

Earnings Management and Firm Performance Following Open-Market Repurchases

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ABSTRACT

Both post-repurchase abnormal returns and *reported* improvement in operating performance are driven, at least in part, by pre-repurchase downward earnings management rather than genuine growth in profitability. The downward earnings management increases with both the percentage of the company that managers repurchase and CEO ownership. Pre-repurchase abnormal accruals are also negatively associated with future performance, with the association driven mainly by those firms that report the largest income-decreasing abnormal accruals. The study suggests that one reason firms experience post-repurchase abnormal returns is that post-repurchase realized earnings growth exceeds expectations formed on the basis of pre-repurchase deflated earnings numbers.

The last two decades have seen a proliferation of stock repurchases. According to Stefan Selig, vice-chairman of Banc of America Securities, “[r]epurchasing stock is one of the most frequently discussed corporate finance topics in boardrooms today” (*Business Week Online*, November 29, 2004). The increasing importance of repurchases in corporate payout policy has stimulated a considerable amount of academic research. However, the evidence on long-term operating and stock performance after repurchases remains largely unexplained. Further, although many well-documented anomalies seem to have disappeared in recent years (see Schwert (2003)), Peyer and Vermaelen (2006) find that long-term post-repurchase abnormal returns still persist. It is, therefore, important to explore potential explanations for the superior stock performance following repurchases.

Prior studies find that firms manage their reported earnings prior to corporate events such as management buyouts (Perry and Williams (1994)), initial public offerings (IPOs) (Teoh, Welch, and Wong (1998a)), seasoned public offerings (SEOs) (Teoh, Welch, and Wong (1998b) and Shivakumar (2000)), and stock-for-stock mergers (Erickson and Wang (1999) and Louis (2004)). Extant studies also find that long-term abnormal returns are negatively associated with (abnormal) accruals (Sloan (1996) and Xie (2001)) and that long-term stock

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performance after many corporate events is driven, at least in part, by pre-event earnings management (Teoh et al. (1998a, 1998b) and Louis (2004)). We conjecture that managers who conduct repurchases for purposes other than signaling¹ also have incentives to temporarily deflate their reported earnings prior to open-market repurchases, and that pre-repurchase earnings management is likely one determinant of both the post-repurchase *reported* improvement in operating performance and the post-repurchase superior stock performance documented in the literature.²

Consistent with our conjecture, we find evidence suggesting that managers deflate earnings around open-market repurchase announcements. Remarkably, the evidence of downward earnings management is observed only for firms that actually repurchase shares shortly after the repurchase announcements.³ For firms that announce repurchases but do not actually buy back shares, we find no evidence of downward earnings management around the repurchase announcements. Moreover, we find that the extent of downward earnings management increases with the number of shares (as a percentage of total shares outstanding) actually repurchased, which provides additional support to the conjecture that the observed evidence of downward earnings management is associated with actual open-market repurchases. The effect of the proportion of shares outstanding repurchased on abnormal accruals (our earnings management proxy) is robust to controls for the plausibility that the relation between abnormal accruals and the percentage of shares outstanding repurchased may be endogenous. We also find that the extent of downward earnings management increases with the equity holdings of the Chief Executive Officer (CEO), which is consistent with the notion that high equity stakes increase managerial incentives to reduce the repurchase price.

Furthermore, we find a significantly negative association between pre-repurchase abnormal accruals and post-repurchase operating performance improvement, suggesting that the reported improvement in operating performance is due, at least in part, to pre-repurchase earnings management rather than genuine growth in profitability. We also find a significantly negative association between pre-repurchase abnormal accruals and long-term abnormal stock returns following open-market repurchase announcements. The market is apparently surprised by the subsequent performance improvement, resulting in subsequent positive abnormal stock returns. Interestingly, the negative

¹ Potential nonsignaling reasons for repurchases include: distribution of excess cash (Brennan and Thakor (1990)), reduction of agency costs (Denis and Denis (1993) and Grullon and Michaely (2004)), change toward the optimal financial leverage (Dittmar (2000)), expropriation of creditors (Maxwell and Stephens (2003)), financing of employee stock option plans (Kahle (2002)), and maximization of employee stock option value (Jolls (1998)).

² See the next section for a discussion of the motivation for our conjecture.

³ It is worth noting that, prior to open-market repurchases, the repurchasing firms' operating performance is on average better than the operating performance of their industry peers (Lie (2005)). Thus, the observed negative abnormal accruals are less likely to be driven by poor performance or restructuring charges. We have also adjusted our earnings management proxy for the potential effects of performance. In addition, as a robustness check, we delete observations that are potentially associated with restructuring and obtain qualitatively similar results.

association between pre-repurchase abnormal accruals and post-repurchase performance appears to be driven largely by those firms that report the most negative abnormal accruals prior to the repurchases. These results are consistent with Louis's (2004) argument that, because of the intricacies of earnings management and the difficulty in observing certain managerial actions, investors are likely to be surprised when realized growth falls short of or exceeds expectations formed on the basis of manipulated earnings numbers.

Subsequent analyses also indicate that once we control for the effect of pre-repurchase earnings management, there is no evidence of performance improvement, and the significantly negative association between post-repurchase performance and pre-repurchase abnormal accruals essentially disappears. This additional evidence further supports our conjecture that the post-repurchase superior performance is due, at least in part, to pre-repurchase earnings management.

The remainder of the study is organized as follows. The next section discusses related studies and our motivation. Section II describes our variable measurement process. Section III describes the sample selection process. Section IV analyzes post-repurchase performance. Section V analyzes the evidence on pre-repurchase earnings management. Section VI analyzes the association between pre-purchase earnings management and post-repurchase performance. The study concludes in Section VII.

I. Related Studies and Motivation

Lie (2005) finds that firms report significant improvement in operating profitability relative to their peers after open-market repurchase announcements. He infers that managers initiate share repurchase programs when they expect future operating performance to be better than what the capital market expects. We conjecture that the post-repurchase improvement in *reported* operating performance is also likely to be driven by pre-repurchase downward earnings management. We posit that managers who conduct repurchases for nonsignaling purposes are likely to have incentives to reduce the repurchase price. Deflating the repurchase price effectively transfers wealth from the shareholders who sell (i.e., the leaving shareholders) to those who hold onto their shares (i.e., the remaining shareholders). This wealth transfer can benefit the managers because their interests are more likely to be aligned with those of the remaining shareholders through their equity stakes in the firm, career concerns, and their future compensation.⁴

One way that managers allegedly manipulate stock prices is through "earnings management" (see, e.g., Healy and Wahlen (1999)). Hence, we contend that managers are likely to use their reporting discretion to deflate stock prices prior to open-market repurchases. Managers have discretion in their financial

⁴ Graham, Harvey, and Rajgopal (2005), for instance, report that executives manage earnings primarily to influence stock prices and their own welfare *via career concerns*. Fried (2005) also makes a similar argument.

reporting because of the flexibility offered in current accounting standards. For example, current accounting rules often provide managers with discretion regarding how to account for transactions and/or estimate unrealized gains or losses.⁵ Hence, managers who are acting opportunistically can use their reporting discretion to reduce the repurchase price by temporarily deflating earnings in the quarter of and/or the quarter prior to the repurchase announcement.

In addition to deflating earnings for the quarter prior to the repurchase announcement, managers may also deflate earnings for the announcement quarter for two reasons. First, open-market repurchase programs are not always executed immediately. A program can be executed through many transactions over the months after the repurchase announcement. In fact, Lie (2005) shows that actual repurchases typically occur during the quarter of, and the quarter after, repurchase announcements. The number of shares repurchased after the initial two quarters is typically very small. Second, managers generally start guiding the market toward the reported numbers early in the quarter. For instance, if the managers want to depress their stock prices before a repurchase, they are likely to guide market expectations toward the lower earnings number months before the earnings announcement, which is consistent with Grullon and Michaely's (2004) finding that analysts revise their earnings forecasts for the upcoming year downward in the month of repurchase announcement.⁶

Our conjecture that managers are likely to deflate earnings prior to repurchases is consistent with extant studies that document that firms manage their reported earnings prior to corporate events (Perry and Williams (1994), Teoh, Welch, and Wong (1998a), Teoh, Welch, and Wong (1998b), Shivakumar (2000), Erickson and Wang (1999), and Louis (2004)). If managers also deflate earnings before open-market repurchases, using the reported performance prior to repurchases as the benchmark is likely to result in an improvement in the post-repurchase reported relative operating performance. For instance, Lie (2005) matches sample firms on operating performance in Quarter 0 (the repurchase announcement quarter) and on operating performance improvement (decline) from Quarter -3 through Quarter 0. If managers deflate earnings around repurchase announcements, the repurchasing firms are likely matched with firms that indeed have slower earnings growth (or faster earnings decline), implying that the matching firms show greater earnings declines than the sample firms, after adjusting for earnings management. Consider, for instance, a firm that has average unmanaged earnings of \$11/share over Quarter -3 and Quarter -2 and \$10/share over Quarter -1 and Quarter 0 (i.e., earnings decline from \$11/share to \$10/share from quarter -3 to quarter 0). If this firm deflates its earnings over Quarter -1 and Quarter 0 to an average of \$8/share, it is expected to be matched with a firm that has declining earnings from \$11/share

⁵ Note that as long as managers use their discretion within the limits of generally accepted accounting principles (GAAP), earnings management is not illegal. Managers have some discretion in determining how aggressive or conservative their financial reporting should be.

⁶ Part of the downward revisions may be mechanical due to forgone investment returns from cash distributed in share buybacks and/or interest expenses for borrowed funds to finance repurchases (Lie and McConnell (1998)).

to \$8/share over Quarter –3 through Quarter 0 and earnings of \$8/share over Quarter –1 and Quarter 0. Therefore, we would end up with a match firm that has a faster rate of earnings decline than that of the sample firm.⁷

If the market fails to fully correct for the effects of earnings management, an open-market repurchase will also result in positive post-repurchase abnormal stock returns. Because the pre-repurchase earnings benchmark is lowered by the downward earnings management, a repurchasing firm will likely report a faster earnings growth rate in the future than what the market expects, leading to positive abnormal stock returns after the repurchase. These conjectures are consistent with extant evidence that long-term abnormal returns are negatively associated with (abnormal) accruals (Sloan (1996) and Xie (2001)) and that the long-term stock performance after corporate events such as stock-for-stock mergers, IPOs, and SEOs is driven, at least in part, by pre-event earnings management (Teoh et al. (1998a, 1998b) and Louis (2004)). At first glance, one might expect the announcement of a repurchase to alert investors to managers' incentives to deflate their reported earnings prior to the repurchase. However, prior studies find that investors fail to completely undo the stock price effects of earnings management around various corporate events (e.g., Teoh et al. (1998a and 1998b) and Louis (2004)). As Louis (2004) illustrates, as long as investors cannot directly observe managers' actions, it is likely that pre-event earnings management will be associated with post-event abnormal stock returns.

Coles, Hertz, and Kalpathy (2006) find that accruals are abnormally low in the period following announcements of cancellations of executive stock options up to the time the options are reissued, but stock prices are unaffected by these apparent manipulations. They conclude that investors are not misled by the manipulation because management's incentives in the setting of a stock option re-issuance are obvious. They argue that Teoh et al.'s (1998a, 1998b) finding that earnings management around equity offerings apparently affects stock prices is plausible because management's incentives are likely less apparent to investors prior to the offerings. Coles, Hertz, and Kalpathy's finding is consistent with Stein (1989), who suggests that investors may anticipate a firm's earnings management activities and, consequently, price the firm at fundamental value. In contrast, Teoh et al.'s findings are consistent with Fischer and Verrecchia (2000), who show that investors are unable to reconstruct the unmanaged earnings series and correctly price a firm's securities when there are uncertainties about the managers' incentives. One source of uncertainty in the context of a repurchase comes from the conjecture that some managers use repurchases to communicate favorable private information. The uncertainty arises because managerial intent is unobservable and managers who intend

⁷ Similarly, if a firm that has average unmanaged earnings of \$10/share over Quarter –3 through Quarter –2 and \$12/share over Quarter –1 and Quarter 0 deflates earnings over Quarter –1 and Quarter 0 to an average of \$11/share, it is expected to be matched with a firm that has an earnings increase of \$1/share over Quarter –3 through Quarter –2 and earnings of \$11/share over Quarter –1 and Quarter 0. Therefore, we would end up with a match firm that has a slower earnings growth rate (or even declining earnings if the sample firm manages earnings below \$10/share) than the sample firm.

to signal favorable private information are unlikely to manage earnings down. Another source of uncertainty comes from the fact that open-market repurchase announcements are not firm commitments; many managers announce open-market repurchases but do not carry them through (Ikenberry and Vermaelen (1996), Stephens and Weisbach (1998), and Lie (2005)). Consistent with the notion that managerial incentives around repurchases are not always clear to investors, Chan et al. (2006) suggest that some managers who are under pressure to boost their stock prices use both open-market repurchases and upward earnings management to mislead investors. In particular, they find that the market fails to sort out differences in earnings quality across buyback programs.

