

**An Empirical Study of the Information Content and Insider Trading  
Around Open Market Share Repurchase Announcements**

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A Thesis

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## **ABSTRACT**

### **An Empirical Study of the Information Content and Insider Trading Around Open Market Share Repurchase Announcements**

**Liang Feng**

This paper employs a conditional event study to analyze managers' motives to announce a share repurchase while at the same time exploring the factors that drive a firm's abnormal announcement return. We find that firms that have more free cash flow and less debt are more likely to initiate a repurchase. We also document that the market reacts more positively to announcements made by firms that exhibit poor pre-announcement stock price performance as well as firms that seek to buy back a higher percentage of shares. We do not find any significant positive correlation between managers' private information and unexplained abnormal returns, which suggests that the market's discovery of insiders' private information has already been incorporated into abnormal returns, or that the announcement return may be explained entirely by public information as predicted by the agency hypothesis.

This study also provides complementary evidence on the information content of open market repurchases by analyzing insider trading activities around the repurchase announcements. We show that in general, insiders in repurchasing firms tend to decrease their selling activity and increase their buying activity before repurchase announcements. After the announcement, the differences in insider trading activity between repurchasing firms and non-repurchasing firms are largely insignificant.

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## **1. Introduction**

Since the regulatory framework in the U.S. was established in 1982, share repurchases have become an increasingly important payout policy. As Grullon and Michaely (2002) suggest, in the early years of the period from 1972 to 2000, the dollar amount spent by U.S. firms on stock repurchases was a small fraction of that of dividends; however, this fraction kept rising over time. Since 1999 the dollar amount of share repurchases has exceeded that of dividends.

There are three types of common stock repurchases: open-market repurchases, fixed-price self-tender offers, and Dutch-auction self-tender offers. Fixed-price tender offers specify a single purchase price, the number of shares sought, and an expiration date. Dutch-auction tender offers specify a range of prices within which each tendering shareholder chooses his or her minimum acceptable selling price. The offering firm assembles all of selling prices, ordering them by the shareholders' minimum acceptable prices, and determines the lowest price that will fetch the number of shares sought. This price is then paid to all shareholders who tendered shares at an ask-price equal to, or lower than, this price. In contrast, open-market repurchases do not provide shareholders with a premium and may be carried out over several months (and years in many cases, see Comment and Jarrell, 1991). Under this method, firms purchase their own stock, just as anyone would buy shares of a particular stock. Thus, the seller does not know whether the shares were sold back to the firm or just another investor (Ross et al., 2005).

The literature is rich with motives for share repurchases. In addition, there are many

studies that examine abnormal returns around repurchase announcements. In this paper we focus our attention on the information signaling or undervaluation hypothesis, the excess cash distribution and dividend substitution hypothesis, and the optimal capital structure hypothesis.

The signaling or undervaluation hypothesis is based on the premise that the informational asymmetry between insiders and shareholders may cause a firm to be misvalued. Under this hypothesis, firms buy back their shares to signal that their stocks are undervalued. Thus, repurchase announcements usually lead to an increase in a firm's stock price. It is hypothesized that the positive market reaction to repurchase announcements is consistent with the notion that repurchases are looked upon favorably by the market and shareholders. Dann (1981), Vermaelen (1981), and Dittmar (2000) discover that information signaling is the main motivation for stock repurchases. Also consistent with this hypothesis, Stephens and Weisbach (1998) reveal a negative correlation between repurchase activity and prior stock returns, indicating that firms buy back shares when they perceive their stock to be undervalued. Similarly, a number of studies have found that announcement-period stock returns are inversely related to prior-period returns for stock buybacks when the prior return is measured over a relatively short period (Masulis and Korwar, 1986; Korajczyk, Lucas, and McDonald, 1989; Comment and Jarrell, 1991).

By analyzing a sample of share repurchase announcements by U.S. firms during the period from 1984 to 1989, Comment and Jarrell (1991) find that the above-mentioned three kinds of stock buybacks are on average all associated with significant positive excess returns. Fixed-price self-tender offers result in an average



excess return of about 11%, compared with under 8% for Dutch-auctions, while open-market repurchases induce an average excess return of about 2%, suggesting that open-market repurchases are the least effective signals of stock undervaluation because open-market repurchases expose the personal wealth of managers to less risk than self-tender offers. In addition, Comment and Jarrell (1991) show that firms employ the target repurchase proportion as a signal of the firm's future earnings. They find that for all types of repurchases every increase of 10 percent in the proportion of share sought leads to an increase of 2 percent in the announcements return.

However, despite their reduced signaling effect, open-market repurchases are more popular than fixed-price and Dutch auction self-tender offers. Ikenberry Lakonishok and Vermaelen (1995) and Stephens and Weisbach (1998) report that open-market stock repurchases account for approximately 90% of the total dollar value of all stock repurchases between 1985 and 1993. Obviously, the information-signaling theory cannot explain the popularity of open-market repurchases. Comment and Jarrell (1991) argue that open-market repurchases are excellent vehicles for paying cash to shareholders but are not the most effective vehicles for signaling stock undervaluation. Consistent with the theory of rational choice, open market repurchases, which present the lowest risk for both firms and managers, are used more frequently. The popularity of open-market market repurchases suggests that most stock buybacks may be motivated by objectives other than (or in addition to) signaling stock undervaluation, such as distributing excess cash to shareholders and preventing hostile takeovers (Comment and Jarrell, 1991).

Many firms select repurchases as their payout policy. This popularity is not

surprising: first, open market repurchases provide a flexible way of capital distribution without any commitment. Jensen (1986) asserts that firms repurchase stock to distribute excess cash flows. Stephens and Weisbach (1998) and Dittmar (2000) support this notion and find a positive relation between repurchases and levels of cash flow. Second, the tax rate on capital gains is lower than the tax rate on dividend income. At the same time, if repurchases and dividends are substitutes, then repurchases should be negatively related to dividend yield. However, when investigating the relationship between repurchasing activity and dividend payout, both Dittmar (2000) and Li and McNally (2007) find no support for this hypothesis.

Another motive for repurchases is provided by the optimal capital structure hypothesis. Bagwell and Shoven (1989) show that firms may use stock repurchases to achieve their target leverage ratio. If a firm's financial leverage is below the optimal leverage ratio of its industry, this firm can repurchase its shares in order to increase its leverage ratio, and thus increase its firm value. Therefore, a firm is more likely to buy back shares if its leverage ratio is below the optimum leverage ratio.

According to the signaling and undervaluation hypotheses, repurchase announcements reveal private information to the market on a limited scale and thus the abnormal announcement return should be correlated with the private information conveyed in the announcement. Li and McNally (2007) find that the announcement period returns of Canadian repurchases are strongly and positively related to the private information possessed by company insiders. However, Barclay and Smith (1988) and Ikenberry et al. (1995, 2000) argue that asymmetrically informed inside shareholders use open market repurchases as disguised insider trading. Firms initiate repurchases

when their shares are undervalued, and so the repurchase transfers wealth from the selling shareholders to the insiders (and other non-selling shareholders). Under this hypothesis, the announcement signals that the firm's shares are undervalued, but the signal is incomplete. The market does not learn all of the insiders' private information from the announcement and so it continues to undervalue the firm's shares afterwards. In addition, Easterbrook (1984) and Jensen (1986) argue that the announcement return may be explained entirely by public information under the agency hypothesis. Insiders have the opportunity to deploy corporate resources in ways that benefit themselves but may not benefit outside shareholders. Repurchases may cause an abnormal announcement return because they reduce free cash flow and therefore reduce the opportunities for insiders to squander corporate resources. Isagawa (2000) argues that announcement returns may also reflect private information as reflected in management's preferences for empire building and perquisite consumption. On the other hand, as currently conceived in the literature, the optimal capital structure and dividend substitution hypotheses provide explanations for why firms repurchase, but do not imply that there is private information conveyed through the announcement.

Aside from exploring the aforementioned hypotheses, we add to the extant literature by examining the trading behavior of insiders around repurchase announcements. A number of prior studies have analyzed the insider trading activities around share repurchases.<sup>1</sup> Based on the information asymmetry hypothesis, insiders

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<sup>1</sup> The term "insiders" refers to people who have knowledge of, or access to, valuable nonpublic information about a corporation. Consistent with the extant literature, we consider all directors and officers of a company as well as the stockholders who own more than 10% of a company's stock as insiders.

exploit share repurchases to conceal insider trading (Barclay and Smith (1988) and Ikenberry et al. (1995, 2000)). Because share repurchases transfer wealth from the selling shareholders to the insiders and because there tend to be significant positive abnormal returns around repurchase announcements, the repurchase always benefits insiders rather than outsiders (or the market). Lee, Mikkelsen, and Partch (1992) find that managers of repurchasing firms increase their frequency of buying and decrease their frequency of selling shares prior to (especially in the six month before) repurchase announcements. They argue that managerial net-buying activities may be motivated by managers' belief that the stock is undervalued, and this belief also motivates the repurchase decision of the firms. Wansley, Lane and Sarkar (1989) conduct a survey about the motives for stock repurchases. In response to this survey, chief financial officers of 98 large firms pointed out that the belief that the firm's shares are undervalued is the most important reason for implementing a stock repurchase program.

