# Does Overvaluation Lead to Bad Mergers?

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## Abstract

This study tests *overvaluation* as an explanation for merger and acquisition activity by examining whether insider trading patterns of acquiring firm around acquisition announcements are related to long-term post-acquisition performance, and provides evidence on the consequences of acquisitions motivated by overvaluation. My findings show that there is a sharp contrast in the behavior of insiders from my earlier sample period (1986-1996) and the later "hot market" period (1997-2000). For the hot market period, there is a dramatic peak in the average number of shares sold by top insiders of acquiring firms in the month before the acquisition announcement date, followed by another sharp spike in sales when the deal approaches completion. These large increases in insider selling around the acquisition announcement are driven by firms whose insiders are "pure sellers." This behavior is not observed for the earlier time period. For acquisitions occurring during the "hot market" period, acquirers whose insiders are "pure sellers" significantly underperform their control firms three years following the acquisitions, while acquirers whose insiders are "pure buyers" do not. Moreover, only "pure seller" acquirers experience deterioration in abnormal operating performance from the year before to three years after the acquisition, implying that these mergers are "bad mergers". Overall, the evidence that pure sellers are associated with worse long-term stock performance even after controlling for the "bad merger" effect indicates that overvaluation is an important motive for acquisitions. The evidence also suggests that the agency costs of overvalued equity described by Jensen (2005) could be an important explanation for wealth destroying deals in the late 1990s.



*JEL* classification: G34, G38

Keywords: Overvaluation, bad merger, insider trading, and long-term stock performance.

*Two institutional shareholders said they filed suit against AOL Time Warner Inc., accusing Chairman Steve Case and other top executives of insider trading as part of 2001 merger while using "tricks, contrivances and bogus transactions" to inflate the company's share price. —CNN Money, April 14, 2003*

## I. Introduction

In the late 1990s, the U.S. experienced the largest wave of mergers and acquisitions (M&A) in history. The M&A activity in this period differed from that of earlier waves in some important respects. The first distinction is the relatively frequent use of equity as the method of payment for these transactions. Related to this, these transactions were completed during a time period of tremendously high overall equity market valuations. Moeller, Schlingemann and Stulz (2005) suggest that many deals completed during this time period were value destroying.[1]

Two recent theories examine the link between high equity valuations and merger activity. Shleifer and Vishny (2003) argue that mergers and acquisitions may occur for the sole reason that overpriced stock can be used as cheap currency to buy real assets. This theory implies that these acquisitions are beneficial to acquiring firm's original shareholders even though the stock price later falls. Jensen (2005) suggests that "agency costs of overvalued equity" can manifest themselves in value-destroying mergers and acquisitions. When a firm's equity becomes substantially overvalued, instead of attempting to eliminate overvaluation, managers attempt to meet the market's growth expectations by engaging in value destroying acquisitions. Once the market learns the high value and growth was an illusion, firm value will fall dramatically. In addition to the disappearance of overvaluation, part or all of the core business value may be destroyed. This implies that not only will the overvaluation eventually be corrected, but also that operating performance will deteriorate following the completion of such poor-quality acquisitions.

[1] Moeller, Schlingemann and Stulz (MSS (2005) hereafter) report that between 1998 and 2001 acquiring firm shareholders lost a total of $240 billion, or 12 cents per dollar spent on acquisitions in the three-day period around acquisition announcement. These losses are concentrated in 87 large loss transactions.

The common theme behind these two theories is that overvaluation is a motive for acquisitions, but their implications on consequences of these acquisitions are different.[2] Both theories have empirical implications for long-term performance. Stock price decline is expected as valuations are later realized. Both models are most applicable to the later "hot market" period. Further, the model of Shleifer and Vishny is only applicable to stock mergers. Jensen's, while may be more applicable to stock deals, is broadly to either stock or cash transactions. Shleifer and Vishny (2003) implies that stock mergers motivated by overvaluation were in best interest of acquirer shareholders. Jensen (2005), however, predicts that overvaluation leads to "bad mergers" which reduce core value of the firm. His model suggests long-term deterioration in operating performance. Although some anecdotal evidence has been provided, previous studies have not offered large sample empirical evidence on the real effects of overvalued equity. As argued by Jensen (2005), elimination of overvaluation is not value destruction because the overvaluation would disappear anyway. This suggests that value-destroying mergers should have real effects, in addition to the subsequent stock price decline.

If managers intentionally make acquisitions when their firms are overvalued (and they know it), the same private information presents opportunities for trading by these insiders. Therefore, using managers' own portfolio decisions as a window into their beliefs, I can observe whether their behavior is consistent with the belief that their firm is overvalued.[3] If managers' motive for acquisitions is their overvalued share price, holding constant other reasons for trading, I expect managers of acquirers to be net sellers of their stocks. Further, I expect a strong relation

[2] Rhodes-Kropf and Viswanathan (2004) propose another theoretical model in which firm-specific and market-wide misvaluations can cause merger waves.

[3] Jenter (2005) provides evidence that managers' views of fundamental value diverge systematically from market valuations, and argues that we can use managers' own trading decisions as a window into their beliefs on firm's valuation. Previous insider trading studies show that firm insiders can identify mispricings of their own companies and that they trade for their personal accounts on this information. See Jaffe (1974), Finnerty (1976) and Seyhun (1986, 1988, 1990b).

between insider trading of acquiring firms prior to the acquisition announcement and long-run post-acquisition performance.

My study is based on a sample of 1,356 acquisitions made by U.S. firms from 1986 to 2000 with insider trading data available. Seyhun (1990b) examines the insider trading behavior of acquiring firms using a sample of acquisitions from 1975 to 1986, and tests whether acquirer managers knowingly overpay for targets so as to benefit themselves personally. He finds that top managers of acquirers increase their net purchases rather than sales prior to takeover announcements.[4] My findings show that there is a sharp contrast in the behavior of insiders from my earlier sample period (1986-1996) and the later "hot market" period (1997-2000).[5] Not coincidently, the largest merger wave in U.S. history emerges and a dramatic increase in the number of deals is observed during this period. For the hot market period, there is a dramatic peak in the average number of shares sold by top insiders of acquiring firms in the month before the acquisition announcement date, followed by another sharp spike in sales when the deal approaches completion. These large increases in insider selling around the acquisition announcement are driven by "pure sellers," defined as firms for which there are *only* insider sale transactions during the 6-month period ending on, and including the acquisition announcement.[6] This behavior is not observed for the earlier time period.

I next relate these patterns in insider trading around the acquisition announcement both to abnormal returns at the announcement and to long term stock and operating performance. According to the signaling model of insider trading of John and Mishra (1990), announcement

[4] Boehmer and Netter (1997) examine insider trading around corporate acquisitions during 1982-1988 and find little cross-sectional differences in the trading patterns of all managers around an acquisition depending on whether the insiders' firm itself was subject to a takeover bid.

[5] As documented in Shiller (2000), there is an enormous spike in price-earnings ratios of the S&P Composite Index since 1997, with the ratio rising until it hits an historical high of 44.3 by January 2000.

[6] Similarly, an acquiring firm is defined as "pure buyer" firm if there are *only* insider purchase transactions during this period. "No trading" firms are acquirers without any insider trade transactions during the prior six-month period. "Mixed trading" firms are those with both insider buying and selling six months prior to the announcement.

period returns should be most negative when insider selling prior to the acquisition announcement is highest. For the full sample, the mean 2-day CAR for the pure buyer group is -0.59% (significant at 5% level), whereas the comparable figure in the pure seller group is -1.32% (significant at 1% level). The difference in the mean CARs between these two groups is also significant (0.73%, at 5% level), consistent with the prediction of John and Mishra (1990).[7] Interestingly, the difference in announcement period returns between pure buyers and pure sellers varies over time. The earlier time period shows significant difference in both mean and median announcement period CAR between pure sellers and pure buyers, while the later hot market period does not. This may not be surprising, however, given the increased use of executive stock options as a popular form of compensation in recent years, the market may expect firm insiders to sell stock for diversification reasons. Therefore, the market does not, on average, interpret insider sales during the hot market period as a signal of negative information.[8] However, we do not observe significant difference in announcement CAR between "pure seller" acquirers and "pure buyers" in the hot market period. The importance of this result is that it highlights the contrast both in behavior between these time periods and the market's interpretation of that behavior.

I next find that insider trading is strongly related to long-term post-acquisition stock performance during the hot market period (1997-2000). For acquisitions occurring during this period, the mean 3-year buy-and-hold abnormal return following acquisitions is –11.51% (*p*-value=0.027). However, when the acquiring firms are "pure sellers", the average 3-year buy-and-hold abnormal return is –19.34% (*p*-value=0.012). For acquiring firms whose insiders are "pure buyers", long-run abnormal stock performance is generally positive but insignificant. These results

[7] The John and Mishra model depends on availability of insider trading information to the market at the acquisition announcement. The results on announcement period returns using the reporting date to classify insider trading pattern groups are qualitatively similar to those using the transaction date.

[8] Meulbroek (2000) finds that insider selling in Internet-based companies from 1996 to 1998 does not produce negative excess returns.

are robust to alternative abnormal return measurement methodology such as calendar-time abnormal returns. I do not find similar results for the earlier period (1986-1996); the mean 3-year post-acquisition abnormal returns are generally insignificant for both pure buyers and pure sellers. The strong difference in post-acquisition stock performance and behavior of insiders between these two time periods is consistent with the idea that incentives related to overvaluation and motivations for mergers may be quite different across these periods. [9]

The underperformance in long-run stock returns of acquiring firms during the hot market period could be due to "bad mergers" which does not improve performance but destroy business value, in addition to the disappearance of overvaluation. If the underperformance in stock returns is purely driven by overvaluation, then acquiring firm's operating performance will not necessarily deteriorate relative to a matching firm after the completion of the acquisition. If, as Jensen (2005) argues, the acquisition is of poor quality and does not improve performance (i.e., a bad merger), it is likely that negative abnormal operating performance will also be observed. I provide empirical evidence on this view by examining the operating performance of acquiring firms around acquisition completion as well as changes in abnormal operating performance of acquiring firms from before to after the merger completion. Most importantly, when acquiring firms are "pure sellers", the median abnormal operating performance (relative to industry-performance-matched peers) declines after the completion of the deal. The "pure buyer" group does not show a similar decline. This evidence is consistent with Jensen's (2005) argument that many of the acquisitions made during the period of high market valuations were poor quality, value-destroying mergers.

[9] In addition, the above result is not that surprising, given that pure seller acquirers show significantly worse announcement period returns than pure buyer firms for the earlier time period but not the later period. The market is less likely to detect the information on firm misvaluation conveyed by insider trading in the later hot market period, probably because the increased use of executive stock-based compensation blurs the true incentive of insider trading. The market did not react enough to the acquisition announcement made by pure seller firms in the later period as compared to the earlier period. Therefore, the information effect tends to be reflected in the long run stock performance for the later period.

