

Do insiders trade strategically within the SEC Rule 10b5-1 safe harbor?

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Abstract: The SEC enacted Rule 10b5-1 to deter insiders from trading with private information, yet also protect insiders' preplanned, non-information-based trades from litigation. Despite its requirement that insiders plan trades when not privately informed, the Rule appears to enable strategic trade. Participating insiders' sales systematically follow positive and precede negative firm performance, generating abnormal forward-looking returns larger than those earned by non-participating colleagues. Neither market transaction disclosure response nor "predictable" reversion following positive performance appears to explain the association between 10b5-1 sales and negative future performance. There is evidence, however, that a substantive proportion of randomly drawn plan initiations are associated with pending adverse news disclosures. There is also evidence that early sales plan terminations are associated with pending positive performance shifts, reducing the likelihood that insiders' sales execute at low prices. Collectively, this suggests that, on average, trading within the Rule does not solely reflect uninformed diversification.

Keywords: *Insider trading; Securities Exchange Act of 1934; diversification trade; planned trade.*

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Introduction

This study examines whether insiders strategically trade within the SEC Rule 10b5-1 safe harbor. The Rule protects insiders' trades from civil or criminal penalties if they are planned in advance when insiders do not possess material nonpublic information. Certain Rule provisions, however, may allow insiders to trade strategically and earn abnormal trade rents while still obtaining legal protection within the safe harbor. The potential for insiders to protect strategic trade makes the Rule interesting since it seems to conflict with regulatory intent and since there appears to be broad use of the Rule in the market.

An analysis of Rule 10b5-1 provides an understanding of how insiders respond to a regulation that both increases insiders' trade risk by implementing a stricter enforcement standard, and decreases insiders' trade risk by implementing a safe harbor to protect certain trades. The ambiguous effect of the regulation on insiders' trade risk makes this analysis different from prior research that shows that regulation limits insiders' profitable trade opportunities. Prior research shows that insiders appear reluctant to trade profitably before forthcoming news events (Givoly and Palmon, 1985); earnings announcements (Park, Jang, and Loeb, 1995), and management earnings forecasts (Penman, 1982; Noe, 1999). Insiders also appear to reduce profitable trade before takeover announcements (Seyhun, 1992) and before negative earnings surprises (Garfinkel, 1997) in response to regulation or case law that increases penalties for illegal insider trading.

This study should interest those who would like to evaluate the effect of the Rule, since the Rule is intended to deter insiders from trading with material nonpublic information, yet protect trades by uninformed insiders from legal liability. Regulators, for example, might be interested in whether insiders mimic Kenneth Lay, who relied on the Rule to protect up to \$100 million in

personal stock sales prior to Enron's demise.¹ This study should also help firms and insiders assess costs and benefits of establishing trade plans within the Rule's safe harbor.

Ex ante, it is not clear whether the Rule provides insiders the opportunity to strategically trade. The safe harbor requires insiders to plan trades when they do not possess material nonpublic information, so insiders should not be able to systematically earn abnormal rents in an efficient market. Trades planned in advance are also subject to greater future uncertainty, thereby making their profit potential less certain. Yet, certain Rule provisions may protect insiders' strategic trades, allowing insiders to earn abnormal trade returns and perhaps encouraging them to trade when they might not have otherwise.²

Evidence suggests there is an association between Rule 10b5-1 participation and abnormal trade returns, rejecting the notion that trading within the Rule solely reflects uninformed diversification. Specifically, participants' sales, which comprise the bulk of trade within 10b5-1, tend to follow price increases and precede price declines generating statistically significant forward-looking abnormal returns. Participants' abnormal trade returns are, in fact, systematically larger than returns to other within-firm colleagues, who choose not to participate within the Rule, reducing the likelihood that observed 10b5-1 trade returns reflect omitted firm-, industry-, market-, or other macro-level factors.

Evidence suggests the observed association between 10b5-1 sales and negative future returns is not explained by market transaction disclosure response or "predictable" reversion following positive performance (DeBondt and Thaler, 1985). Specifically, there is no evidence of a

¹ Lichtblau, Eric, and David G. Savage. "Convictions for Enron Execs Would Be Hard Won." *Los Angeles Times*. January 28, 2002.

² Glen Meakem, chairman and CEO of FreeMarkets Inc., sold \$3,000,000 of stock in 2001 within a Rule 10b5-1 trading plan where the final trade occurred five days before the company lowered earnings guidance for the year. "It [is] fair to assume that if the rule had not been adopted, he might have thought twice before selling so much stock in advance of an earnings report" (Lane, Marc J. December 3, 2001. *SEC Insider Trading Rule Doesn't Instill Confidence*. Crain's Chicago Business [cited October 2, 2003]). <<http://www.marcjlane.com/article/SECinsider120301.html>>.

negative market response to disclosure of 10b5-1 transaction filings with the SEC. In addition, there is no evidence of “predictable” systematic price reversion following price run-ups in a large cross-section of non-sample firms and in the pre-10b5-1 returns history for the sample firms.

There is some evidence, however, that a substantive proportion of randomly selected 10b5-1 plan initiations are associated with pending adverse news disclosure and that early sales plan termination is, on average, associated with pending positive firm performance. This evidence, in part, provides some explanation for the abnormal returns patterns associated with 10b5-1 sales transactions.

Collectively, the results of this study reject the notion that trade within the Rule is purely liquidity- or diversification-driven, which may have policy implications if the intent of the regulation is to hinder insiders’ strategic trade. The results of this study also suggest that participants’ trade predicts future market performance. This may have implications for outside investors who might look to insiders’ trade signals to develop profitable trading strategies.³ Finally, the results of this study suggest a predictable relationship exists between regulation that lowers insiders’ trade risk and insiders’ trade behavior.⁴

This paper proceeds as follows: Section I provides background information about SEC Rule 10b5-1. Section II presents the hypotheses. Section III presents the sample. Section IV presents results. And Section V concludes the paper and discusses future research ideas.

I. Rule 10b5-1

The SEC released Rule 10b5-1 in October 2000, in part to deter insiders from trading while in possession of material nonpublic information. The Rule specifically makes trading while in

³ See Seyhun (2000) for a summary of the potential for outside investors to profit from mimicking insiders’ trades.

⁴ Jaffe (1974) and Seyhun (1992) do not find evidence that regulation that increases insider trading enforcement and penalties had a decreasing effect on insider trading volume and profitability. So there is some ex ante ambiguity regarding the association between regulatory litigation risk and insiders’ trade behavior.

possession of material nonpublic information illegal across all jurisdictions. Prior to the Rule, the SEC enforced this possession standard but some courts instead enforced a use standard.⁵ For trading to be deemed illegal, these courts required proof that an insider actually used material nonpublic information in his possession as a basis for his decision to trade. The use standard thereby allowed an insider in these jurisdictions to avoid legal jeopardy by credibly demonstrating that possession of nonpublic information did not influence his decision to trade.⁶ The SEC enacted the Rule to effectively eliminate the use standard because it is “highly doubtful that a person who knows inside information relevant to the value of a security can completely disregard that knowledge when making the decision to purchase or sell that security. ...Indeed, even if the trader could put forth purported reasons for trading other than awareness of the inside information, other traders in the marketplace would clearly perceive him or her to possess an unfair advantage.”⁷

The SEC implemented relief within the Rule because it recognized that the possession standard limits insiders’ ability to trade for diversification since insiders routinely possess material nonpublic information. The Rule provides an affirmative defense against litigation to insiders who preplan trades when they do not possess material nonpublic information. This safe harbor does not prevent a party from initiating a lawsuit against insiders, but it does provide

⁵ For example, *United States v. Adler*, 137 F.3d 1325 (11th Cir. 1998) and *United States v. Smith*, 155 F.3d 1325 (9th Cir. 1998) supported the use standard.

⁶ Usually, this argument requires the insider to demonstrate some tangible need for the proceeds from the equity transaction (for example, a house purchase).

⁷ Proposed Rule: S7-31-99, IIIA. *Rule 10b5-1: Trading “On the Basis of” Material Nonpublic Information*. The Securities and Exchange Commission. Cited November 27, 2003. <<http://www.sec.gov/rules/proposed/34-42259.htm>>.

insiders a defense “which, if found to be credible, will negate criminal or civil liability, even if it is proven that the defendant committed the alleged acts.”^{8,9}

To qualify for the affirmative defense, insiders must: (1) enter into an explicit contract to purchase or sell firm securities; (2) transfer trade execution authority to an uninformed third party (for example, a broker); or (3) provide an uninformed broker an explicit written algorithm for trade execution. Many insiders choose option (3) since it provides a written record of the agreement that can be produced, if needed, for defense. Option (3) plans often outline specific dates for trades to execute or outline trade execution windows in which trades should execute subject to limit orders. Appendix A provides one example.

