (-0.76)	0.44 (0.49)	3.61 (3.70) ^c	7.14 (5.32) ^c	2.62 (0.27)	-4.52 (-0.93)
Oct. 29 (<i>N</i> = 14)	2.22 (1.19)	1.40 (1.54)	4.07 (4.72) ^c	5.95 (4.48) ^c	14.44 (2.67) ^c	8.49 (1.73) ^a
Oct. 30 (<i>N</i> = 14)	1.90 (1.23)	0.39 (0.43)	0.28 (0.23)	1.81 (1.46)	7.80 (1.48)	5.99 (1.19)
All Firms Oct 20–30 (181)	-0.96 (-1.22)	-0.75 (-3.40) ^c	4.05 (13.43) ^c	6.21 (15.21) ^c	16.76 (9.96) ^c	10.57 (7.45) ^c

¹The ARs and CARs are calculated using the CRSP Equally Weighted OTC Index as the market index. Standardized prediction errors are in parentheses.

^aSignificant at the 0.10 level.

^bSignificant at the 0.05 level.

^cSignificant at the 0.01 level.

folio return is -0.75% and statistically significant at the 0.01 level.

The repurchase-announcement effect is reported in Column 4, the announcement day or day (0), and Column 5, day (0,1), of Exhibits 2 and 3. Eight of the nine

NYSE/AMEX portfolios exhibited positive stock-price performance on the announcement day (all eight significantly). For the two-day announcement period, all nine are positive (eight significantly). The average NYSE/AMEX portfolio abnormal return on day (0) is 2.78% and signifi-

cant at the 0.01 level. The average two-day NYSE/AMEX announcement abnormal return is 3.45% and significant at the 0.01 level.

The announcement period results for the OTC portfolios are similar to those of the NYSE/AMEX portfolios. On the day of the stock-repurchase announcement, all of the nine OTC portfolios increased in value (eight significantly). In addition, all of the OTC portfolios increased in value during the two-day announcement period (eight significantly). The average OTC portfolio announcement day abnormal return is 4.05% and significant at the 0.01 level. The average OTC portfolio two-day announcement abnormal return is 6.21% and significant at the 0.01 level.

Columns 6 and 7 of Exhibits 2 and 3 display evidence on the permanence of the stock-price reaction. Column 6 contains abnormal returns for the (0, 40) window while the abnormal returns for window (2, 40) are listed in Column 7. Since the results from the two windows do not differ significantly, the following discussion focuses on the (2, 40) window. All nine of the NYSE/AMEX portfolios increased in value during the (2, 40) period (seven significantly). The value of eight of the OTC portfolios increased during this period (seven significantly). The average NYSE/AMEX portfolio abnormal return during the (2, 40) window is 3.45% and significant at the 0.01 level. The average OTC portfolio abnormal return during this period is 10.57% and significant at the 0.01 level.⁶

In sum, the data support the argument that firms announced open-market repurchase programs to signal that their stocks were undervalued as a result of the crash, and the market responded positively to the announcement. Firms (especially NYSE/AMEX firms) that announced a repurchase program, had on average, experienced significant negative abnormal stock-price performance during the crash period prior to their repurchase announcements. The repurchase announcements generated, on average, a significant positive stock-

⁶Equally weighted CRSP indexes are used to proxy for the market instead of value-weighted indexes. While normally there is a high correlation between equally weighted and value-weighted indexes, in the several days around the crash their movements (at least for the exchange indexes) were very different. For example, the equally-weighted CRSP exchange index declined 6.4% on October 20 while the S&P 500 increased 5.3%. On October 21, the respective movements were 9.8% and 9.1%. While these differences were partially due to nonsynchronous trading, they also could be a function of the fact that at this time firms announcing repurchases tended to be in the S&P 500. Therefore, using a value-weighted index such as the S&P 500 understates the effects of a typical announcement, since the announcement was also affecting the value-weighted index.

price effect that does not disappear, but actually increases over the next 40 trading days.