Because insiders have insight into the workings of their company, people have for years based their investment decisions on the actions of insiders. The market considers insider trading prior to stock repurchases as a complementary signal and takes advantage of insider trading to assess the information value of repurchase announcements. Hsu (1999) analyzes the information content of insider trading and open-market stock repurchases and finds insider-buying activities prior to open-market repurchase announcements to be positively related to the returns around the announcement, but this relation does not hold in the long run.

This paper uses conditional event study methodology to examine the motives for share repurchases and then inspects whether the abnormal announcement return is related to the private information possessed by insiders. Specifically, we contrast three hypotheses that explain repurchases and the announcement return: the information signaling or undervaluation hypothesis, the excess cash distribution and dividend substitution hypothesis, and the optimal capital structure hypothesis. Past studies of announcement returns generally employ standard event-study methodology. As Li and Prabhala (2005) point out, when corporate events are voluntary, like repurchase announcements, standard event studies will likely produce biased parameter estimates, whereas conditional event study methodology is free of self-selection bias. We follow Li and McNally (2007) who deploy conditional event study methodology to measure the returns around Canadian repurchase announcements. The benefit of using this approach is that it models both the likelihood of a repurchase and the abnormal return around repurchase announcements—two research questions that have generally been investigated separately in the previous literature.

Moreover, while Li and McNally (2007) employ a comparatively small sample of repurchase announcements by Canadian firms for their study, our study will be the first to use a conditional event study approach for a large comprehensive sample of repurchase announcements by U.S. firms and to explore whether the abnormal returns for U.S. repurchases can be attributed to private information possessed by insiders. The likelihood of a repurchase is modeled as a function of publicly observable proxies suggested by theory and of unobservable private determinants known only to corporate insiders. The conditional event study approach therefore provides a direct test of the

correlation between the private information conveyed by the announcement and the abnormal announcement return.

We find that firms that have more free cash flow and less debt are more likely to initiate a repurchase. This finding supports the excess cash distribution hypothesis and the optimal capital structure hypothesis. We also document that the market reacts more positively to undervalued firms, i.e. firms that exhibit poor pre-announcement stock price performance, that seek to buy back a higher percentage of shares. However, in contrast to the results of Li and McNally (2007), we do not find any significant positive correlation between managers' private information and the unexplained abnormal return. We argue that it is more likely that the market's discovery of insiders' private information has already been incorporated into our abnormal return, which is derived from the market model. Our results provide support for Barclay and Smith's (1988) and Ikenberry et al.'s (1995, 2000) hypothesis that the signals provided by repurchase announcements are incomplete, and that the market does not learn all of the insiders' private information from the announcement. Our results also support the explanation by Easterbrook (1984) and Jensen (1986) who suggest that the announcement return may be explained entirely by public information under the agency hypothesis.

While our conditional event study directly explores the relationship between managers' private information and the unexplained abnormal returns, our analysis of insider trading activities around announcements provides complementary evidence on the information content conveyed by open market repurchases. Many studies have shown that managers employ their information advantage by trading their firms'

shares prior to a repurchase announcement, and that managers' trading activities around such announcements tend to be highly profitable when considered in light of the stock price change around the announcement date. Lee, Mikkelson, and Partch (1992) find that for fixed price tender offer repurchases, managers increase their frequency of buying and decrease their frequency of selling shares prior to the repurchase announcement, but they find no such evidence for Dutch auction offers. This difference suggests that managers have different motives for these two types of offers, which convey different information. While Lee, Mikkelson, and Partch (1992) examine stock repurchases made via tender offers, we focus on insider-trading activities around open-market repurchases. We show that, on average, insiders in repurchasing firms tend to decrease their selling activity and increase their buying activity before repurchase announcements. After the announcement, the differences in insider trading activity between repurchasing firms and the non-repurchasing firms are largely insignificant. As such, our results provide support for the findings by Lee, Mikkelson, and Partch (1992), and show that informed insider trading is not limited to tender offers but is also evident around open market repurchase announcements.

The remainder of this paper is organized as follows. Section 2 describes our sample construction process and provides preliminary results on firms' abnormal returns around repurchase announcements. Section 3 presents our conditional event study model and provides the corresponding results. Section 4 analyzes insider-trading activities around announcements. Finally, in Section 5, we offer conclusions and suggestions for future research.

## **2. Sample and data description**

### **2.1. Sample selection**

From the Securities Data Corporation (SDC), we obtain a complete record of open market repurchase programs announced by firms traded on the NYSE, AMEX, and NASDAQ between 1995 and 2006. Besides ruling out repurchases that are connected to attempts to take over or to solidify control of a firm, we also exclude all repurchases made by financial institutions, public utilities, and transportation companies (i.e. firms with one-digit SIC codes of 6 or 4, respectively) since their motives for repurchasing stock may differ from other firms' motives. During this sample period, a total of 6,398 open market repurchase programs were announced. For each repurchase, we collect the announcement date, the percentage of share buybacks initially authorized, company identification information, and the firm's SIC code.

Stock returns and market returns are from the Center for Research in Securities Prices (CRSP), and financial accounting data is from Standard & Poor's Compustat. After removing firms with missing data, the number of sample firms is reduced for certain analyses.

We obtain insider trading data from the Nasdaq website ([www.nasdaq.com](http://www.nasdaq.com)) that provides insider trading information from Form 4 filings with the U.S. Securities and Exchange Commission (SEC). Insiders are defined as officers and beneficial owners who are buying or selling their company's stock. A beneficial owner is a person who owns more than 10% of the stock, or who, directly or indirectly, through any contact, arrangement, understanding, and relationship or otherwise, has or shares a direct or



indirect pecuniary interest in the stock (www.nasdaq.com). Because of the high cost of gathering such data, we only include insider-trading data for the sub-sample between 1995 and 2001.

Table 1 provides information on the number of repurchase announcements over the period from 1995 to 2006. There appears to be a cyclical trend in share repurchases. While the number of repurchasing announcements climbed from 1995 to 1998, it then descended every year during the 1999 to 2003 period, only to rise again towards the end of our sample period.

\*\*\*Insert Table 1 about here\*\*\*

## **2.2. *Matching procedure***

We match each sample firm with a Compustat-listed firm in the same industry (as measured by three-digit SIC codes) that is similar in firm size and market-to-book ratio, but has not experienced a repurchase event over the corresponding sample period. After eliminating the missing data, we have 1,949 sample firms and 1,928 matched firms in our final sample. Table 2 presents a univariate comparison of firm characteristics for repurchasing firms and matched firms during the sample period. Repurchasing firms generate significantly greater cash flows of 100 million compared to only 80 million for matched firms. Repurchasing firms also have significantly less debt (0.21 percent vs. 0.31 percent). On the other hand, we find no significant difference in the pre-announcement dividend payout or stock returns between repurchasing firms and matched firms.

\*\*\*Insert Table 2 about here\*\*\*

### 2.3. *Abnormal returns around repurchase announcements*

The abnormal returns are calculated by using standard event study methodology. Based on a simple market model, the prediction error for firm  $i$  on day  $t$  can be written as:

$$AR_{it} = R_{it} - \alpha_i - \beta_i R_{mt} \quad (1)$$

where

$AR_{it}$  = Abnormal return to firm  $i$  on day  $t$ ,

$R_{it}$  = Realized return for firm  $i$  on day  $t$ ,

$\alpha_i, \beta_i$  = Market model parameter estimates, and

$R_{mt}$  = Return on the equally-weighted or value-weighted CRSP market index on day  $t$ .

Accumulating the abnormal returns over a given window  $[t_1, t_2]$  provides the cumulative abnormal return CAR; for each firm:

$$CAR_i = \sum_{t=t_1}^{t_2} AR_{it} \quad (2)$$

The market parameters estimates for each firm in our sample are obtained from a market model regression for days  $-280$  to  $-26$  (estimation period). Day zero ( $t=0$ ) is defined as the repurchase announcement date. Table 3 provides the daily abnormal returns of repurchasing firms over the period  $(-20, 20)$ . Table 4 provides the average cumulative abnormal returns of repurchasing firms over different intervals. The average cumulative abnormal return over the period  $(-1,1)$  is 2.64 percent when abnormal returns are derived from the market model when using the CRSP equally-weighted index as a market proxy and 2.39 percent when using the CRSP value-weighted index. These results are largely consistent with Comment and Jarrell

(1991) who find average abnormal returns of 2.3 percent around open market repurchase announcements.