To differentiate the underperformance of stock returns attributable to "overvaluation" from that attributable to "bad mergers", I further implement a multivariate test on long-run abnormal stock performance. For acquisitions completed in the hot market period, I find that insider trading patterns still have an explanatory power after controlling for the change in abnormal operating performance (a proxy for bad merger), along with other control variables. I also find that the long-run abnormal stock performance of acquiring firms is positively correlated with changes in abnormal operating performance. These results indicate that both overvaluation and bad merger contribute to post-acquisition underperformance (negative abnormal stock returns) for deals completed in the hot market period.

I believe these findings are of interest for three reasons. First, this paper provides a direct test on whether acquiring firms' shareholders gain or lose following the acquisitions relative to their well-specified benchmarks.[10] My results show that the magnitude of the negative mean abnormal subsequent stock returns by "pure seller" acquirers is large. This result suggests that, on the one hand, insiders profit from selling shares when their stock is overvalued and before the deterioration of their firms' share price; on the other hand, the acquisitions motivated by overvaluation reduce acquirer shareholders' values in the long run.

Second, this paper provides direct evidence on the consequences of overvalued equity. I find that acquisitions motivated by overvaluation (pure seller acquirers) show significant deterioration in abnormal operating performance subsequent to the completion of the deals, suggesting these acquisitions are bad mergers. It also helps us understand the source of the negative long-run abnormal stock performance. I show that both "overvaluation" and "bad

[10] The findings of MSS (2005) provide some evidence on the large losses from acquisitions. However, MSS (2005) only focus on long-term stock performance of a sample of 87 *serial* acquirers from 1998 to 2001 that have incurred large losses around announcement, using BHAR approach. They do not look into the operating performance of the merged firms. One potential problem associated with the BHAR approach is that it assumes independent observations. As argued in Mitchell and Stafford (2000), the statistical inference of the mean *BHAR* assuming independent observations is inappropriate because major corporate events are not independent actions. This is especially true with serial acquirers.

mergers" attribute to long-run post-acquisition underperformance, which has never been documented in the literature.[11]

Finally, my results extend the insider trading literature.[12] My findings suggest insider trading behavior is more informative when mispricings of their companies are of large magnitude, which is the case in the late 1990s. In addition, the detailed analysis of insider trading activities around acquisition announcements in this paper helps us understand better how insiders trade around major corporate events.

Overall, the evidence provided in this paper suggests that managers of acquiring firms are more likely to make value-destroying acquisitions when their stocks are overvalued, especially during the period of late 1990s when overall market valuation is high. This result is not surprising because it is in the late 1990s when overvaluation is likely to be substantial enough to lead to agency problems, as documented in Jensen (2005). The finding that only acquirers whose insiders are prior sellers are reliably associated with significantly negative long-term abnormal returns is consistent with the overvaluation driven acquisition hypothesis. This finding together with the evidence that "pure seller" acquirers are associated with worse post-acquisition operating performance indicates that acquisitions motivated by overvaluation are value destroying. It also suggests that the agency problem of overvalued equity (Jensen, 2005) is the main reason for massive wealth-destruction deals in the late 1990s.

The remainder of the paper is organized as follows. In Section II, I describe the data sources and sample construction. Section III reports the insider trading patterns around acquisition

[11] Several recent empirical studies attempt to link overvaluation and merger activities by examining long-term post-acquisition stock performance (see Bouwman, Fuller, and Nain, 2003 and Akbulut, 2005). However, none of them control for the alternative hypothesis of "bad mergers".

[12] One strand of literature on insider trading examines whether insider trading patterns change around corporate events, and most indicates significant changes in trading patterns before the public announcement (see Penman, 1982; Elliot et al., 1984; Karpoff and Lee, 1991; Lee, et al., 1992; and Seyhun and Bradley, 1997, among others). Another strand of this literature examines whether insider trading predicts subsequent stock returns (see Lakonishok and Lee, 2001). Several papers examine insider trading around corporate events and the relationship between insider trading and subsequent stock returns (see Lee, 1997 and Kahle, 2000).

announcement. In Section IV, I present the short-term market reaction to acquisition announcement. Evidence on long-run stock performance and operating performance of acquiring firms is presented in Section V and Section VI concludes.

## II. Data Sources and Sample Description

### *A. Corporate Acquisition Data*

Using the Securities Data Company's (SDC) U.S. Mergers and Acquisitions database, 3,190 corporate acquisitions are initially identified during the period January 1, 1986, to December 31, 2000 based on standard sample selection criteria.[13] I then exclude firms that do not have insider trading data, reducing the sample size to 2,036 acquisitions made by 1,474 firms. Of the 2,036 transactions, 1,667 were completed and 369 were withdrawn.

In order to obtain the acquirers' size, book-to-market, and pre-acquisition return-adjusted benchmarks, I include only deals with acquirers' non-negative book value of equity for the fiscal year prior to the acquisition announcement available in COMPUSTAT. To measure long-term stock price performance following the acquisition, I exclude acquisitions that were withdrawn. This leaves a sample of 1,356 completed acquisitions over the period 1986 to 2000, for which I analyze insider trading patterns and announcement period returns.

For long-term stock price performance analysis, I require sample firms to have a three-year pre-event period with no acquisition (following Loughran and Ritter, 1995, and Spiess and Affleck-Graves, 1995).[14] This requirement alleviates the impact of multiple events on the long-term post-acquisition stock return, and ensures that the insider trading behavior prior to the

[13] Deal value is at least $10 million; both acquirer and target are public firms and acquirer is listed on NYSE/AMEX or Nasdaq; the acquisition is either completed or withdrawn with an announcement date that falls into the sample period 1986 to 2003; the deal is either identified as a merger or tender offer by SDC; the means of payment is either cash, stock or a mix of these two.

[14] MSS (2005) focuses on a sample of 87 *serial* acquirers with large losses from 1998 to 2001, while my sample excludes acquirers with multiple acquisitions in the pre-event 3-year period. Therefore, my sample essentially has no overlap with that of MSS (2005).

acquisition is not influenced by multiple events of the same acquirer. Thus, the subsample of firms for which long-term performance is analyzed consists of 1,091 acquisitions over the period 1986 to 2000.

*B. Insider Trading Data*

The insider trading data are from the Securities and Exchange Commission's (SEC) monthly Ownership Reporting System data file, which contains all transactions by insiders subject to disclosure according to the Securities and Exchange Act of 1934. The SEC defines an insider as an officer or director of the firm, or any beneficial shareholder who owns more than 10% of the total common stock outstanding. Previous research, however, indicates that large trades by beneficial owners who are not officers or directors do not convey much information (Seyhun, 1986). Moreover, the focus of this study is to see whether the acquiring firm's decision-makers intentionally make acquisitions when their firms are overvalued. Consequently, I only examine trades by top insiders defined as chairpersons of the board, persons who are both officers and directors, company executives, presidents, and controlling persons.

I study both open market and private transactions by insiders. Seyhun (1992) shows that open market transactions are more informative than private transactions, but the insider trading tapes do not separately identify the two types of transactions after 1991. To maintain consistency throughout the sample period, I combine open market and private transactions for earlier years. Following Seyhun (1986), I exclude all duplicate, amended, and inconsistent transactions, and transactions involving less than 100 shares.

Since many insider trades are undertaken for motives such as diversification or portfolio rebalancing, it is very likely that much of the insider trading transactions reported to the SEC is not based on insider information. To reduce the potential noise from such trades and to isolate

trades that are more likely to be based on information, I adopt the "pure" insider trading criterion to classify acquiring firms into different insider trading groups, as in Lee (1997). Pure buyer firms are defined as acquirers with all top insiders *only* purchasing their shares during a specified pre-acquisition period. Pure seller firms are defined similarly. Lee argues that a pure insider trading pattern provides outside investors with a clearer signal than does a mixed insider trading pattern. Therefore, my focus of the analysis will be on the comparison between "pure seller" firms and "pure buyer" firms. I do not use a measure of abnormal insider trading because the choice of a "normal" period to estimate a firm's expected insider trading is problematic. I use top executives' trading during the six-month period ending on, and including, the announcement date to determine the insider trading pattern.[15]

SEC rule (16a) requires officers, directors, and owners of more than 10% of the common stock of a firm to report their trades to SEC within 10 days after the end of month in which trades occurred.[16] Due to the lag in insider reporting their trades in my sample, I use both the date when the insider trade was reported to the SEC and the date when the trade actually occurred to determine insider trading patterns.

*C. Sample Summary Statistics*

Table 1 presents some descriptive statistics for the 1,356 completed acquisitions during the period 1986 to 2000. The frequency distribution of the sample, shown in Panel A, indicates that there is a big jump in the number of deals undertaken since 1994, double those announced in the late 1980s. It is not surprising that the rising of number of acquisitions is associated with the growing stock market in the late 1990s. The last column of the panel shows that the average deal

[15] I also use different trading periods (three months, nine months, and twelve months) to classify insider trading patterns and the results are not sensitive to the trading window I use.

[16] The reporting rule has been amended since August 29, 2002. The new rule requires that any reportable transactions executed on or after August 29, 2002 be reported before the end of the second business day following the day on which the transaction has been executed.

value (in constant of 2000 dollars using the CPI) has increased from $240 million in 1994 to $1,854 million in 2000. Of the 1,356 transactions, 1,098 are mergers and 258 are tender offers. Consistent with previous studies, a majority of tender offers (93.4%) are pure cash offers, while most mergers are pure stock deals (61.5%), as shown in Panel B. In addition, 477 acquirers are in the banking and utility industries. The majority of banking/utility acquisitions are stock deals. Panel C shows that, on average, the acquirer is 14 times as large as the target in terms of market capitalization of equity. Acquirer book-to-market tends to be lower than that of target, implying that more overvalued acquirers tend to acquire less overvalued targets. The last row of panel C shows that the completion of the acquisitions occurs on average (median) 143 (125) days from the announcement date.

**Insert Table 1 here**

## III. Insider Trading Patterns before and after Acquisition Announcement

I first examine the monthly average number of insider transactions for sales and for purchases by top insiders in acquiring firms from six months before through six months after the acquisition announcement. It is worth noting that 418 deals are made by acquirers whose insiders are pure sellers while 313 deals are made by acquirers whose insiders are pure buyers. Overall, the average number of sales is about twice the average number of purchases, consistent with findings in previous studies. I also examine the trading behavior of acquiring firm insiders by grouping their firms into different trading patterns according to the "pure" trading criterion. Firms in pure buyer (seller) group have on average 2.57 purchases (4.87 sales) each month (and by definition here no sales (purchases) in the six months prior to the announcement). The pure buyers (sellers) start selling (buying) their shares in a small number of trades after the announcement. The mixed trading group behaves as a combination of the pure buyer and pure seller groups, but has relatively less sales and more purchases than the pure groups.