Commentators, including Grossman and Miller [10], have suggested that firms announcing repurchases were instrumental in saving the market on October 20 when it threatened to continue to crash. The evidence presented in this study is consistent with this claim. Repurchase announcements on October 20 generated positive abnormal returns. The portfolio of 51 NYSE/AMEX firms announcing a repurchase on October 20 experienced a positive announcement day abnormal return of 8.65%, significant at the 0.01 level. Of the 51 firms, 25 are in the S&P 500 Index.⁷ To the extent the 25 firms were large enough to materially affect the value-weighted S&P 500, the repurchase announcements could explain a large part of the 5.3% increase in the S&P 500 on October 20.

E. Did Firms Actually Repurchase Shares After the Crash?

Firms engaging in open-market repurchase programs do not have to report how, when, and if they actually repurchase their own shares. This study used an indirect source to check whether firms followed through with a repurchase of shares. The number of outstanding shares reported in the *Standard & Poors Daily Stock Price Record* for the end of the third quarter of 1987 (September 30) and the end of the first quarter of 1988 (March 31) are examined. A decrease in the number of outstanding shares from September 30, 1987 to March 31, 1988 is consistent with a repurchase of shares. Note, however, this is an indirect measure of whether the announcing firms actually repurchased shares and it does not account for transactions between September 30, 1987 and March 31, 1988 that were unrelated to the repurchase announcement at the time of the crash, or repurchases after March 31, 1988.

There is no evidence of an overwhelming rush by firms announcing a repurchase program during October 19–30 to actually repurchase their shares. From September 30, 1987 to March 31, 1988 outstanding shares declined for only 41% of NYSE/AMEX firms and 33% of OTC firms that had announced a repurchase.⁸ Even among the firms where the number of

⁷The comparable figures in the sample for S&P 500 firms that made repurchase announcements on the other dates around the crash are: 1 of 9 on 10/19, 21 of 72 on 10/21, 14 of 39 on 10/22, and 9 of 27 on 10/23. One OTC firm in the S&P 500 announced a repurchase on October 20 and October 23 respectively.

shares outstanding declined, the reduction in the number of shares outstanding was generally not as large as the number announced in the repurchase program.⁹ Only for 15% of the NYSE/AMEX firms and 17% of the OTC firms, where the shares outstanding declined, did the decline in the number of shares equal or exceed the number of shares in the repurchase-program announcement.

Recall from Exhibit 1 that the number of shares announced in repurchase programs was 5.63% of the outstanding shares for NYSE/AMEX firms and 7.02% of the outstanding shares for OTC firms. From September 30, 1987 to March 31, 1988, the number of shares outstanding for NYSE/AMEX firms that had announced a repurchase in the two weeks after October 19 declined 0.36%, while the number of shares outstanding for the OTC firms announcing a repurchase actually increased 1.67%. This evidence suggests that by March 31, 1988 firms that had announced a post-crash repurchase program had generally not followed through with the repurchase.¹⁰

Did announcing firms that had actually repurchased shares within six months of the announcement outperform firms that announced a repurchase program but did not repurchase shares? To the extent that share-repurchase program announcements signal management's belief that its stock is undervalued and a good investment, it is necessary for firms to follow through with the repurchase for the stock-price increase to be permanent. Firms that are unwilling to follow through

with the repurchase program should lose any stock-price increase realized at the announcement. To the extent, however, that the announcements were only guarantees by the firms that they would attempt to mitigate any further stock-price decline or that they would repurchase shares if the market did not correct the mispricings, it is less likely that firms that failed to follow through would have eventually suffered negative abnormal returns.