\*\*\*Insert Table 3 about here\*\*\*

\*\*\*Insert Table 4 about here\*\*\*

Figure 1 depicts our results graphically and presents cumulative abnormal returns (CARs) around repurchase announcements for our sample of 1,949 firms that announced a share buyback program between January 1995 and December 2006. Daily abnormal returns are accumulated over a period from twenty days before the announcement to twenty days afterwards and are derived from the market model that uses the CRSP equally-weighted index to proxy for market returns.<sup>2</sup> Our results suggest that firms' performance prior to repurchase announcements tends to be very poor, with significantly negative pre-announcement returns. On the other hand, there is a significant increase in stock prices following the announcement of repurchases. Consistent with previous studies (e.g. Masulis and Korwar, 1986; Korajczyk, Lucas, and McDonald, 1989; Comment and Jarrell, 1991), this result implies that the prior-period returns over a relatively short period are inversely related to announcement-period stock returns.

\*\*\*Insert Figure 1 about here\*\*\*

### **3. Conditional event study model**

#### ***3.1. Methodology***

---

<sup>2</sup> Our results are highly similar if we use the CRSP value-weighted index instead.

Following Li and McNally's (2007) methodology, we employ conditional event study methodology to model both the likelihood of a repurchase and a series of factors that explain the announcement return for U.S. open market repurchases.

Our model is based on the premise that a company decides to repurchase stock if its marginal utility of repurchase, denoted by  $u^*$ , is positive. We can present marginal utility as  $u^* = \beta X + \varepsilon$ , where  $\beta$  is a vector of  $k$  parameters, and  $X$  is a set of firm characteristic variables which are public information. The error,  $\varepsilon$ , can be treated as insiders' private information. Thus, for a repurchasing firm, it must be true that  $\varepsilon \geq -\beta X$ . The abnormal announcement period return for repurchasing firms can be presented as  $CAR = \alpha Y + E(e | \varepsilon \geq -\beta X)$ , where  $\alpha$  is a vector of  $j$  parameters, and  $Y$  is a set of CAR-related explanatory variables. The correlation of  $\varepsilon$  and  $e$  is denoted by  $\rho$ , and it represents the correlation between the private information of insiders and the abnormal announcement period returns unexplained by  $\alpha Y$ . If this correlation is significantly positive, we can conclude that the market learns about insiders' private information through the announcement

### **3.2. Results**

Table 5 presents estimates for the logistic regression which explains the likelihood of a stock repurchase. For a given firm, the results for our 1995-2006 sample show that firms are more likely to repurchase if they have more free cash and less debt. This finding is consistent with the excess cash distribution hypothesis (Jensen, 1986; Stephens and Weisbach, 1998; and Dittmar, 2000) and the optimal capital structure hypothesis (Bagwell and Shoven, 1989). Consistent with Dittmar (2000) and Li and McNally (2007), the dividend payout variable is insignificant, which suggests that

firms are not substituting dividends for repurchases. Despite having a negative sign, the return variable is not statically significant, thus providing no support for the undervaluation hypothesis. This may be due to open-market repurchases, compared to tender-offer repurchases, providing the least effective signal of stock undervaluation because open market repurchases expose the personal wealth of managers to less risk than self-tender offers. As such, our results are consistent with Comment and Jarrell (1991) who argue that open-market repurchases are excellent vehicles for paying cash to shareholders but are not the most effective vehicles for signaling stock undervaluation, and that most stock buybacks may be motivated by objectives other than (or in addition to) signaling stock undervaluation. Our finding implies that managers may primarily decide to repurchase based on the positive impact they expect the announcement to have on their firms' share price since repurchases involve significant positive abnormal returns as we have seen in Section 2.3 (and as shown in our announcement return regression). In other words, it appears likely that managers take advantage of the information asymmetry that exists between themselves and outside investors and announce a stock repurchase program to increase their firms' stock price by conveying a false signal of undervaluation to the market. In addition to the full-sample results, Table 5 provides results for the 1995-2000 and 2001-2006 sub-sample respectively. The sub-periods results are qualitatively similar to those for the whole sample, offering a robustness check for our whole sample results, and suggesting that our results are largely unaffected by such coinciding events as the extraordinary market runup from 1998 to 2000.

\*\*\*Insert Table 5 about here\*\*\*

Table 6 presents the results of an announcement return regression for our sample of 1,663 firms that made a repurchase announcement between January 1995 and December 2006. The dependent variables are the cumulative abnormal returns over the period (-1, 1) in column 1, (-1, 2) in column 2, and (-2, 2) in column 3, respectively. In each regression, we use the return on the CRSP equally-weighted index as a proxy for market return in our CAR calculation.<sup>3</sup> For all CARs, the coefficient of the return variable is significantly negative, implying that abnormal announcement returns are higher for firms that experienced poor stock price performance prior to the announcements and may thus be perceived by insiders as being undervalued.

All CARs are positively related to percentage of shares sought. This finding is consistent with Comment and Jarrell (1991), who find that for all types of repurchases the proportion of share sought is positively related to the announcement return. Because the percentage of shares sought at the announcement is considered a sign of the extent of undervaluation perceived by managers, the market reacts positively with higher returns to firms that seek to repurchase a higher percentage of shares. The last row of Table 6 presents the correlation coefficients between the residuals of our abnormal announcement return regression and the residual of the logistic regression presented in Table 5. The correlation is not statistically significant for any CAR. This means that the market does not learn about the private information of managers from their decision of repurchase. Our results provide support for Barclay and Smith (1988) and Ikenberry et al. (1995, 2000) who argue that the signal provided by a repurchase

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<sup>3</sup> Our results are highly similar if we use the CRSP value-weighted index instead.

announcement is incomplete, and that the market does not learn about all of the insiders' private information from the announcement. Our results also support the argument by Easterbrook (1984) and Jensen (1986) who assert that the announcement return may be explained entirely by public information. Our findings are different from the results of Li and McNally (2007) who find a significantly positive correlation between these residuals for Canadian open market repurchases. However, their daily abnormal return estimate is based on each firm's daily stock return less the TSX 300 index return; in other words, they use market-adjusted returns to calculate their abnormal returns. In contrast, our abnormal return measurement which employs the market model that adjusts for each firm's beta should capture a firm's abnormal performance more accurately and more completely than market-adjusted returns do. As a result, it is likely that the market's knowledge about insiders' private information has already been incorporated into our abnormal return measure. A simple market adjustment on the other hand is not accurate enough to provide for a proper reflection of this information.

\*\*\*Insert Table 6 about here\*\*\*

#### **4. Insider trading activities**

##### ***4.1. Measures of insider trading***

To further examine the undervaluation hypothesis and the potential presence of insiders' private information about the true value of their firm (as well as the impending repurchase announcement the firm plans to make), we analyze insider

trading activities that occurred from 180 calendar days before the repurchase announcement to 180 days after the announcement. Within this timeframe, we consider various subperiods over which we measure insider trading. Insider trading activities can be measured in several different ways. In this paper, we report the proportion of firms with insider sale and purchase transactions, the number of insider sale and purchase transactions per firm, and the number of shares purchased and sold by insiders during each event window. In addition, we report the net sale activities, i.e. sales minus purchases, during each interval. On a transaction basis, we define the number of net sales as the number of sale transactions minus the number of purchase transactions by insiders during each interval. Similarly, with respect to the number of shares traded, we define net sales as the number of shares sold minus the number of shares purchased by insiders in each period. If in a particular interval the number of shares sold by insiders is greater than the number of shares purchased by insiders for a firm, we classify this firm as having net sales during this period. By comparing these measures between repurchasing and matched (non-repurchasing) firms, we can evaluate whether insiders indeed engage in informed trading prior to and after a repurchase announcement.

#### ***4.2. Evidence on insider trading***

Table 7 shows insider trading activities around stock repurchase announcements for repurchasing firms in the period from 1995 to 2001. Our results consistently suggest that insider sales (measured as the percentage of firms with sale transactions by insiders, the mean number of sale transactions by insiders per firm, and the mean



number of shares sold by insiders) decrease prior to the repurchase announcement. In contrast, insider purchases (as reflected by all measures) increase during the same period. As a result, we find that our net sale variables show a clear declining trend both on a quarterly basis, i.e. from (-180, 90) to (-90, 0), and on a monthly basis, i.e. over the intervals (-90, -60), (-60, -30), and (-30, 0). The weekly data, presented for the four weeks prior to and after the announcement, suggest no clear short-term trends, although we still find that insiders sell shares less frequently in the last two weeks prior to the announcement ((-14, -7) and (-7, 0)) than during the preceding two weeks ((-28, -21) and (-21, -14)). This trend is accompanied by a concurrent short-term increase in purchasing activity. After repurchase announcements, we don't find any perceptible patterns in insider trading.