**Insert Figure 1 here**

Figure 1 shows the average monthly acquirer's insider trading, in number of shares traded, in the six months before and after the announcement date.[17] Figure 1 (a) shows the pattern of sales and purchases for the full sample. What is striking is the peak in selling in the month before (and including) the announcement date; this is followed by a dramatic drop in selling until month +4, where there is second sharp increase in sales. A possible reason for the increase in selling four months after the announcement is that insiders increase their selling just prior to completion of the deal. The average duration from announcement to completion of a deal is 140 days for full sample (and 120 days for the pure seller group). Figure 1 (b) shows that large rise in selling after the announcement date is driven by the pure seller group.

I also examine whether this behavior differs for the more recent wave of mergers. Figure 1 (c) shows that in the earlier period (1986-1996), no significant increase in insider selling is found prior to acquisition announcement. In sharp contrast, figure 1 (d) shows that insiders of acquiring firms in the later "hot market" period (1997-2000) increase their selling as deal is close to announcement. The strong difference in behavior of insiders between these two time periods is consistent with the idea that incentives related to overvaluation and motivations for mergers may be quite different across these periods.

## IV. Insider Trading and Acquisition Announcement Period Returns

In this section, I examine whether announcement period returns are related to acquirer's insider trading behavior. In table 2, I report the two-day (-1, 0) acquisition announcement period cumulative abnormal returns (CAR) for the full sample, and subsamples based on the type of

[17] The results using either trading volume (transaction price times number of shares traded) or the shares traded as a percentage of outstanding shares are qualitatively similar to those reported.

acquisition (merger or tender offer), the method of payment (cash or stock)[18] and the time period. Each of the subsamples is further partitioned into four groups based on the insider trading pattern. The mean (median) difference in the CAR between the pure buyer and pure seller groups is reported in the last column of table 2. [19]

For the full sample, both the mean and median acquisition announcement period CAR is negative and statistically significant, even within each trading pattern group. In addition, the announcement effect varies with the insider trading patterns. It is clear from columns four and five that acquisitions by firms whose insiders are pure buyers prior to the announcement receive less negative announcement effect than those made by firms with insider pure selling. For the full sample, the mean CAR for the pure buyer group is -0.59% (significant at 5% level), whereas the comparable figure in the pure seller group is -1.32% (significant at 1% level). The difference in the mean CARs between these two groups is 0.73% (significant at 5% level) for the full sample.

For the acquisition type subsamples, both mean and median acquisition announcement period CARs are significantly negative for mergers, while the comparable figures for tender offers are insignificant. For the method of payment subsamples, the evidence in column two corroborates prior studies that cash acquisitions are viewed positively by the market, while stock acquisitions are not value–increasing based on the mean two-day CAR of a significant -1.33%. Importantly, I find that not all cash deals have a positive market response, and only deals made by firms whose insiders are pure buyers have a significantly positive announcement CAR (0.74%). For stock acquisitions, however, acquirers' shareholders experience significant losses at the announcement regardless of insider trading patterns. These univariate comparisons, however, do not control for

[18] Cash acquisitions refer to deals that are paid with 100 percent cash. Stock acquisitions refer to pure stock deals (paid with 100 percent stock) and hybrid deals (a combination of cash, stock and/or other sources of payment).
[19] The results on announcement period returns using insider trade reporting date to classify trading pattern groups are qualitatively similar to those reported in table 2 using the transaction date.

other characteristics of the acquisitions that have been shown in previous literature to be related to announcement period returns.

The last panel of table 2 reports the announcement period returns of acquiring firms based on time period. Announcement period CARs for the earlier period are insignificant for all the insider trading groups except the pure seller acquirers. Both mean and median acquisition announcement period CARs are negative and statistically significant for firms in the hot market subsample, regardless of insider trading patterns. This finding is consistent with the large losses to acquiring shareholders follow the announcement of these acquisitions documented by Moeller, et al. (2005).

**Insert Table 2 here**

Interestingly, the earlier time period shows significant difference in both mean and median announcement period CAR between pure sellers and pure buyers, while the later hot market period does not.[20] This may not be surprising, however, given the increased use of executive stock options as a popular form of compensation in recent years and that the executive stock options are likely to form a large component of the insider's total wealth. The lack of diversification in their own portfolio gives insiders an incentive to diversify by selling their stock holding, irrespective of their beliefs about the accuracy of the valuation of their stocks. Therefore, the market does not, on average, interpret insider sales in fast-growing firms during the later hot market period as a signal of negative information. This may to some extent explain why we do not observe significantly different market reactions to acquisitions made by "pure seller" acquirers vs. "pure buyers" in the hot market period.

[20] I also examine the relationship between insider trading pattern and the announcement CAR in a multivariate regression setting. For the earlier time period, I find that announcement period returns are negatively related to pure seller acquirers. Moreover, the coefficient on stock offer is significantly negative, consistent with previous research on the method of payment. The results are not reported in a table for the sake of brevity.

## V. Long-term Stock Performance of Acquiring Firms

### *A. Matching Firm Approach*

I use control firms matched on size, book-to-market ratio, and prior one-year stock return as the benchmark for post-acquisition stock performance. Barber and Lyon (1997) document that the control firm approach eliminates the skewness bias associated with the long-run buy-and-hold abnormal returns and note that the size-and-book-to-market-matched control firm approach yields well-specified statistics. Rau and Vermaelen (1998) show that the pre-event performance of the acquiring firms plays an important role in explaining the post-acquisition long-run abnormal performance. Moreover, Lyon, et al. (1999) demonstrate that long horizon test statistics are subject to sampling biases, and suggest the pre-event stock return is an important dimension on which to choose control firms. In addition, Fama (1998) suggests that abnormal returns can be estimated using either matching firms, matching portfolios, or an asset pricing model. The matching procedure in this paper is similar in the spirit to that used by Spiess and Affleck-Graves (1999) and same as that implemented by Datta, et al. (2001).

At the end of each month from January 1986 to December 2000, all NYSE/AMEX common stocks (excluding the sample firm) listed on the CRSP tape without any equity offerings or merger announcements during the prior three-year period are used as the pool of possible matching firms. I rank firms at each month-end by their market capitalization (size), book-to-market (B/M) ratio, and prior one-year stock return. For each NYSE/AMEX-listed firm in the sample, I select the first matched firm from the pool of potential matches such that the sum of the absolute percentage difference between the sizes, book-to-market ratios and prior one-year stock returns of the sample firm and the matching firm is minimized. As in Spiess and Affleck-Graves (1999), the set of potential matching firms is constrained so that matching firms are not more than 10 percent smaller than the sample firm.

To ensure that the book value is available to the market at the time used in my calculation, I do not use the book value of a given fiscal year until at least four months after the fiscal year-end.[21] The B/M ratio is calculated by dividing the book equity value (COMPUSTAT annual data item 60) by the market capitalization (price per share times number of shares outstanding on CRSP). For a sample firm, the B/M ratio is calculated on the day prior to the acquisition effective date. I measure the prior annual return of the sample firm as the one-year buy-and-hold return beginning 252 trading days prior to the effective date and ending on the last trading day prior to the effective date. I use the same holding periods to calculate the prior one-year returns of the matching firms.

I apply the same matching algorithm to choose matching firms for Nasdaq-listed sample firms. The potential pool of matching firms are all the Nasdaq common stocks listed on CRSP without any equity offerings or mergers during the prior three-year period at the end of each month from January 1986 to December 2000.

I retain the two closest matching firms for each sample firm. If a matching firm is delisted before the end of the three-year anniversary or the combined firm's delisting date, whichever is earlier, I substitute the second closed matching firm on the delisting date. If the second matching firm is delisted during the measurement period, the CRSP value-weighted return is substituted as the return of the control firm from the removal time.

*B. Acquiring Firm's Post-acquisition Stock Performance*

Table 3 presents the three-year post-acquisition mean (median) buy-and-hold returns (BHRs) of sample firms and their control firms matched by size, book-to-market and prior one-year stock return and some acquiring firm characteristics such as size, book-to-market, and prior

[21] For instance, firms with a December 31 fiscal year-end begin using the book value of the current year-end for calculations done on or after April 30 of the following year.

one year returns. For the overall sample, the mean (median) firm insignificantly underperforms its control by 3.24% (0.29%) over the three years following the acquisition. Loughran and Vijh (1997) and Datta, et al. (2001) examine acquisitions made during period 1970 to 1989 and from 1993 to 1996, respectively, and they also find that acquirers do not underperform their control matches, on average, in the post-acquisition period.

**Insert Table 3 here**

Buy-and-hold returns for each of the four insider trading groups are also reported in panel A. The 3-year mean BHR of the pure buyer group is the highest (44.66%) while that of the pure seller group is the lowest (22.15%) among the four trading groups. However, the various trading pattern groups have very different characteristics. Panel B shows that the pure buyer group is associated with poor past performance (18.21% in the prior one-year), while the pure seller group exhibits an extraordinary past return (52.27% in the prior one-year). The four trading groups also have substantially different book-to-market and size characteristics.

Panel A also reports buy-and-hold returns for the matching firms selected on size, book-to-market and pre-acquisition stock performance and the difference from the sample firms. On average, firms whose insiders do not sell outperform their controls by 6.78% for the pure buyer group, although this outperformance is not statistically significant. In contrast, firms in the pure seller group significantly underperform their controls by 10.85%.

I next separate the sample into two time periods defined earlier, and examine both equal-weighted and value-weighted buy-and-hold returns following the completion of the acquisition. Panel A of table 4 presents value-weighted (VW) three-year buy-and-hold returns (BHR), buy-and-hold abnormal returns (BHAR), and wealth relatives for acquiring firms during each of the subperiods. As defined in Mitchell and Stafford (2000), the wealth relative is the average gross return of the event firms divided by the average gross return of the benchmark firms. Each

subperiod of the sample is further divided into four insider trading groups; only results for the pure buyer group and pure seller group are reported for the sake of brevity. *P*-values of a traditional *t*-test are reported in column five.[22]

**Insert Table 4 here**

The VW buy-and-hold abnormal return for hot market acquirers is –18.69% with a *p*-value of 0.005, while the mean *BHAR* for acquirers in the earlier period is 3.01% with a *p*-value of 0.741.[23] Moreover, the underperformance of hot market acquirers is primarily driven by firms whose insiders are "pure sellers" before the acquisition announcement. The VW average *BHAR* of hot market "pure seller" acquirers is –20.39% (*p*-value=0.006 and wealth relative=0.806), while the mean *BHAR* of hot market "pure buyer" acquirers is –4.22% with a *p*-value of 0.651. The equal–weighted (EW) results (not reported) are similar.[24] Figure 2 demonstrates the pre- and post-acquisition performance (on an equal-weighted basis) of acquiring firms and their matching firms across different insider trading patterns. Pure seller firms exhibit extraordinary 1-year pre-acquisition performance compared to pure buyer firms. However, their 3-year post acquisition returns are negative and significantly lower than their size, B/M and prior 1-year return matched control firms by 19.34%. On the other hand, the pure buyer firms do not show any underperformance. This result is striking given that the matching firms of pure seller acquirers have the similar strong performance in the year prior to the acquisition announcement.