Our study is also related to Louis and White (2007a), who use firm financial reporting behavior prior to repurchase tender offers to infer managerial intent. Their analysis yields mixed evidence as to whether firms report income-decreasing abnormal accruals prior to repurchase tender offers. They find that the average firm reports income-decreasing abnormal accruals prior to Dutch-auction tender offers but not prior to fixed-price tender offers. They also find a positive association between abnormal accruals and abnormal returns after fixed-price tender offers, but a negative association after Dutch-auction tender offers. In particular, they find that firms that report the largest income-increasing abnormal accruals prior to fixed-price tender offers tend to experience the most positive abnormal returns in the subsequent years. They infer that large positive discretionary accruals prior to fixed-price tender offers apparently act as an indicator of managerial intent to signal undervaluation.

Given the argument that Dutch-auction tender offers are more likely to be conducted for nonsignaling purposes,⁸ Louis and White's (2007a) finding that the average firm reports income-decreasing abnormal accruals prior to Dutch-auction tender offers provides another indication that earnings management could be a reason for the reported improvement in operating performance after open-market repurchases that is documented by Lie (2005). However, Louis and White (2007a) do not analyze post-repurchase operating performance and, hence, do not make any attempt to relate earnings management to the post-repurchase reported improvement in operating performance. Furthermore, repurchase tender offers and open-market repurchases are very different—in particular, repurchase tender offers are much larger and much more costly.⁹ The cost associated with tender offers likely increases managers' incentives to deflate the repurchase price, but also makes tender offers more credible as signaling devices. Also, while repurchases in general have become a frequent

⁸ Extant studies generally suggest that fixed-price tender offers are more likely to signal favorable private information than Dutch-auction tender offers (see, for example, Comment and Jarrell (1991), Lee et al. (1992), and Persons (1994)), although Lie and McConnell (1998) cast doubt on that contention.

⁹ As opposed to an open-market repurchase, a tender offer generally involves the hiring of investment bankers to structure the repurchase, lawyers to register the offering with the Securities and Exchange Commissions (SEC), and an outside firm to administer the repurchase, and the payment of huge premiums (up to an average premium of 21.8% according to Lakonishok and Vermaelen (1990)).

activity in U.S. corporations,¹⁰ repurchase tender offers remain relatively rare. For these reasons, it is difficult to make inferences about repurchases in general by only observing repurchase tender offers. The fact that repurchases have become so common and that most repurchases are open-market repurchases heightens the interest in exploring plausible explanations for the documented improvement in operating performance and abnormal returns after open-market repurchases.

II. Variable Measurement

A. Measuring Post-repurchase Operating Performance

Following Lie (2005), we measure the post-repurchase operating performance as the performance-adjusted return-on-assets (ROA) over the eight quarters after the repurchase announcement quarter. We define ROA as operating income divided by cash-adjusted total assets (i.e., total assets minus cash and cash equivalents) at the beginning of the quarter. The performance-adjusted ROA for a given firm is the firm-specific ROA minus the ROA of a matched firm with similar pre-event performance.

We select the matching firms using the matching procedure proposed by Lie (2005). For each sample firm, we select all firms in the same two-digit SIC code that have operating performance for the announcement quarter (quarter 0) within 20% or within 0.01, operating performance for the four quarters ending with Quarter 0 within 20% or within 0.01, and pre-announcement market-to-book value of assets within 20% or within 0.1. If no firm meets the above criteria, we relax the industry criterion to a one-digit SIC. If still no firm meets the criteria, we relax the industry, performance, and market-to-book criteria. From all the potential matches, we select the firm that has the lowest sum of absolute performance difference, defined as

$$\begin{aligned}
 & |\text{Performance}_{\text{Quarter 0, Sample firm}} - \text{Performance}_{\text{Quarter 0, Firm } i}| \\
 & + |\text{Performance}_{\text{Four quarters ending with Quarter 0, Sample firm}} \\
 & - \text{Performance}_{\text{Four quarters ending with Quarter 0, Firm } i}|.
 \end{aligned} \tag{1}$$

Following Lie (2005), if the sample firm lacks necessary data to calculate operating performance for any of the four quarters ending with Quarter 0, we disregard the second term in the equation above.

Untabulated results show that the sample firms and the matched firms have similar pre-repurchase operating performance and growth potential. Specifically, the mean (median) ROA is 4.96% (4.63%) for the sample firms and 4.91%

¹⁰ "According to Standard & Poor's, repurchases among companies in the S&P 500 index soared 91% during the first quarter of 2005, and by 64% for the 12 months ended Mar. 31" (Michael Kaye, *BusinessWeek Online*, June 10, 2005). Open-market repurchases have become so frequent that Richard Gibbons writes: "It seems that every other company on Wall Street is announcing a share buyback" (*The Motley Fool*, September 16, 2005, <http://www.fool.com/investing/value/2005/09/16/share-buybacks-arent-all-equal.aspx>).

(4.61%) for the matched firms for the announcement quarter; the mean (median) quarterly ROA for the four quarters ending with the announcement quarter is 5.14% (4.79%) for the sample firms and 5.03% (4.73%) for the matched firms; and the mean (median) book-to-market ratio at the beginning of the announcement quarter is 0.642 (0.524) for the sample firms and 0.589 (0.518) for the matched firms.

B. Measuring Long-Term Stock Performance

We examine post-repurchase long-term stock performance based on two alternative measures of abnormal stock returns. First, we use the calendar-time portfolio approach suggested by Fama (1998). Brav, Geczy, and Gompers (2000) note that events may be correlated in calendar time and that existing methods of computing long-term abnormal returns may not fully account for the correlation. To control for cross-sectional correlations, Fama (1998) advocates drawing inferences on the basis of the mean and standard deviation of the time series of average abnormal portfolio returns. Accordingly, we compute monthly abnormal returns of individual firms using the benchmark return adjustment procedure in Daniel et al. (1997).¹¹ This procedure controls for the effects of size, book-to-market, and return momentum.¹² Next, each month, we group the firms that had repurchases within the last 1 (or 2) year(s) into one portfolio and calculate the average abnormal returns of the monthly portfolios. This yields time series of monthly portfolio abnormal returns. We then base our inferences on the mean and standard deviation of the time series of monthly portfolio abnormal returns (Fama and MacBeth (1973)). Second, in addition to combining Daniel et al.'s (1997) match-portfolio procedure with the Fama and MacBeth (1973) procedure, we use Carhart's (1997) four-factor model.¹³

¹¹ Alternatively, we could use the match-firm procedure suggested by Barber and Lyon (1997). The firm-match approach mitigates the effect of positive skewness on long-run abnormal returns; however, as Lyon, Barber and Tsai (1999) point out, it may also lead to noisy point estimates. In any case, since the abnormal returns are measured on a monthly basis, skewness bias is not a problem (see Ikenberry, Shockley, and Womack (1999) for a discussion on the effect of skewness on benchmark portfolio returns). Accordingly, Fama (1998, p. 295) suggests that the monthly abnormal returns "can be estimated in any reasonable way, for example, with a matching firm or matching portfolio approach, or with a formal asset pricing model."

¹² To construct the benchmark portfolios, we first assign each stock that has book value of equity on Compustat and price and shares outstanding on CRSP to a size quintile (using NYSE size quintile breakpoints). Within each size quintile, we rank the stocks based on their industry adjusted book-to-market ratios, and assign them to book-to-market quintiles, yielding a total of 25 size and book-to-market sorted fractiles. We then sort the stocks into quintiles within each of the 25 fractiles sorted on size and book-to-market, based on the prior 12-month stock return. This results in a total of 125 fractiles. Next, we compute a monthly value-weighted buy-and-hold return for each of the 125 fractile portfolios. The benchmark portfolios are reconstructed annually at the end of June. The monthly abnormal return for each stock is the difference between the stock's monthly raw return and its monthly benchmark portfolio return.

¹³ Each month, we group the firms that had repurchases within the last 1 (2) year(s) into one portfolio and calculate the average excess returns of the monthly portfolios over the risk-free rate, yielding a time series of monthly portfolio average excess returns. Then, we run a time-series

Note that both approaches are consistent with Fama's (1998) calendar-time approach.

C. Measuring Earnings Management

Following the extant literature (Teoh et al. (1998a, 1998b) and Louis (2004)), we proxy for earnings management using abnormal accruals. We measure abnormal accruals by the residual from the modified version of the Jones (1991) model in Louis, Robinson, and Sbaraglia (2008) and Louis and White (2007a). Specifically, for each *calendar* quarter and two-digit SIC-code industry, we estimate the following model using all firms that have the necessary data on Compustat:

$$TA_i = \sum_{j=1}^4 \lambda_{j-1} Q_{j,i} + \lambda_4 \Delta SALE_i + \lambda_5 PPE_i + \lambda_6 LTA_i + \lambda_7 ASSET_i + \varepsilon_i, \quad (2)$$

where TA is total accruals;¹⁴ Q_j is a binary variable taking the value of one for *fiscal* quarter j and zero otherwise; $\Delta SALE$ is the quarterly change in sales; PPE is property, plant, and equipment at the beginning of the quarter; LTA is the lag of total accruals; $ASSET$ is total assets at the beginning of the quarter; and ϵ is the regression residual.

All the variables, including the indicator variables, are scaled by total assets at the beginning of the quarter. After deflating the model, $ASSET$ is transformed into a column of ones, which allows us to estimate the model with the standard intercept. To mitigate the effect of outliers and errors in the data, for each calendar quarter, we delete the top and bottom one percentiles of the deflated TA , $\Delta SALE$, PPE , and LTA . We also require at least 20 observations for each estimation.

Following Kothari, Leone, and Wasley (2005), we adjust the estimated abnormal accruals (i.e., the regression residuals) for performance. Consistent with Louis (2004) and Louis and Robinson (2005), among others, for each quarter and each industry (two-digit SIC code), we create five portfolios with at least four firms each by sorting the data into quintiles based on the return-on-assets from the same quarter in the previous year. The performance-matched abnormal accruals for a sample firm are the firm-specific abnormal accruals minus the median abnormal accruals for its respective industry-performance-matched

regression of the monthly portfolio average excess returns on the time series of the following four factors: the market excess return over the risk-free rate factor, the small-minus-big capitalization factor, the high-minus-low book-to-market factor, and the momentum factor. The mean monthly abnormal return is represented by the regression intercept.

¹⁴ We measure total accruals based on changes in balance sheet data. Specifically, $TACC = \Delta CA - \Delta CL - \Delta CASH + \Delta STD - DEP$, where ΔCA is change in current assets (Compustat quarterly data item #40); ΔCL is change in current liabilities (#49); $\Delta CASH$ is change in cash and cash equivalents (#36); ΔSTD is change in debt included in current liabilities (#45); and DEP is depreciation and amortization expense (#5). We use the balance sheet approach to calculate accruals instead of the cash flow approach, because the sample period starts in 1984 and cash flow statement data are not widely available before 1988.

portfolio. In addition to controlling for performance, the portfolio benchmarking approach controls for random effects arising from other events that may affect accruals or other managerial incentives to manage earnings. As Kothari et al. (2005) suggest, the success of the benchmarking approach is predicated on the assumption that the differences between the discretionary accruals of the repurchase firms and those of the control portfolios proxy for earnings management that relates solely to the repurchases.¹⁵

III. Sample Selection

Our sample period extends from 1984 to 2002. Following the extant literature (see, e.g., Jagannathan et al. (2003), Grullon and Michaely (2004), and Lie (2005)), we use the Security Data Company's (SDC) Mergers and Acquisitions database to identify repurchase announcements. Conditional on an open-market repurchase announcement on SDC, we estimate the value of actual repurchases in a given quarter based on Compustat quarterly data item #93 (Purchases of Common and Preferred Stock). We combine the two data sources (SDC and Compustat) because, on the one hand, SDC generally codes a repurchase as complete only after the firm essentially repurchases all the shares that it intended to repurchase. Therefore, partial repurchases are generally coded as pending and the number of shares repurchased is not reported. On the other hand, Compustat quarterly data item #93 is an aggregation of many other types of transactions besides open-market repurchases, including conversions of other classes of stock into common stock, purchases of treasury stock, retirements of common or preferred stock, and redemptions of redeemable preferred stock. The purchases of treasury stock also include privately negotiated repurchases and self-tender offers in addition to open-market repurchases. Compustat does not distinguish open-market repurchases from other types of repurchases. Thus, Compustat data item #93 may have a positive value even when no open-market repurchase occurs. To reduce the noise associated with using Compustat data item #93 to estimate actual repurchases, we follow the sample selection process used by Lie (2005). First, we condition on an open-market-repurchase announcement on SDC. Then, we require that the dollar value reported in #93 exceeds 1% of the firm's market value.