\*\*\*Insert Table 7 about here\*\*\*

Table 8 presents information on insider trading activities for matched non-repurchasing firms. For comparability, we use the repurchase announcement date of the repurchasing firm as the announcement date for the corresponding matched firm. Our results for matched firms neither suggest any significant difference between purchasing and selling activity nor any time series patterns.

\*\*\*Insert Table 8 about here\*\*\*

Table 9 compares insider trading activities between repurchasing firms and matched firms. Although not significant in every event window, we find that there is significantly greater net selling activity among insiders of repurchasing firms in the long term (e.g. during the (-180, -90) and (-90, -60) periods), followed by a reversal, i.e. significantly less net selling activity in repurchasing firms relative to matched firms in

the short term immediately prior to repurchasing announcements. For example, the number of purchase transactions exceeds the number of sale transactions by an average of 0.17 per firm during the one-month period prior to the repurchasing announcements, whereas there are 0.74 more sales than purchases for matched firms during the same period. The tendency for insiders to purchase rather than sell shares prior to a repurchasing announcement is even more evident when examining weekly trading data during the last four weeks prior to the announcement, where matched firms continue to engage in net sales while repurchasing firms display significant net purchasing activity when measured either on a transaction basis (number of purchase and sale transactions) or on a traded share basis (number of shares purchased and sold).<sup>4</sup> After repurchase announcements, we do not find any noticeable differences in insider trading activities between repurchasing firms and matched firms except that in the intervals (21, 28), (0, 30), (60, 90), and (0, 90), the number of net sale transactions for repurchasing firms is significantly smaller than for matched firms, suggesting that insiders may expect the firm's repurchasing activities to have a positive long-term affect on the firm's share price performance and are thus more inclined to hold on to their shares.

\*\*\*Insert Table 9 about here\*\*\*

Overall, our results imply that insiders tend to decrease selling activity and increase buying activity before repurchase announcements. As a result, when compared to matched firms, insiders of repurchasing firms display decreased net selling behavior. The difference is especially obvious during the three weeks prior to

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<sup>4</sup> We attribute the tendency of matched firm insiders to engage in net selling to the fact that share repurchases are more frequent in market and industry declines than during bullish market conditions.

the announcement. Finally, after the announcement, there is somewhat limited evidence that suggests that insiders in repurchasing firms raise their outlook about their firms.

\*\*\*Insert Table 10 about here\*\*\*

\*\*\*Insert Table 11 about here\*\*\*

Table 10 provides the results for a regression of net insider selling activity in repurchasing and matched firms against the same set of explanatory factors we used in our repurchase and announcement return regression in Tables 5 and 6. Our dependent variable is a net sale dummy, which is equal to one if a firm exhibits net insider selling during a given period, and zero otherwise. In the interval (-30, 0), (-14, -7), (-7, 0), (21, 28), (0, 30), and (0, 90), repurchasing firms experience less net selling activity by insiders than matched firms. Table 11 presents the results for a similar regression model in which we employ the number of net sold shares, defined as the number of shares sold by insiders minus the number of shares bought by insiders, as a dependent variable. Our results for this regression model are similar to those in Table 10 and suggest that the coefficient on our Repurchase variable is only significantly in the short-term. In particular, we observe a significantly negative coefficient for this variable during the intervals (-21, -14) and (-14, -7) while this variable is insignificant during longer periods. Table 10 and Table 11 imply that approximately one month before their repurchase announcements, repurchasing firms display less net sale activity than matched firms, i.e. that insiders actively acquire or hold on to their shares, thus benefiting from the post-announcement stock price increase. Our results are similar to the findings by Lee, Mikkelsen, and Partch (1992) who show that managers

increase their frequency of buying and decrease their frequency of selling shares prior to repurchase announcements involving fixed price tender offers.

## **5. Conclusions**

This paper employs a conditional event study to analyze managers' motives to announce a share repurchase while at the same time exploring the factors that drive a firm's abnormal announcement return. We find that firms that have more free cash flow and less debt are more likely to initiate a repurchase. This finding supports the excess cash distribution hypothesis and the optimal capital structure hypothesis - two theoretical explanations for share repurchases that have so far enjoyed at best mixed empirical support in the extant literature. We also document that the market reacts more positively to undervalued firms that exhibit poor pre-announcement stock price returns and seek to buy back a higher percentage of shares. We do not find any significant positive correlation between managers' private information and the unexplained abnormal return. We argue that it is more likely that the market's discovery of insiders' private information has already been incorporated into our abnormal return, which is derived from the market model. Our results provide support for Barclay and Smith (1988) and Ikenberry et al. (1995, 2000) who argue that the signal provided by repurchase announcements is incomplete. Our findings also support the explanation by Easterbrook (1984) and Jensen (1986) who suggest that the announcement return may be explained entirely by public information under the agency hypothesis.

This study further provides complementary evidence on the information content

of open market repurchases by analyzing insider trading activities around repurchase announcements. We show that in general, insiders in repurchasing firms tend to decrease their selling activity and increase their buying activity before repurchase announcements. After the announcement, the differences in insider trading activities between repurchasing firms and non-repurchasing firms are largely insignificant. Our results thus provide supplementary support for Lee, Mikkelsen, and Partch (1992) who show that managers increase their frequency of buying and decrease their frequency of selling shares prior to repurchase announcements involving fixed price tender offers.

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Table 1: Summary statistics

We provide information on the distribution of repurchase announcements over our sample period. The first column lists the years in our sample period. The second column provides a yearly breakdown of the number of repurchase announcements made in the U.S. between January 1995 and December 2006, as provided by the Securities Data Company (SDC) database (now administered by Thomson Financial). The third and fourth column list the number of repurchase announcements that we use in our motivation regression and our CAR estimation, respectively. In these later samples, we exclude firms which have incomplete or missing data entries in Compustat and CRSP.

Year	All repurchase announcements	Repurchases in logistic regression	Repurchases in CAR calculation
1995	435	74	56
1996	538	93	69
1997	570	105	83
1998	983	230	190
1999	653	148	123
2000	610	175	150
2001	547	207	173
2002	431	177	150
2003	299	116	105
2004	377	181	165
2005	464	211	190
2006	491	232	209
Total	6,398	1,949	1,663



Table 2: Univariate comparison of repurchasing firms and matched firms

We provide a univariate comparison of our sample of 1,949 repurchasing firms with a sample of 1,928 comparable non-repurchasing firms that are matched based on industry (3-digit SIC codes), size, and book-to-market ratios. FreeCash is the free cash flow in the preceding year measured in billions of dollars. DivPayout is calculated as the sum of all cash dividends over net income in the preceding year. Return is the one-year total return on the company's common stock during the preceding year. Debt is the ratio of total debt over total capital in the preceding year. Tests of differences are provided in the last two columns and include the p-value for a t-test of differences in means and a p-value for a Wilcoxon test of difference in medians.

	Repurchasing firms			Matched firms			Tests of differences (p-value)	
	Mean	Median	St Dev	Mean	Median	St Dev	t-test	Wilcoxon test
FreeCash	0.10	0.01	0.49	0.08	0.00	0.40	0.0739	<.0001
DivPayout	0.08	0.00	1.20	0.18	0.00	6.37	0.4934	0.4478
Return	0.32	0.12	1.17	10.75	0.08	455.48	0.3122	0.0043
Debt	0.21	0.11	0.30	0.31	0.19	1.97	0.0262	<.0001

Table 3: Daily abnormal returns of repurchasing firms

This table provides information on the daily abnormal returns of repurchasing firms during a period of 20 days before and after the repurchase announcement. The sample includes 1,949 firms that made repurchase announcements between 1995 and 2006. The symbols \$, \*, \*\*, and \*\*\* denote statistical significance at the 0.10, 0.05, 0.01 and 0.001 levels, respectively, using a two-tailed test.