Insiders may find trading within the Rule costly because the Rule limits their ability to influence trades after plans have been initiated. The Rule expressly prohibits insiders’ subsequent influence over whether specific planned trades may execute. Insiders may, however, selectively terminate their plans before they are scheduled to expire or selectively execute additional trades outside of their plans. These selective acts may compromise the Rule’s legal protection or trigger a negative market response. The SEC suggests that “termination of a plan...could affect the availability of the Rule 10b5-1(c) defense for prior plan transactions if it calls into question whether the plan was ‘entered into in good faith.’”¹⁰ A roundtable of corporate attorneys suggests that trading outside of an existing plan, particularly to hedge or negate positions within the plan, will likely jeopardize the plan’s legal protection.¹¹ And there is

⁸ Quinlivan, S., and M. Phelps. June 6, 2001. *SEC Rule 10b5-1: A New Opportunity for Officers and Directors of Public Companies to Sell Stock Legally* [online]. Minneapolis: Leonard, Street, and Diernard law firm. Cited October 2, 2003. <<http://www.leonard.com/generic.asp?item=/frontpageweb/generic/newsitem53.html>>.

⁹ Legal Information Institute, Cornell Law School [cited June 6, 2003]. <http://www.law.cornell.edu/lexicon/affirmative_defense.htm>.

¹⁰ Division of Corporation Finance: Manual of Publicly Available Telephone Interpretations, May 2001. <<http://www.sec.gov/interps/telephone/phonesupplement4.htm>>.

¹¹ “Electronic Roundtable on Rule 10b5-1.” [Cited: May 29, 2003]. <<http://www.realcorporatelawyer.com/ElectronicRoundtable10b5-1.html>>.

anecdotal evidence that the market reacts negatively to a failure to comply with a preannounced trade commitment.¹²

Some 10b5-1 use is not observable since the SEC allows firms to choose who participates within the Rule and whether participation is disclosed. In most firms, the board chooses whether to amend insider trade policy to allow 10b5-1 trade. Then firms generally delegate the decision of whether to trade within 10b5-1 to the insider.¹³ In April 2002, the SEC proposed to mandate 8-K disclosure of insiders' enrollment in 10b5-1 trading plans and also considered mandating disclosure of 10b5-1 participation within Form 4 for trades that are executed pursuant to these plans.¹⁴ This proposal, however, has been tabled indefinitely.¹⁵ Some firms, however, choose to voluntarily disclose participation in 10b5-1 trading programs, which provides the opportunity to identify the sample used in this study.

II. Hypotheses

This study examines 10b5-1 participants' trade returns and trade patterns to provide inferences regarding whether trades appear to be executed strategically or for uninformed diversification. It is not possible to directly observe the relationship between insiders' trades and insiders' nonpublic information, so one must draw inferences regarding this relationship from ex post realizations of trade returns (e.g., Jaffe, 1974) and the timing of trades relative to material information disclosure events (e.g., Karpoff and Lee, 1991; Seyhun, 1992; Seyhun and Bradley, 1997; Noe, 1999).

¹² Healthon/WebMD's price fell 37% after the market discovered that two prominent insiders failed to comply with their publicly announced commitment to purchase shares. (Simons, David. *Healthon/WebMD's Misguided PR Scheme*. Forbes.com. [Cited: August 9, 2000]. <<http://www.forbes.com/2000/08/09/mu6.html>>.

¹³ A few firms mandate trade through 10b5-1 to reduce litigation risk and reduce stock price sensitivity to insider trade signals. Most firms, however, allow insiders the choice to trade within 10b5-1 because they value insider trade flexibility. This is consistent with Roulstone (2003), who finds that firms that limit insider trade flexibility incur additional compensation expense.

¹⁴ "Form 8-K Disclosure of Certain Management Transactions," SEC Release No. 33-8090, April 12, 2002.

¹⁵ Phone conversation with SEC Division of Corporate Finance, March 24, 2003. Status confirmed with the SEC on October 30, 2006.

Abnormal Returns

One should not observe abnormal trade returns if participants comply with the Rule's proscription that trades be planned absent private information.¹⁶ The strength of the Rule's legal defense relies on this notion that insiders will, in good faith, not plan trade when they possess material nonpublic information. In fact, for the legal defense to hold, the burden of proof rests with insiders to show they have complied with the Rule.¹⁷ Therefore, it is possible that there is no association between participants' trades and abnormal returns.

On the other hand, one might observe abnormal trade returns if some elements of the Rule allow participants to trade strategically. This is possible if (1) insiders believe other provisions of the Rule inadvertently reduce litigation risk for informed trade; (2) the Rule opens otherwise restricted trade opportunities; (3) the Rule allows insiders to manipulate the timing or content of information disclosures subsequent to plan initiation; or (4) the Rule allows participants to selectively terminate their trading plans at times when participants possess nonpublic information.

The Rule may, inadvertently, reduce informed trade litigation risk because the Rule applies the possession standard at the initiation date of the plan, not at the execution dates for trades within the plan. This shift forward makes it more difficult for shareholders or the SEC to link possession of information to execution of abnormally profitable trades.¹⁸

¹⁶ Systematic abnormal trade returns are generally indicative of insiders' information advantage (Finnerty, 1976).

¹⁷ Quinlivan, S., and M. Phelps. June 6, 2001. *SEC Rule 10b5-1: A New Opportunity for Officers and Directors of Public Companies to Sell Stock Legally* [online]. Minneapolis: Leonard, Street, and Dienard law firm. Cited October 2, 2003. <<http://www.leonard.com/generic.asp?item=/frontpageweb/generic/newsitem53.html>>.

¹⁸ An example can illustrate this point. An insider sells shares the day before her firm releases news that triggers a large stock price decline. Without 10b5-1, courts evaluate whether she possessed material nonpublic information regarding the news release on the transaction date. Because of close proximity, there is a greater probability that courts will link the transaction with possession. However, if the transaction was planned six months earlier within the Rule, courts must now assess whether she possessed material nonpublic information regarding the news release at the plan initiation date. Because of the distance between events, it will be more difficult for courts to link the transaction with possession.

The Rule opens otherwise restricted trade opportunities because some firms allow plan trades to execute within “blackout windows,” such as prior to earnings announcements, where trading by insiders is normally forbidden.^{19,20} Further, the SEC allows 10b5-1 trades to execute during pension fund blackout windows.²¹ This may provide an incentive and enhance the opportunity for participants to trade during periods when they have a distinct information advantage.

The Rule may provide participants the opportunity to manipulate the timing or content of disclosures related to material information obtained subsequent to faithful plan initiation. This is because the Rule does not require an insider to abstain from trade if she obtains material nonpublic information after she has initiated her trading plan. Therefore, insiders with existing plans can disclose subsequently obtained material nonpublic information when it maximizes planned trade profits.²²

Finally, the SEC allows participants to terminate plans before events or changes in firm performance that might negatively affect their trade returns. As discussed in Section I, this may affect participants’ ability to successfully invoke the Rule’s legal defense, however, termination by insiders who possess nonpublic information is not illegal, according to the SEC.²³

Trade strategies

It is not clear, *ex ante*, whether participants will opt to trade strategically since doing so may jeopardize the legal defense provided within the Rule. However, if they choose, there are several

¹⁹ Firms’ use of the Rule as a substitute for blackout windows was confirmed through discussion with several firms’ corporate attorneys and a review of several firms’ publicly disclosed insider trading policies.

²⁰ See Jeng (1999); Bettis, Coles, and Lemmon (2000); and Roulstone (2003) for discussion about firm-imposed blackout windows.

²¹ Rule 101(c) of Regulation BTR, 17 CFR 245.101(c).

²² Aboody and Kasznik (2000) show evidence that firms strategically modify news disclosure timing to lower employee option grant exercise prices.

²³ The SEC explicitly states that the act of terminating a plan while aware of material nonpublic information does not result in liability under Section 10(b) and Rule 10b-5 because these regulations strictly apply in connection with the purchase or sale of a security. Therefore, a purchase or sale of a security must be present for liability to attach. See SEC Division of Corporate Finance: Manual of Publicly Available Telephone Interpretations, Fourth Supplement, May 2001: “Written Trading Plans” para. 15.

implementable trade strategies that might allow 10b5-1 participants to generate positive abnormal returns. Informed participants, for example, may plan trade in anticipation of pending firm news events if they feel there is a low likelihood that outsiders will discern possession of information at plan initiation. Alternatively, participants may modify the timing or content of news announcements to increase returns on previously planned trades. Participants may also terminate their trade plans prior to events or price movements that would otherwise reduce their trade returns.