The analysis focuses on the (2, 40) event window for firms that announced a repurchase from October 20–30 to determine whether firms that bought back stock differed from those that did not. The results for the sub-samples of NYSE/AMEX and OTC announcing firms that experienced a decline in shares outstanding do not differ significantly from the firms that did not reduce shares outstanding. For exchange firms that followed through, the average abnormal return in the (2, 40) window is 5.37%, while it is 5.38% for the other firms. Thus, there is no evidence that the market rewarded the actual repurchase of stocks. For the OTC firms, the results are counter to the hypothesis. The average abnormal return in the (2, 40) window for firms that repurchased is 5.47% and is 12.60% for those firms that did not repurchase. (Note that the stock-price evidence only extends to the end of 1987, while the measure of whether the firm repurchased comes is based on March 1988.)

A difficulty in interpreting these results is that it is impossible to disentangle the long-term effect of the announcement on price with the effect of the long-term price movement on the propensity of firms to actually repurchase shares. It is plausible that announcing firms which had positive abnormal returns in the longer window did not need to actually repurchase any shares. Repurchase announcements in this period could have meant and been understood to mean that the issuer was promising to repurchase their stock if the price continued to fall or did not rebound after the repurchase announcement.

II. Insider Transactions After the Crash

Immediately following the crash, a large number of insiders purchased and sold stock. Presumably, insiders were better informed than other investors about possible mispricing of their stock. This section examines whether mispricing of stocks motivated insider transactions immediately after the crash and whether insiders' perceptions of mispricings were correct.

⁸Shares outstanding actually increased for 41% of the NYSE/AMEX firms and 38% of the OTC firms that announced repurchases. The number of shares outstanding remained constant for 18% of the NYSE/AMEX firms and 29% of the OTC firms.

⁹Of the firms where shares outstanding declined, the decline in the number of shares outstanding was greater than 25% of the number of shares in the announced program for 61% of the exchange-listed firms and 68% of the OTC firms. Similarly, the decline in the number of shares exceeded 50% of the number of shares in the announced program for 38% of the NYSE/AMEX firms and 40% of the OTC firms.

¹⁰The change in shares outstanding for all the firms listed on the NYSE, AMEX, and OTC on September 30, 1987 and on March 31, 1988 that did not announce a repurchase in the two weeks after the crash was also computed. Shares outstanding increased 0.86% for the NYSE and AMEX firms and 2.55% for the OTC firms from September 30, 1987 to March 31, 1988. Thus, relative to firms that did not announce share-repurchase programs immediately after the crash, firms announcing repurchase programs appear to have reduced shares outstanding, though still not by the magnitude indicated by the repurchase announcements.

Exhibit 4. Stock Purchases and Sales by Officers and Directors from October 19–30, 1987

	NYSE/AMEX Firms	OTC Firms
<i>Panel A: Shares and Dollar Value</i>		
Shares Purchased		
Number of Purchasers	1092	821
Number of Shares Purchased	10,011,553	9,709,073
Dollar Value	\$115,841,076	\$67,306,256
Average Number Purchased	9168	11826
Average Dollar Value of Purchase	\$106,081	\$81,980
Shares Sold		
Number of Sellers	143	112
Number of Shares Sold	3,605,420	5,109,806
Dollar Value	\$100,467,808	\$29,938,846
Average Number Sold	25,212	45,623
Average Dollar Value of Sale	\$702,572	\$267,210
<i>Panel B: Distribution of Share Purchases/Sales by Officers and Directors</i>		
Purchases (number of shares)		
more than 1 million	1	0
100,000–999,999	16	216
10,000–99,999	115	164
1,000–9,999	<u>605</u>	<u>483</u>
Total	1092	821
Sales (numbers of shares)		
more than 1 million	1	0
100,000–999,999	5	11
10,000–99,000	42	43
1,000–9,999	71	50
less than 1000	<u>25</u>	<u>8</u>
Total	144	112

A. Description of Insider Transaction Data

Data on the insider transactions (purchases and sales by insiders) come from *Insiders' Chronicle*, which publishes the corporate insider transactions by company and date. Section 16 of the Securities Exchange Act of 1934 requires officers, directors, and 10% equity holders to file their holdings and all transactions in the company's stock to the SEC. In this analysis, insider transactions are limited to purchases and sales by officers and directors.