Days around Announcement	Equally weighted Index		Value-weighted Index	
	Mean (%)	Median (%)	Mean (%)	Median (%)
-20	-0.19\$	-0.20***	-0.22*	-0.23***
-19	-0.21*	-0.19***	-0.23*	-0.18***
-18	-0.18\$	-0.24***	-0.23*	-0.27***
-17	-0.29**	-0.16**	-0.37***	-0.18***
-16	-0.24*	-0.16***	-0.29*	-0.20***
-15	-0.10	-0.17**	-0.19\$	-0.20***
-14	-0.11	-0.13**	-0.17	-0.17***
-13	-0.28**	-0.17***	-0.30**	-0.17***
-12	-0.17\$	-0.13**	-0.22*	-0.13***
-11	-0.03	-0.08	-0.09	-0.11*
-10	-0.14	-0.14**	-0.17	-0.19**
-9	-0.31**	-0.16***	-0.34**	-0.19***
-8	-0.34***	-0.24***	-0.37***	-0.23***
-7	-0.07	-0.12**	-0.12	-0.18***
-6	-0.26*	-0.23***	-0.36**	-0.23***
-5	-0.35***	-0.25***	-0.46***	-0.27***
-4	-0.27**	-0.19***	-0.35**	-0.28***
-3	-0.36***	-0.18***	-0.42***	-0.18***
-2	-0.41***	-0.14***	-0.46***	-0.16***
-1	-0.27**	-0.07\$	-0.37**	-0.17**
0	1.05***	0.88***	1.79***	0.84***
1	0.83***	0.39***	0.97***	0.34***
2	0.30**	0.03\$	0.20\$	-0.02
3	0.31**	-0.06	0.25*	-0.07
4	0.14	-0.03	0.10	-0.03
5	0.03	-0.03	-0.04	-0.08
6	0.21*	0.03\$	0.16	0.00
7	0.13	0.04	0.07	-0.02
8	-0.03	-0.08	-0.08	-0.06
9	0.06	-0.02	0.03	-0.03
10	0.23*	0.04	0.19\$	-0.02
11	0.18\$	-0.01	0.19\$	-0.04
12	0.05	-0.05	0.06	-0.03
13	0.06	-0.06	0.08	-0.07
14	0.11	-0.10	0.10	-0.06
15	-0.02	-0.03	0.01	0.01
16	0.09	-0.12	0.12	-0.07
17	0.07	-0.03	0.07	-0.04
18	0.25*	0.04	0.26*	0.07
19	-0.05	-0.08	-0.04	-0.09
20	0.06	-0.04	0.08	0.00

Table 4: Average cumulative abnormal returns of repurchasing firms

This table provides information on the cumulative abnormal returns of repurchasing firms over various time windows during a period of 20 days before and after the repurchase announcement. The sample includes 1,949 repurchase announcements made between 1995 and 2006. The symbols \$, \*, \*\*, and \*\*\* denote statistical significance at the 0.10, 0.05, 0.01 and 0.001 levels, respectively, using a two-tailed test.

Days around Announcement	Equally-weighted Index		Value-weighted Index	
	Mean (%)	Median (%)	Mean (%)	Median (%)
(-20, -1)	-4.59***	-3.46***	-5.75***	-3.90***
(-10, -1)	-2.78***	-1.87***	-3.44***	-2.27***
(-5, -1)	-1.66***	-0.72***	-2.07***	-1.01***
(-2, -1)	-0.68***	-0.23***	-0.83***	-0.31***
(0, 1)	2.91***	1.81***	2.76***	1.64***
(0, 5)	3.69***	2.38***	3.27***	1.94***
(0, 10)	4.29***	2.83***	3.64***	2.51***
(0, 20)	5.09***	3.40***	4.57***	2.98***
(-1, 1)	2.64***	1.87***	2.39***	1.65***
(-1, 2)	2.94***	2.04***	2.59***	1.66***
(-2, 2)	2.54***	1.95***	2.13***	1.63***
(-5, 5)	2.03***	1.60***	1.21**	0.95***
(-10, 10)	1.51**	1.52***	0.21	0.59
(-20, 20)	0.50	0.94	-1.17	-0.39*

Table 5: Logistic regression of repurchasing likelihood

This table presents the results for a logistic regression that explains a firm's likelihood of making a repurchase announcement. The dependent variable is a dummy variable that equals to one if the firm made a repurchase announcement during our sample period and zero otherwise, i.e. it differentiates between repurchasing firms and matched non-repurchasing firms. Column 1 presents the regression results for our entire sample from 1995 to 2006, i.e. for our whole sample of 1,949 repurchasing firms and 1,928 matched non-repurchasing firms. Column 2 presents the results for a subsample from 1995 to 2000, while the last column provides the subsample results for the second half of our sample period, i.e. from 2001 to 2006. FreeCash is the free cash flow in the preceding year measured in billions of dollars. DivPayout is calculated as the sum of all cash dividends over income in the preceding year. Return is the one-year total return on the company's common stock during the preceding year. Debt is the ratio of total debt over total capital in the preceding year.

	1995-2006 sample		1995-2000 Sample		2001-2006 Sample	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
Intercept	0.0667	0.0860	0.0107	0.8651	0.0843	0.0932
FreeCash	0.1303	0.0848	0.0625	0.6996	0.1494	0.0800
DivPayout	-0.0052	0.5589	0.0387	0.4604	-0.0073	0.5124
Return	-0.0046	0.6335	0.0478	0.3960	-0.0061	0.5557
Debt	-0.2743	0.0020	-0.1135	0.3966	-0.3745	0.0020
Wald Test (p-value)	0.0104		0.6989		0.0100	
N	3,877		1,645		2,232	

Table 6: Announcement return regression

This table presents the results of an announcement return regression for our sample of 1663 firms that made a repurchase announcement between January 1995 and December 2006. The dependent variables are the cumulative abnormal returns over the period (-1, 1) in column 1, (-1, 2) in column 2, and (-2, 2) in column 3, respectively. In each regression, we use the return on the CRSP equally weighted index to proxy for market returns in our CAR calculations. FreeCash is the free cash flow in the preceding year measured in billions of dollars. DivPayout is calculated as the sum of all cash dividends over income in the preceding year. Return is the one-year total return on the company's common stock during the preceding year. Debt is the ratio of total debt over total capital in the preceding year. %Purchase is the percentage of shares sought at the initial announcement.

	CAR (-1,1)		CAR (-1,2)		CAR (-2,2)	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
Intercept	0.017	<.0001	0.0214	<.0001	0.0130	0.0081
FreeCash	-0.0078	0.1205	-0.0087	0.1028	-0.0059	0.2972
DivPayout	0.0022	0.2806	0.0018	0.4006	0.0042	0.0706
Return	-0.0035	0.0818	-0.0053	0.0117	-0.0077	0.0006
Debt	-0.0102	0.2166	-0.0130	0.1368	-0.0065	0.4825
%Purchase	0.1552	0.0004	0.1543	0.0008	0.1977	<.0001
N	1,663		1,663		1,663	
Adjusted R <sup>2</sup>	0.0104		0.0119		0.0183	
Residual correlation	0.0006	0.9810	0.0007	0.9761	0.0007	0.9781

Table 7: Insider trading activities around repurchase announcements in repurchasing firms

This table provides information on insider trading activities around stock repurchase announcements for 884 repurchasing firms during the period from 1995 to 2001. Panel A and B report insider trading activities before and after repurchase announcement, respectively. If in a particular interval the number of shares sold by insiders is greater than the number of shares purchased by insiders for a firm, we classify this firm as having net sale transactions during that period. For each firm, we define the number of net sale transactions as the number of sale transactions minus the number of purchase transactions by insiders during each interval. Similarly, the number of net sold shares for each firm is defined as the number of shares sold minus the number of shares purchased by insiders in each period. In Columns 2, 3, and 4, we report the proportion of firms with insider sales, purchase, and net sale transactions. In Columns 5 to 10, we report the number of insider sale, purchase, and net sale transactions per firm. In Columns 11 to 16, we report the number of shares purchased and sold by insiders as well as the number of net sold shares for each interval.