Because firms often execute open-market-repurchase programs over several months after repurchase announcements, we define a carry-through repurchase announcement as an announcement followed by actual share repurchases during the fiscal quarter of the announcement and/or the subsequent quarter. This definition is consistent with Lie (2005), who finds that actual repurchases typically occur during the quarter of, and the quarter after, the repurchase announcements. This definition also allows us to include in the "carry-through" sample announcements that are made at the end of a fiscal quarter and executed in the following quarter. Limiting the carry-through sample to

¹⁵ See Campbell and Stanley (1963) and Cook and Campbell (1979) for a discussion of the implications of using a benchmarking approach in general.

repurchases that occur in the announcement quarter would exclude end-of-quarter announcements even when their execution may have been relatively quick.¹⁶ Consistent with Lie (2005), we exclude block-repurchases and self-tender offers. We also exclude firms that miss necessary accounting data on Compustat to compute abnormal accruals, performance-adjusted ROA, or stock returns on the Center for Research in Security Prices (CRSP) database.¹⁷ The final sample has 1,720 open-market repurchase announcements that are followed by actual repurchases during the quarter of the repurchase announcement and/or the subsequent quarter.¹⁸

IV. Operating and Stock Performance Following Open-Market Repurchases

Panel A of Table I presents the average post-repurchase announcement operating performance improvement over the four and eight quarters following the repurchase announcement quarter.¹⁹ The post-repurchase announcement performance improvement is the difference between the average post-repurchase announcement quarterly performance-matched ROA and the performance-matched ROA for the repurchase announcement quarter. We measure the relative improvement in two ways. First, we set missing ROAs to the respective firms' average quarterly ROAs over the measurement period. Second, we require that a firm has no missing ROA from Quarter -3 to Quarter $+8$. Consistent with Lie (2005), we find that, relative to its match-firm, the average repurchasing firm reports a significant improvement in operating performance after the repurchase announcement quarter. The average quarterly reported relative improvements in ROA are, respectively, 0.445% and 0.504% over the 1-year and 2-year periods after the quarter of the repurchase announcement when missing ROAs are set to the average quarterly ROA. They are 0.379% and 0.478% when firms are required to have nonmissing ROAs for each of the quarters from Quarter -3 to Quarter $+8$. All the reported quarterly improvement measures are highly significant with p -values below the 0.000 level.²⁰

Although the sample firms and the match firms are similar on multiple dimensions, their operating performances over Quarter -3 to Quarter -1 are

¹⁶ We assess the robustness of our results by removing the 143 repurchases that are executed in the quarter after the announcement quarter. Our results are qualitatively similar after removing these observations.

¹⁷ As a robustness check, we replicate the study after deleting open-market repurchases announced during the last quarter of 1987. All our results are qualitatively the same.

¹⁸ Our primary sample has 1,720 open-market repurchases; however, some individual regression analyses may use fewer than 1,720 repurchases if the variables used in the regressions have missing data.

¹⁹ To mitigate the effect of outliers, we winsorize all the variables at the top and bottom one percentiles. All our inferences are qualitatively the same if we do not winsorize the variables.

²⁰ We also compute the post-repurchase improvement in operating performance for firms that do not act on their repurchase announcements (i.e., Compustat data item #93 is nonpositive). Consistent with Lie (2005), we find no evidence that these firms report any improvement in operating performance after the repurchase announcement.

Table I
Mean Post-repurchase Announcement Performance

This table reports post-repurchase operating performance (Panel A) and stock performance (Panel B) for firms that actually purchase shares (i.e., the repurchase amount, Compustat data item #93, is greater than 1% of market value at the beginning of the quarter) either in the quarter of the repurchase announcements or the subsequent quarter. Panel A reports average improvement in operating performance over a 1-year or 2-year horizon. Improvement in operating performance is measured as performance-matched quarterly ROA averaged over a 1-year or 2-year horizon minus performance-matched ROA for Quarter 0 (the average for Quarter -3 to Quarter 0), where Quarter 0 is the open-market repurchase announcement quarter. Please refer to Section II.A for details on the performance matching procedure. Panel B reports abnormal stock returns following open-market repurchase announcements. "Method 1" refers to average *monthly* abnormal stock returns over the 12-month (24-month) period after the month of the open-market repurchase announcement, based on the Fama (1998) calendar-time procedure. The monthly returns are adjusted using the Daniel et al. (1997) benchmark adjustment procedure. "Method 2" refers to average *monthly* abnormal stock returns over the 12-month (24-month) period after the month of the open-market repurchase announcement, measured using the Carhart (1997) four-factor model. There is a total of 242 monthly returns for both the 1- and 2-year horizons. Please refer to Section II.B for details on measurement of abnormal stock returns. One-tail *p*-values are reported in parentheses.

	<i>N</i>	1-year	2-year
Panel A: Improvement in operating performance using Lie's (2005) matching procedure			
Benchmark is Quarter 0			
Missing ROAs are set to the respective firms' average quarterly ROAs for the measurement period	1,720	0.445% (0.000)	0.504% (0.000)
Firms have no missing ROA from Quarter -3 to Quarter +8	1,306	0.379% (0.000)	0.478% (0.000)
Benchmark is Quarter -3 to 0			
Missing ROAs are set to the respective firms' average quarterly ROAs for the measurement period	1,720	0.346% (0.000)	0.424% (0.000)
Firms have no missing ROA from Quarter -3 to Quarter +8	1,306	0.320% (0.000)	0.437% (0.000)
Panel B: Stock performance			
Method 1	1,720	0.309% (0.010)	0.309% (0.003)
Method 2	1,720	0.498% (0.001)	0.472% (0.000)

slightly different. The difference in the average quarterly ROAs between the two groups of firms is only 0.045% in Quarter 0 but 0.131% over Quarter -3 to Quarter -1. The main reason for the larger difference in the average quarterly ROAs for Quarter -3 to Quarter -1 is that the matching procedure is not as tight for these quarters as it is for Quarter 0. It therefore seems necessary to control not only for the difference in Quarter 0 but also, and even more importantly, for the average difference in Quarter -3 to Quarter -1. Accordingly, we also measure the relative improvement as the change over the average performance for Quarter -3 to Quarter 0. We obtain average quarterly reported

relative improvements in ROA of 0.346% and 0.424% over the 1- and 2-year periods after the quarter of the repurchase announcement when missing ROAs are set to the average quarterly ROA, and of 0.320% and 0.437% when firms are required to have ROAs for each of the quarters from Quarter -3 to Quarter +8. All the average reported quarterly improvement measures are highly significant with *p*-values below the 0.001 level.

Panel B of Table I presents the long-term abnormal returns after the repurchase announcement. Consistent with Ikenberry, Lakonishok, and Vermaelen (1995, 2000), we find significantly positive average abnormal returns over the 1- and 2-year periods after the repurchase announcement. The average monthly abnormal returns are 0.309% for both the 1- and 2-year periods when we use the Fama and MacBeth (1973) procedure combined with the Daniel et al. (1997) match-portfolio approach,²¹ and 0.498% and 0.472% when we use the Carhart (1997) method. All these returns are significant at conventional levels.

V. Analysis of Abnormal Accruals around Open-Market Repurchases

A. Pre-repurchase Abnormal Accruals

Table II reports abnormal accruals around the repurchase announcement. Consistent with the conjecture that repurchases create incentives for managers to temporarily reduce their firms' stock prices, the evidence indicates that firms that repurchase shares in the quarter of the announcement and/or the subsequent quarter significantly deflate earnings prior to the repurchases. The average quarterly abnormal accrual over the quarter of, and the quarter prior to, the repurchase announcement is -0.567% of total assets. In contrast, the results reported in Panel A of Table II provide no evidence that the matched firms obtained under Lie's (2005) matching procedure manage earnings downward. In fact, the matched firms have an insignificantly positive average abnormal accrual of 0.056%.

To further validate our conjecture that the abnormal accruals are associated with *actual* repurchases, we analyze the abnormal accruals for a sample of open-market repurchase announcements that are followed by actual repurchases over neither the quarter of the repurchase announcement nor the subsequent quarter (defined as non-carry-through announcements, per Lie (2005)). Consistent with our conjecture that repurchases are associated with managers' decisions to report negative abnormal accruals, the results reported in Panel B of Table II provide no evidence of negative abnormal accruals for

²¹ The buy-and-hold 1-year and 2-year abnormal returns are 6.937% and 12.800%, respectively, using the Daniel et al. (1997) match-portfolio approach. We use the Fama and MacBeth (1973) procedure combined with the Daniel et al. (1997) match-portfolio approach, and the Carhart (1997) procedure because of Fama's (1998) and Brav et al.'s (2000) arguments that events are correlated in calendar time and that the buy-and-hold methods of computing abnormal returns do not fully account for the correlation. Fama (1998) advocates drawing inference on the basis of the mean and standard deviation of the time series of the average abnormal portfolio returns across firms.

Table II

Abnormal Accruals before Open-Market Repurchase Announcements

This table compares abnormal accruals for both the quarter of open-market repurchase announcements and the preceding quarter between Sample firms (or carry-through announcements) and Control firms (either Match firms in Panel A or Non-carry-through announcements in Panel B). Abnormal accruals are measured as the average of the performance-matched abnormal total accruals for Quarter -1 and Quarter 0 (where Quarter 0 is the open-market repurchase announcement quarter). Sample firms (or carry-through announcements) are defined as open-market repurchase announcements followed by actual shares repurchases (i.e., the repurchase amount, Compustat quarterly data item #93, is greater than 1% of market value at the beginning of the quarter) either in the announcement quarter or the subsequent quarter. The Match firms (in Panel A) have pre-repurchase operating performance and book-to-market ratio similar to those of the Sample firms, and are used to construct performance-matched operating performance for Sample firms. There are fewer match firms that have necessary information on Compustat to compute abnormal accruals. Non-carry-through announcements are defined as open-market repurchase announcements that are accompanied by no repurchases (i.e., Compustat data item #93 is nonpositive) in the announcement quarter and the subsequent quarter. Two-tail (one-tail) p -values are reported in brackets (parentheses).

Panel A: Difference between sample firms and match firms				
	(1) Sample firms ($N = 1,720$)	(2) Match firms ($N = 1,530$)	1-2 Paired difference	1-2 Unpaired difference
Mean	-0.567% (0.000)	0.056% [0.450]	-0.643% (0.000)	-0.623% (0.000)
Median	-0.393% (0.000)	-0.037% [0.888]	-0.435% (0.000)	-0.356% (0.000)
Panel B: Difference between sample firms and non-carry-through firms				
	(1) Carry-through announcements (Sample firms) ($N = 1,720$)	(2) Non-carry-through announcements ($N = 310$)	1-2 Difference	
Mean	-0.567% (0.000)	-0.042% [0.806]	-0.525% (0.001)	
Median	-0.393% (0.000)	-0.117% [0.830]	-0.276% (0.001)	

those firms that announce repurchases but do not follow through on their announcements.

Because our sample period starts in 1984, we measure total accruals based on changes in balance sheet data instead of cash flow statement data. To assess the robustness of our results, we also estimate abnormal accruals using total accruals based on cash flow statement data. We define accruals as earnings before extraordinary items (Compustat data item #76) minus operating cash flows (Compustat data item #108). Because the necessary cash flow statement data for most firms are available on Compustat only after 1987, we limit this analysis to the period starting in 1988. Using cash flow statement data to

compute abnormal accruals does not qualitatively change the results. Untabulated results show that the average quarterly total abnormal accrual over the quarter of, and the quarter prior to, the repurchase announcement is -0.527% of total assets. In contrast, we find no evidence that the matched firms obtained under Lie's (2005) matching procedure manage earnings downward. These firms have an insignificant average abnormal accrual of -0.043% over the two quarters. We also find no evidence of negative abnormal accruals for those firms that announce repurchases but do not follow through on their announcements, as these firms report an insignificant average abnormal accrual of -0.121% over the two quarters. In addition, we estimate abnormal accruals using various versions of Jones's (1991) model. The results are qualitatively similar to those reported in the paper, whether we compute accruals using information from the balance sheet or the cash flow statement.