For the earlier time period (1986-1996), however, the 3-year mean buy-and-hold abnormal returns are generally insignificant and do not appear to vary across different trading pattern groups.

[22] To correct the skewness bias, I use bootstrapped skewness-adjusted test statistics to determine *p*-value for statistical inference. The *p*-values are not reported because they are very similar to the *p*-values based on traditional t-statistics. This result also confirms that the control firm approach eliminates the skewness bias as documented in Barber and Lyon (1997).

[23] Bouwman, Fuller, and Nain (2003) find similar results. They document that acquisitions initiated during high market-valuation periods earn negative abnormal returns in the long run, while those announced during a low market-valuation period earn positive abnormal returns.

[24] The EW results are available from the author.

Taken together, evidence from both the EW and VW average *BHARs* suggests that acquiring firms are more likely to intentionally make acquisitions when they know their firms are overvalued (reflected in their "pure selling" insider trading patterns) and when stock market overall is overvalued (as reflected in high price-earnings ratios during the period 1997-2000).

Previous research has suggested that poor stock performance following acquisitions is largely driven by glamour firms. Therefore, I also report results for the later time period separately for glamour and value firms. Glamour acquirers are defined as firms with book-to-market ratios at or below the sample median, while value firms are those with book-to-market ratios above the median. Consistent with Rau and Vermaelen (1998), who examine the relationship between firm-level valuation (as reflected in the acquirer's book-to-market ratio) and the long-run performance of acquiring firms, both the EW *BHAR* and VW *BHAR* indicate that the low book-to-market glamour firms significantly underperform their benchmark (*p*-value is 0.001 and 0.004 respectively), even after including pre-acquisition annual returns as an additional control to choose the matching firms, while the value acquirers do not underperform. However, the long-term underperformance of glamour acquirers is primarily driven by firms whose insiders are pure sellers before the announcement. For example, the VW average *BHAR* for the pure seller glamour firms during the hot market period is –22.11% (*p*-value=0.005 and wealth relative=0.789), implying an economically significant loss to investing in these firms versus their control firms. The proportion of sample firms that are pure buyers vs. pure sellers also differs considerably across time periods. In the earlier period (1986-1996), the number of transactions where the acquirer is a pure buyer or pure seller is similar (140 vs. 143). In the later "hot market" period, however, the number of acquisitions made by pure sellers is much higher (195, or 36% of all deals).

Further, prior research has argued that post-acquisition performance is related to the method of payment (see Loughran and Vijh, 1997 and Mitchell and Stafford, 2000). From table 4, subsamples partitioned by method of payment (cash deals vs. stock deals) for the hot market period show that overall later deals underperform. The underperformance of stocks deals, however, is primarily driven by the pure seller firms. In contrast to previous findings, cash acquisitions made during the hot market period significantly underperform their control firms by 25.05% on a VW basis.[25] Overall, these results suggest that acquirer's insider trading behavior plays a more important role in explaining long-term abnormal returns than does method of payment for this period.

Finally, as a robustness check, I use the calendar-time abnormal returns (CTAR) advocated by Fama (1998) to correct the dependence problem of observations. Mitchell and Stafford (2000) argue that the statistical inference of the mean *BHAR* assuming independent observations (see Lyon et al. 1999) is inappropriate because major corporate events are not independent actions. They also argue that statistical significance will be overstated by any methodology that assumes independence if event clustering leads to positively correlated individual BHARs. Results similar to those described above are obtained using the CTAR approach. Panel B of table 4 shows acquirers whose insiders are pure sellers experience significant negative monthly abnormal returns following the acquisition completion on a VW basis.[26] In contrast, the acquirers in the pure buyer group show no sign of abnormal performance on either an EW or VW basis. For example, within the glamour firm subsample, the EW pure seller portfolio exhibits a monthly abnormal return of –

[25] Loughran and Vijh (1997) and Mitchell and Stafford (2000) use size-and-book-to-market reference portfolio as benchmark, while I use pre-event stock performance as an additional criterion to choose the matching firms. Lyon et al. (1999) show that not controlling for pre-event performance leads to biased test statistics of long-run abnormal returns, especially following events that are characterized by unusual performance prior to the event. Datta, et al. (2001) use the same matching algorithm as in this study.

[26] The *p*-values are based on the *t*-statistics using the time-series of monthly CTARs. The number of monthly observations is given in the last column. As documented in Mitchell and Stafford (2000), CTARs are better specified when the portfolios are value weighted rather than equally weighted. Therefore, only value-weighted CTAR results are reported in table 4.

0.69% (*p*-value=0.05), which corresponds to a three-year abnormal return of –24.84%. The corresponding VW three-year abnormal return is even larger (-36%, *p*-value=0.016). Overall, the CTAR results largely confirm our inferences from the BHAR approach, and the estimates from the CTAR analysis are comparable in magnitude to those using BHAR approach.[27] The evidence that the prevailing underperformance of acquirers during the period 1997 to 2000 is driven by the pure selling group is consistent with the idea that significant overvaluation motivates these acquisitions.

*C. Post-acquisition Operating Performance*

In this subsection I examine the operating performance of acquiring firms versus industry- and performance-matched control firms to determine whether the poor stock returns following acquisitions by pure seller firms are linked to changes in operating performance following completion of the acquisition. In other words, is the poor stock performance related just to overvaluation, or are these "bad" mergers also associated with deterioration in operating performance?

Matching firms are chosen following the procedure outlined in Barber and Lyon (1996). Firms must be listed on AMEX, NYSE or NASDAQ and must not have been involved in a takeover (either as a target or an acquirer) during the three years after the acquisition completion year. From that set of firms, I identify firms in the same two-digit SIC codes as acquiring firm in year 0 (deal completion year) with operating income before depreciation (OIBD, COMPUSTAT item #13) divided by total asset (COMPUSTAT item #6) within 90%-110% of the acquiring firm's in year –1. If no firm of similar performance in year –1 with the same two-digit SIC code can be found, I attempt to match performance within the 90%-110% filter, using all firms in the

[27] BHAR and CTAR are also calculated for subsamples based on type of acquisition (merger vs. tender offer), method of payment (cash vs. stock), and firm industry (industrial firms vs. banking/utility firms). Results are available upon request.

same one-digit SIC code. If I still find no performance match, then I match performance within 90%-110% filter using all firms without regard to industry, and select the firm with the closest OIBD/Asset. Due to the skewness of accounting ratios, I follow conventional operating performance measurement methodology and report medians.

**Insert Table 5 here**

Panel A of table 5 reports the median abnormal operating performance of the acquiring firms over the years –3 to +3 relative to acquisition completion for the entire sample period (1986-2000), for the earlier time period (1986-1996), and for the hot market period (1997-2000). I use Wilcoxon signed-rank tests to test for the equality of the distribution between acquiring firms and their matching firms. It is not surprising that the median abnormal performance in year –1 is zero for all the groups across all the sample periods, because the matching firm is selected based on performance of year –1. We find evidence of significantly negative abnormal performance in year 0 when acquisitions are completed for all groups except the "pure seller" group during each sub-period. For deals which occur during the hot market period, I find that positive but insignificant abnormal performance following the acquisition is associated with "pure buyer" acquirers, while negative and significant (at the 5% level or better in year +1 and year +3) abnormal performance following the acquisition is associated with "pure seller" acquirers. It is worth noting that the opposite is true for deals occurring during the earlier time period. That is, negative abnormal performance is found for "pure buyer" acquirers following the acquisition and positive is found for "pure seller" firms. It is possible that managers of "pure buyer" acquirers during the earlier period make worse decisions due to hubris (see Seyhun, 1990b). The positive abnormal return of "pure seller" acquirers is not surprising given that previous studies (see Healy, Palepu, and Ruback, 1992) document an increase in operating performance following mergers for this earlier period.

Panel B of table 5 presents the changes in abnormal performance measures from the year before to several years after the acquisition completion. For "pure buyer" acquirers, there is no significant decrease in abnormal operating performance from the year before to 3 years after the acquisition. This result holds for both sample periods. In contrast, hot market "pure seller" acquirers significantly underperform on a matching firm-adjusted basis in the 1 and 3 years after the completion.

I also examine whether insider trading patterns can explain changes in abnormal operating performance in a multivariate setting. The hypothesis is that insiders will more likely to sell (buy) their shares prior to the announcement if they believe that the merger will be value-decreasing (increasing). Therefore, firms whose insiders sell (buy) prior to the merger announcement should have negative (positive) changes in operating performance. Results are reported in table 6.

**Insert Table 6 here**

The dependent variable in these regressions is the abnormal operating performance 3 years after the acquisition completion minus abnormal performance 1 year prior to the completion. In addition to controlling for stock price runup, size of the acquirer, and book-to-market ratio, I include a dummy variable *BUY*, which takes value 1 if acquirer is a "pure buyer", and a dummy variable *SELL*, which takes value 1 if acquirer is a "pure seller". *Mixed Trading* and *No Trading* are defined similarly. Additional control variables are defined as follows. *Size* is the natural logarithm of the acquirer's market capitalization of equity; *Runup* is the one-year pre-acquisition BHR for the sample firm minus the contemporaneous BHR for the size, book-to-market, and prior one-year return matched sample; *B/M* is the book-to-market ratio defined as the natural logarithm of the book value of equity (COMPUSTAT item #60) divided by market value of equity (price times shares outstanding from CRSP) on the day before effective date; *Merger* is a dummy variable which equals 1 if an acquisition is classified as a merger in SDC, 0 if it is a tender offer. *Stock* is a dummy

variable that takes value of 1 if an acquisition is financed by 100% stock or a combination of stock and cash and 0 if it is financed by 100% cash. *Industrial* is a dummy variable that takes a value of 1 if acquirer is an industrial firm and 0 if it is a banking/utility firm; *Nasdaq* is a dummy variable that equals 1 if acquirer is listed on Nasdaq, 0 if it is listed on NYSE/AMEX.

Table 6 reports these regressions for the later (hot market) period. In models 1 and 2, the key variables of interest are *BUY* and *SELL* (default group is mixed trading and no trading); both coefficients are statistically insignificant. Models 3 and 4 present results with *SELL*, *MIX*, and *No Trading* as the independent variables (*BUY* as the default group). The coefficients on these variables are all positive but insignificant. This result indicates that insiders' trading behavior conveys no clear information on whether managers have made "bad" merger decisions which are associated with deterioration in subsequent operating performance.