Days around Announcement	Proportion of firms with insider trades			Number of insider transactions per firm						Number of shares traded by insiders per firm (Thousand)											
	Percentage of firms with sale transactions (%)	Percentage of firms with purchase transactions (%)	Percentage of firms with net sale transactions (%)	Sales			Purchases			Net sales			Sales			Purchases			Net sales		
				Mean	Median	p-value	Mean	Median	p-value	Mean	Median	p-value	Mean	Median	p-value	Mean	Median	p-value	Mean	Median	p-value
Panel A: Before the announcement																					
(-180, -90)	23.64	10.97	22.62	2.79	1.00	0.74	0.00	2.06	1.00	346.16	20.00	12.62	0.00	333.54	19.22						
				<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0405	<.0001	0.0030	<.0001	0.0485	<.0001						
(-90, 0)	21.04	15.95	19.23	2.06	1.00	1.19	1.00	0.87	1.00	196.74	10.32	24.12	0.35	172.61	7.50						
				<.0001	<.0001	<.0001	<.0001	0.0002	0.0022	0.0301	<.0001	0.0073	<.0001	0.0584	<.0001						
(-90, -60)	11.31	6.00	11.09	1.72	1.00	0.61	0.00	1.10	1.00	265.19	12.70	9.93	0.00	255.27	10.50						
				<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0649	<.0001	0.0912	<.0001	0.0758	<.0001						
(-60, -30)	10.52	6.79	9.73	1.40	1.00	0.69	0.00	0.71	1.00	70.61	10.00	29.16	0.00	41.45	8.75						
				<.0001	<.0001	<.0001	<.0001	0.0010	0.0015	<.0001	<.0001	0.0702	<.0001	0.0892	<.0001						
(-30, 0)	7.13	8.94	6.56	0.89	0.00	1.06	1.00	-0.17	-1.00	38.98	0.00	8.08	1.00	30.90	-0.60						
				<.0001	<.0001	<.0001	<.0001	0.3597	0.2964	0.1128	<.0001	<.0001	<.0001	0.2109	0.8342						

(-28, -21)	2.04	1.70	2.04	0.76	1.00	0.64	0.00	0.12	1.00	28.38	0.72	3.54	0.00	24.84	0.72
				0.0002	<0.0001	<0.0001	<0.0001	0.6765	0.8972	0.0935	<0.0001	0.0032	<0.0001	0.1454	0.4142
(-21, -14)	2.83	2.60	2.83	0.67	1.00	0.58	0.00	0.08	1.00	8.01	0.84	5.17	0.00	2.84	0.84
				<0.0001	<0.0001	<0.0001	<0.0001	0.6744	0.6468	<0.0001	<0.0001	0.0576	<0.0001	0.4230	0.1717
(-14, -7)	2.15	3.17	2.15	0.46	0.00	0.87	1.00	-0.41	-1.00	6.91	0.00	7.90	0.85	-1.00	-0.67
				<0.0001	<0.0001	<0.0001	<0.0001	0.0656	0.0723	0.0053	<0.0001	0.0027	<0.0001	0.7924	0.7106
(-7, 0)	1.92	3.05	1.81	0.56	0.00	0.98	1.00	-0.42	-1.00	73.29	0.00	6.00	1.00	67.29	-1.00
				<0.0001	<0.0001	<0.0001	<0.0001	0.1240	0.1583	0.2990	<0.0001	0.0399	<0.0001	0.3413	0.1933

Panel B: After the announcement

(0, 7)	3.73	2.94	3.73	0.91	1.00	1.16	0.00	-0.25	1.00	39.13	1.10	23.91	0.00	15.23	1.00
				<0.0001	<0.0001	0.0019	<0.0001	0.5574	0.6674	0.0109	<0.0001	0.2076	<0.0001	0.5383	0.0566
(7, 14)	3.05	2.71	3.05	0.73	1.00	0.67	0.00	0.06	1.00	292.67	2.50	24.52	0.00	268.15	2.50
				<0.0001	<0.0001	<0.0001	<0.0001	0.7882	0.4097	0.2768	<0.0001	0.0086	<0.0001	0.3198	0.5593
(14, 21)	2.94	2.38	2.83	0.91	1.00	0.77	0.00	0.14	1.00	37.23	3.65	10.75	0.00	26.48	1.65
				<0.0001	<0.0001	0.0021	<0.0001	0.6764	0.2523	0.0076	<0.0001	0.0398	<0.0001	0.0815	0.0561
(21, 28)	3.28	2.60	2.94	0.84	1.00	0.53	0.00	0.31	1.00	58.17	2.75	12.55	0.00	45.62	2.00
				<0.0001	<0.0001	<0.0001	<0.0001	0.1527	0.1837	0.0311	<0.0001	0.0211	<0.0001	0.0947	0.0835
(0, 30)	9.62	8.82	8.94	1.37	1.00	1.17	1.00	0.20	0.00	166.21	2.00	26.27	0.40	139.95	1.00
				<0.0001	<0.0001	<0.0001	<0.0001	0.4847	0.1625	0.0972	<0.0001	0.0031	<0.0001	0.1644	0.0092
(30, 60)	10.41	6.00	10.29	1.23	1.00	0.58	0.00	0.65	1.00	207.98	8.50	9.82	0.00	198.16	5.95
				<0.0001	<0.0001	<0.0001	<0.0001	0.0003	<0.0001	0.0584	<0.0001	0.0117	<0.0001	0.0717	<0.0001
(60, 90)	8.48	4.52	7.92	1.35	1.00	0.68	0.00	0.68	1.00	691.68	9.69	208.71	0.00	482.97	7.50
				<0.0001	<0.0001	<0.0001	<0.0001	0.0040	0.0058	0.1223	<0.0001	0.2606	<0.0001	0.2598	<0.0001
(0, 90)	18.78	14.93	17.42	1.95	1.00	1.22	1.00	0.73	1.00	485.92	9.28	106.20	0.10	379.72	5.65
				<0.0001	<0.0001	<0.0001	<0.0001	0.0062	0.0010	0.0971	<0.0001	0.1704	<0.0001	0.1798	<0.0001
(90, 180)	19.34	10.97	17.99	2.27	1.00	0.90	0.00	1.37	1.00	199.41	10.29	37.38	0.00	162.03	8.67
				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0075	<0.0001	0.1221	<0.0001	0.0393	<0.0001

Table 8: Insider trading activities around repurchase announcements in matched non-repurchasing firms

This table provides information on insider trading activities around stock repurchase announcements for 884 matched non-repurchasing firms during the period from 1995 to 2001. Panel A and B report insider trading activities before and after repurchase announcement, respectively. If in a particular interval the number of shares sold by insiders is greater than the number of shares purchased by insiders for a firm, we classify this firm as having net sale transactions during that period. For each firm, we define the number of net sale transactions as the number of sale transactions minus the number of purchase transactions by insiders during each interval. Similarly, the number of net sold shares for each firm is defined as the number of shares sold minus the number of shares purchased by insiders in each period. In Columns 2, 3, and 4, we report the proportion of firms with insider sales, purchase, and net sale transactions. In Columns 5 to 10, we report the number of insider sale, purchase, and net sale transactions per firm. In Column 11 to 16, we report number of shares purchased and sold by insiders as well as the number of net sold shares for each interval.

Days around Announcement	Proportion of firms with insider trades			Number of insider transactions per firm						Number of shares traded by insiders per firm (Thousand)												
	Percentage of firms with sale transactions (%)	Percentage of firms with purchase transactions (%)	Percentage of firms with net sale transactions (%)	Sales			Purchases			Net sales			Net sales									
				Mean	Median	p-value	Mean	Median	p-value	Mean	Median	p-value	Mean	Median	p-value							
(-180, -90)	18.33	11.54	16.97	2.37	1.00	<.0001	0.96	0.00	<.0001	1.41	1.00	<.0001	128.77	13.00	<.0001	21.84	0.00	<.0001	106.93	10.90	<.0001	
(-90, 0)	17.31	11.76	16.29	2.07	1.00	<.0001	1.05	0.00	<.0001	1.02	1.00	<.0001	144.56	10.03	<.0001	27.86	0.00	<.0001	116.70	9.00	<.0001	
(-90, -60)	9.05	5.32	8.94	1.21	1.00	<.0001	0.73	0.00	<.0001	0.48	1.00	<.0001	70.08	8.00	<.0001	8.73	0.00	<.0001	61.36	8.00	<.0001	
(-60, -30)	8.71	5.32	8.60	1.48	1.00	<.0001	0.68	0.00	<.0001	0.80	1.00	<.0001	95.02	8.00	<.0001	32.71	0.00	<.0001	62.31	6.00	<.0001	
(-30, 0)	7.47	4.52	7.47	1.40	1.00	<.0001	0.66	0.00	<.0001	0.74	1.00	<.0001	124.16	8.00	<.0001	13.28	0.00	<.0001	110.88	5.00	<.0001	
				<.0001	<.0001	<.0001	<.0001	<.0001	0.0039	0.0026	0.0934	<.0001	0.0152	<.0001	0.1357	<.0001						

Panel A: Before the announcement



(-28, -21)	2.49	1.24	2.49	1.18	1.00	0.39	0.00	0.79	1.00	257.03	8.00	3.32	0.00	253.71	8.00
				<.0001	<.0001	0.0008	0.0010	0.0133	0.0179	0.2652	<.0001	0.0401	0.0010	0.2716	0.0018
(-21, -14)	2.49	1.24	2.49	1.12	1.00	0.42	0.00	0.70	1.00	40.84	5.60	12.80	0.00	28.04	5.60
				<.0001	<.0001	0.0009	0.0010	0.0170	0.0186	0.0047	<.0001	0.2308	0.0010	0.1284	0.0100
(-14, -7)	2.60	2.04	2.49	0.93	1.00	0.68	0.00	0.25	1.00	43.40	4.00	8.92	0.00	34.48	4.00
				<.0001	<.0001	0.0003	<.0001	0.4362	0.3597	0.0143	<.0001	0.0066	0.0010	0.0597	0.0840
(-7, 0)	2.38	1.13	2.38	0.84	1.00	0.39	0.00	0.45	1.00	35.74	3.50	15.43	0.00	20.30	3.50
				<.0001	<.0001	0.0015	0.0020	0.0552	0.0640	0.0258	<.0001	0.1001	0.0020	0.2877	0.0558