Our accrual measure could be misestimated because of corporate transactions such as mergers and divestitures (see Revsine, Collins, and Johnson (1999) and Hribar and Collins (2002)). In particular, a merger can be finalized at any point during the quarter, creating the need to (arbitrarily) allocate the earnings (cash flows and accruals) of the target over the quarter, depending on the existing relation between the merging partners and the acquisition method (purchase versus pooling). In addition, when an acquisition or a divestiture occurs in the first quarter, Compustat adjusts only the data for the first quarter of the prior year. Hence, total assets at the beginning of the quarter and sales for the fourth quarter of the prior year are stated on different bases. Repurchases may also be associated with divestiture because some firms may choose to distribute cash to shareholders after selling assets. Firms allegedly tend to clean their books by taking "big baths" when engaging in restructuring activities. If divestiture is associated with both negative accruals and cash distribution, the negative abnormal accruals that we observe could be driven by divesting activities. To assess the potential effect of mergers and divestitures on our results, we delete firms that have absolute value of cash flows related to acquisitions (quarterly Compustat data item #94) scaled by total assets greater than 0.005 or absolute value of discontinued operations (quarterly Compustat data item #33) scaled by total assets greater than 0.005. These restrictions do not qualitatively alter our inferences.²²

²² We also use special items (Compustat quarterly item #32) to proxy for restructuring charges. We find no evidence that our sample firms engage in more restructuring activities around the repurchase announcement quarter than the matched firms. Untabulated results show that the amount of special items is about 0.2% of total assets for both our sample firms and their corresponding matched firms. Furthermore, our sample firms report above-industry median ROA (4.63%) in the quarter prior to the repurchase, which is not consistent with restructuring firms taking "big baths." In recent years, many firms had to restate their financial statements. Generally, restatements have significant effects on earnings management estimation because the original earnings numbers and the components of earnings have been restated. Compustat reports the restated numbers instead of the numbers that were initially issued by the firms. Therefore, for firms that restated their earnings, our abnormal accruals are not based on the (allegedly managed) numbers that were reported at the time of the repurchase. To assess the effect of restatements on our results, we exclude observations for the 53 sample firms that have made restatement announcements up to 4 years

Managers may reduce accruals in order to raise the cash necessary to finance the repurchases. They may, for instance, accelerate collections of receivables or delay payments of payables, which would reduce their accruals. However, as Grullon and Michaely (2004) document, firms typically have ample cash reserves and declining investment opportunities prior to open-market repurchases, suggesting that an average repurchasing firm has sufficient internal funds to execute an open-market repurchase. Nonetheless, we investigate whether the negative abnormal accruals are associated with the need to generate cash by sorting the sample on the ratio of pre-repurchase cash balance to the value of the repurchase (cash-to-repurchase ratio). If the negative abnormal accruals are induced by accrual-reducing actions taken by managers to raise the cash needed to finance the repurchases, we expect the negative abnormal accruals to concentrate among firms with low cash-to-repurchase ratios (those with the highest financing need) as opposed to those with high cash-to-repurchase ratios. However, untabulated results show that the average abnormal accrual is actually more negative for high cash-to-repurchase ratio firms (-0.614%) than for low cash-to-repurchase ratio firms (-0.520%), although the difference is not statistically significant. We also sort on the level of pre-repurchase cash balances and obtain qualitatively similar results. The average abnormal accrual is -0.652% for high cash-balance firms and -0.482% for low cash balance firms. Therefore, it does not appear that the pre-repurchase negative abnormal accruals are driven by pre-repurchase financing need.

B. Time-Series Behavior of Abnormal Accruals

We hypothesize that the average repurchasing firm is likely to temporarily deflate its earnings in the quarter of and/or the quarter prior to the repurchase announcement. The results reported in Table II strongly support this conjecture. However, it is possible that our sample firms systematically have low accruals. To assess whether the abnormally low accruals that we observe are associated with the repurchases, we analyze the time-series behavior of abnormal accruals for our sample firms.

We plot the quarterly abnormal accruals from 2 years before to 2 years after the repurchase announcement. The results are reported in Figure 1. The graph reports both the unadjusted abnormal accruals and the performance/industry-adjusted abnormal accruals. Over the 2 years from Quarter -9 to Quarter -2 , we find no evidence that accruals are abnormally low for our sample firms. We then observe a sharp decline in Quarter -1 and Quarter 0 , followed by a rebound over the following two years, from Quarter $+1$ to Quarter $+8$.²³ These results suggest that, on average, managers deflate their reported earnings prior to open-market repurchases.

before and 2 years after the repurchase announcements. None of our inferences are affected by the exclusion of these observations.

²³ We find no evidence that abnormal accruals turn positive immediately after the repurchase, which is consistent with extant evidence on the time-series pattern of abnormal accruals around

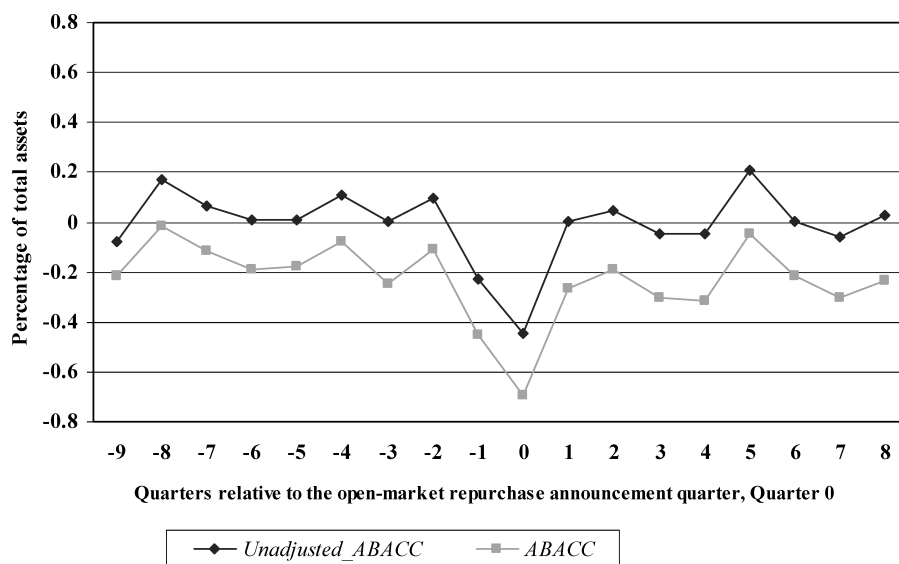


Figure 1. Average abnormal accruals around the open-market repurchase announcement quarter. This figure presents the time series of abnormal accruals around open-market announcements that were followed by actual purchases (or carry-through announcements). Carry-through announcements are defined as open-market repurchase announcements followed by actual share repurchases (i.e., the repurchase amount, Compustat quarterly data item #93, is greater than 1% of market value at the beginning of the quarter) either in the announcement quarter or the subsequent quarter. Abnormal accruals are measured as the average of the performance-matched abnormal total accruals (*ABACC*) for Quarter -1 and Quarter 0 (where Quarter 0 is the open-market repurchase announcement quarter). *Unadjusted_ABACC* is abnormal accrual without the performance adjustment. Refer to Section II.C for details.

Figure 2 plots the abnormal accruals for those firms that announce repurchases but do not follow through on their announcements during either the repurchase announcement quarter or the subsequent quarter. We find no evidence that accruals are abnormally low in Quarter -1 and Quarter 0 relative to the other quarters. If anything, it appears that managers of the “non-carry-through” firms report aggressively around the repurchase announcement.²⁴

corporate events. For instance, Teoh et al. (1998a – Table II) find that discretionary current accruals are abnormally positive in the year of an IPO. The discretionary accruals decline over time, but do not turn negative until the fifth year after the offering. Teoh, Welch, and Wong (1998b – Panel A of Table III) and Louis (2004 – Table IV) find a similar result for SEOs and stock-for-stock mergers, respectively. Teoh, Welch, and Wong (1998b) and Teoh, Wong, and Rao (1998) discuss potential reasons for the slow reversal of abnormal accruals. They suggest litigation threats, among other factors, as potential reasons for managers to avoid the immediate reversal of accruals after corporate events.

²⁴ The “non-carry-through” firms apparently act as if they have exhausted their income-increasing discretionary accruals and then resort to repurchase announcements to sustain their stock prices. The abnormal accruals tend to become negative overtime. One potential explanation is that managers of some of the “non-carry-through” firms later undertake the repurchases and

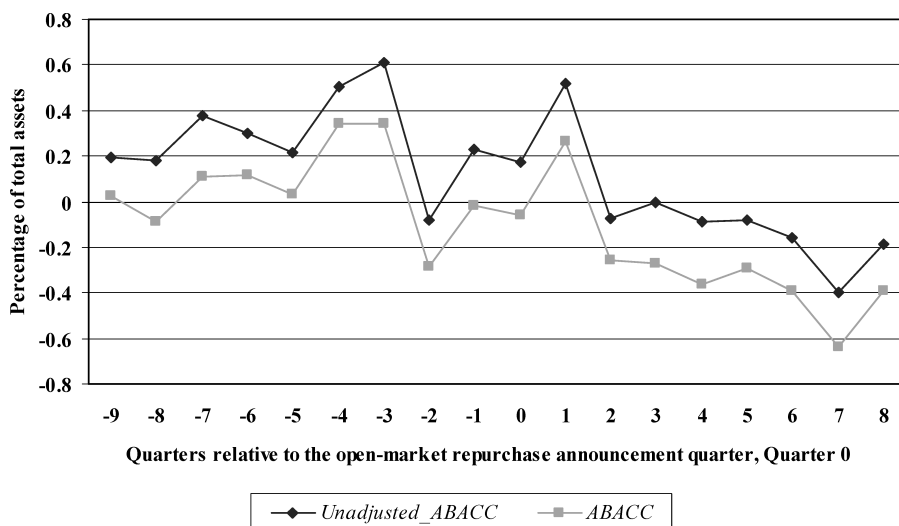


Figure 2. Average abnormal accruals for non-carry-through firms around the open-market repurchase announcement quarter. This figure presents the time series of abnormal accruals around open-market announcements that were not followed by actual purchases (or non-carry-through announcements). Non-carry-through announcements are defined as open-market repurchase announcements that are accompanied by no repurchases (i.e., Compustat data item #93 is nonpositive) in the announcement quarter and the subsequent quarter. Abnormal accruals are measured as the average of the performance-matched abnormal total accruals (*ABACC*) for Quarter -1 and Quarter 0 (where Quarter 0 is the open-market repurchase announcement quarter). *Unadjusted_ABACC* is abnormal accrual without the performance adjustment. Refer to Section II.C for details.

Unreported results also show no evidence that accruals are abnormally low in Quarter -1 and Quarter 0 relative to the other quarters for the matched firms.

One implication of the results in Figure 1 is that the average repurchasing firm is likely to show a subsequent improvement in its reported earnings because the accruals are abnormally low prior to the repurchase and improve over time. To assess the potential impact of earnings management on the reported improvement in operating performance (relative to the operating performance in Quarter 0), we analyze the changes in quarterly abnormal accruals over the 2 years after the repurchase relative to the abnormal accruals in Quarter 0 . The results presented in Table III clearly show that the changes in abnormal accruals after the repurchases are significantly positive, with p -values below the 1% significance level in almost every quarter.²⁵ This result strongly supports the

deflate their earnings before the repurchases. Accruals can also be low if the managers exhausted their income-increasing discretionary accruals prior to the repurchase announcements. Differentiating between these alternative explanations is beyond the scope of our current study. Subsequent studies could examine the financial reporting behavior of these firms in more detail.

²⁵ Note that the changes in Table III cannot be derived from Figure 1 because the number of firms varies from quarter to quarter.

Table III
Improvement in Abnormal Accruals from the Repurchase Announcement Quarter to the Subsequent Quarters

This table reports the differences between abnormal accruals over the eight quarters subsequent to the open-market repurchase announcement quarter and abnormal accruals over the open-market repurchase announcement quarter for firms that actually purchase shares either in the quarter of repurchase announcements or the subsequent quarter. Abnormal accruals are measured as performance-matched abnormal total accruals. One-tail *p*-values are reported in parentheses.

	Quarter+1	Quarter+2	Quarter+3	Quarter+4	Quarter+5	Quarter+6	Quarter+7	Quarter+8
Mean	0.447% (0.002)	0.541% (0.000)	0.414% (0.002)	0.388% (0.001)	0.637% (0.000)	0.397% (0.005)	0.296% (0.026)	0.411% (0.001)
Median	0.123% (0.023)	0.203% (0.001)	0.335% (0.001)	0.280% (0.001)	0.325% (0.000)	0.207% (0.013)	0.394% (0.003)	0.231% (0.005)
<i>N</i>	1,685	1,620	1,582	1,536	1,483	1,456	1,412	1,372

conjecture that pre-repurchase earnings management is likely to contribute to the reported improvement in performance after open-market repurchases.

C. The Effects of the Proportion of Shares Repurchased and CEO Ownership on the Abnormal Accruals

The evidence of downward earnings management prior to carry-through repurchase announcements but not prior to non-carry-through repurchase announcements is a strong indication that the abnormal accruals are associated with actual repurchases. If the abnormal accruals are indeed associated with the repurchases, then they are likely to decrease in the proportion of shares outstanding that the firms repurchase. Hence, to further ensure that the observed abnormal accruals are associated with the repurchases, we analyze the effect of the proportion of shares outstanding repurchased on the pre-repurchase abnormal accruals. We also conjecture that the incentive to reduce the repurchase price is also likely to increase in the managers' ownership in the firm. A manager who holds no equity stake in the firm typically receives little direct benefit from reducing the repurchase price.²⁶ Hence, we expect the extent of downward earnings management to increase with CEO ownership. Prior studies also suggest that other factors such as political costs, leverage, and operating performance are also related to earnings management (see, e.g., Watts and Zimmerman (1978, 1990), DeFond and Jiambalvo (1994), and Klein (2002)). Hence, we model abnormal accruals as a function of the percentage of shares outstanding repurchased, CEO ownership, size, leverage, and lagged earnings.

²⁶ Note, however, that managers may have some *indirect* incentives to manage earnings down prior to repurchases. As Graham, Harvey, and Rajgopal (2005) report, executives manage earnings primarily to influence stock prices and their own welfare *via career concerns*. To the extent that earnings management profits the remaining shareholders, it may benefit the managers in the long term by contributing to, among other things, their job security and future compensation. Therefore, a manager may deflate earnings prior to a repurchase even if her ownership in the firm is small, although a manager who has a high equity stake is more likely to manage earnings down prior to a repurchase.