*D. Multivariate Regression Tests of Long-term Post-acquisition Stock Performance*

Table 7 presents cross-sectional regressions testing whether insider trading patterns, especially their behaviors of "pure selling" and "pure buying", have a systematic relationship with abnormal stock performance following acquisitions that occurred during the hot market period (1997-2000).[28] This test is to estimate the effect of pure insider selling on long-run abnormal stock performance (compared with pure insider buying). The dependent variable in the regression, *LAR*, is defined as the natural logarithm of one plus the sample firm's three-year BHR, minus the natural logarithm of one plus the matched firm's three-year BHR. Several variations of the following model are estimated:

[28] Long-term stock performance of acquisitions made during the earlier period does not show significant difference among different insider trading groups. Therefore, multivariate analysis reported in Table 7 is based on the data from the hot market period.

$$LAR_i = \beta_0 + \beta_1 \cdot Size_i + \beta_2 \cdot BM_i + \beta_3 \cdot runup_i + \beta_4 \cdot Stock_i + \beta_5 \cdot Merger + \beta_6 \cdot Industrial_i + \beta_7 \cdot Nasdaq + \beta_8 \cdot SELL_i + \beta_9 \cdot MixedTrading_i + \beta_{10} \cdot NoTrading + \beta_{11} \cdot \Delta OperatingPerformance(-1,+3)_i + \beta_{12} \cdot CAR(-1,0)_i + \beta_{13} \cdot NewOptions + \beta_{14} \cdot YearDummy_i + \varepsilon_i$$

I define other independent variables as follows. *NewOptions* is options granted to insiders during the one-year period prior to the acquisition announcement, measured by number of shares of stock underlying the options as a percentage of firm's common stock outstanding. *SELL* is a dummy variable that equals 1 if insiders are pure sellers and 0 otherwise; *Mixed Trading* and *No Trading* is defined similarly. $\Delta OperatingPerformance(-1,+3)$ is abnormal operating performance 3 years after the acquisition completion less abnormal performance 1 year prior to the completion, and operating performance is measured as operating income before depreciation over total asset; CAR(-1,0) is the 2-day (-1,0) cumulative abnormal return of acquiring firm at the acquisition announcement. In addition, year dummies are included in the estimation to control for time trends in all models.

**Insert Table 7 here**

To estimate the differences based on insider trading patterns, I regress *LAR* on control variables that have proved to influence the long-term abnormal stock performance in model 1, such as firm size, book-to-market ratio, stock price runup, type of acquisition (merger vs. tender offer), method of payment (stock vs. cash), and whether acquiring firm is an industrial firm versus a banking firm. In model 2, I introduce the dummy variables of insider trading patterns, *SELL*, *Mixed Trading* and *No Trading* (*BUY* is the default group). I also control for the quality of the acquisition, or whether the acquisition enhances business value in model 3, proxied by the change in abnormal operating performance from 1 year before to 3 years after the deal completion. I find that the long-run abnormal stock performance of acquiring firms is positively correlated with changes in abnormal operating performance. This result implies that "bad mergers" do contribute

to post-acquisition underperformance in stock returns of acquirers. Mitchell and Lehn (1990) show that the stock market negatively values acquisitions by firms that subsequently become targets and positively value acquisitions by firms that never become targets during their sample period. Their findings suggest that announcement period CARs can be a measure of whether the acquisition creates value; hence I include the 2-day (-1, 0) CAR at the announcement of the acquisition in model 4 of table 7. The coefficient on CAR (-1, 0) is negative but insignificant (*p*-value=0.157), implying that acquirers that receive a better market reaction at announcement appears to make worse acquisitions and earn worse long-run abnormal returns. In model 5, I add the new options granted to insiders in the 12-month period prior to acquisition announcement as a control. *NewOptions* has a positive but insignificant impact on the long-term abnormal stock performance following acquisitions.

Most importantly, after controlling for all the other factors, the coefficient on *SELL* is negative and significant in each model. This result confirms the univariate results in table 4 and indicates that acquiring firms whose insiders are pure sellers perform significantly worse than firms with pure buying, even after controlling for other factors.

Given that *B/M* and *Runup* can be regarded as additional measures of overvaluation of firms, the ability of insider trading variables to explain post-acquisition performance after controlling for *B/M* and *Runup* indicates that insider trading behavior prior to acquisition announcement brings additional information on acquiring firm's misvaluation. This evidence is consistent with the argument that managers of acquiring firms tend to make acquisitions when their stocks are overvalued, as reflected by their insider trading behavior. The main conclusion from the multivariate regression analysis is that acquirers' insider trading behavior emerges as an important and robust determinant of the long-term abnormal stock performance following the

acquisition, even after controlling for the quality of merger proxied by abnormal operating performance.

## VI. Summary and Conclusion

This paper provides a direct test on whether overvaluation is a motive for acquisitions and provides strong evidence on the consequences of overvalued equity. It is the first paper documenting the relation between insider trading patterns around acquisition announcement and long-run post-acquisition stock performance. Although stock performance following acquisitions has been well documented in the literature, little is known about insider trading around acquisition announcement. If overvaluation is an important motive for acquisitions, managers of acquiring firms also have incentives to sell their own stock or postpone planned purchases. As a consequence, firms whose insiders engage in extreme selling should perform worse than their control firms in the long run. The recent merger wave in the late 1990s provides an opportunity to test whether managers of acquiring firms knowingly make acquisitions when their firms are overvalued.

Using a sample of 1,356 domestic mergers and tender offers during the period January 1, 1986 to December 31, 2000, I find that there is a clear increase in average insider selling (number of shares traded) during the six-month period prior to the acquisition announcement and the average number of shares sold peaks in the month before the announcement date, followed by another spike in sales when the deal approaches completion. I find that for acquisitions that occur during the hot market period (1997-2000), the trading patterns of acquirers' insiders reliably relate to post-acquisition long-term stock performance. Acquirers whose insiders are pure sellers significantly underperform their control firms, while acquirers whose insiders are pure buyers do not.

This is also the first paper that attempts to differentiate the source of post-acquisition underperformance in stock returns. Evidence provided in this paper indicates that the underperformance of acquirers is the result of both “bad mergers” and “overvaluation”. Overall, the evidence that acquirers whose insiders are prior sellers show significant underperformance in terms of both stock returns and operating performance suggests that these mergers are “bad mergers”. However, the evidence that pure sellers are associated with worse long-term stock performance even after controlling for the “bad merger” effect indicates that overvaluation is an important motive for acquisitions. The evidence suggests that the agency costs of overvalued equity described by Jensen (2005) could be an important explanation for wealth destroying deals in the late 1990s.

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**Table 1** Distribution and Descriptive Statistics of Acquisitions during Period 1986 to 2000

The final sample consists of 1,356 completed acquisitions during the period January 1, 1986, to December 31, 2000, with stock return data available in CRSP, accounting data available in COMPUSTAT and insider trading data available in SEC Ownership Reporting System tape. Deal value is measured in constant 2000 dollars using the CPI. Pure Cash (Pure Stock) refers to deals where payment to targets consists of 100 percent cash (stock). Hybrid refers to a combination of cash, stock and/or other sources of payment. Mergers (Tender Offers) are deals that are identified as a merger (tender offer) by SDC. Industrial firms denote firms other than banking and utility firms. Banking (utility) firms refers to firms with SIC between 6000 and 6799 (4900 and 4942). Market capitalization of equity is measured on the day prior to the acquisition announcement. Book-to-market is measured as book value of equity at the end of fiscal year prior to the acquisition announcement from COMPUSTAT divided by market value of equity one day prior to the announcement. Premium is the percentage difference between the offer price and target share price four weeks prior to the announcement date. Duration is number of calendar days between the announcement and completion date.

Panel A: Distribution of Acquisitions by Announcement Year (Constant 2000 dollars)

| Year | Final Sample (N=1356) | | |
|---|---|---|---|
| | Number of deals | % of sample | Avg. Deal Value ($ million) |
| 1986 | 46 | 3.4 | 305.38 |
| 1987 | 43 | 3.2 | 290.43 |
| 1988 | 44 | 3.2 | 319.53 |
| 1989 | 43 | 3.2 | 387.63 |
| 1990 | 30 | 2.2 | 418.91 |
| 1991 | 31 | 2.3 | 270.26 |
| 1992 | 43 | 3.2 | 192.37 |
| 1993 | 57 | 4.2 | 217.31 |
| 1994 | 100 | 7.4 | 240.80 |
| 1995 | 137 | 10.1 | 585.17 |
| 1996 | 144 | 10.6 | 723.98 |
| 1997 | 175 | 12.9 | 582.27 |
| 1998 | 183 | 13.5 | 752.70 |
| 1999 | 179 | 13.2 | 1,551.87 |
| 2000* | 101 | 7.4 | 1,854.43 |
| Total | 1,356 | 100 | 746.38 |

* I include deals that were announced and completed in 2000.

Panel B: Number of Acquisitions by Deal or Firm Characteristics

| | All | Method of payment | | |
|---|---|---|---|---|
| | | Pure Cash | Pure Stock | Hybrid |
| Type of acquisition | | | | |
| Merger | 1,098 (81%) | 195 | 676 | 227 |
| Tender Offer | 258 (19%) | 241 | 6 | 11 |
| Industry | | | | |
| Industrial | 879 (65%) | 361 | 370 | 148 |
| Banking/Utility | 477 (35%) | 75 | 312 | 90 |
| Total | 1,356 (100%) | 436 | 682 | 238 |

Panel C: Descriptive Statistics

| Deal Characteristics | Mean | Median | Observations |
|---|---|---|---|
| Acquirer market capitalization of equity ($ millions) | 6179.11 | 1016.50 | 1356 |
| Target market capitalization of equity ($ million) | 437.65 | 85.58 | 946 |
| Acquirer book-to-market | 0.454 | 0.392 | 1356 |
| Target book-to-market | 0.691 | 0.564 | 845 |
| Acquisition premium (%) | 48.94 | 41.18 | 1034 |
| Acquisition duration (days) | 143 | 125 | 1356 |

**Table 2** Announcement Period Returns for Acquirers

This table presents the two-day (-1,0) cumulative abnormal returns at acquisition announcement for acquirers for the full sample, and subsamples partitioned by type of acquisition (merger or tender offer) and means of payment (cash and stock). Cash acquisitions refer to deals that are paid with 100 percent cash. Stock acquisitions refer to both stock deals (paid with 100 percent stock) and hybrid deals (a combination of cash, stock and/or other sources as payment). The two-day (-1,0) cumulative abnormal returns (CARs) are computed using the market model. The estimation period is from 210 trading days to 42 trading days prior to announcement date. A minimum of 100 daily returns is required for the estimation of beta. Within each sample, the CARs (-1, 0) for different insider trading groups are also reported. Pure buyer firms are defined as acquirers with only top insiders purchasing their shares for the 6-month period before, and including, the announcement date. Pure seller firms are similarly defined. No trading firms are acquirers without any insider transactions during this period. Mixed trading firms are those with both insider buying and selling six months prior to and including the announcement date.