Anticipating pending events or modifying event disclosures

Informed 10b5-1 insiders may plan trade in anticipation of pending firm news events if they feel there is a low likelihood that outsiders will discern possession of information at plan initiation. Insiders may also modify disclosure timing or quality surrounding pending trades to increase trade returns. It is not possible to directly examine, through publicly available data, whether either strategy is specifically utilized. However, one might infer whether 10b5-1 trade is generally strategic by examining the association between 10b5-1 trade volume and pending firm news events. Strategic trade should generate a predictable association, namely that there will be greater sales trade preceding negative firm events and greater purchase trade preceding positive firm events.

Planning trade with current, short-term information

If informed participants plan trade to anticipate the news in pending events, they may be inclined to initiate their trade plans while their information is current. If insiders' nonpublic information generally loses value with the passage of time and participants plan trade to fully capture the value of private information they possess at plan initiation, then one should observe higher trade returns for trades executed in closest proximity to the plan initiation date.

Terminating trade plans

Early termination of trade plans is not illegal, even for participants who possess material nonpublic information at the termination date. It is therefore possible that some participants will terminate their plans when it appears that plan continuation would negatively impact pending trade returns. If so, then one would observe an association between the timing of termination and a shift in returns that would otherwise induce negative returns to pending plan trades.

III. Sample

Rule 10b5-1 participants are identified from voluntary disclosure in SEC Form 4 and 8-K filings and in business press newswire releases. Table 1, Panel A shows that 3,426 insiders from 1,241 firms are identified from Form 4, 8-K, and business wire disclosures between October 2000 and December 2005. Most observations derive from Form 4 disclosures, thereby weighting the sample to periods that follow mandatory Form 4 electronic filing (May 7, 2003). Panel A shows little overlap between Form 4 and 8-K or business wire disclosure. Therefore, the sample size is increased by appending insider and firm observations from firms that disclosed participation through means other than Form 4.

Since the sample is drawn from firms that voluntarily disclose 10b5-1 participation, some inference issues arise. Specifically, there may be systematic differences between firms that voluntarily disclose 10b5-1 participation and firms that do not (in governance characteristics, for

example), that may impact how participants trade within their plans.²⁴ Therefore, it is not clear to what extent the results of this study can be generalized to the market at-large.²⁵

Table 1 provides descriptive statistics for the disclosure firms (Panel B), their insiders (Panel C), and insiders' trade activity (Panel D). Panel B of Table 1 shows that disclosure firms are smaller (lower assets, sales, and market value of equity), on average, than firms in the S&P 500 index, yet are larger than those listed on the Nasdaq exchange. Most disclosure firms are listed on Nasdaq (59.2%), and the New York Stock Exchange (35.0%). Some disclosure firms are ranked in the Fortune 500 (12.1%) or are included in the S&P 500 (13.6%).

Panel C of Table 1 shows that most 10b5-1 participants are top-level managers. There is some lower-level management representation within this group (for example, Corporate Secretary), so the Rule does not appear to be exclusively available to top management.

Panel C and Panel D of Table 1 show that 10b5-1 trades are predominantly sales. This is consistent with insiders using the Rule to protect sales since insiders' sales are subject to greater litigation risk relative to insiders' purchases.²⁶ Specifically, the average total dollar volume of sales is almost seventeen times that of purchases during the period. There are also approximately 29 sellers for every one purchaser.

²⁴ There appears to be reasonably broad participation by insiders who cannot be observed because their firms provide no disclosure. I conduct a survey of 2,690 Nasdaq-listed firms that did not disclose insider participation within the Rule between October 20, 2000 and December 31, 2002. Almost 18% of the 378 survey respondents report that their firms had at least one insider participating within a 10b5-1 trading plan during the period. Several respondents reporting no participation also indicated that insiders at their firms might participate in the near future. This evidence, suggests that participation within the Rule extends beyond the sample in this study, and therefore has broader market implications.

²⁵ Results in this paper may understate the extent of strategic 10b5-1 trade activity by insiders at nondisclosure firms. There may be more strategic trade within the Rule at nondisclosure firms because there is less ability to monitor insiders' compliance. Participating insiders at nondisclosure firms, for example, may find it easier to terminate plans before poorly-timed trades execute since the market is not aware these plans exist. The study still provides insight into how some participants utilize the Rule and the within-firm research design (that examines Rule participants and non-participants from within the same firm) helps ensure that results reported herein are not influenced by systematic bias associated with disclosure choice.

²⁶ Johnson, Nelson, and Pritchard (2006) show that insiders' net purchase volume (i.e., purchase minus sales volume) is inversely associated with the probability that a firm will be named as a 10b5 class action suit defendant.

Table 2 shows the industry distribution for the sample firms. Rule 10b5-1 use appears to be distributed across industry classifications with some clustering in industries that Rogers and Stocken (2005) show to have greater general levels of litigation risk (e.g., biotechnology and electronics).

IV. Empirical Results

I identify actual 10b5-1 trade executions utilizing all electronically filed Form 4 footnote disclosures (in the SEC EDGAR database) that annotate 10b5-1 compliance, between October 2000 and December 2005. I also append all open-market transactions (from Thomson Financial Insider Trading database) that occur within the 350-calendar-day window subsequent to an 8-K or business wire disclosure of 10b5-1 plan commencement. I assume that all transactions during this window, which reflects the average disclosed trading plan length (Table 1, Panel D), are pursuant to the insiders' 10b5-1 plan.²⁷

Abnormal Returns

One should not observe a systematic relationship between insiders' trades and future returns if insiders' trades are not strategic. Therefore, to generally assess the degree of strategic trade within the Rule, I first examine the association between returns and trades executed by disclosed 10b5-1 participants. Figure 1, Panels A and B provide graphs of the average cumulative abnormal return preceding and following randomly selected 10b5-1 sales and purchase transactions from each sample firm. A typical firm has multiple 10b5-1 participants who execute multiple transactions during the period. To estimate Figure 1, one sales and one purchase trade are selected from each firm's multiple transaction pool to mitigate the potential that overlapping returns or multiple firm observation bias will confound results. To mitigate the potential for

²⁷ This assumption seems appropriate since it is costly for participants to trade outside of their plans (see section I) and misclassification error should bias against results. Results are similar when analyses are estimated solely on the Form 4 disclosure sample.

randomly drawing a single influential observation, the random draw procedure is iterated 100 times and the average of the iterations is plotted.²⁸ Both Panels show a discernable kink in the returns pattern, centered on the trade execution date. These returns patterns are similar in nature to those observed in studies that infer strategic behavior related to employee option grants (e.g., Yermack, 1997; Aboody and Kasznik, 2000; Lie, 2005). Specifically, sales transactions appear to follow systematic run-ups and precede systematic declines.²⁹ Purchase transactions appear to follow systematic declines and precede systematic run-ups.

Patterns in Panels A and B support the notion that selected trades appear strategically timed, however, they do not, by themselves, necessarily relate to Rule 10b5-1 use. To obtain better inference regarding Rule 10b5-1, Panels C and D compare 10b5-1 trade returns to trade returns for same-firm insiders who transact outside of the Rule. Panel C shows a marked after-trade pattern difference between the 10b5-1 sales (solid line) and sales executed outside of the Rule (dashed line). Specifically, only sales executed within 10b5-1 appear to systematically anticipate pending firm performance declines. Panel D, on the other hand, does not show a marked difference across trader types for post-purchase performance, suggesting that all traders' purchases anticipate price increases.³⁰

To provide further evidence regarding the association between 10b5-1 trade and returns, I compute one-, three-, and six-month future buy-and-hold abnormal returns for each trade executed. I estimate buy-and-hold returns to better assess potential trade gains from the insiders'

²⁸ Results are similar for draw iterations of 1, 10, 50, and 1,000.

²⁹ The sales CAR pattern differs markedly from the general insider sales CAR pattern presented in Jeng, Metrick, and Zeckhauser (2003), Figure 2. Jeng et al. (2003) show that CARs subsequent to insiders' sales transactions between 1975 and 2006 are flat and approximate 0% for up to 100 days.