Managers presumably have more incentives to dampen the repurchase price as the number of shares they intend to repurchase increases. However, the relation between earnings management and the percentage of shares outstanding repurchased may be endogenous. To mitigate the potential endogeneity bias, we use an instrumental variable approach. More specifically, we jointly estimate the following models using three-stage least squares (3SLS):²⁷

$$ABACC_i = \alpha_0 + \alpha_1 SHREP_i + \alpha_2 CEO_OWN_i + \alpha_3 SIZE_i + \alpha_4 LEV_i + \alpha_5 LAGEARN_i + \gamma_i, \quad (3)$$

$$SHREP_i = \beta_0 + \beta_1 ABACC_i + \beta_2 BM_i + \beta_3 RET + \beta_4 SIZE_i + \beta_5 AC + \beta_6 STINS_i + \beta_7 LTINS_i + \beta_8 LEV_i + \beta_9 CASH_i + \beta_{10} ISSUANCE_i + \gamma_i, \quad (4)$$

where *ABACC* is the average abnormal accruals for the quarter of the repurchase announcement and the preceding quarter; *SHREP* is the percentage of shares outstanding repurchased in the quarter of the repurchase announcement and the following quarter; *CEO.OWN* is the logarithm of the CEO percentage stock ownership in the firm prior to the repurchase announcement; *SIZE* is the logarithm of the total market value of common equity at the beginning of the repurchase announcement quarter; *LEV* is the ratio of debt to market value of equity at the beginning of the announcement quarter; *LAGEARN* is net income (deflated by total assets at the beginning of the quarter) for the same quarter of the previous year (relative to the earnings announcement quarter); *BM* is the book value of equity divided by the market value of equity at the beginning of the repurchase announcement quarter; *RET* is the percentage buy-and-hold return over the second quarter prior to the repurchase announcement quarter;²⁸ *AC* is the logarithm of one plus the number of analysts who cover a firm in the last forecast issued on the institutional brokers estimate (IBES) database in the 180 days prior to the repurchase quarter (the number of analysts is set to zero for firms that are not covered by IBES at any time over the 180 days); *STINS* is the percentage of stock held by short-term institutional investors at the beginning of the repurchase announcement quarter; *LTINS* is the percentage of stock held by long-term institutional investors at the beginning of the repurchase announcement quarter; *CASH* is the cash balance at the

²⁷ We model the proportion of outstanding shares repurchased; therefore, our inferences obviously do not apply to the entire population of trading firms, but only to repurchasing firms. Given that the managers have decided to conduct a repurchase, we want to assess whether the proportion of the outstanding shares they repurchase affects their incentives to manage earnings downward.

²⁸ We measure the return over the second quarter prior to the repurchase to ensure that it is exogenous and not affected by the abnormal accruals. We use raw returns instead of abnormal returns because managers are likely to repurchase shares when they have a temporary shock in their stock price independent of what happens to the broader market. As a robustness check, we also use the abnormal return. The results are qualitatively the same. We also use various return windows from four quarters to one quarter. In general, there is no evidence that the proportion of the shares outstanding repurchased is associated with the pre-repurchase return and our inferences are not sensitive to the return measurement.

beginning of the announcement quarter, deflated by cash-adjusted assets (total assets minus cash and cash equivalents); and *ISSUANCE* is the logarithm of stock issuance during the quarter after the actual repurchase deflated by the market value at the beginning of the quarter.²⁹

If managers have greater incentives to dampen earnings before repurchasing shares, we expect the coefficient on *SHREP*, α_1 , to be significantly negative. If CEOs with large stock holdings have greater incentives to dampen earnings prior to stock repurchases, we expect the coefficient on *CEO_OWN*, α_2 , to also be significantly negative.

Managers have stronger incentives to repurchase shares when their firms are undervalued. We use the book-to-market ratio in equation (3) to proxy for firm valuation.³⁰ We include the short-term return in the model because managers are also likely to repurchase more shares after temporary negative shocks in stock prices. We include size in the model because firms allegedly use share repurchases to signal private information and the need to signal is likely stronger for smaller firms (e.g., Lakonishok and Vermaelen (1990)). We also include analyst coverage and institutional investor holdings because the probability of mispricing is likely to decrease in the levels of analyst coverage and institutional investor ownership. We separate institutional ownership into short-term and long-term ownership because short-term institutions (transient institutions)—as opposed to long-term institutions (dedicated and quasi-index funds)—are more likely to arbitrage short-term mispricing.³¹ We include leverage in the model because prior studies suggest that low leverage firms tend to repurchase shares to move their leverage toward optimal levels (Dittmar (2000)). We include cash balances because firms that have high cash balances are more likely to use repurchases as a means of distributing free cash (Grullon and Michaely (2004)). We also include stock issuance (Compustat quarterly

²⁹ Because the number of shares issued, the number of analysts, and the number of shares owned by the CEO are zero for some observations and because the logarithm of zero does not exist, we add one to the number of shares issued, the number of analysts, and the number of shares owned by the CEO to allow for the logarithm transformations. We use the logarithms of the percentage of shares issued and the percentage of shares owned by the CEO because these variables are severely skewed. We observe, for instance, that the means of these variables are greater than their 75th percentiles. However, estimating the models without the log transformations does not qualitatively change our results.

³⁰ We also add book-to-market in the abnormal accruals model (Equation (2)). The *t*-value for the coefficient on book-to-market in that model is very low and the addition does not qualitatively change our results.

³¹ The classification of institutional investors is based on Bushee (1998). Bushee (1998) defines transient institutions as those with high portfolio turnover and a diversified portfolio, dedicated institutions as those with low portfolio turnover and more concentrated holdings, and quasi-indexing institutions as those with low portfolio turnover and a diversified portfolio. We reclassify transient institutions as short-term institutions and both dedicated and quasi-indexing as long-term institutions. Prior literature (e.g., Bushee (2001)) documents that transient institutional investors tend to focus on short-term earnings and behave differently from the other two types. As a robustness check, we separately include transient, quasi-indexing, and dedicated institutional holdings in the regression. This alternative specification yields similar results. We thank Brian Bushee for providing the institutional investor classification.

data item #84) after the repurchase because managers are likely to repurchase shares to finance their equity compensation programs and other forms of stock issuance.³² We assume that it is not common for a firm to repurchase stock and then sell shares within two quarters. We therefore assume that the amount included in item #84 after a repurchase reflects mainly conversions of other forms of securities into common stock and the exercise of stock options.³³

The results are presented in Table IV. Because data on CEO ownership are not readily available prior to 1992, we limit any analysis involving CEO ownership to the period 1992 to 2002. We conduct our analyses over the period 1984 to 2002 and the subperiod 1992 to 2002.³⁴ Results reported in Panel A of Table IV show a significantly negative association between pre-repurchase abnormal accruals and the percentage of shares the firms actually repurchase. This negative association is robust to controlling for several firm characteristics that potentially relate to earnings management incentives and the potential endogeneity bias. The results hold for the full sample period 1984 to 2002 as well as the subperiod 1992 to 2002. The evidence strongly suggests that the proportion of the shares outstanding the firm repurchases is a significant determinant of pre-repurchase abnormal accruals. We also find a significantly negative association between pre-repurchase abnormal accruals and CEO ownership, which

³² Data item #84 includes: conversion of Class A, Class B, or special stock into common stock; conversion of preferred stock and/or debt into common stock; equity offerings; exercise of stock options and/or warrants; increase in capital surplus due to stock issuance; issuance of warrants when combined with common stock; related tax benefits due to issuance of common and/or preferred stock; sale of common stock; sale of preferred stock; and sale of redeemable preferred stock.

³³ In general, stock issuance could be considered endogenous because firms might issue stock because abnormal accruals are high. However, we believe that it is unlikely that stock issuances that take place after repurchases would be motivated by high abnormal accruals. The decision to convert securities into common stock, for instance, usually rests with the holders of these securities instead of the managers. Consistent with our conjecture, we find no significant association between pre-repurchase abnormal accruals and stock issuances if we include *ISSUANCE* in the abnormal accruals model (Equation (2)). The *t*-value for the coefficient on that variable is very close to zero and our results are qualitatively unchanged by the inclusion. Our results are also qualitatively unchanged if we estimate the repurchase model (Equation (3)) without the stock issuance variable. Teoh et al. (1998b) find that firms manage earnings prior to stock issuances; however, stock issuances that take place after repurchases do not appear to be associated with abnormal accruals. It seems that it is uncommon for managers to repurchase shares and then sell them right after. For the repurchasing firms, the amounts included in Compustat quarterly data item #84 seem more likely to relate to other transactions such as conversion of convertible bonds into common stock.

³⁴ Our sample period and selection process match Lie's (2005) as closely as possible. However, some of our analyses have more stringent data requirements and the number of observations varies with the analysis. For the period 1984 to 2002, the sample size is reduced to 1,582 observations because some of the control variables have missing observations. For the period 1992 to 2002, the sample size is further reduced to 1,030 observations. Ownership data are available starting in 1992 on the Wharton Research Data Services' (WRDS) executive compensation database and from SEC proxy statements through the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) system. Therefore, our analysis on the effect of CEO ownership is limited to the period 1992 to 2002. Our sample includes 1,286 observations from 1992 to 2002. Of these observations, 543 have CEO ownership data on Execucomp. We hand-collect data on CEO ownership on the EDGAR system for 487 observations. In total, we have CEO ownership data for 1,030 observations. Ownership data are not available for the remaining firms.

Table IV
The Effect of the Proportion of Shares Repurchased on
Pre-repurchase Earnings Management

$$ABACC_i = \alpha_0 + \alpha_1 SHREP_i + \alpha_2 CEO_OWN_i + \alpha_3 SIZE_i + \alpha_4 LEV_i + \alpha_5 LAGEARN + \gamma_i \quad (\text{Model 1})$$

$$SHREP_i = \beta_0 + \beta_1 ABACC_i + \beta_2 BM_i + \beta_3 RET_i + \beta_4 SIZE_i + \beta_5 AC_i + \beta_6 STINS_i + \beta_7 LTINS_i + \beta_8 LEV_i + \beta_9 CASH_i + \beta_{10} ISSUANCE_i + \gamma_i. \quad (\text{Model 2})$$

ABACC is abnormal accruals, measured as the average of the performance-matched abnormal total accruals for Quarter -1 and Quarter 0 (where Quarter 0 is the repurchase announcement quarter). *SHREP* is the sum of the shares actually repurchased during Quarter 0 and Quarter $+1$, deflated by the market value at the beginning of Quarter 0 and Quarter $+1$ (where Quarter 0 is the repurchase announcement quarter). *CEO_OWN* is the logarithm of the CEO percentage stock ownership in the firm prior to the repurchase announcement. *SIZE* is the logarithm of market value of equity (Compustat quarterly data item #14 times #61) at the beginning of Quarter 0 . *LEV* is the ratio of debt (Compustat quarterly data item #51 plus #45) to market value of equity at the beginning of Quarter 0 . *LAGEARN* is net income (Compustat quarterly data item #8) during Quarter -4 , the same quarter of the announcement quarter from the previous year, as a percentage of total assets (Compustat quarterly data item #44) at the beginning of Quarter -4 . *BM* is the book value of equity (Compustat quarterly data item #59) divided by the market value of equity at the beginning of Quarter 0 . *RET* is the percentage buy-and-hold return over Quarter -2 . *AC* is the logarithm of one plus the number of analysts the number who cover a firm in the last IBES forecast issued in the 180 days prior to Quarter 0 (the number of analysts is set to zero for firms that are not covered by IBES at any time over the 180 days). *STINS* is the percentage of stock holding by short-term institutional investors at the beginning of Quarter 0 . *LTINS* is the percentage of stock held by long-term institutional investors at the beginning of Quarter 0 . *CASH* is the cash balance (Compustat quarterly data item #36) at the beginning of Quarter 0 , deflated by cash-adjusted assets (total assets minus cash and cash equivalents) at the beginning of Quarter 0 . *ISSUANCE* is the logarithm of stock issuance (Compustat quarterly data item #84) during the Quarter $+2$, deflated by market value of equity at the beginning of Quarter $+2$. We report results for two periods: 1992 to 2002 and 1984 to 2002. Because data on CEO ownership is not readily available prior to 1992, we limit any analysis involving CEO ownership to the period 1992 to 2002. For the period 1992 to 2002, there are 1,582 repurchasing firms (carry-through) firms that have necessary data to estimate the regression. The numbers of observations are 1,030 for the period 1992 to 2002. *T*-values are reported in parentheses. */*** indicates significance level at less than 10%/5%/1% using two-tail tests. +/+/+++ indicates significance level at less than 10%/5%/1% using one-tail tests.