Exhibit 4 displays summary statistics on the purchases and sales by officers and directors during the two weeks beginning October 19. Panel A contains data on

the number and value of shares purchased and sold by all insiders for NYSE/AMEX firms and OTC firms. Panel B reports the distribution of insider transactions.¹¹

A comparison of the purchases and sales by insiders in the NYSE/AMEX sample reveals that, while there was a much larger number of insiders purchasing (1,092) than selling (143), the total dollar value of purchases and sales were similar (\$116 million versus \$100 million). For OTC firms, the comparison of the total purchases and sales has a different outcome. Not only did many more insiders in OTC firms purchase shares (821) than sold shares (112), the dollar value of purchases (\$67 million) was more than twice as much as the dollar value of sales (\$30 million).

B. Prior Evidence

Researchers have examined whether insiders make abnormal profits on their security transactions in their own firm. Seyhun [19] examines 59,148 insider transactions that occurred from 1975–1981. He finds that during the 100 days following insider purchases, there is a 3.0% abnormal return and he reports a negative 1.7% abnormal return in the 100 days after insider sales. In the 100 days preceding insider purchases stock prices fall 1.4%, and for insider sales stock prices rise 2.5%. All of these abnormal price movements are statistically significant and suggest that insiders are able to capitalize on superior information to make their transactions. Earlier empirical studies by Finnerty [9], Jaffee [11], Lorie and Niederhoffer [12], and Pratt and DeVere [18] also find that insiders earn abnormal returns by trading stocks of their own firms.

C. Abnormal Stock Performance Associated with Insider Transactions

Were insiders able to profit from the extreme volatility in stock-price movements during the crash period that may have temporarily caused some stocks to be priced incorrectly? Under the assumption that insiders transacted in their own firms' stock during this period because of mispricing, negative abnormal stock-price performance should precede insider purchases and posi-

¹¹The sales of Alan Clore, chairman of Kaiser Tech are excluded, from the sales by insiders of NYSE/AMEX firms. He sold almost \$50 million of Kaiser Tech stock in this period. Since his sales were related to special financial considerations and not the stock's performance around the crash, his transaction is excluded from the sample. For a complete discussion of the Kaiser Tech case see Miller and Barrett [14].

Exhibit 5. Abnormal Returns (AR) and Cumulative Abnormal Returns (CAR) for Portfolios of NYSE/AMEX and OTC Firms in which Insiders Purchased/Sold Shares between October 20–30, 1987¹

Listing (N)	Oct. 19– Day -1	Windows	
		(-1)	(0, 40)
<i>Panel A: Insider Purchase</i>			
NYSE/AMEX Firms	-3.61	-1.08	4.36
Oct. 20–30 (570)	(-9.03) ^c	(-6.32) ^c	(5.67) ^c
OTC Firms	-0.54	-0.61	11.53
Oct. 20–30 (371)	(-2.58) ^c	(-1.53)	(9.12) ^c
<i>Panel B: Insider Sale</i>			
NYSE/AMEX Firms	3.95	1.64	-1.35
Oct. 20–30 (91)	(8.09) ^c	(6.75) ^c	(-0.45)
OTC Firms	10.52	3.58	-0.10
Oct. 20–30 (44)	(5.08) ^c	(5.17) ^c	(0.75)

¹ARs and CARs are calculated using the CRSP Equally Weighted Index as the Market Index for NYSE/AMEX Firms and CRSP Equally Weighted OTC Index for OTC Firms. Standardized prediction errors are in parentheses.

^cSignificant at the 0.01 level.

tive abnormal price performance follow their purchases. Similarly, positive abnormal price performance should precede insider sales and negative abnormal price performance follow sales by insiders.