³⁰ Lakonishok and Lee (2001) document that insiders' purchases are generally associated with future positive returns performance.

personal perspective (Barber and Lyon, 1997).³¹ To mitigate issues related to overlapping return windows and to better understand general insider trade behavior, I dollar weight and then average transaction returns to each insider. Specifically, I compute *WtAbnRet* as

$$\sum_{j=1}^J \frac{DollarVol_j}{\sum_{j=1}^J DollarVol_j} (BHR_w - VWBHR_w)_j,$$

where *DollarVol* is the trade dollar volume, *BHR_w* is the trade's *w*-month buy and hold return, *VWBHR_w* is the *w*-month buy and hold return to the CRSP value-weighted portfolio, *j* is a subscript for each trade executed during the period, and *w* is a subscript for the one-, three-, or six-month returns horizon, respectively.

Table 3 presents a comparison of 10b5-1 participants' sales- and purchase-related *WtAbnRet* to *WtAbnRet* generated by nonparticipants from the same firm. Comparing participants' returns to nonparticipants' returns during a similar period provides some control for firm-, industry-, and macro-level variables that may otherwise influence participants' trade returns.

The top panel of Table 3 documents the one-month weighted buy-and-hold return, *Run-up*, that precedes insiders' sales transactions. On average, both participants and non-participants observe statistically positive price movement before sales trades execute. The top panel also reports one-, three-, and six-month horizon *WtAbnRet* estimates for both groups. For all three returns horizons, the mean *WtAbnRet* is statistically more negative for 10b5-1 participants than for non-participants from the same firms. Participants' 1%, 2.9%, and 4.1% greater negative one-, three-, and six-month returns confirms the plot in Figure 1, Panel C that shows that 10b5-1 sales have a greater association than non-participating sales with future returns declines.

The bottom panel of Table 3 reports returns related to insiders' purchase transactions. There is some evidence that purchases by both trader types precede price increases, confirming the plots in

³¹ Several papers (e.g., Barber and Lyon, 1997; Kothari and Warner, 1997; Mitchell and Stafford, 2000) document bias in buy-and-hold return estimates over long horizon windows. To mitigate potential bias in my returns estimates, I report short-horizon window (i.e., one- and three-month) buy-and-hold returns and also show alternative abnormal returns estimates in subsequent analyses.

Figure 1, Panels B and D. Also consistent with Figure 1, Panel D, there is no evidence that 10b5-1 purchases better predict future positive returns relative to non-participant purchases. In fact, it appears that, on average, non-participant purchases have a greater association with future performance increases, which may indicate that insiders do not generally regard purchases before price increases as high-risk transactions.

Insider characteristics associated with self-selection into trader groups could influence the *WtAbnRet* results documented in Table 3. To control for self-selection, I regress *WtAbnRet* in a second-stage regression that includes a dichotomous partitioning variable for 10b5-1 participation and an Inverse Mills ratio computed from a first stage probit regression that estimates the decision to participate in a 10b5-1 program.³² Inclusion of the Inverse Mills ratio does not affect the statistically negative association between 10b5-1 participation and *WtAbnRet* computed over all three horizons (results not tabulated).

Alternative Abnormal Returns Estimates

Inferences regarding the association between 10b5-1 and abnormal returns rely heavily on the estimation used to compute expected returns. To assess the sensitivity of *WtAbnRet* to the choice of portfolio benchmark, I also compute *WtAbnRet* by replacing the value-weighted CRSP portfolio return with the return to the equally-weighted CRSP portfolio, the return to the equally-weighted Nasdaq firm portfolio, and the return to the equally-weighted S&P 500 firm portfolio. Results (untabulated) are similar for all other benchmarks.

Inferences regarding the association between 10b5-1 participation and returns may be confounded by distributional biases in buy-and-hold returns (Barber and Lyon, 1997; Kothari and Warner, 1997; Mitchell and Stafford, 2000). To provide further evidence regarding the association, and mitigate the risk of bias in abnormal returns estimates, I also estimate monthly

³² The probit regression (results not tabulated) finds that participation is associated more with the CEO and President officer positions, greater firm holdings, greater stock based compensation, and greater prior period sales frequency.

firm excess returns after controlling for factors shown by Fama and French (1993) and Carhart (1997) to explain firm returns. Specifically, I randomly select one 10b5-1 transaction and one nonparticipating transaction from each sample firm between 2001 and 2005. I then estimate the following firm-specific monthly regression for the 1,116 sales and 65 purchase transaction firms that have at least 20 months of returns data available during the window.

$$(R_h - R_f)_t = a_0 + \sum_{t=-3}^{+6} a_{t+4} MonthDum_t + a_{11} (R_{mkt} - R_f)_t + a_{12} SMB_t + a_{13} HML_t + a_{14} MOM_t + v_t \quad (1);$$

where R_h is the monthly firm return, R_f is the monthly risk-free interest rate; $MonthDum$ is a dichotomous variable that equals one if the observation falls within the specified month and is zero otherwise; R_{mkt} is the monthly value-weighted market average return, SMB , HML , and UMD are the monthly size, book-to-market, and momentum mimicking factor returns (Fama and French, 1993; Carhart, 1997); and t is a subscript denoting month.

Table 4 reports the average cross-sectional coefficient estimates for regression equation (1). To mitigate the potential for randomly drawing a single influential observation, the transaction random draw and regression estimation is iterated 100 times and the average of these iterations is reported.³³ The coefficients of interest in Table 4 are those relating to months one through six that follow the transaction month (i.e., $MonthDum_{+1}$ through $MonthDum_{+6}$). These coefficients reflect the difference in mean excess return attributable to months that follow specified transactions, relative to baseline estimation months (months that precede $MonthDum_{.3}$ or follow $MonthDum_{+6}$ whose mean excess return will be captured in the intercept). The net mean excess return attributable any given month of interest can be computed by adding the intercept coefficient estimate to the coefficient estimate for $MonthDum_t$.

³³ Results are similar for draw iterations of 1, 10, 50, and 1,000.

Table 4, Panel A reports estimation results for randomly selected sales transactions. When excess return estimates for 10b5-1 participants are compared to those for non-participants, a pattern consistent with Table 3 and Figure 1 is observed. Specifically, the estimates show that only 10b5-1 sales transactions are statistically associated with negative mean excess returns in the months that follow transaction execution. Mean excess return estimates ($a_0 + MonthDum_t$) are statistically negative for months + 1 through + 5 and are statistically more negative for participants than non-participants for months + 1 through + 4. The cumulative six-month excess return following 10b5-1 sales is -5.9% , which approximates buy-and-hold return estimates and is statistically more negative than the modestly positive (1.5%) estimated excess return associated with non-participants sales.³⁴

Results in Table 4, Panel B neither support nor conflict with prior evidence regarding the association between 10b5-1 purchases and returns. Table 4, Panel B does not provide evidence that 10b5-1 purchase transactions are associated with excess returns or with returns that differ from non-participants' purchase transactions.

Collectively, results in Table 4 provide further evidence of a systematic association between 10b5-1 sales and negative future performance, casting doubt that sales within the Rule solely reflect uninformed diversification.

Alternative Hypotheses

At least two alternative hypotheses may, in part, explain the observed association between 10b5-1 sales and subsequent negative abnormal returns. The first hypothesis suggests that a

³⁴ The cumulative six-month excess return of -5.9% appears slightly more negative than the abnormal return documented by Seyhun (1992) following net insider sales months between 1975 and 1989 (-5.3% , Table 3). The cumulative six-month excess return appears markedly more negative than returns following sales documented by Jeng et al. (2003, -0.05% , Table 1) who control for Fama and French (1993) factors and estimate returns on more recent data (1976 through 1996). The estimated cumulative six-month excess return also appears substantive when considering that no evidence of an association is detected between insiders' sales and subsequent negative firm performance in other recent studies (e.g., Lakonishok and Lee, 2001; Jenter, 2005).

negative association might develop if the market responds negatively to Form 4 disclosure of insiders' sales transactions. The second hypothesis suggests that a negative association might develop if 10b5-1 sales plans include graduated limit orders and "predictable" mean reversion occurs subsequent to fulfillment of the limit orders (DeBondt and Thaler, 1985).³⁵

Market Response to 10b5-1 Sales Disclosure

The market might respond negatively to insiders' sales transactions if the market suspects the transactions indicate insiders' private information or if the market infers insiders have unwound a previously-optimal level of equity incentives. To examine whether the market responds negatively to 10b5-1 sales transactions, I estimate the three-day cumulative abnormal return, centered on the Form 4 transaction disclosure date, for 23,340 sales transactions executed by 10b5-1 participants between 2001 and 2005.³⁶ The mean three-day response (raw return minus raw return to the value-weighted CRSP portfolio) is 0.21% (t -statistic = 6.80), which does not suggest the market responds negatively, on average, to Form 4 disclosures of 10b5-1 sales.