Panel A: Dependent variable <i>ABACC</i> (Model 1)				
	Period: 1992–2002 (<i>N</i> = 1,030)		Period: 1984–2002 (<i>N</i> = 1,582)	
	OLS	3SLS	OLS	3SLS
<i>Intercept</i>	−0.228 (−0.69)	1.857* (1.89)	−0.417* (−1.71)	1.143 (1.58)
<i>SHREP</i>	−0.084+++ (−3.81)	−0.398+++ (−2.88)	−0.070+++ (−3.84)	−0.337+++ (−2.88)
<i>CEO_OWN</i>	−0.070++ (−1.79)	−0.101++ (−2.25)	—	—
<i>SIZE</i>	−0.027 (−0.57)	−0.153++ (−2.02)	0.002 (0.05)	−0.063+ (−1.37)
<i>LEV</i>	0.350++ (2.23)	0.506+++ (2.75)	0.407+++ (2.80)	0.563+++ (3.33)

Table IV—Continued

	Period: 1992–2002 (<i>N</i> = 1,030)		Period: 1984–2002 (<i>N</i> = 1,582)	
	OLS	3SLS	OLS	3SLS
<i>LAGEARN</i>	0.058 ⁺⁺ (2.18)	0.079 ⁺⁺⁺ (2.74)	0.050 ⁺⁺ (2.10)	0.047 ⁺⁺ (1.86)
Adj. <i>R</i> ² (%)	1.88	N/A	1.27	N/A
System-weighted <i>R</i> ² (%)	N/A	3.22	N/A	2.22
Panel B: Dependent variable <i>SHREP</i> (Model 2)				
	Period: 1992–2002 (<i>N</i> = 1,030)		Period: 1984–2002 (<i>N</i> = 1,582)	
	OLS	3SLS	OLS	3SLS
<i>Intercept</i>	4.415 ^{***} (7.38)	4.439 ^{***} (4.26)	3.666 ^{***} (7.64)	3.715 ^{***} (4.70)
<i>ABACC</i>	−0.136 ⁺⁺⁺ (−3.10)	2.002 (1.68)	−0.115 ⁺⁺⁺ (−3.34)	1.559 (0.90)
<i>BM</i>	1.221 ⁺⁺⁺ (3.72)	2.425 ⁺⁺⁺ (2.97)	1.323 ⁺⁺⁺ (4.82)	2.194 ⁺⁺⁺ (2.40)
<i>RET</i>	0.004 (0.75)	0.008 (1.04)	0.003 (0.57)	0.007 (0.77)
<i>SIZE</i>	−0.166 ⁺⁺ (−1.71)	0.032 (0.14)	0.019 (0.23)	0.126 (0.84)
<i>AC</i>	−0.019 (−0.11)	−0.428 (−0.87)	−0.334 ⁺⁺⁺ (−2.38)	−0.588 ⁺ (−1.54)
<i>STINS</i>	−0.016 ⁺ (−1.38)	−0.043 ⁺⁺ (−1.69)	−0.011 (−1.06)	−0.026 (−1.00)
<i>LTINS</i>	0.005 (0.79)	0.011 (0.87)	0.005 (0.74)	0.013 (0.75)
<i>LEV</i>	0.193 (0.78)	−0.733 (−1.08)	0.293 ⁺ (1.33)	−0.521 (−0.55)
<i>CASH</i>	0.171 (0.74)	0.034 (0.08)	0.124 (0.63)	0.014 (0.03)
<i>ISSUANCE</i>	1.152 ⁺⁺⁺ (2.76)	2.483 ⁺⁺ (2.30)	1.057 ⁺⁺⁺ (3.03)	1.645 ⁺⁺⁺ (2.26)
Adj. <i>R</i> ² (%)	6.56	N/A	5.24	N/A
System-weighted <i>R</i> ² (%)	N/A	3.22	N/A	2.22

is consistent with the conjecture that managers' incentives to deflate earnings prior to repurchases increase in their equity ownership.

Results reported in Panel B of Table IV provide no evidence that the percentage of the shares outstanding repurchased is determined by the level of abnormal accruals. The OLS regression results indicate that there is a significantly negative association between abnormal accruals and the proportion of shares repurchased, with *t*-statistics of −3.10 and −3.34 over the periods 1992 to 2002 and 1984 to 2002, respectively. However, the 3SLS estimation provides no evidence that low abnormal accruals lead to higher level of repurchases. The

coefficient on the abnormal accrual variable is actually positive in the 3SLS estimation, with t -statistics of 1.68 and 0.90 over the periods 1992 to 2002 and 1984 to 2002, respectively. The book-to-market ratio is significantly positively associated with the proportion of shares repurchased, which is consistent with the notion that managers are more likely to repurchase shares when the shares are undervalued. There is also a significantly positive association between the proportion of shares repurchased and post-repurchase stock issuance, which is consistent with the notion that firms repurchase shares to finance equity-base compensation programs and investors' conversion of securities such as convertible bonds and warrants into common stock.

We also condition our analysis on the level of CEO ownership. Untabulated results show that the effect of shares repurchased on abnormal accruals is associated with the level of CEO ownership. For firms in the lowest tercile of CEO ownership, the t -statistic for the OLS coefficient on the proportion of shares repurchased is -0.51 and the t -statistic for the 3SLS coefficient is -1.04 . In contrast, for firms in the highest tercile of CEO ownership, the t -statistic for the OLS coefficient on the proportion of shares repurchased is -2.70 and the t -statistic for the 3SLS coefficient is -2.68 . Overall, the evidence suggests that the proportion of the outstanding shares a firm repurchases determines the extent of pre-repurchase earnings management and that this effect increases in CEO ownership.

As explained earlier, we benchmark the abnormal accruals of each repurchasing firm to the median abnormal accrual of an industry/performance-matched portfolio. In addition to industry and performance, the portfolio benchmarking approach controls for random effects arising from other incentives to manage earnings and events that may affect accruals. However, some effects may still be systematically associated with repurchases. Prior studies suggest that managers tend to deflate (inflate) earnings before they buy (sell) (see, e.g., Huddart and Louis (2007)) or grant options to executives (e.g., Baker, Collins, Reitenga (2003)). There is also evidence that patterns of insider trading may be different for repurchasing firms than for the average firm (Lee, Mikkelsen, and Partch (1992) and Louis and White (2007b)). We control for the potential effects of insider trading by deleting all firms that have trading by, or options grants to, the CEO over the two quarters beginning with the quarter subsequent to the repurchase announcements. We obtain insider trading information from the Thomson Financial Insider Trading database.³⁵ Untabulated results show that our findings are robust to deleting observations that involve trading by, or option grants to, the CEO. After deleting these firms, the average abnormal accruals are still significantly negative and the coefficients on the proportion of shares repurchased and CEO ownership still significantly negative. The t -statistic for the OLS coefficient on the proportion of shares repurchased is -3.17

³⁵ We cumulate equity and derivative transactions (i.e., transactions with code P and S in Table I of the insider trading database and transactions with code A in Table II of the insider trading database) by the CEOs over the two quarters beginning with the quarter subsequent to the open market repurchase announcement. We include open-market stock transactions and equity grants, but exclude option exercises to avoid double counting.

and the t -statistic for the 3SLS coefficient is -2.82 . The t -statistic for the OLS coefficient on CEO ownership is -2.16 and the t -statistic for the 3SLS coefficient is -2.31 .

VI. The Association between Post-repurchase Performance and Pre-repurchase Earnings Management

Lie (2005) documents that repurchasing firms experience an increase in their operating performance during the eight quarters following the repurchase announcement quarter (Quarter 0) relative to control-firms that report similar operating performance from Quarter -3 to Quarter 0. Given extant evidence that long-term stock performance after many corporate events, such as stock-for-stock mergers, IPOs, and SEOs, is negatively associated with pre-event earnings management (Teoh et al. (1998a, 1998b) and Louis (2004)), we conjecture that the post-repurchase improvement in relative performance (earnings and stock returns) is likely to be associated with the pre-repurchase downward earnings management.

A. Regression Analysis

To examine the association between pre-repurchase abnormal accruals and post-repurchase firm performance, we estimate the following regression model:

$$FPERF_i = \alpha + \beta_1 ABACC_i + \beta_2 SIZE_i + \beta_3 BM_i + \beta_4 LEV_i + \beta_5 CASH_i + \varepsilon_i, \quad (5)$$

where $FPERF_i$, future performance, is either future relative improvement in operating performance or long-term abnormal stock returns over the 1 (or 2) year(s) after the repurchase announcements. All the other variables are defined as before. We control for leverage and cash because, all else equal, firms that have high leverage and those that are short on cash are more likely to undertake repurchases for signaling purposes (see Dittmar (2000) and Grullon and Michaely (2004)). Therefore, these firms are more likely to experience superior performance following open-market repurchases.

Table V reports the association between post-repurchase operating performance and pre-repurchase abnormal accruals. We hypothesize that the post-repurchase improvement in operating performance is negatively associated with pre-repurchase earnings management. Consistent with our expectation, we find that pre-repurchase abnormal accruals have a strong negative association with post-repurchase operating performance. If we set missing ROAs to the respective firms' average ROAs for the measurement period, the coefficient on the abnormal accrual variable is -0.133 (-0.137), with a t -value of -4.05 (-3.93) in a regression of abnormal accruals on the average quarterly performance-matched improvement in ROA over the 1 year (2 years) after the repurchase announcement. If we require that a firm has no missing ROAs from Quarter -3 to Quarter $+8$, the coefficient on the abnormal accrual

Table V
Association between Pre-Repurchase Abnormal Accruals
and Post-repurchase Operating Performance

$$FOPERF_i = \alpha + \beta_1 ABACC_i + \beta_2 SIZE_i + \beta_3 BM_i + \beta_4 LEV_i + \beta_5 CASH_i + \varepsilon_i.$$

This table reports the regression results for open-market announcements that are followed by actual purchases (i.e., the repurchase amount, Compustat quarterly data item #93, is greater than 1% of market value at the beginning of the quarter) either in the quarter of repurchase announcements or the subsequent quarter. The dependent variable, *FOPERF*, is the *improvement* in performance-matched operating performance, measured as performance-matched quarterly return on assets averaged over a one-year (two-year) horizon minus performance-matched return on asset for the repurchase announcement quarter. Please refer to Section II.A for details on the performance matching procedure. Please refer to the caption of Table IV for the definitions of the independent variables. In "Sample 1," we set missing ROAs to the respective firms' average quarterly ROAs over the measurement period. In "Sample 2," we require that a firm have no missing ROA from Quarter -3 to Quarter +8. *T*-values are reported in parentheses. *** indicates significance at less than the 10%/5% level using two-tail tests. +++ indicates significance at less than the 1% level using one-tail tests.

	Sample 1		Sample 2	
	1-year	2-year	1-year	2-year
<i>Intercept</i>	0.792* (1.80)	0.426 (0.91)	1.019** (2.00)	0.722 (1.32)
<i>ABACC</i>	-0.133+++ (-4.05)	-0.137+++ (-3.93)	-0.134+++ (-3.46)	-0.138+++ (-3.33)
<i>SIZE</i>	-0.061 (-1.15)	-0.012 (-0.20)	-0.055 (-0.91)	-0.015 (-0.24)
<i>BM</i>	-0.109 (-0.44)	0.029 (0.11)	-0.383 (-1.29)	-0.260 (-0.82)
<i>LEV</i>	0.006 (0.07)	0.003 (0.03)	-0.002 (-0.02)	-0.006 (-0.07)
<i>CASH</i>	0.017 (0.10)	0.176 (0.92)	-0.509** (-2.45)	-0.228 (-1.02)
Adj. <i>R</i> ² (%)	0.76	0.67	1.07	0.60
<i>N</i>	1,701	1,701	1,293	1,293

variable is -0.134 (-0.138), with a *t*-value of -3.46 (-3.33) for the 1-year (2-year) horizon.

Next, we analyze the association between pre-repurchase abnormal accruals and post-repurchase stock performance based on a variation of the Fama (1998) method. Using the Daniel et al. (1997) method to compute monthly abnormal returns, we estimate our regression model every month using all firms that had an open-market repurchase over the preceding 12 and 24 months, respectively. This yields monthly coefficient estimates. Then, following Fama and MacBeth (1973), we use the mean and standard deviation of the time series of the coefficient estimates to make inferences. The results are reported in Table VI. We hypothesize a negative association between post-repurchase abnormal returns and pre-repurchase abnormal accruals. Consistent with our

Table VI
**Association between Pre-repurchase Abnormal Accruals
 and Post-repurchase Market Performance**

$$FMPERF_i = \alpha + \beta_1 ABACC_i + \beta_2 SIZE_i + \beta_3 BM_i + \beta_4 LEV_i + \beta_5 CASH_i + \varepsilon_i.$$

This table reports the regression results for open-market announcements that were followed by actual purchases (i.e., the repurchase amount, Compustat quarterly data item #93, is greater than 1% of the market value at the beginning of the quarter) either in the quarter of repurchase announcements or the subsequent quarter. The independent variable, *FMPERF*, is abnormal stock return measured after the repurchase announcements. Please refer to the caption of Table IV for the definitions of the independent variables. The average *monthly* abnormal stock returns are measured over the 12 month (or 24 month) period after the month of open-market repurchase announcement, based on Fama (1998) and measured using the Daniel et al. (1997) benchmark return adjustment procedure. We estimate a cross-sectional regression each month for all firms that have made a repurchase within 12 months (or 24 months) of a repurchase announcement over the period 1984 to 2002. There is a total of 235 (238) monthly regressions for the 1-year (2-year) return horizon. The coefficient estimates and the *t*-statistics are then computed according to Fama and MacBeth (1973). *indicates significance at less than the 10% level using two-tail tests. +++ indicates significance level at less than 1% using a one-tail test.