Panel B: After the announcement

(0, 7)	2.26	1.47	2.26	0.85	1.00	0.52	0.00	0.33	1.00	66.87	1.62	10.35	0.00	56.51	1.62
				<.0001	<.0001	0.0012	0.0002	0.2496	0.2144	0.1102	<.0001	0.0224	0.0002	0.1824	0.1754
(7, 14)	1.81	1.47	1.70	0.93	1.00	0.61	0.00	0.32	1.00	40.16	3.10	11.98	0.00	28.18	3.10
				0.0015	<.0001	0.0002	0.0002	0.3753	0.5752	0.0781	<.0001	0.0819	0.0002	0.2442	0.2164
(14, 21)	3.28	1.70	3.17	1.16	1.00	0.40	0.00	0.77	1.00	86.04	8.00	3.55	0.00	82.49	8.00
				<.0001	<.0001	<.0001	<.0001	0.0044	0.0061	0.0113	<.0001	0.0429	<.0001	0.0157	0.0004
(21, 28)	3.17	1.36	3.17	1.28	1.00	0.41	0.00	0.87	1.00	118.06	10.00	4.50	0.00	113.56	10.00
				<.0001	<.0001	0.0023	0.0005	0.0043	0.0015	0.0093	<.0001	0.0996	0.0005	0.0128	0.0001
(0, 30)	8.37	4.64	8.03	1.56	1.00	0.64	0.00	0.93	1.00	125.55	7.00	9.64	0.00	115.91	7.00
				<.0001	<.0001	<.0001	<.0001	0.0003	0.0006	0.0003	<.0001	0.0009	<.0001	0.0009	<.0001
(30, 60)	10.07	4.64	9.73	1.55	1.00	0.58	0.00	0.97	1.00	125.39	9.00	16.16	0.00	109.23	8.90
				<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0475	<.0001	0.0083	<.0001	0.0859	<.0001
(60, 90)	8.37	4.07	8.37	1.83	1.00	0.52	0.00	1.31	1.00	154.38	10.73	7.87	0.00	146.50	10.73
				<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0365	<.0001	0.0278	<.0001	0.0477	<.0001
(0, 90)	18.33	10.41	17.42	2.49	1.00	0.88	0.00	1.61	1.00	204.17	14.04	17.40	0.00	186.78	13.05
				<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0002	<.0001	<.0001	<.0001	0.0008	<.0001
(90, 180)	16.06	12.10	14.93	2.48	1.00	0.99	1.00	1.50	1.00	142.05	10.42	55.42	0.20	86.63	9.63
				<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0232	<.0001	0.0203	<.0001



Panel B: After the announcement

(0, 7)	-0.25 0.5574	1.00 0.6674	0.33 0.2496	1.00 0.2144	0.3290	0.6891	15.23 0.5383	1.00 0.0566	56.51 0.1824	1.62 0.1754	0.3628	0.9255
(7, 14)	0.06 0.7882	1.00 0.4097	0.32 0.3753	1.00 0.5752	0.5204	0.9867	268.15 0.3198	2.50 0.5593	28.18 0.2442	3.10 0.2164	0.3746	0.6835
(14, 21)	0.14 0.6764	1.00 0.2523	0.77 0.0044	1.00 0.0061	0.1312	0.1057	26.48 0.0815	1.65 0.0561	82.49 0.0157	8.00 0.0004	0.1202	0.2105
(21, 28)	0.31 0.1527	1.00 0.1837	0.87 0.0043	1.00 0.0015	0.1082	0.0816	45.62 0.0947	2.00 0.0835	113.56 0.0128	10.00 0.0001	0.1692	0.0479
(0, 30)	0.20 0.4847	0.00 0.1625	0.93 0.0003	1.00 0.0006	0.0590	0.0736	139.95 0.1644	1.00 0.0092	115.91 0.0009	7.00 <0.0001	0.8204	0.0549
(30, 60)	0.65 0.0003	1.00 <0.0001	0.97 <0.0001	1.00 <0.0001	0.2748	0.5076	198.16 0.0717	5.95 <0.0001	109.23 0.0859	8.90 <0.0001	0.4952	0.3707
(60, 90)	0.68 0.0040	1.00 0.0058	1.31 <0.0001	1.00 <0.0001	0.0802	0.0943	482.97 0.2598	7.50 <0.0001	146.50 0.0477	10.73 <0.0001	0.4499	0.5321
(0, 90)	0.73 0.0062	1.00 0.0010	1.61 <0.0001	1.00 <0.0001	0.0225	0.0195	379.72 0.1798	5.65 <0.0001	186.78 0.0008	13.05 <0.0001	0.5029	0.0450
(90, 180)	1.37 <0.0001	1.00 <0.0001	1.50 <0.0001	1.00 <0.0001	0.7547	0.9637	162.03 0.0393	8.67 <0.0001	86.63 0.0203	9.63 <0.0001	0.3839	0.9133

Table 10: Net sale regression for repurchasing and matched firms (based on a net sale dummy)

This table reports the results for a net sales regression for repurchasing and non-repurchasing firms for our sample period from 1995 to 2001. The dependent variable is a net sale dummy, which is equal to one if a firm is classified as a net sale firm, and zero otherwise. A firm is classified as a net sale firm if the number of shares sold exceeds the number of shares purchased by its insiders. Repurchase is equal to one for repurchasing firms, and zero otherwise. FreeCash is the free cash flow in the preceding year measured in billions of dollars. DivPayout is calculated as the sum of all cash dividends over income in the preceding year. Return is the one-year total return on the company's common stock during the preceding year. Debt is the ratio of total debt over total capital in the preceding year.

Panel A: Before the announcement

Variables	(-180, -90)		(-90, 0)		(-90, -60)		(-60, -30)		(-30, 0)		(-28, -21)		(-21, -14)		(-14, -7)		(-7, 0)	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
Intercept	0.8732	<.0001	0.5927	0.0014	0.4386	0.0825	0.8167	0.0021	0.4088	0.1407	0.5551	0.3560	0.1800	0.7296	0.1374	0.7815	-0.3346	0.5293
Repurchase	0.3128	0.1465	-0.0980	0.6243	0.1942	0.4791	-0.2435	0.3924	-0.8394	0.0038	-0.8245	0.1651	-0.9168	0.1205	-1.1663	0.0245	-1.2329	0.0346
FreeCash	0.5888	0.1678	1.9343	0.0138	1.0811	0.2030	2.3262	0.0195	2.2081	0.0448	0.4914	0.7463	12.2784	0.0918	5.4960	0.0774	4.1031	0.1385
DivPayout	-0.2457	0.1128	-0.0453	0.7261	-0.1666	0.6667	-0.0013	0.9929	0.0928	0.8124	-0.9994	0.3723	-2.7129	0.0925	2.3237	0.2088	1.6708	0.2404
Return	1.0992	<.0001	0.5896	0.0002	0.7354	0.0012	0.3153	0.1128	0.5531	0.0069	1.3313	0.0164	1.7023	0.0033	0.2709	0.2882	0.4511	0.1796
Debt	-1.3027	0.0013	-0.5495	0.1167	-0.4131	0.4026	-0.6781	0.1463	-0.1178	0.8132	-0.2281	0.8192	1.3136	0.3026	0.0004	0.9997	1.4988	0.1789
Wald Test (p-value)	<.0001		0.0004		0.0124		0.0488		0.0030		0.1369		0.0097		0.1388		0.0574	
N	475		473		258		242		220		63		78		81		69	