Exhibit 5 reports abnormal stock-price movements for portfolios constructed of firms in which insiders purchased or sold stock. The event date in these estimations is the date of the first purchase (or sale) by an insider in each company. Thus, the stock-price performance of each company is only included in the estimation once. In four cases for an NYSE/AMEX firm and three cases for an OTC firm there were both purchases by one insider and sales by a different insider on the same day. In those seven cases the transaction is counted as a purchase when the number of shares purchased is greater than the number of shares sold and vice versa. Since there is no immediate public release of an insider transaction, the abnormal return on day (0) is not reported.

Two event windows measure the price performance prior to the insider transactions: (i) October 19 through

the day prior to the insider transaction and (ii) the day prior to the insider transaction. For the reasons discussed in the repurchase section the analysis concentrates on insider transactions during October 20–30. For the NYSE/AMEX firms, the average portfolio abnormal return for the October 19 through the day (-1) window is -3.61% (significant at the 0.01 level) for insider purchases and 3.95% (significant at the 0.01 level) for insider sales. The comparable figures for OTC firms are -0.54% and 10.52% (both significant at the 0.01 level).

The average abnormal returns on day (-1) are similar to those for the longer window. For the NYSE/AMEX firms, the abnormal return is -1.08% on the day prior to insider purchases and 1.64% on the day prior to insider sales (both significant at the 0.01 level). For OTC firms, the abnormal return is -0.61% on the day prior to insider purchase (not significant) and 3.58% on the day prior to insider sales (significant at the 0.01 level).¹²

These results support the argument that in the period immediately after the crash, stock mispricings motivated insider transactions. In the firms where insiders purchased stock, the stock price had declined abnormally in the crash period prior to their purchase, and for the firms where insiders sold stock the stock price had increased abnormally in the crash period prior to their sale.

Exhibit 5 also displays the abnormal price movement over the period from the day of the insider transaction through forty days after (0, 40). The stock prices of NYSE/AMEX firms where insiders purchased stock increased 4.36% and the stock prices of OTC firms where insiders purchased stock increased 11.53% during the (0, 40) window (both significant at the 0.01 level). These results also are consistent with the argument that insiders had superior information regarding the price of their stocks. In support of the argument that insiders knew when their stocks were overvalued,

¹²Note that for insider purchases in OTC firms, the October 19 through the day (-1) abnormal return is -0.54% with a standardized prediction error of -2.58 while the day (-1) abnormal return is more negative (-0.61%) with a standardized prediction error (-1.53) that is less significant. This occurs because in calculating the returns from October 19 through Day (-1) there are several days with large positive abnormal returns and small standardized prediction errors and several days with large negative abnormal returns and large standardized prediction errors. Therefore, in averaging over the window the positive and negative abnormal returns tended to cancel out but the negative standardized prediction errors swamped the positive standardized prediction errors.

the stock-price performance following insider sales is negative, though insignificantly different from zero. For firms where insiders sold stock, stock prices of NYSE/AMEX firms decreased 1.35% and stock prices of OTC firms decreased 0.10% during the (0, 40) window.

III. Insider Transactions in Firms Announcing Stock-Repurchase Programs

The empirical evidence on both stock-repurchase announcements and insider transactions supports the hypothesis that managers recognized mispricings stemming from the market crash. A comparison of firms that had both insider transactions and announcements of repurchase programs provides further support for the hypothesis. The evidence presented so far shows firms announced repurchase programs following negative abnormal price performance and insiders bought stock following negative abnormal price performance and sold stock following positive abnormal stock performance. If managers announced stock repurchases because they believed the market crash devalued their firms' stock prices below their true risk adjusted values, then arguably in those same firms the managers should also have been inclined to purchase stock for their own accounts. Conversely, one would not expect many firms where managers both announced a stock repurchase and sold stock from their own accounts. (Potentially, a firm's stock price could have declined below management's view of its true value and management responded with the announcement of a repurchase program, which resulted in a stock-price increase to a level above the stock's true value, and managers then sold their own stock.)