	1-year	2-year
<i>Intercept</i>	0.926 (1.36)	0.206 (0.40)
<i>ABACC</i>	-0.129 ⁺⁺⁺ (-2.61)	-0.093 ⁺⁺⁺ (-3.08)
<i>SIZE</i>	-0.055 (-0.69)	0.009 (0.14)
<i>BM</i>	-0.635* (-1.69)	-0.268 (-0.93)
<i>LEV</i>	0.059 (0.14)	0.328 (1.24)
<i>CASH</i>	0.089 (0.20)	0.144 (0.43)
Adj. <i>R</i> ² (%)	5.17	3.09
<i>N</i>	1,701	1,701

expectations, we find a significantly negative average coefficient on the abnormal accrual variable. The average coefficient is -0.129 (-0.093), with a *t*-value of -2.61 (-3.08) using the one-year (two-year) abnormal returns as the dependent variable. These results strongly suggest that the post-repurchase abnormal return is associated with investors' failure to fully undo earnings management.

We obtain qualitatively the same results using buy-and-hold returns. Unabulated results show that the coefficient is -2.010 (-2.678), with a *t*-value of -3.95 (-3.08), when using the 1-year (2-year) buy-and-hold abnormal returns as the dependent variable. However, as mentioned earlier, we use the Fama and MacBeth (1973) approach because of Fama's (1998) and Brav et al.'s (2000) arguments that events are correlated in calendar time and that the buy-and-hold methods of computing abnormal returns do not fully account for the

correlation. Fama (1998) advocates drawing inference on the basis of the mean and standard deviation of the time series of the average abnormal portfolio returns across firms. Unfortunately, long-term abnormal returns obtained under this approach are averaged across firms and, hence, are not conducive to cross-sectional regression analyses.

B. Is the Association between Post-repurchase Performance and Earnings Management Driven by Firms with Low Abnormal Accruals?

Sloan (1996) finds that firms with extremely high (low) accruals experience subsequent negative (positive) abnormal returns. We assess whether our results are distinct from the previously documented accrual anomaly. Previous studies generally find that high (abnormal) accrual firms are as likely as low (abnormal) accrual firms to be mispriced (see, e.g. Sloan (1996) and Xie (2001)). However, if our results are related to the repurchases, we expect the association between pre-repurchase abnormal accruals and post-repurchase performance to be driven mainly by the low abnormal accrual firms. That is, we expect the results to be driven by those firms that manage earnings down prior to the repurchases.

Results reported in Table VII show that firms ranked in the bottom quartile of abnormal accruals experience significantly positive performance improvement following the repurchase announcements. In contrast, firms ranked in the top quartile of abnormal accruals experience little performance improvement. More importantly, there is no evidence that firms in the top quartile experience negative performance at all. All the positive difference between the performance of low and high abnormal accrual firms is due to the positive performance of the low abnormal accrual firms. These results hold for both operating and stock performance, and suggest that the negative associations between abnormal accruals and future operating/stock performance that we document in Tables V and VI are driven by those firms that report income-decreasing abnormal accruals around the repurchase announcements. Note that these results are not necessarily inconsistent with Sloan (1996). They actually suggest that the (abnormal) accrual anomaly is driven, at least in part, by managerial incentives to manage earnings prior to corporate events (such as stock issuances, stock-for-stock mergers, and repurchases) and to the market's failure to completely undo earnings management around such events. For stock issuances and stock-for-stock mergers, the accrual anomaly would be driven by the high abnormal accrual side of the hedge portfolio, whereas for open-market repurchases, it is driven by the low abnormal accrual side. This conjecture is consistent with Louis (2004), who suggests that the accrual anomaly is associated with incentives related to accrual-based earnings management.

C. Controlling for Earnings Management

The results in Table II clearly indicate that repurchasing firms report more negative abnormal accruals for the repurchase announcement quarter and the

Table VII
Mean Post-repurchase Performance for Low and High Abnormal
Accrual Firms

This table compares the post-repurchase operating performance (Panel A) and the stock performance (Panel B) between carry-through announcements in the highest quartile of *ABACC* versus carry-through announcements in the lowest quartile of *ABACC*. *ABACC* is abnormal accruals, measured as the average of the performance-matched abnormal total accruals for the Quarter-1 and Quarter 0 (where Quarter 0 is the repurchase announcement quarter). Panel A compares average improvement in operating performance over a 1-year (or 2-year) horizon. Please, refer to the caption of Table I for an explanation of the measurement of improvement in operating performance. Please refer to the caption of Table V for the descriptions of “Sample 1” and “Sample 2”. Please refer to Section II. A for details on the performance matching procedure. Panel B compares abnormal stock returns following repurchase announcements. Please refer to the caption of Table I and Section II.B for details on the measurement of the abnormal stock returns. One-tail *p*-values are reported in parentheses.

Panel A: Improvement in operating performance using Lie's (2005) matching procedure						
	1-year			2-year		
	(1) Lowest quartile of <i>ABACC</i>	(2) Highest quartile of <i>ABACC</i>	One-tail <i>p</i> -value for test of mean difference	(1) Lowest quartile of <i>ABACC</i>	(2) Highest quartile of <i>ABACC</i>	One-tail <i>p</i> -value for test of mean difference
Sample 1	0.920% (0.000)	0.173% (0.825)	0.003	0.922% (0.000)	0.175% (0.833)	0.006
Sample 2	0.770% (0.000)	0.070% (0.635)	0.010	0.766% (0.002)	0.111% (0.701)	0.020
Panel B: Stock performance						
	1-year			2-year		
	(1) Lowest quartile of <i>ABACC</i>	(2) Highest quartile of <i>ABACC</i>	One-tail <i>p</i> -value for test of mean difference	(1) Lowest quartile of <i>ABACC</i>	(2) Highest quartile of <i>ABACC</i>	One-tail <i>p</i> -value for test of mean difference
Method 1	1.154% (0.000)	−0.014% (0.522)	0.000	0.670% (0.000)	0.146% (0.787)	0.020
Method 2	1.404% (0.000)	0.286% (0.859)	N/A	0.886% (0.000)	0.319% (0.940)	N/A

preceding quarter. We reexamine post-repurchase performance after removing the potential effect of earnings management on pre-repurchase operating performance. Specifically, we construct an earnings-management-adjusted matching procedure that controls for abnormal accruals and “premanaged” operating performance (i.e., scaled operating earnings minus abnormal accruals). Our earnings-management-adjusted matching procedure closely follows Lie's (2005) matching procedure, with three modifications. First, because the repurchasing firms report significantly negative abnormal accruals around the repurchase announcement, we match on *pre-managed* operating income instead of reported operating performance. We define pre-managed operating income as ROA

minus abnormal accruals.³⁶ Second, we add abnormal accruals as an additional matching criterion. Specifically, for each sample firm, we add an additional requirement that the abnormal accruals of a match firm be within 10% of the corresponding abnormal accruals of the sample firm for the quarter of the repurchase announcement and the preceding quarter. Third, after matching on pre-managed earnings over Quarter -3 to Quarter 0 and on abnormal accruals for Quarter -1 and Quarter 0, our matched and sample firms may still have different *reported* earnings in Quarter -3 and Quarter -2. Therefore, we measure the change in operating performance relative to the average performance over Quarters -3 to Quarter 0 instead of just the performance in Quarter 0.

The results are presented in Table VIII. Panel A of this table shows that the sample firms and the matched firms have the same level of abnormal accruals, suggesting that our earnings-management-adjusted matching procedure provides a desirable matching sample with similar levels of abnormal accruals as the repurchasing firms. Panel B shows that, after controlling for abnormal accruals, there is no evidence that repurchasing firms experience significant improvement in operating performance after the repurchase announcement. Panel C reports the association between post-repurchase relative improvement in operating performance and pre-repurchase abnormal accruals. We find an insignificant association between the relative improvement in operating performance (based on the earnings-management-adjusted matching procedure) and pre-repurchase abnormal accruals.³⁷ The evidence in Panel D and Panel E also indicates that the abnormal returns of the sample firms are not significantly larger than the abnormal returns of their earnings-management-matched firms, and that the association between abnormal accruals and the match-pair difference in the abnormal returns between the repurchasing firms and the earnings-management-matched firms is not statistically significant. Overall, the results in Table VIII further confirm that the post-repurchase superior performance is due, at least in part, to pre-repurchase earnings management. Once we control for pre-repurchase earnings management, we find no evidence of superior performance, and the significant negative association between post-repurchase performance and pre-repurchase abnormal accruals essentially disappears.

As an alternative means of assessing the effect of earnings management on the post-repurchase performance, we replicate the results for a subsample of repurchasing firms that have fairly normal accruals prior to the repurchases. The subsample includes 113 repurchasing firms that have abnormal accruals within plus and minus 0.15% of total assets. Untabulated results show that, for this subsample, the average quarterly improvement in operating performance is 0.278% (two-tail p -value = 0.284) for the four quarters after the repurchase

³⁶ Note that abnormal accruals are already deflated by assets.

³⁷ We also compare the relative improvement of low (bottom quartile) and high (top quartile) abnormal accrual firms. Untabulated results show that neither the low nor the high abnormal accrual firms experience improvements in their relative operating performance.

Table VIII
Earnings Management Adjusted Matching

This table reports pre-repurchase abnormal accruals and post-repurchase performance improvement for firms that actually purchase shares (i.e., the repurchase amount, Compustat quarterly data item #93, is greater than 1% of market value at the beginning of the quarter) either in the quarter of repurchase announcements or the subsequent quarter. An *earnings-management-adjusted* matching is developed based on Lie’s (2005) matching procedure, with firm-specific operating performance replaced by firm-specific pre-managed operating performance. Please, refer to the caption of Table V for an explanation of the measurement of *FOPERF*. Please, refer to the caption of Table V for the descriptions of “Sample 1” and “Sample 2”. *DIFF_FMPERF* is the difference in the average *monthly* abnormal stock return after the repurchase announcement (*FMPERF*) between sample firms and control firms. *FMPERF* is measured over the 12-month (or 24-month) period after the month of the repurchase announcement, based on Fama (1998) and measured using the Daniel et al. (1997) benchmark return adjustment procedure. We estimate a cross-sectional regression each month for all firms that have made a repurchase within 12 months (or 24 months) of a repurchase announcement over the period 1984 to 2002. There is a total of 232 (237) monthly regressions for the 1-year (2-year) return horizon. The coefficient estimates and the *t*-statistics are then computed according to Fama and MacBeth (1973). Two-tail (one-tail) *p*-values are reported in brackets (parentheses) in Panels A, B, and D. *T*-values are reported in parentheses in Panels C and E.

Panel A: Mean abnormal accruals before open-market repurchases for sample and matched firms

	<i>N</i>	Sample Firms	Matched Firms	Paired Difference	Unpaired Difference
Sample 1	1,720	−0.567% (0.000)	−0.557% (0.000)	−0.009% [0.581]	−0.008% [0.931]
Sample 2	1,306	−0.514% (0.000)	−0.511% (0.000)	−0.003% [0.860]	−0.003% [0.977]

Panel B: Improvement in operating performance (*FOPERF*)

	<i>N</i>	1-year	2-year
Sample 1	1,720	0.026% [0.789]	0.141% [0.188]
Sample 2	1,306	−0.079% [0.458]	0.091% [0.452]

Panel C: Association between pre-repurchase abnormal accruals and post-repurchase operating performance using earnings-management-adjusted matching

$$FOPERF_i = \alpha + \beta_1 ABACC_i + \beta_2 SIZE_i + \beta_3 BM_i + \beta_4 LEV_i + \beta_5 CASH_i + \varepsilon_i.$$

	Sample 1		Sample 2	
	One-year	Two-year	One-year	Two-year
<i>Intercept</i>	0.686 (1.44)	0.344 (0.64)	0.682 (1.27)	0.365 (0.59)
<i>ABACC</i>	−0.004 (−0.11)	−0.047 (−1.16)	−0.010 (−0.24)	−0.054 (−1.15)
<i>Control variables</i>	Not reported			
Adj. <i>R</i> ² (%)	0.72	0.54	1.39	1.05
<i>N</i>	1,701	1,701	1,293	1,293

(continued)

Table VIII—Continued

Panel D: Difference in stock performance between sample and match firms (<i>DIFF_FMPERF</i>)			
	<i>N</i>	1-year	2-year
Long term average monthly abnormal return	1,720	0.244% [0.214]	0.180% [0.265]
Panel E: Association between pre-repurchase abnormal accruals and post-repurchase difference in stock performance using earnings-management-adjusted matching			
$DIFF_FMPERF_i = \alpha + \beta_1 ABACC_i + \beta_2 SIZE_i + \beta_3 BM_i + \beta_4 LEV_i + \beta_5 CASH_i + \varepsilon_i$			
		1-year	2-year
<i>Intercept</i>		0.786 (0.77)	−0.304 (−0.41)
<i>ABACC</i>		−0.076 (−0.98)	−0.041 (−0.92)
<i>Control variables</i>		Not reported	
Adj. R^2 (%)		4.14	2.48
<i>N</i>		1,701	1,701

announcement and 0.196% (two-tail p -value = 0.491) for the eight quarters after the announcement. The average monthly abnormal returns are 0.024% (two-tail p -value = 0.949) for the four quarters after the repurchase announcement and 0.109% (two-tail p -value = 0.680) for the eight quarters after the announcement, using the Fama and MacBeth (1973) method combined with the Daniel et al. (1997) match-portfolio approach. The average monthly abnormal returns are 0.132% (two-tail p -value = 0.751) for the four quarters after the repurchase announcement and 0.234% (two-tail p -value = 0.433) for the eight quarters after the announcement using the Carhart (1997) approach.