Panel B: After the announcement

Variables	(90, 180)		(0, 90)		(60, 90)		(30, 60)		(0, 30)		(21, 28)		(14, 21)		(7, 14)		(0, 7)	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
Intercept	0.5059	1.0868	0.9788	0.9727	0.9983	0.0004	1.1700	0.0105	0.7008	0.1249	0.7008	0.1683	0.8205	0.2830	0.4786	0.2830		
Repurchase	0.2991	<.0001	-0.4338	-0.1527	-0.5529	0.0534	-0.9687	0.0538	-0.3076	0.0629	-0.3076	0.5324	0.9058	0.6867	-0.1957	0.6867		
FreeCash	0.3185	0.9902	0.7203	0.3580	1.3428	0.1069	0.3008	0.3008	1.8102	1.8999	1.8102	0.2019	0.1409	0.1963	3.4543	0.1963		
DivPayout	0.4497	0.1009	0.2808	0.3830	0.1069	0.1069	0.5932	0.5932	0.2019	0.1409	0.2019	0.1409	0.0951	0.9546	0.9546	0.9546		
Return	-0.1493	0.0762	0.4182	0.8370	-0.5873	0.3879	-0.9774	0.3223	-1.6649	0.0951	-1.6649	0.4032	0.9473	0.3784	0.3784	0.3784		
Debt	0.3332	0.8346	0.4518	0.3273	0.3879	0.3879	0.3223	0.3223	0.4032	0.9473	0.4032	0.4032	0.9473	0.3784	0.3784	0.3784		
Wald Test (p-value)	0.4622	0.2680	0.3055	0.1910	0.3816	0.0621	0.8265	0.8265	0.5233	0.3562	0.5233	0.1968	0.3239	0.4189	0.3284	0.4189		
N	0.0048	0.0446	0.1751	0.2792	0.0621	0.0621	0.0278	0.0278	0.1968	0.3239	0.1968	0.1968	0.3239	0.4189	0.4189	0.4189		
	-0.3647	-0.9388	-0.4007	-0.8802	-1.2667	0.0226	-1.0879	0.2444	-0.9061	-0.7160	-0.9061	0.3853	0.4908	0.4012	-0.7568	0.4012		
	0.2924	0.0130	0.4999	0.0830	0.0226	0.0226	0.2444	0.2444	0.3853	0.4908	0.3853	0.3853	0.4908	0.4012	0.4012	0.4012		
	0.0324	0.0013	0.3660	0.2746	0.0088	0.0088	0.0553	0.0553	0.3530	0.4842	0.3530	0.3530	0.4842	0.5854	0.5854	0.5854		
	417	456	205	242	238	238	86	86	82	74	82	82	74	87	87	87		

Table 11: Net sale regression for repurchasing and matched firms (based on net sold shares)

This table reports the results for a net sales regression for repurchasing and non-repurchasing firms for our sample period from 1995 to 2001. The dependent variable is the number of net sold shares, which is defined as the number of shares sold by insiders minus the number of shares bought by insiders. Repurchase is equal to one for repurchasing firms, and zero otherwise. FreeCash is the free cash flow in the preceding year measured in billions of dollars. DivPayout is calculated as the sum of all cash dividends over income in the preceding year. Return is the one-year total return on the company's common stock during the preceding year. Debt is the ratio of total debt over total capital in the preceding year.

Panel A: Before the announcement

Variables	(-180, -90)		(-90, 0)		(-90, -60)		(-60, -30)		(-30, 0)		(-28, -21)		(-21, -14)		(-14, -7)		(-7, 0)		
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	
Intercept	-0.0675	0.0515	-0.0086	0.1084	0.0983	0.0265	0.2655	0.0265	0.0265	0.0265	0.0265	0.0265	0.0265	0.0265	0.0265	0.0265	0.0265	0.0265	0.0265
	0.5665	0.5536	0.9467	0.0017	0.1495	0.3003	0.3003	0.3003	0.3003	0.3003	0.3003	0.3003	0.3003	0.3003	0.3003	0.3003	0.3003	0.3003	0.3003
Repurchase	0.1210	0.0632	0.1890	-0.0413	-0.1119	-0.3103	-0.3103	-0.3103	-0.3103	-0.3103	-0.3103	-0.3103	-0.3103	-0.3103	-0.3103	-0.3103	-0.3103	-0.3103	-0.3103
	0.3543	0.4996	0.1725	0.2648	0.1146	0.2213	0.2213	0.2213	0.2213	0.2213	0.2213	0.2213	0.2213	0.2213	0.2213	0.2213	0.2213	0.2213	0.2213
FreeCash	2.7344	1.2488	1.0342	0.1107	0.3109	-0.0045	-0.0045	-0.0045	-0.0045	-0.0045	-0.0045	-0.0045	-0.0045	-0.0045	-0.0045	-0.0045	-0.0045	-0.0045	-0.0045
	<.0001	<.0001	<.0001	<.0001	<.0001	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945	0.9945
DivPayout	-0.0854	0.0177	-0.0823	0.0399	-0.0367	-0.1492	-0.1492	-0.1492	-0.1492	-0.1492	-0.1492	-0.1492	-0.1492	-0.1492	-0.1492	-0.1492	-0.1492	-0.1492	-0.1492
	0.3787	0.7818	0.6904	0.0442	0.7082	0.7602	0.7602	0.7602	0.7602	0.7602	0.7602	0.7602	0.7602	0.7602	0.7602	0.7602	0.7602	0.7602	0.7602
Return	0.0332	0.0346	-0.0103	0.0057	0.0480	0.1820	0.1820	0.1820	0.1820	0.1820	0.1820	0.1820	0.1820	0.1820	0.1820	0.1820	0.1820	0.1820	0.1820
	0.6405	0.5030	0.9088	0.8118	0.1574	0.2318	0.2318	0.2318	0.2318	0.2318	0.2318	0.2318	0.2318	0.2318	0.2318	0.2318	0.2318	0.2318	0.2318
Debt	0.0322	-0.1194	-0.0557	-0.1486	-0.0110	-0.0920	-0.0920	-0.0920	-0.0920	-0.0920	-0.0920	-0.0920	-0.0920	-0.0920	-0.0920	-0.0920	-0.0920	-0.0920	-0.0920
	0.8965	0.4753	0.8248	0.0195	0.9289	0.8346	0.8346	0.8346	0.8346	0.8346	0.8346	0.8346	0.8346	0.8346	0.8346	0.8346	0.8346	0.8346	0.8346
Adjusted R <sup>2</sup>	0.5547	0.2961	0.2780	0.1010	0.1307	-0.0350	-0.0350	-0.0350	-0.0350	-0.0350	-0.0350	-0.0350	-0.0350	-0.0350	-0.0350	-0.0350	-0.0350	-0.0350	-0.0350
N	475	473	258	242	220	63	63	63	63	63	63	63	63	63	63	63	63	63	63

Panel B: After the announcement

Variables	(90, 180)		(0, 90)		(60, 90)		(30, 60)		(0, 30)		(21, 28)		(14, 21)		(7, 14)		(0, 7)	
	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient
Intercept	-0.0294	-0.1235	0.6285	0.4916	-0.0087	0.9695	0.0592	0.4384	0.0175	0.7770	0.0760	0.0717	0.0531	0.0975	-0.3231	0.0364	0.1067	0.0122
Repurchase	0.0821	0.0754	0.2303	0.6928	-0.1759	0.4911	0.0121	0.8831	0.0161	0.8019	-0.0635	0.1713	-0.0317	0.3044	0.2243	0.1286	-0.0556	0.2269
FreeCash	1.2323	5.1571	<.0001	<.0001	3.5354	<.0001	1.1359	<.0001	1.2060	<.0001	0.0274	0.2173	0.0114	0.3981	1.1912	<.0001	0.0333	0.1293
DivPayout	-0.0111	-0.2746	0.8249	0.4161	-0.1616	0.6484	-0.1983	0.3809	-0.1466	0.3556	0.0338	0.7186	0.0837	0.4724	-0.2105	0.6021	-0.1475	0.1290
Return	0.0590	0.0475	0.1931	0.6465	0.0669	0.6064	-0.0159	0.6919	0.0582	0.1822	0.0707	0.0071	0.0275	0.2551	0.1106	0.2546	0.0219	0.5626
Debt	0.0356	0.2425	0.7543	0.4983	0.2738	0.5774	-0.0246	0.8708	0.0141	0.9100	-0.0228	0.7983	-0.0277	0.6709	0.3895	0.1796	-0.1378	0.1105
Adjusted R <sup>2</sup>	0.4574	0.6695	0.417	0.456	0.6932	0.6932	0.6444	0.6444	0.7412	0.7412	0.0627	0.0627	-0.0095	-0.0095	0.8524	0.8524	0.0613	0.0613
N	417	456	417	456	205	205	242	242	238	238	86	86	82	82	74	74	87	87

Figure 1: Cumulative abnormal return of repurchasing firms over the window (-20,20)

This figure presents cumulative abnormal returns (CARs) around repurchase announcements for our sample of 1,663 firms that announced a share buyback program between January 1995 and December 2006. Daily abnormal returns are accumulated over a period from twenty days before the announcement to twenty days afterwards and are derived from the market model that uses the CRSP equally-weighted index as a proxy for market return.