| | Total | Insider Trading Groups | | | | Difference (2)-(3) |
|---|---|---|---|---|---|---|
| | | (1) No Trading | (2) Pure Buyer | (3) Pure Seller | (4) Mixed Trading | |
| **Panel A: All** | | | | | | |
| mean | -0.88*** | -0.71** | -0.59** | -1.32*** | -0.76*** | 0.73[b] |
| median | -0.56*** | -0.57*** | -0.55*** | -1.01*** | -0.28** | 0.46 |
| [No. of obs] | [1356] | [334] | [313] | [418] | [291] | |
| **Panel B: Acquisition Type** | | | | | | |
| *Merger* | | | | | | |
| mean | -1.01*** | -0.67** | -0.94*** | -1.50*** | -0.75** | 0.56 |
| median | -0.69*** | -0.62*** | -0.96*** | -1.12*** | -0.31** | 0.16 |
| [No. of obs] | [1098] | [268] | [243] | [342] | [245] | |
| *Tender Offer* | | | | | | |
| mean | -0.35 | -0.88 | 0.63 | -0.53 | -0.80 | 1.16 |
| median | -0.23 | -0.33 | 0.29 | -0.78 | -0.17 | 1.07 |
| [No. of obs] | [258] | [66] | [70] | [76] | [46] | |
| **Panel C: Method of Payment** | | | | | | |
| *Stock Offer* | | | | | | |
| mean | -1.33*** | -1.01*** | -1.41*** | -1.84*** | -0.86*** | 0.43 |
| median | -0.99*** | -0.74*** | -1.23*** | -1.34*** | -0.45** | 0.11 |
| [No. of obs] | [920] | [220] | [193] | [301] | [206] | |
| *Cash Offer* | | | | | | |
| mean | 0.07 | -0.13 | 0.74* | 0.01 | -0.52 | 0.73 |
| median | -0.07 | -0.11 | 0.01 | -0.07 | -0.17 | 0.08 |
| [No. of obs] | [436] | [114] | [120] | [117] | [85] | |
| **Panel D: Time Period** | | | | | | |
| *1986 - 1996* | | | | | | |
| mean | -0.49*** | -0.07 | -0.27 | -1.04*** | -0.55* | 0.77[c] |
| median | -0.38*** | 0.04 | -0.38* | -1.07*** | -0.23 | 0.69 [c] |
| [No. of obs] | [718] | [192] | [178] | [198] | [150] | |
| *1997 - 2000* | | | | | | |
| mean | -1.32*** | -1.58*** | -1.00** | -1.57*** | -0.99** | 0.57 |
| median | -1.11*** | -1.34*** | -1.26** | -0.98*** | -0.46 | -0.28 |
| [No. of obs] | [638] | [142] | [135] | [220] | [141] | |

***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.
[a], [b], [c] denote significance at the 1%, 5%, and 10% levels, respectively, for the difference.

**Table 3** Three-year Buy-and-Hold-Returns, Firm Size, Book-to-Market Ratio, and Pre-acquisition Return for Acquiring Firms and Their Matched Controls

The final sample consists of 1,356 completed acquisitions during the period 1986 to 2000. To eliminate the cross-sectional dependence in sample observations by the same acquirer generated by overlapping periods of return calculation, I require sample firms to have a three-year pre-event period with no acquisition. The sample size is therefore restricted to 1,091 observations. The matched control firms are chosen based on size, book-to-market ratio, and one-year pre-acquisition stock return. The buy-and-hold return for matched firms is computed over the same holding period as the sample firms. At the end of each month from January 1986 to December 2000, all NYSE/AMEX common stocks (excluding the sample firm) listed on the CRSP tape without any equity offerings and merger announcements during the prior three-year period are used as a pool of possible matching firms. I rank these firms at each month-end by their market capitalization (size), book-to-market (B/M) ratio, and prior one-year stock return. For each NYSE/AMEX-listed firm in the sample, I select the first matched firm from the pool of potential matches such that the sum of the absolute percentage difference between the sizes, book-to-market ratios and prior one-year stock return of the sample firm and the matching firm is minimized. The set of potential matching firms is constrained so that matching firms are not more than 10 percent smaller than their sample firm. To ensure that the book value is available to the market when used for calculation, I do not use the book value of a given fiscal year until at least four months after the fiscal year-end. For a sample firm, the B/M ratio is calculated on the day prior to the acquisition effective date. I measure the prior annual return of the sample firm as the one-year buy-and-hold return (BHR) beginning 252 trading days prior to the effective date and ending on the last trading day prior to the effective date. I use the same holding periods to calculate the prior one-year returns of matched firms. I follow a similar procedure to choose matched firms for Nasdaq listed sample firms. *p*-values reflect the significance level based on the *t*-statistics for difference between means and the Wilcoxon rank sum test *Z*-statistics for differences between the distributions. Medians are reported below the means in parentheses.

| **Panel A: Post-acquisition Buy-and-hold returns** | | Grouped by Insider trading Pattern | | | |
|---|---|---|---|---|---|
| | All | No Trading | Pure Buyer | Pure Seller | Mixed Trading |
| Sample Firm 3-year BHR (%) | 32.86 | 33.38 | 44.66 | 22.15 | 34.79 |
| | (20.45) | (23.65) | (32.30) | (6.54) | (24.68) |
| Matching Firm 3-year BHR (%) | 36.11 | 32.35 | 37.88 | 33.00 | 43.37 |
| | (20.74) | (19.08) | (23.71) | (8.31) | (33.37) |
| Difference (%) | -3.24 | 1.03 | 6.78 | -10.85 | -8.58 |
| | (-0.29) | (4.57) | (8.59) | (-1.77) | (-8.69) |
| *p*-value | 0.353 | 0.88 | 0.40 | 0.08 | 0.21 |
| | (0.363) | (0.94) | (0.46) | (0.22) | (0.19) |
| **Panel B: mean (median) acquiring firm characteristics** | | | | | |
| Acquirer Firm Size ($ million) | 5097.82 | 2279.41 | 3064.84 | 7560.99 | 7422.07 |
| | (831.39) | (459.63) | (622.34) | (1405.67) | (1132.23) |
| Acquirer Book-to-market ratio | 0.463 | 0.561 | 0.555 | 0.340 | 0.426 |
| | (0.392) | (0.492) | (0.468) | (0.281) | (0.382) |
| Acquirer Pre-acquisition 1-year return (%) | 33.32 | 29.79 | 18.21 | 52.27 | 21.81 |
| | (18.99) | (21.21) | (11.17) | (26.16) | (15.28) |
| Number of observations | 1091 | 273 | 258 | 338 | 222 |

**Table 4** Three-year Mean Buy-and-Hold Abnormal Returns and Calendar-time Abnormal Returns for Acquirers

Panel A presents value-weighted three-year BHRs and BHARs (in %) for acquiring firms during period of 1986-1996 and during period of 1997 to 2000. Subsamples of glamour firms and value firms, stock offers and cash offers for period 1997-2000 are also reported. Each category of the sample is furthermore divided into four insider trading groups, and only results on pure buyer group and pure seller group are reported for sake of brevity. *P*-values of traditional *t*-test are reported in column five in panel A and column three in panel B. I calculate 3-year BHARs for each firm using the size, book-to-market ratio and prior one-year return matched control firm as expected return benchmarks. Panel B presents value-weighted average monthly CTARs (in %) for acquiring firms during the same period. For each month from January 1997 to December 2000, I form value-weighted portfolios of all sample firms that completed acquisitions within the previous three years. Portfolios are rebalanced monthly to drop all companies that reach the end of their three-year period and add all firms that have just finished a transaction. The three-year post-acquisition period starts from the first month after the acquisition completion month. At each month t, the portfolio abnormal returns are the average abnormal returns for all sample firms. I use the returns of the same matched firm in calculating BHARs as the expected returns benchmarks when I computing CTARs. The *p*-values are based on the *t*-statistics using the time-series of monthly CTARs. The number of monthly observations is listed under column [N].

Panel A: Mean performance: BHAR (%)

| Characteristics | Sample size | Sample Firm *BHR* | Matching Firm *BHR* | Value-weighted *BHAR* | *p*-value | Wealth Relative |
|---|---|---|---|---|---|---|
| **1986 - 1996** | | | | | | |
| All | 551 | 71.03 | 68.02 | 3.01 | 0.741 | 1.018 |
| Pure Buyer | 140 | 73.73 | 77.10 | -3.37 | 0.841 | 0.981 |
| Pure Seller | 143 | 90.96 | 100.82 | -9.86 | 0.631 | 0.951 |
| **1997 - 2000** | | | | | | |
| All | 540 | -2.40 | 16.29 | -18.69 | 0.005 | 0.839 |
| Pure Buyer | 118 | 39.08 | 43.30 | -4.22 | 0.651 | 0.971 |
| Pure Seller | 195 | -15.37 | 5.02 | -20.39 | 0.006 | 0.806 |
| ***Glamour Firms*** | | | | | | |
| All | 326 | -4.09 | 16.90 | -20.99 | 0.004 | 0.820 |
| Pure Buyer | 55 | 43.53 | 49.32 | -5.79 | 0.599 | 0.961 |
| Pure Seller | 142 | -17.38 | 4.73 | -22.11 | 0.005 | 0.789 |
| ***Value Firms*** | | | | | | |
| All | 214 | 14.25 | 10.27 | 3.98 | 0.586 | 1.036 |
| Pure Buyer | 63 | 19.17 | 16.35 | 2.82 | 0.838 | 1.024 |
| Pure Seller | 53 | 8.70 | 8.53 | 0.17 | 0.989 | 1.002 |
| ***Stock Offer*** | | | | | | |
| All | 384 | -11.07 | 3.14 | -14.21 | 0.058 | 0.862 |
| Pure Buyer | 75 | 45.32 | 48.07 | -2.75 | 0.825 | 0.981 |
| Pure Seller | 148 | -29.89 | -12.68 | -17.21 | 0.017 | 0.803 |
| ***Cash Offer*** | | | | | | |
| All | 156 | 9.86 | 34.91 | -25.05 | 0.036 | 0.814 |
| Pure Buyer | 43 | 26.61 | 33.76 | -7.15 | 0.576 | 0.947 |
| Pure Seller | 47 | 14.56 | 41.53 | -26.97 | 0.121 | 0.809 |

| Panel B: Mean performance: CTAR (%) | | | | |
|---|---|---|---|---|
| Characteristics | Sample Size | Value-weighted CTAR | *p*-value | N |
| **Hot Market Period: 1997-2000** | | | | |
| All | 540 | -0.30 | 0.392 | 82 |
| Pure Buyer | 118 | -0.47 | 0.293 | 77 |
| Pure Seller | 195 | -0.83 | 0.025 | 80 |
| ***Glamour Firms*** | | | | |
| All | 326 | -0.50 | 0.142 | 81 |
| Pure Buyer | 55 | -0.06 | 0.918 | 68 |
| Pure Seller | 142 | -1.00 | 0.016 | 78 |
| ***Value Firms*** | | | | |
| All | 214 | -0.01 | 0.984 | 79 |
| Pure Buyer | 63 | -0.59 | 0.270 | 66 |
| Pure Seller | 53 | -0.03 | 0.953 | 63 |
| ***Stock Offer*** | | | | |
| All | 384 | -0.51 | 0.159 | 80 |
| Pure Buyer | 75 | -0.34 | 0.588 | 69 |
| Pure Seller | 148 | -0.79 | 0.092 | 76 |
| ***Cash Offer*** | | | | |
| All | 156 | -0.43 | 0.421 | 81 |
| Pure Buyer | 43 | -0.32 | 0.696 | 63 |
| Pure Seller | 47 | -1.00 | 0.125 | 75 |