"Predictable" Mean Reversion Subsequent to Price Run-ups

If a preponderance of the sample's 10b5-1 sales transactions are executed subject to limit order instructions, then it is possible that the associated subsequent price decline reflects "predictable" mean reversion that "naturally" occurs after a sustained run-up in returns (which, presumably, would trigger the limit order sales).³⁷ To examine whether the potential exists for

³⁵ If true, this second hypothesis would also bias the $WtAbnRet$ estimates since the dollar weighting increases as higher graduated limits are executed.

³⁶ Form 4s must be electronically filed within two days of transaction execution. If transaction execution authority has been delegated to a third party (as is the case for some 10b5-1 plans), the third party must notify the insider of trade execution within two days. The Form 4 must then be electronically filed within two days of insider notification.

³⁷ It is not possible to discern whether 10b5-1 plans share a common structure since there is no mandate to disclose 10b5-1 plan terms. It is possible, however, that a number of plans observed in the sample contain instructions to execute sales subject to meeting limit order thresholds. Several of the few publicly disclosed explicit trading plans delineate graduated limit order sales thresholds, where instructions dictate greater sales volume after meeting higher price thresholds.

“predictable” mean reversion following price run-ups, I estimate the post-run-up returns to non-sample firms that observe a similar one-month price run-up between 2001 and 2005, and to sample firms that observe a similar one-month price run-up between 1997 and September 2000 (before Rule 10b5-1 enactment).³⁸ If post-run-up mean reversion is “predictable”, then one would expect to observe similar magnitude reversion in the alternative samples.

Table 5 presents results for the analysis of “predictable” mean reversion in the alternative samples. By design, the one-month *Run-up* estimate of 4.5% approximates the observed buy-and-hold performance preceding insiders’ 10b5-1 sales (Table 3). In contrast to Table 3 results, however, the subsequent *AbnRet* estimates are not statistically negative for either alternative sample. This casts doubt that one might expect “predictable” mean reversion of the observed magnitude following similar price run-ups (that presumably trigger limit order sales).

Trade patterns

The previous analyses show that 10b5-1 participants, on average, generate abnormal trade returns from sales transactions, suggesting that there may be strategic trade within the Rule. In this section, I examine 10b5-1 trade patterns to better discern how insiders may generate the abnormal returns documented above. I first analyze the volume of trade by participants in short windows that immediately precede earnings announcements to determine whether participants’ trades appear to anticipate the pending earnings news. I then analyze the association between specific trades’ abnormal returns and the relative timing of these trades to plan initiation to determine whether participants appear to initiate trading plans when they have current, short term private information. Next, I examine the association between 10b5-1 plan initiation and subsequent adverse news disclosure to determine whether participants’ trades appear to anticipate the pending disclosure news. Finally, I examine the association between firm returns

³⁸ Results are similar when I select firms based on similar three-month run-up returns.

and early sales plan termination to discern whether insiders appear to terminate plans to reduce the likelihood that sales execute at lower prices.

Trade patterns before earnings announcements

It is unclear, ex ante, whether 10b5-1 trades are systematically associated with the news in pending earnings announcements. As mentioned previously, prior research shows that insiders are typically reluctant to trade before pending information releases (for example, Givoly and Palmon, 1985; Noe, 1999; Jagolinzer and Roulstone, 2006) due to litigation concerns or firm-imposed trade restrictions. If participants feel that litigation risk is reduced within the Rule, they may be more inclined to initiate trade before pending information releases, particularly since many firms relax trade blackout restrictions for trades within 10b5-1 plans. To examine whether 10b5-1 participants appear to trade strategically before pending earnings announcements, I examine both participants' and non-participants' sales volume during the 20-trading day window that immediately precedes each firm's quarterly earnings announcements from 2001 to 2005. Of particular interest is whether 10b5-1 participants sell more shares before earnings, when the market infers the earnings news to be negative. Because trade volume in the short window before earnings is censored at zero, I estimate the following Tobit regression:

$$PercVol_{hiq} = b_0 + b_1 Part10b5-1_i + b_2 NegEarningsResp_{hiq} + b_3 (Part10b5-1 * NegEarningsResp)_{hiq} + w_{hiq}, \quad (2);$$

where *PercVol* is the dollar volume of firm equity sold by the insider during the 20-trading-day window preceding a quarterly earnings announcement scaled by the firm's prior quarter market value of equity; *Part10b5-1* is a dichotomous variable that equals one if an insider's trades execute within a Rule 10b5-1 plan and is zero otherwise; *NegEarningsResp* is a dichotomous variable that equals one if the firm's three day market response to its quarterly earnings announcement (the firm's three day raw return, centered on the Compustat quarterly announcement date, minus the three day raw return to the CRSP Value Weighted portfolio) is

negative and is zero otherwise; and h , i , and q , are subscripts denoting firm, insider, and quarter, respectively. If participating insiders tend to sell greater volume before negative earnings news, then the coefficient for $Part10b5-1 * NegEarningsResp$ should be positive.

Table 6 provides results of the Tobit estimation for both sales (Panel A) and purchases (Panel B). The Panel A regression is estimated for 3,312 participants and 9,546 non-participants from 1,167 firms that have an average of 17.74 quarterly earnings announcement dates between 2001 and 2005 with available data from Compustat (the quarterly earnings announcement date) and CRSP (prices). The Panel B regression is estimated for 114 participants and 449 non-participants from 74 firms that have an average of 16.33 quarterly earnings announcement dates between 2001 and 2005 with available data. Regression t -statistics are corrected for firm-level clusters in accordance with Rogers (1993). Both panels show that 10b5-1 participants are more apt than non-participants to initiate sales and purchases in short windows immediately before earnings announcements. The 0.0118 (t -statistic = 6.91) coefficient estimate for $Part10b5-1$ in Panel A suggests that the marginal probability of observing sales trade before earnings increases by 3.2% if the trader participates in Rule 10b5-1.³⁹ Relatedly, the expected increase in trade volume conditional on observing sales trade is 0.129% of market value of equity greater for 10b5-1 participants than for non-participants. Panel B shows similar results regarding purchase volume. Collectively, this suggests that the Rule appears to relax litigation constraints to trade in short windows that precede earnings announcements, which are periods that are frequently otherwise restricted from trade (Jeng, 1999; Bettis, Coles, and Lemmon, 2000; Roulstone, 2003; Jagolinzer and Roulstone, 2006).

³⁹ See McDonald and Moffitt (1980) and Roncek (1992) for discussion of how to interpret Tobit regression coefficient estimates.

Table 6 provides no evidence that Rule 10b5-1 participants increase the probability of trade or the magnitude of trade volume before earnings news that the market perceives to be negative. The coefficient estimate for *Part10b5-1 * NegEarningsResp* is neither statistically positive in Panel A nor statistically negative in Panel B. Therefore, although it appears the Rule relaxes constraints to trade in windows before earnings announcements, there is no systematic evidence of strategic trade in relation to the sign of the earnings news.

Relative trade timing and abnormal returns

The lack of evidence regarding strategic trade in anticipation of earnings news leaves open the question of whether 10b5-1 participants plan trade when they have current, short term private information. While there is no direct method to observe whether participants initiate 10b5-1 plans when they have current, short term private information, one might infer whether this is the case by examining the association between specific trades' abnormal returns and the timing of these trades relative to the initiation of the 10b5-1 plan. If participants plan trades when their information is current and with short-term value, then one would expect higher abnormal returns for those trades executed closest to plan initiation.

To examine this, Figure 2 plots each trade's six-month buy-and-hold abnormal return as a function of its relative sequence from the 10b5-1 plan start date.⁴⁰ Figure 2 includes all trades by participants who disclosed 10b5-1 participation through 8-K or newswire release and who initiated at least five trades within the 350-day period following this disclosure. If participants plan trades when their information is current and with short-term value, one would expect to see decay in abnormal returns as the sequence of trades gets farther along. For sales, this would suggest the largest negative future return is associated with the sale closest to plan initiation. Figure 2 provides evidence that is strongly inconsistent with this hypothesis. It appears, from

⁴⁰ I surrogate the 10b5-1 announcement date for insiders that do not disclose the actual plan start date.