Insider trading law limits the ability to directly examine the propensity of insiders to transact in their firm's stock in firms where there was an announced repurchase program. The law requires insiders to refrain from trading if they have inside nonpublic information that would materially affect their firm's stock price. Since the announcement of a stock repurchase program could be considered material information, insiders who knew of a pending repurchase announcement could be required to refrain from purchasing stock until after the announcement. Insider trading law does not prohibit purchases by insiders after information has been released, and thus purchases by insiders after the public announcement would have been legal. The announcement itself, however, could have led to a

price increase that made an insider purchase unattractive.¹³

A comparison is made of insider transactions in firms that announced a repurchase with insider transactions in firms that did not announce a repurchase. In the 530 publicly traded firms that announced stock repurchases for which CRSP price data were available, 347 insiders purchased stock and 33 insiders sold stock. Thus, purchases by insiders account for 91.3% of all the insider transactions in this sample. In the sample of firms for which CRSP stock-price data were available and there was no stock repurchase announcement, 1,566 insiders purchased stock and 22 insiders sold stock. For this sample, insider purchases account for 87.6% of all transactions and is not much lower than that for the stock repurchase sample. The value of insider purchases relative to the value of all insider transactions, however, is much higher in firms that announced repurchases (85.9%) than firms that did not announce repurchases (55.6%).

The results in this section provide further support for the finding in Section II that managers announced repurchase programs to signal their stock was undervalued. In light of insider trading laws, these results are biased against finding a difference in insider transactions for firms announcing repurchase programs versus those that did not. This is because it is likely there were many insiders who refrained from purchasing stock because of knowledge of an upcoming repurchase announcement.

IV. Concluding Comments

Earlier studies of issuer stock repurchases have emphasized the signal content of the repurchase. Asquith

¹³According to the data source used here, *Insiders' Chronicles*, in the 135 NYSE/AMEX firms where there was both a repurchase announcement and insider purchases, the first insider purchasing shares purchased one or two days before the announcement in 27 cases and on the same day as the announcement in 24 cases. The comparable figures for the 45 OTC firms with a repurchase announcement and insider purchases are in 8 cases the first insider purchase occurred one or two days before the announcement and in 6 cases on the same day. The numbers are slightly different using the SEC's Official Summary of Security Transactions and Holdings.

Note, however, that while some insiders may have purchased stock immediately prior to repurchase announcements, they did not necessarily do so in violation of insider trading laws. The announcement might not be considered material and the insider purchase might have been due to the extreme volatility in stock-price movements during this period, not because of the announcement. Further, given the large number of repurchase announcements, it is likely that some insiders purchased stock without knowing the firm would soon be making a repurchase announcement.

and Mullins [2] call a repurchase a “news bulletin justified when management is convinced that its stock is substantially undervalued.” This study is consistent with the theory that repurchases announced at the time of the October 19 stock market crash signaled undervalued stock prices. Firms that announced repurchases underperformed the market in the period immediately before the announcement. The announcement generated a positive abnormal return, on average, and these firms continued to outperform the market in the 40 trading days after the announcement. Additionally, indirect evidence suggests a substantial proportion of the firms that announced a repurchase did not follow through with the repurchase in the four months after the crash. It is unlikely, however, that for these firms it was unnecessary to repurchase shares since the announcement itself signaled and corrected the mispricing.

In addition, evidence from insider transactions suggests that at the time of the crash, officers and directors were able to determine to some extent if the crash-period stock-price performance of their firm was accurate. Insiders tended to buy after a period of poor abnormal performance which then preceded a period of positive abnormal performance. Insiders tended to sell after a period of good abnormal performance which was followed by a period of slightly negative abnormal performance.

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