**Table 5:** Operating Performance of Acquiring firms

Panel A reports the median abnormal operating performance relative to the matched firm for the 1091 acquiring firms present on Compustat for their deal completion year (year 0). Matching firms are chosen by matching each acquiring firm with a firm that has not been involved in a takeover during the three years after the acquisition completion year using the following algorithm: all firms in the same two-digit SIC codes as acquiring firm in year 0 with operating income before depreciation (OIBD) over total asset within 90%-110% of acquiring firm's in year -1 are ranked, and the firm with the closest OIBD/Asset is used. The *p*-values from a paired Wilcoxon test of differences between acquiring and matched firms are reported in parentheses in panel A. Panel B presents the median changes in abnormal performance over various windows and the *p*-values from Wilcoxon signed-rank test are reported in parentheses in Panel B.

| | **Operating Income/ Total Asset** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | *1986 - 2000* | | | *1986 - 1996* | | | *1997 - 2000* | | |
| | All | Pure Buyer | Pure Seller | All | Pure Buyer | Pure Seller | All | Pure Buyer | Pure Seller |
| | **Panel A: Abnormal Operating Performance (medians, %)** | | | | | | | | |
| Fiscal year around deal completion | | | | | | | | | |
| -3 | -0.01<br>(0.609) | 0.09<br>(0.493) | -0.15<br>(0.122) | 0.10<br>(0.496) | 0.16<br>(0.397) | -0.14<br>(0.657) | -0.08<br>(0.183) | 0.00<br>(0.894) | -0.18<br>(0.127) |
| -2 | -0.02<br>(0.777) | -0.12<br>(0.428) | 0.12<br>(0.582) | -0.03<br>(0.857) | -0.23<br>(0.088) | 0.18<br>(0.270) | 0.03<br>(0.549) | 0.11<br>(0.623) | 0.12<br>(0.828) |
| -1 | 0.00<br>(0.865) | 0.00<br>(0.480) | 0.00<br>(0.864) | 0.00<br>(0.445) | 0.00<br>(0.194) | 0.00<br>(0.795) | 0.00<br>(0.568) | 0.00<br>(0.802) | 0.00<br>(0.585) |
| 0 | -0.27<br>(0.000) | -0.30<br>(0.003) | -0.35<br>(0.033) | -0.32<br>(0.000) | -0.33<br>(0.013) | -0.43<br>(0.158) | -0.23<br>(0.019) | -0.25<br>(0.088) | -0.28<br>(0.116) |
| 1 | -0.03<br>(0.782) | -0.19<br>(0.305) | -0.04<br>(0.717) | 0.05<br>(0.542) | -0.27<br>(0.069) | 0.42<br>(0.062) | -0.26<br>(0.383) | 0.02<br>(0.722) | -0.54<br>(0.038) |
| 2 | -0.02<br>(0.853) | -0.10<br>(0.736) | -0.05<br>(0.718) | -0.10<br>(0.795) | -0.31<br>(0.260) | 0.38<br>(0.061) | 0.07<br>(0.929) | 0.31<br>(0.563) | -0.20<br>(0.299) |
| 3 | 0.01<br>(0.897) | 0.03<br>(0.996) | -0.31<br>(0.676) | 0.10<br>(0.369) | -0.02<br>(0.898) | 0.46<br>(0.064) | -0.06<br>(0.487) | 0.03<br>(0.965) | -0.99<br>(0.040) |
| | **Panel B: Changes in Abnormal Operating Performance (medians, %)** | | | | | | | | |
| Fiscal year i to year j | | | | | | | | | |
| -1, +1 | -0.02<br>(0.825) | -0.14<br>(0.386) | -0.05<br>(0.696) | 0.05<br>(0.491) | -0.27<br>(0.112) | 0.39<br>(0.074) | -0.25<br>(0.381) | 0.02<br>(0.683) | -0.54<br>(0.039) |
| -1, +2 | -0.02<br>(0.930) | -0.08<br>(0.878) | -0.05<br>(0.686) | -0.08<br>(0.910) | -0.30<br>(0.376) | 0.30<br>(0.052) | 0.05<br>(0.922) | 0.36<br>(0.534) | -0.20<br>(0.299) |
| -1, +3 | 0.01<br>(0.864) | 0.10<br>(0.903) | -0.35<br>(0.671) | 0.10<br>(0.344) | -0.02<br>(0.988) | 0.46<br>(0.069) | -0.06<br>(0.492) | 0.13<br>(0.981) | -0.93<br>(0.038) |

**Table 6:** Regressions of Long-run Abnormal Operating Performance: (1997-2000)

The dependent variable is abnormal operating performance 3 years after the acquisition completion less abnormal performance 1 year prior to the completion. In model 1 and 2, I include dummy variables of *BUY* and *SELL* (default group is mixed trading and no trading) in regressions. Model 3 and 4 presents results with *SELL*, *MIX*, and *No Trading* as the independent variables (*BUY* as the default group). *Size* is the natural logarithm of the acquirer's market capitalization of equity; *Runup* is the one-year pre-acquisition BHR for the sample firm minus the contemporaneous BHR for the size, book-to-market, and prior one-year return matched sample; *B/M* is the book-to-market ratio defined as the natural logarithm of the book value of equity (COMPUSTAT item #60) divided by market value of equity (price times shares outstanding from CRSP) on the day before effective date; *BUY* is a dummy variable which takes value 1 if acquirer is a "pure buyer", and *SELL* is a dummy variable which takes value 1 if acquirer is a " pure seller". *MIX* and *No Trading* are defined similarly. *Merger* is a dummy variable that equals 1 if an acquisition is classified as a merger in SDC, 0 if it is a tender offer. *Stock* is a dummy variable that takes value of 1 if an acquisition is financed by 100% stock or a combination of stock and cash and 0 if it is financed by 100% cash. *Industrial* is a dummy variable that takes a value of 1 if acquirer is an industrial firm and 0 if it is a banking/utility firm; *Nasdaq* is a dummy variable that equals 1 if acquirer is listed on Nasdaq, 0 if it is listed on NYSE/AMEX. *P*-values are in parentheses.

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| *Constant* | 0.039 | 0.008 | 0.022 | -0.006 |
| | (0.378) | (0.855) | (0.605) | (0.876) |
| *Runup* | -0.005 | -0.006 | -0.005 | -0.006 |
| | (0.577) | (0.529) | (0.571) | (0.527) |
| *B/M* | 0.043 | 0.046 | 0.042 | 0.046 |
| | (0.006) | (0.004) | (0.006) | (0.004) |
| *Size* | 0.001 | 0.001 | 0.001 | 0.001 |
| | (0.894) | (0.867) | (0.874) | (0.858) |
| *BUY* | -0.016 | -0.014 | | |
| | (0.372) | (0.455) | | |
| *SELL* | 0.006 | 0.006 | 0.022 | 0.020 |
| | (0.624) | (0.624) | (0.296) | (0.342) |
| *MIX* | | | 0.014 | 0.013 |
| | | | (0.473) | (0.512) |
| *No Trade* | | | 0.018 | 0.014 |
| | | | (0.367) | (0.480) |
| *Merger* | | 0.015 | | 0.015 |
| | | (0.475) | | (0.475) |
| *Stock* | | 0.016 | | 0.016 |
| | | (0.449) | | (0.458) |
| *Industrial* | | 0.017 | | 0.017 |
| | | (0.161) | | (0.162) |
| *Nasdaq* | | -0.005 | | -0.005 |
| | | (0.694) | | (0.701) |
| Observations | 415 | 415 | 415 | 415 |
| R-squared | 0.086 | 0.093 | 0.086 | 0.093 |

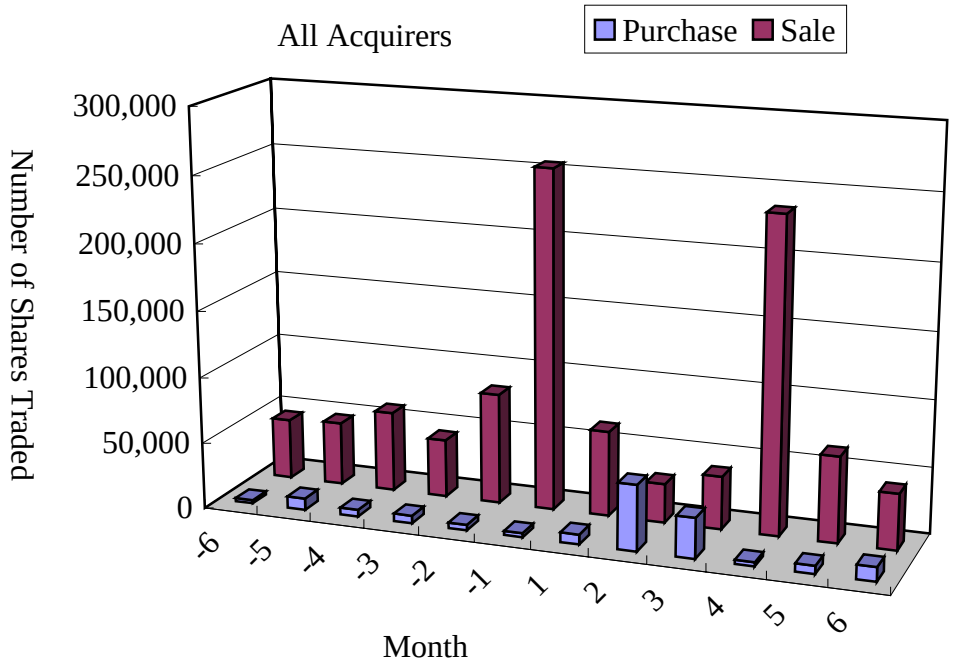
**Table 7** Regressions of Long-run Abnormal Buy-and-Hold-Returns for Acquiring Firms (1997-2000)

This table reports the estimation of long-run post-acquisition abnormal BHRs of acquiring firms. The regression is to estimate the effect of insider trading pattern on firms' stock performance. The dependant variable, LAR, is defined as the natural logarithm of 1+ the sample firm's three-year BHR minus the natural logarithm of 1+ the matched firm's three-year BHR. *New Options* is options granted to insiders during the one-year period prior to the acquisition announcement, measured by number of shares of stock underlying the options as a percentage of firm's common stock outstanding. *SELL* is a dummy variable that equals 1 if insiders are pure sellers and 0 otherwise; *Mixed Trading* is a dummy variable that takes value of 1 if insiders are mixed traders, buying and selling of their stocks. *No Trading* is a dummy variable that equals 1 if insiders of acquirers do not trade at all during the 6-month period prior to acquisition announcement. $\Delta OperatingPerformance(-1,+3)$ is abnormal operating performance 3 years after the acquisition completion less abnormal performance 1 year prior to the completion, and operating performance is measured as operating income before depreciation over total asset; CAR(-1,0) is the 2-day (-1,0) cumulative abnormal return of acquiring firm at the acquisition announcement; Year dummies are included in the estimation to control time trends in all models. Other variables are defined in previous table. *p*-values are in parentheses. Abnormal returns are Winsorized at 1% and 99% level.