Figure 2 that the largest negative future returns are, instead, associated with trades executed farther away from the 10b5-1 announcement date. This pattern may reflect that insiders are hesitant to place high-profit trades in close proximity to the plan start date since insiders' litigation risk is increasing in proximity.⁴¹

The pattern observed in Figure 2 shows that abnormal trade returns appear to grow more negative as trades sequence grows larger. This observed relationship, however, may be influenced by a potential relationship between abnormal trade returns and the number of trades executed by an insider during the period. For example, it may be the case that insiders who trade more frequently generate more negative abnormal trade returns. To control for this, I estimate a regression where each trade's six-month buy-and-hold abnormal return, *AbnRet*, is regressed on *Sequence*, the numerical timing of the trade in relation to other trades executed in the year, and *NumberTrades*, which is the total number of trades executed by an insider during the year. Specifically, I estimate:

$$AbnRet_{hi} = c_0 + c_1Sequence_{hi} + c_2NumberTrades_i + x_{hi}, \quad (3)$$

where *AbnRet*, *Sequence*, and *NumberTrades* are as defined above and *h* and *i* are subscripts for trade and insider, respectively.

Table 7 summarizes the results from equation (3), reporting insider-level cluster-adjusted *t*-statistics (Rogers, 1993) to control for potential correlation in errors from clustered observations. From Table 7, it appears that, after controlling for the number of trades made by an insider during the period, the negative relationship between *AbnRet* and *Sequence* remains for sales transactions. A similar relationship appears to exist for purchase transactions, suggesting the most profitable purchases are distanced from plan initiation.

⁴¹ As noted in Section 2, courts and regulators apply the possession-of-material-information standard regarding legality of trade at the 10b5-1 plan initiation date. Therefore, if a materially profitable trade is observed in close proximity to the plan initiation date, it increases the likelihood that the trade or the plan may be perceived as illegal.

The relationship between *AbnRet* and *Sequence* for sales transactions fails to support the hypothesis that participants plan trades when they have current private information. It is possible that participants plan trade with information that is of longer duration (for example, Ke, Huddart, and Petroni, 2003 document that insiders trade on long-term information regarding pending breaks in earnings strings) because of litigation concerns. Piotroski and Roulstone, 2005 find that insider trade volume is associated more with longer-term information than contemporaneous information after the passage of two regulatory Acts that increase penalties associated with illegal insider trading. It is also possible that participants do not plan trade with information, but instead modify the disclosure timing or quality regarding information they obtain subsequent to plan initiation.

Rule 10b5-1 plan initiation and subsequent adverse news events

Since there is no evidence of strategic trade in anticipation of earnings news and it appears that abnormal returns tend to generate from sales distanced from plan initiation, it is still unclear what might explain the association between 10b5-1 sales and performance declines. To better assess this, I randomly draw 60 plan announcements from the pool of 8-K and newswire disclosures, to discern the degree to which plan initiation appears associated with pending adverse news disclosures. Table 8 delineates the 60 randomly drawn observations, their industry affiliation, and the number of days that transpire between initiation and a subsequent potentially adverse news event. To gauge whether there are subsequent adverse news events, I examine all Lexis-Nexis businesswire news summaries for reports of adverse news during the 180-day calendar period that follows plan initiation. For 19 firms (32%), I do not discern adverse news within this period, denoted by “n/a” for the number of days. For 41 firms (68%), however, I identify potentially adverse news for which I then compute the three-day raw and market-

adjusted returns.⁴² Eight of the selected event market-adjusted returns are positive, however, Table 8 still provides evidence that a substantive proportion of randomly selected plan initiations precede materially negative news. On average, plan initiation precedes adverse news events (that exhibit a mean market-adjusted return of -9.9%) by 72.2 days.

While Table 8 does not provide insight into whether insiders were informed of pending adverse events at plan initiation or whether disclosure of these events may have been delayed to allow profitable trade execution, it does provide some evidence of an association between plan initiation and adverse news disclosure. Evidence in Table 8 also helps to identify a potential source for the abnormal trade returns documented above.

Price patterns and early plan termination

Another potential source for participants' abnormal sales returns may be selective early termination of sales plans in anticipation of positive returns. As noted in Section 2, selective plan termination is not costless to participants; it may call into question whether the insiders entered the plan in "good faith" and jeopardize the plan's affirmative defense. However, as discussed previously, plan termination, itself, is not deemed illegal by the SEC even if it is done when the insider has material information about pending firm performance. So it is possible then to observe sales plan termination before positive returns performance, thereby preventing planned sales from executing at low price points.

To examine the relationship between price patterns and plan terminations, Figure 3 plots, the average cumulative abnormal return for a sample of 54 firms, for which there is public disclosure of early sales plan termination.⁴³ Figure 3 shows a noticeable kink in the cumulative abnormal

⁴² Potentially adverse news, for example, includes lower quarterly earnings guidance, missing earnings expectations, accounting inquiries, and analyst downgrades.

⁴³ There is no requirement to disclose plan terminations, so the sample size of observed terminations is inherently small.

return at date 0, when sales plans were announced to be terminated early. Prior to termination, returns appear negative. Immediately after termination, returns appear to reverse, beginning a gradual climb upward. This noticeable pattern is consistent with insiders timing sales plan termination to avoid sales that execute at low price points.⁴⁴ It is interesting to note that, for this sample of observed sales plans, the average last observed sales transaction is executed 21 days prior to the termination announcement, which appears to avoid the subsequent returns decline.

Table 9 provides univariate statistics for raw (*RawRet*) and abnormal (*AbnRet*) returns preceding and subsequent to the sales plan termination announcement. Abnormal returns are computed by subtracting the return to the value-weighted CRSP index from the raw return for the noted time horizon. Consistent with Figure 3, Table 9 shows that terminations follow negative returns. Specifically, over a 30-day time horizon preceding termination, the average *RawRet* and *AbnRet* are approximately -10% . After termination, Table 9 shows a discernable shift towards positive returns. Although post-termination *AbnRet* estimates are not statistically positive, there is evidence of statistically positive post-termination *RawRet* estimates and the shift in the pattern of *AbnRet* is statistically significant for all estimated horizons. Collectively, the pattern in Figure 3 and evidence in Table 9 suggest that early plan terminations are not timed randomly in relation to firm performance.

V. Conclusions and Future Research

The evidence documented in this study collectively points to some level of general strategic trade by participants in Rule 10b5-1. There is evidence that participants' sales, on average, generate abnormal trade returns, that a substantive proportion of selected 10b5-1 plan initiations

⁴⁴ Prices may also increase in response to the termination announcement. If so, however, one would expect to see an immediate price jump subsequent to the announcement rather than the gradual price increase that is observed.

are associated with pending adverse news disclosure, and that participants terminate sales plans before positive shifts in firm returns.

It is important to note that it is not clear whether the evidence described in this study is indicative of any illegal behavior by participants. Regulators generally consider many factors when determining whether particular trade patterns appear to violate insider trading laws. Perhaps the most important factor is that of materiality, and it is not clear that the patterns and returns described herein are material enough to warrant regulatory concern. The evidence in this study should still provide interesting inferences for those who debate whether insiders should be allowed to earn even small abnormal trade returns (in other words, trade returns that are below legally enforceable materiality thresholds yet are still tangible), and whether insiders should be able to abstain from trade when they have private information (e.g., Fried, 2003).⁴⁵ The evidence should also provide some interesting inferences for those who monitor insider trading patterns in an attempt to predict pending firm performance.

This study leaves open the question of how participants are able to generate abnormal trade returns within their plans. There is some evidence that suggests participants terminate plans before price increases, which provides a partial explanation for the association between observed sales and future price declines. However, abnormal returns could also result if participants illicitly plan trade when they possess nonpublic information or if participants alter the timing or content of disclosures once trades have already been planned. Aboody and Kasznik (2000) find that insiders delay good news and rush forward bad news disclosures around the timing of new option compensation grants, suggesting that insiders manipulate information flows to the market

⁴⁵ The argument against allowing insiders to earn any abnormal trade returns is based in information property rights (summarized in Bainbridge, 2001). For example, in *Diamond v. Oreamuno*, 248 N.E.2d 910, 912 (N.Y. 1969), the court ruled that an agent “who acquires special knowledge or information by virtue of a...fiduciary relationship with another...must account to his principal for any profits derived therefrom.”

to lower the strike price of these grants. While it is possible that participants similarly manipulate information flows to the market to maximize returns to 10b5-1 plan trades, it is difficult to detect empirically. Insiders' 10b5-1 plan trades are not fixed in time, as are the option grants examined by Aboody and Kasznik (2000). Therefore, it is difficult to disentangle whether information flows are manipulated around a set of fixed trade execution dates or whether trade flows are strategically planned around fixed information dissemination dates.