We replicate the analysis for the 113 observations with the most positive abnormal accruals and the 113 observations with the most negative abnormal accruals. For the subsample with the most positive abnormal accruals, the average quarterly improvement in operating performance is −0.478% (two-tail p -value = 0.170) for the four quarters after the repurchase announcement and −0.720% (two-tail p -value = 0.049) for the eight quarters after the announcement. The average monthly abnormal returns are 0.115% (two-tail p -value = 0.800) for the four quarters after the repurchase announcement and −0.381% (two-tail p -value = 0.291) for the eight quarters after the announcement, using the Fama and MacBeth (1973) method combined with the Daniel et al. (1997) match-portfolio method. The average monthly abnormal returns are 0.267% (two-tail p -value = 0.589) for the four quarters after the repurchase announcement and −0.223% (two-tail p -value = 0.541) for the eight quarters after the announcement using the Carhart (1997) method. In contrast, for the 113 observations with the most negative abnormal accruals, the average quarterly

improvement in operating performance is 1.645% (one-tail p -value = 0.000) for the four quarters after the repurchase announcement and 1.475% (one-tail p -value = 0.001) for the eight quarters after the announcement. The average monthly abnormal returns are 1.536% (one-tail p -value = 0.002) for the four quarters after the repurchase announcement and 0.597% (one-tail p -value = 0.042) for the eight quarters after the announcement, using the Fama and MacBeth (1973) method combined with the Daniel et al. (1997) match-portfolio method. The average monthly abnormal returns are 1.986% (one-tail p -value = 0.000) for the four quarters after the repurchase announcement and 0.962% (one-tail p -value = 0.005) for the eight quarters after the announcement using the Carhart (1997) method. These results again support our conjecture that the post-repurchase superior performance is associated with pre-repurchase earnings management.

D. Analysis of the Market Reaction to Post-Repurchase Earnings Announcements

We analyze the market reaction to the post-repurchase earnings announcements. If the superior post-repurchase performance is associated with pre-repurchase earnings management, the effect should be most pronounced around the post-repurchase earnings announcement. One countervailing effect, however, is managers' tendency to guide market expectations toward the forthcoming actual reported earnings. That is, the subsequent stock price effect of earnings management will be mitigated if managers preempt the earnings surprise by guiding the market prior to the official earnings announcement. However, Lie (2005) finds that repurchasing firms experience an average abnormal return of about 0.575% over the 3 days centered on the announcement dates for the eight quarterly earnings announcements starting the quarter after the repurchase announcement quarter. This finding indicates that the potential effect on the post-repurchase earnings surprise is not fully mitigated by earnings guidance.

To mitigate the potential stock price effects of earnings guidance and whisper forecasts, we measure abnormal returns over the 3 days starting 2 days prior to the earnings announcement date (see Bagnoli, Beneish, and Watts (1999) for a discussion of, and evidence on, the effects of whisper forecasts on earnings surprises). We use Carhart's (1997) four-factor model to estimate return expectations for individual firms. The model is estimated over the period from 250 days to 10 days before the quarterly earnings announcement date. Consistent with Lie (2005), the results reported in Panel A of Table IX show that the average abnormal return for the eight quarterly earnings announcements after the repurchase announcement quarter is 0.704%. Interestingly, we find no statistical difference between the average abnormal returns of the sample of repurchasing firms and the average abnormal returns of a control sample of nonrepurchasing firms with similar levels of abnormal accruals. These results further suggest that the superior post-repurchase performance is associated with pre-repurchase earnings management.

Table IX
Analysis of the Market Reaction to Post-repurchase Earnings Announcements

CAR_EA is the cumulative abnormal returns for the 3 days ending on the day of the quarterly earnings announcement. We use Carhart's (1997) four-factor model to estimate return expectations for the individual firms. The model is estimated over the period from 10 days to 250 days before the quarterly earnings announcement date. We average the quarterly abnormal returns over the four quarters (Quarter + 1 to Quarter + 4) and the eight quarters (Quarter + 1 to Quarter + 8) after the repurchase announcement, respectively. *ABACC* is abnormal accruals, measured as the average of the performance-matched abnormal total accruals for the Quarter - 1 and Quarter 0 (where Quarter 0 is the repurchase announcement quarter). *NDCHNI* is the seasonal change in nondiscretionary earnings. Nondiscretionary earnings are measured as net income during the quarter deflated by total assets at the beginning of the quarter, minus the abnormal accruals for the quarter (the abnormal accruals are already deflated by beginning assets). We average the quarterly deflated change in nondiscretionary earnings over the four quarters (Quarter + 1 to Quarter + 4) and the eight quarters (Quarter + 1 to Quarter + 8) after the repurchase announcement, respectively. The regressions are estimated jointly for the sample of repurchasing firms and the control sample of nonrepurchasing firms with similar levels of abnormal accruals. We obtain the control firms using an *earnings-management-adjusted* matching based on Lie's (2005) matching procedure, with firm-specific operating performance replaced by firm-specific pre-managed operating performance. There are more observations for the 2-year (eight-quarter) horizon because we set missing *CAR_EA* in a given quarter to the respective firms' average quarterly *CAR_EA* over the measurement period. The results are qualitatively the same if we require that a firm have no missing *CAR_EA*. Two-tail (one-tail) *p*-values are reported in brackets (parentheses) in Panel A. *T*-values and *F*-values are reported in parentheses in Panels B. *** indicates significance level at less than 1% in a two-tail test. +/++/+++ indicates significance level at less than 10%/5%/1% using one-tail tests.

Panel A: Mean abnormal returns around the post-repurchase earnings announcements						
	Sample firms		Control firms		Difference	
1-year horizon	0.589 (0.000) [<i>N</i> = 1,705]		0.664 (0.000) [<i>N</i> = 1,603]		-0.075 [0.626]	
2-year horizon	0.704+++ (0.000) [<i>N</i> = 1,705]		0.577+++ (0.000) [<i>N</i> = 1,603]		0.127 [0.309]	
Panel B: Association between pre-repurchase abnormal accruals and abnormal returns around the post-repurchase earnings announcements						
$CAR_EA_i = \alpha + \beta_1 ABACC_i + \beta_2 NDCHNI_i + \varepsilon_i$						
	1-year horizon [<i>N</i> = 3,183]			2-year horizon [<i>N</i> = 3,183]		
	Sample firms (<i>T</i> -value)	Control firms (<i>T</i> -value)	Difference (<i>F</i> -value)	Sample firms (<i>T</i> -value)	Control firms (<i>T</i> -value)	Difference (<i>F</i> -value)
<i>Intercept</i>	0.539*** (4.87)	0.662*** (5.74)	-0.133 (0.60)	0.680*** (7.40)	0.619*** (6.45)	0.061 (0.21)
<i>ABACC</i>	-0.103+++ (-2.49)	-0.121+++ (-2.63)	0.018 (0.08)	-0.059++ (-1.74)	-0.057+ (-1.49)	-0.002 (0.00)
<i>NDCHNI</i>	0.122+++ (3.39)	0.144+++ (3.77)	-0.022 (0.17)	0.172+++ (4.04)	0.108++ (2.17)	-0.064 (0.95)
Adj. <i>R</i> ² (%)	2.65		3.45			

Next we model the earnings announcement abnormal return as a function of pre-repurchase abnormal accruals, controlling for seasonal change in the quarterly nondiscretionary earnings (change in net income minus abnormal accruals). The results are reported in Panel B of Table IX. We find a negative association between the pre-repurchase abnormal accruals and the earnings announcement abnormal returns. The association is significant at the 1% level when the abnormal return is averaged over the first four quarters and marginally significant when it is averaged over all eight quarters. The association between pre-repurchase abnormal accruals and earnings announcement abnormal returns is not statistically different across the sample and the control firms, which is again consistent with the conjecture that the superior post-repurchase performance is associated with earnings management.

The estimation interval for our return expectation model covers the period of the repurchase, a period when, in general, the firms' stock price is abnormally high. This may create a downward bias in our abnormal return measures, which is likely mitigated by the inclusion of the momentum factor in our expectation model. To further ensure that our inferences are not affected, we also analyze the association between pre-repurchase abnormal accruals and earnings announcement abnormal returns using the value-weighted market-adjusted return as a proxy for abnormal returns. The untabulated results are qualitatively similar to those reported in Table VIII. The average abnormal returns for the four (eight) quarterly earnings announcements after the repurchase announcement quarter are 0.696% (0.858%) for the sample firms and 0.788% (0.715%) for the control sample of nonrepurchasing firms with similar levels of abnormal accruals. The *t*-values for the association between the pre-repurchase abnormal accruals and the abnormal returns for the (four) eight quarterly earnings announcements are -2.66 (-1.72) for the sample firms and -3.14 (-2.09) for the control firms. The associations are not statistically different across the two groups of firms.

We also analyze the earnings announcement abnormal returns for the 113 repurchasing firms that have abnormal accruals within plus and minus 0.15% of total assets, the 113 observations with the most positive abnormal accruals, and the 113 observations with the most negative abnormal accruals. Untabulated results show that, for the sample firms with abnormal accruals around zero, the average quarterly earnings announcement abnormal returns are 0.28% (two-tail *p*-value = 0.239) for the four quarters after the repurchase announcement and 0.18% (two-tail *p*-value = 0.373) for the eight quarters after the announcement. For the 113 observations with the most positive abnormal accruals, the average quarterly earnings announcement abnormal returns are -0.10% (two-tail *p*-value = 0.817) for the four quarters after the repurchase announcement and 0.28% (two-tail *p*-value = 0.448) for the eight quarters after the announcement. In contrast, for the 113 observations with the most negative abnormal accruals, the average quarterly earnings announcement abnormal returns are 1.03% (one-tail *p*-value = 0.003) for the four quarters after the repurchase announcement and 0.87% (one-tail *p*-value = 0.002) for the eight quarters after

the announcement. Overall, the results are consistent with our conjecture that the superior post-repurchase performance is associated, at least in part, with pre-repurchase earnings management.

VII. Conclusion

This paper provides a potential explanation for the long-term operating performance and abnormal returns following open-market repurchase announcements. We posit that the *reported* post-repurchase performance improvement documented by Lie (2005) is likely driven, at least in part, by pre-repurchase downward earnings management.

Consistent with our conjectures, we find significantly negative abnormal accruals around open-market repurchase announcements. We also find that the negative abnormal accruals increase with the percentage of the company that the managers repurchase and CEO ownership, which is consistent with the notion that managers have greater incentives to deflate earnings when the potential benefits from downward earnings management are greater. Furthermore, we document a significantly negative association between abnormal accruals and both future operating performance and future stock performance. Remarkably, the negative associations between abnormal accruals and post-repurchase performance are due, almost exclusively, to the positive performance of the low abnormal accrual firms. More importantly, once we control for the effect of pre-repurchase earnings management, we find no evidence of superior post-repurchase performance, and the significant association between post-repurchase performance and pre-repurchase abnormal accruals essentially disappears.

Our results contribute to the literature on open-market repurchases, the literature on post-event long-term abnormal stock performance, as well as the literature on managers' discretionary reporting behavior by documenting earnings management as one likely cause for the improvement in *reported* operating performance and the long-term abnormal returns following open-market repurchase announcements. Our findings are consistent with the notion that the cost minimization incentive motivates managers to deflate earnings growth prior to open-market repurchases, resulting in artificial improvement in future operating performance. The market is apparently surprised by the subsequent performance improvement, resulting in subsequent positive abnormal stock returns. This is consistent with Louis's (2004) argument that, because of the intricacies of earnings management and the difficulty in observing certain managerial actions, investors are likely to be surprised when realized growth falls short of or exceeds expectations formed on the basis of manipulated earnings numbers. However, although we find strong evidence suggesting that pre-repurchase earnings management is associated with the post-repurchase superior performance, we do not rule out that other factors may also contribute to the superior performance. It is plausible that managers also time their repurchases.

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