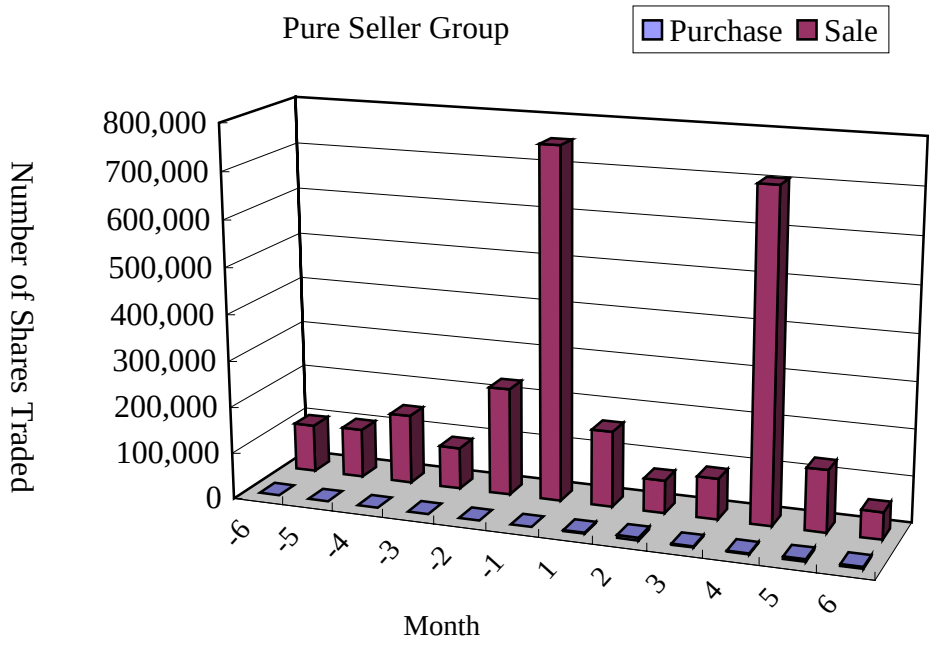
| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| *Constant* | 0.529 | 0.549 | 0.465 | 0.466 | 0.693 |
| | (0.095) | (0.093) | (0.190) | (0.186) | (0.055) |
| *Size* | -0.012 | 0.003 | -0.003 | -0.003 | -0.031 |
| | (0.737) | (0.947) | (0.938) | (0.938) | (0.459) |
| *B/M* | 0.147 | 0.135 | 0.002 | 0.010 | 0.011 |
| | (0.116) | (0.148) | (0.986) | (0.910) | (0.904) |
| *Runup* | -0.088 | -0.088 | -0.193 | -0.183 | -0.190 |
| | (0.502) | (0.503) | (0.051) | (0.065) | (0.057) |
| *Stock* | 0.075 | 0.112 | 0.120 | 0.086 | 0.081 |
| | (0.614) | (0.446) | (0.433) | (0.577) | (0.599) |
| *Merger* | -0.158 | -0.164 | -0.209 | -0.193 | -0.240 |
| | (0.333) | (0.311) | (0.234) | (0.273) | (0.174) |
| *Nasdaq* | -0.226 | -0.196 | -0.033 | -0.037 | -0.009 |
| | (0.082) | (0.136) | (0.808) | (0.791) | (0.952) |
| *Industrial* | -0.452 | -0.445 | -0.446 | -0.444 | -0.409 |
| | (0.000) | (0.000) | (0.001) | (0.001) | (0.005) |
| $\Delta$ *OperatingPerformance* | | | 2.405 | 2.389 | 2.924 |
| | | | (0.000) | (0.000) | (0.000) |
| *CAR (-1,0)* | | | | -1.106 | |
| | | | | (0.320) | |
| *New Options* | | | | | 0.608 |
| | | | | | (0.120) |
| *SELL* | | -0.291 | -0.419 | -0.414 | -0.473 |
| | | (0.067) | (0.012) | (0.013) | (0.005) |
| *MIX* | | -0.246 | -0.324 | -0.310 | -0.340 |
| | | (0.137) | (0.053) | (0.067) | (0.047) |
| *NoTrading* | | -0.162 | -0.335 | -0.332 | -0.393 |
| | | (0.342) | (0.062) | (0.064) | (0.038) |
| *Year Dummies* | Yes | Yes | Yes | Yes | Yes |
| *Observations* | 483 | 483 | 374 | 374 | 350 |
| *R-squared* | 0.058 | 0.064 | 0.135 | 0.138 | 0.172 |

**Figure 1**:
This figure shows average monthly purchases and sales from 6 months prior to through 6 months after acquisition announcement date for the sample of acquisitions occurred from 1986 to 2000. Sales and Purchases are measured as number of shares traded during the month. Announcement date (0) is included in month –1.

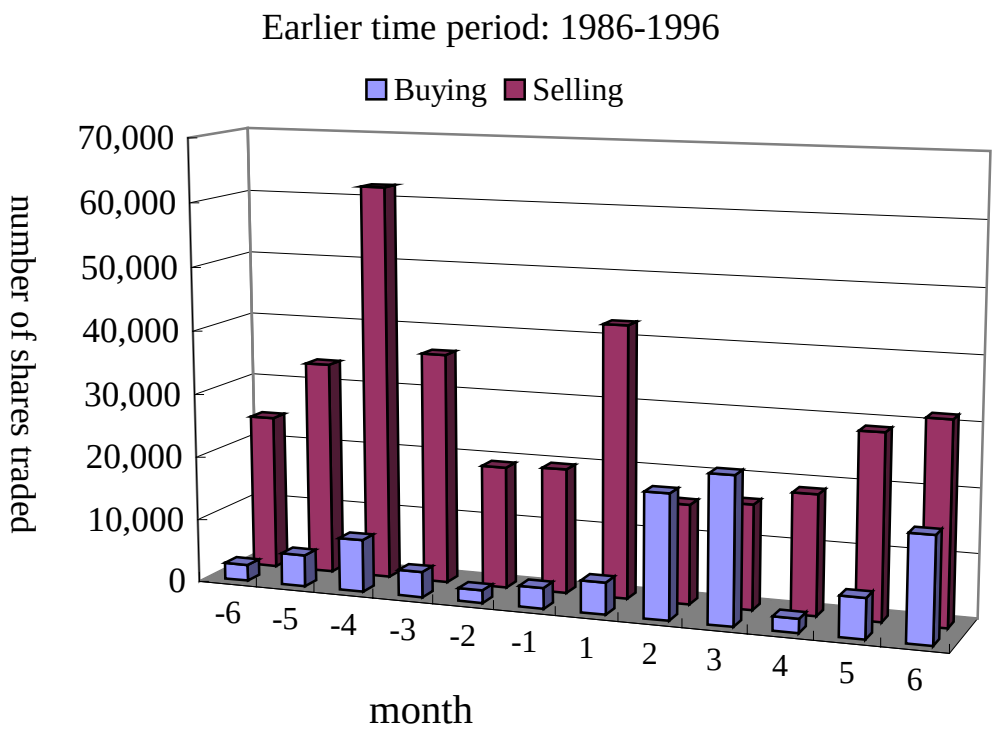
(a) Monthly Insider Trading around Acquisitions by All Acquirers




(b) Monthly Insider Trading around Acquisitions by "Pure Seller" Acquirers



(c) Monthly Insider Trading around Acquisitions during the earlier period (1986-1996)




(d) Monthly Insider Trading around Acquisitions during "hot market" period (1997-2000)

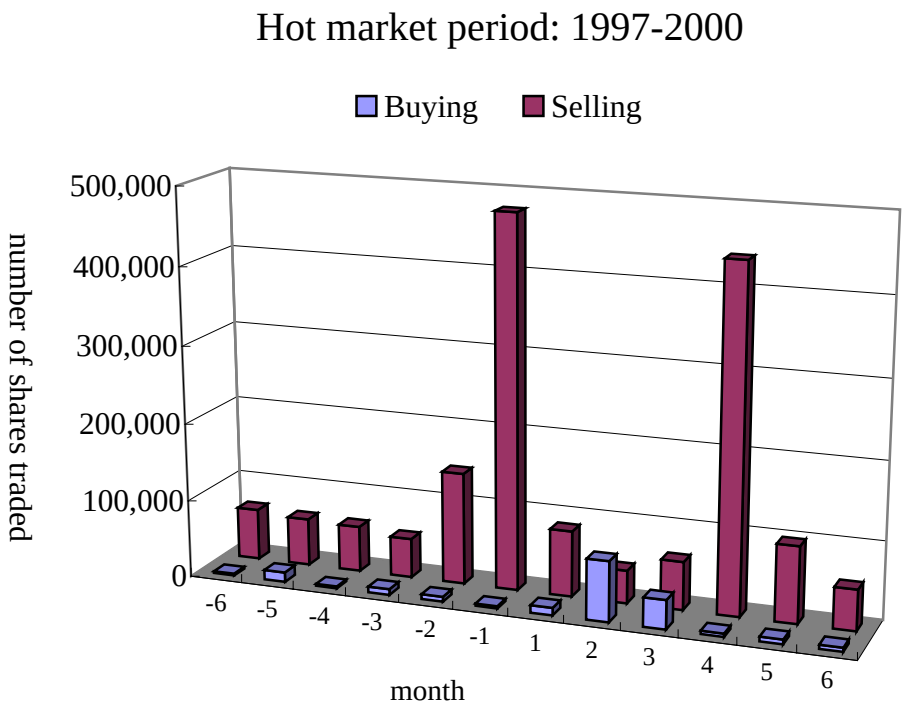


**Figure 2:**
This figure demonstrates the pre- and post-acquisition performance of acquiring firms and their matching firms across different insider trading patterns on an equal-weighted basis. The matching firms of sample firms (acquirers) are chosen based on similar size, B/M and prior 1-year stock return.