There are still some interesting questions to address regarding the market effects of disclosing participation within Rule 10b5-1. The Rule presents one of the few instances where firms provide ex ante information regarding pending insider trades. It might be useful to examine how the market responds to 10b5-1 announcements and to what degree these announcements impact insiders' trade returns. If these announcements reduce insiders' profits, it would be interesting to then examine why firms voluntarily disclose this information when there is no current mandate for this disclosure.

Appendix A Sales Plan Excerpt

SALES PLAN dated November 14, 2001 (this "Sales Plan") between The Estate of Michael Chowdry, represented by Linda Chowdry and John S. Blue, acting jointly as Trustees of the Trust (collectively the "Seller") and Morgan Stanley & Co. Incorporated ("Morgan Stanley"), acting as agent for Seller.

RECITALS

1. This Sales Plan is entered into between Seller and Morgan Stanley for the purpose of establishing a trading plan that complies with the requirements of Rule 10b5-1 (c)(1) under the Securities Exchange Act of 1934, as amended (the "Exchange Act").
2. Seller is establishing this Sales Plan in order to permit the orderly disposition of a portion of Seller's holdings of the Common Stock, par value \$.01 per share (the "Stock"), of Atlas Air Worldwide Holdings, Inc. (the "Issuer").

IMPLEMENTATION OF THE PLAN

1. Seller hereby appoints Morgan Stanley to sell shares of Stock pursuant to the terms and conditions set forth below. Subject to such terms and conditions, Morgan Stanley hereby accepts such appointment.
2. Morgan Stanley is authorized to begin selling Stock pursuant to this Sales Plan on November 15 (date of 3rd Q 10-Q and shall cease selling Stock on the earliest to occur of (i) the date on which Morgan Stanley is required to suspend or terminate sales under the Sales Plan pursuant to paragraph D.1 below, (ii) the date on which Morgan Stanley receives notice of the death of Linda Chowdry, (iii) the date on which the Issuer or any other person publicly announces a tender or exchange offer with respect to the Stock or a merger, acquisition, reorganization, recapitalization or comparable transaction affecting the securities of the Issuer as a result of which the Stock is to be exchanged or converted into cash and/or shares of another company, (iv) the date on which Morgan Stanley receives notice of the commencement or impending commencement of any proceedings in respect of or triggered by Seller's bankruptcy or insolvency, (v) the date that the aggregate number of shares of Stock sold pursuant to this Sales Plan reaches 1,500,000 shares or (vi) November 15, 2002 (the "Plan Sales Period").
3. (a) During the Plan Sales Period, Morgan Stanley shall sell 125,000 shares of Stock for the account of Seller during each 30 calendar day period, the timing of each sale to be determined by Morgan Stanley in its sole discretion.
4. Morgan Stanley shall not sell Stock hereunder at any time when: (i) Morgan Stanley, in its sole discretion, has determined that a market disruption, banking moratorium, outbreak or escalation of hostilities or other crisis or calamity that could, in Morgan Stanley's judgment, impact sales of the Stock has occurred; or (ii) Morgan Stanley, in its sole discretion, has determined that it is prohibited from doing so by a legal, contractual or regulatory restriction applicable to it or its affiliates or to Seller or Seller's affiliates (other than any such restriction relating to Seller's possession or alleged possession of material nonpublic information about the Issuer or the Stock); or (iii) Morgan Stanley has received notice from the Seller that during the Plan Sales Period, a legal, contractual or regulatory restriction that is applicable to Seller or Seller's affiliates, including, without limitation, any restriction related to a merger or acquisition or a stock offering requiring an affiliate lock-up, would prohibit any sale pursuant to the Sales Plan (other than any such restriction relating to Seller's possession or alleged possession of material nonpublic information about the Issuer or its securities). (iv) Morgan Stanley has received notice from Seller to terminate the Sales Plan in accordance with paragraph D.1 below.
5. (a) Seller agrees to deliver the Stock to be sold pursuant to this Sales Plan (the "Plan Shares") into an account at Morgan Stanley in the name of and for the benefit of Seller (the "Plan Account") prior to the commencement of sales under this Sales Plan. (b) Morgan Stanley shall withdraw Stock from the Plan Account in order to effect sales of Stock under this Sales Plan. Morgan Stanley agrees to notify Seller promptly if at any time during the Plan Sales Period the number of shares of Stock in the Plan Account is less than the number of Plan Shares remaining to be sold pursuant to this Sales Plan. Upon such notification, Seller agrees to deliver promptly to the

Plan Account the number of shares of Stock necessary to eliminate this shortfall. (c) To the extent that any Stock remains in the Plan Account after the end of the Plan Sales Period or upon termination of this Sales Plan, Morgan Stanley agrees to return such Stock promptly to the Issuer's transfer agent for relegending to the extent that such Stock would then be subject to transfer restrictions in the hands of the Seller.

6. Morgan Stanley shall in no event effect any sale under this Sales Plan if the Stock to be sold is not in the Plan Account.

7. Morgan Stanley may sell Stock on any national securities exchange, in the over-the-counter market, on an automated trading system or otherwise. Seller agrees that if Morgan Stanley is a market maker in the Stock at the time that any sale is to be made under this Sales Plan, Morgan Stanley may, at its sole discretion, purchase the Stock from Seller in its capacity as market maker. Morgan Stanley shall sell the Stock under ordinary principle of best execution at the then prevailing market price.

8. Morgan Stanley shall promptly notify the Seller in writing of any sales made by Morgan Stanley pursuant to this Sales Plan.

TERMINATION

1. This Sales Plan may not be terminated prior to the end of the Plan Sales Period, except that: (i) upon three days prior written notice sent to Morgan Stanley's compliance office by overnight mail and by facsimile at the address and fax number set forth in paragraph G.4 below, it may be suspended or terminated by Seller at any time: (A) if legal or regulatory restrictions applicable to Seller or Seller's affiliates (other than any such restrictions relating to Seller's possession or alleged possession of material nonpublic information about the Issuer or the Stock) would prevent Morgan Stanley from selling Stock for Seller's account during the Plan Sales Period; or (B) if Seller is not aware of any material nonpublic information concerning the Issuer or its securities and delivers to Morgan Stanley a certificate of Seller dated as of the date of the notice representing that as of the date thereof, Seller is not aware of any material nonpublic information concerning the Issuer or its securities.

2. Seller agrees that Morgan Stanley will execute this Sales Plan in accordance with its terms and will not be required to suspend or terminate any sales of the Stock unless Morgan Stanley has received notice from Seller in accordance with paragraph C.4 or D.1 above at least three days prior to the date on which this Sales Plan is to be suspended or terminated.

3. This Sales Plan may be amended by Seller only upon the written consent of Morgan Stanley and receipt by Morgan Stanley of a certificate signed by Seller certifying that the representations and warranties of Seller contained in this Sales Plan are true at and as of the date of such certificate as if made at and as of such date.

REFERENCES

- David Aboody & Ron Kasznik, CEO Stock Option Awards and the Timing of Corporate Voluntary Disclosures, 29 *J. Acctg. & Econ.* 73 (2000)
- Stephen M. Bainbridge, The Law and Economics of Insider Trading: A Comprehensive Primer (Working paper, Univ. of California at Los Angeles Law School 2001)
- Brad M. Barber & John D. Lyon, Detecting Long-Run Abnormal Stock Returns: The Empirical Power and Specification of Test Statistics, 43 *J. Fin. Econ.* 341 (1997)
- J. Carr Bettis, Jeffrey L. Coles, & Michael L. Lemmon, Corporate Policies Restricting Trading by Insiders, 57 *J. Fin. Econ.* 191 (2000)
- Mark M. Carhart, On Persistence in Mutual Fund Performance, 52 *J. Fin.* 57 (1997)
- W. J. Conover, Practical Nonparametric Statistics, (New York 1999)
- Werner F. M. DeBondt & Richard Thaler, Does the Stock Market Overreact?, 40 *J. Fin.* 793 (1985)
- Eugene F. Fama & Ken R. French, Common Risk Factors in the Returns on Stocks and Bonds, 33 *J. Fin. Econ.* 3 (1993)
- Joseph E. Finnerty, Insiders and Market Efficiency, 31 *J. Fin.* 1141 (1976)
- Jesse M. Fried, Insider Abstention, 113 *Yale L. J.* 455 (2003)
- Jon A. Garfinkel, New Evidence on the Effects of Federal Regulations on Insider Trading: The Insider Trading and Securities Fraud Enforcement Act (ITSFEA), 3 *J. Corp. Fin.* 89 (1997)
- Dan Givoly & Dan Palmon, Insider Trading and the Exploitation of Inside Information: Some Empirical Evidence, 58 *J. Bus.* 69 (1985)
- Jeffrey F. Jaffe, The Effect of Regulation Changes on Insider Trading, 5 *Bell J. Econ. Mgmt. Sc.* 93 (1974)
- Alan D. Jagolinzer & Darren T. Roulstone, 2006. Litigation Risk and the Distribution of Insiders' Trades Around Earnings Announcements (Working paper, Univ. of Chicago).
- Leslie A. Jeng, Corporate Insiders and the Window of Opportunity (Working paper, Boston University 1999)
- Leslie A. Jeng, Andrew Metrick, & Richard Zeckhauser, Estimating the Returns to Insider Trading: A Performance-Evaluation Perspective, 85 *Rev. Econ. & Stat.* 453 (2003)

Dirk Jenter, Market Timing and Managerial Portfolio Decisions, 60 *J. Fin.* 1903 (2005)

Marilyn F. Johnson, Karen K. Nelson, & Adam C. Pritchard, Do the Merits Matter More? The Impact of the Private Securities Litigation Reform Act, *J. Law, Econ. & Org.*, forthcoming.

Jonathan M. Karpoff & Daniel Lee, Insider Trading Before New Issue Announcements, 20 *Fin. Mgmt.* 18 (1991)

Bin Ke, Steven J. Huddart, & Kathy R. Petroni, What Insiders Know About Future Earnings and How They Use it: Evidence from Insider Trades, 35 *J. Acctg. & Econ.* 315 (2003)

S. P. Kothari & Jerold B. Warner, Measuring Long-Horizon Security Performance, 43 *J. Fin. Econ.* 301 (1997)

Josef Lakonishok & Inmoo Lee, Are Insider Trades Informative? 14 *Rev. Fin. St.* 79 (2001)

Erik Lie, On the Timing of CEO Stock Option Awards, 51 *Mgt. Sci.* 802 (2005)

John F. McDonald & Robert A. Moffitt, The Uses of Tobit Analysis, 62 *Rev. Econ. & Stat.* 318 (1980)

Mark L. Mitchell & Erik Stafford, Managerial Decisions and Long-Term Stock Price Performance, 73 *J. Bus.* 287 (2000)

Christopher F. Noe, Voluntary Disclosures and Insider Transactions, 27 *J. Acctg. & Econ.* 305 (1999)

Ofek Eli, & David L. Yermack, Taking Stock: Equity-Based Compensation and the Evolution of Managerial Ownership, 55 *J. Fin.* 1367 (2000)

Sechoul Park, H. Jonathan Jang, & Martin P. Loeb, Insider Trading Activity Surrounding Annual Earnings Announcements, 22 *J. Bus. Fin. & Acctg.* 587 (1995)

Stephen H. Penman, Insider Trading and the Dissemination of Firms' Forecast Information, 55 *J. Bus.* 479 (1982)

Joseph D. Piotroski & Darren T. Roulstone, Do Insider Trades Reflect Both Contrarian Beliefs and Superior Knowledge about Future Cash Flow Realizations? 39 *J. Acctg. & Econ.* 55 (2005)

Dennis W. Roncek, Learning More From Tobit Coefficients: Extending a Comparative Analysis of Political Protest, 57 *Am. Soc. Rev.* 503 (1992)

William Rogers, Regression Standard Errors in Clustered Samples, 13 *Stata Tech. Bull.* 19 (1993)

Jonathan L. Rogers & Philip C. Stocken, Credibility of Management Forecasts, 80 *Acct. Rev.* 1233 (2005)

Darren T. Roulstone, The Relation Between Insider-Trading Restrictions and Executive Compensation, 41 *J. Acctg. Res.* 525 (2003)

Michael S. Rozeff & Mir A. Zaman, Market Efficiency and Insider Trading: New Evidence, 61 *J. Bus.* 25 (1988)

H. Nejhat Seyhun, The Effectiveness of the Insider-Trading Sanctions, 35 *J. Law & Econ.* 149 (1992)

H. Nejhat Seyhun & Michael H Bradley, Corporate Bankruptcy and Insider Trading, 70 *J. Bus.* 189 (1997)

H. Nejhat Seyhun, *Investment Intelligence from Insider Trading*, (The MIT Press, reprint 2000)

David Yermack, Good Timing: CEO Stock Option Awards and Company News Announcements, 52 *J. Fin.* 449, (1997)

Table 1
Descriptive Statistics

Sample descriptive statistics. Firm-level data is from Compustat for the fiscal year ending 2002. Insider position data includes any position an insider held during the trading period 2001 through 2005.

Panel A : Disclosure statistics

	Firms	Insiders
Form 4 only	870	2,802
Form 4 and 8-K/Business Wire	342	850
8-K/Business Wire only	<u>333</u>	<u>1,034</u>
Disclosed Observations	1,545	4,686
Observations missing returns data	(304)	(1,260)
Sample Observations	<u>1,241</u>	<u>3,426</u>

Panel B : Firm statistics

		Sample		S&P 500		Nasdaq	
		Mean	Median	Mean	Median	Mean	Median
Assets	(\$ mill.)	5,543.96	391.57	36,039.65	8,921.88	934.76	165.38
Sales	(\$ mill.)	1,914.66	277.75	11,868.07	5,375.51	460.30	71.20
MVE	(\$ mill.)	2,731.52	377.59	16,005.83	6,349.34	697.69	93.37
MTB		2.68	1.74	2.73	2.28	3.77	1.40
NI/Assets		-0.07	0.02	0.04	0.04	-0.10	0.01
NI/MVE		-0.005	0.02	0.01	0.04	1.52	0.01

	NYSE	AMEX	NASDAQ	OTC	Fortune 500	S&P 500
Sample %	<u>35.0%</u>	<u>3.3%</u>	<u>59.2%</u>	<u>2.5%</u>	<u>12.1%</u>	<u>13.6%</u>

Table 1
Descriptive Statistics (continued)

Panel C: Insider demographics

	<i>n</i>	Officer Only	Officer & Director	Outside Director	Chairman	CEO	Pres	CFO	Secy
10b5-1 Sellers	3,312	55.71%	29.47%	14.07%	11.05%	28.07%	15.22%	10.99%	4.32%
10b5-1 Purchasers	114	28.07%	40.35%	30.70%	14.91%	25.44%	18.42%	4.39%	5.26%

Panel D: Plan and trade statistics

	<u>Sales</u>	<u>Purchases</u>
Average denoted trading plan length in days ($n = 811$)	350.07	n/a
Average number of transactions per insider	35.32	5.94
Average total value transacted per insider (\$ mill.)	5.482	0.323

Table 2
Industry Composition

SIC		Purchases	Sales
		<u>Firm Freq</u>	<u>Firm Freq</u>
1	Agricultural Production - Crops	0	1
2	Agricultural Production - Livestock and animal specialties	0	1
7	Agricultural Services	1	0
12	Coal Mining	0	3
13	Oil and Gas Extraction	0	18
14	Mining and Quarrying of Nonmetallic Minerals	0	1
15	Building Construction	0	4
16	Heavy Construction other than building construction	1	2
17	Construction - special trade contractors	1	2
20	Food and Kindred Products	3	11
21	Tobacco Products	1	1
22	Textile Mill Products	0	1
23	Apparel and other finished products made from fabrics	1	11
24	Lumber and Wood Products	0	2
25	Furniture and Fixtures	0	6
26	Paper and Allied Products	0	4
27	Printing, Publishing, and allied industries	0	8
281	Industrial Inorganic Chemicals	0	4
282	Plastics Materials and Synthetics	0	4
283	Pharmaceuticals	4	88
284	Soap, Cleaners, and Toilet Goods	0	2
285	Paints and Allied Products	0	3
286	Industrial Organic Chemicals	0	4
287	Agricultural Chemicals	0	2
289	Miscellaneous Chemical Products	0	2
29	Petroleum Refining	0	4
30	Rubber and Miscellaneous Plastic Products	1	6
31	Leather and Leather Products	0	6
32	Stone, Clay, Glass, and Concrete Products	0	5
33	Primary Metal Industries	0	10
34	Fabricated Metal Products, except machinery and transportation equipment	0	6
351	Engines and Turbines	0	2
352	Farm and Garden Machinery	0	3
353	Construction and Related Machinery	0	3
354	Metalworking Machinery	1	1
355	Special Industry Machinery	1	13
356	General Industrial Machinery	0	5
357	Computer and Office Equipment	3	32
359	Industrial Machinery, Nec	1	0
361	Electric Distribution Equipment	1	2
362	Electrical Industrial Apparatus	0	4
363	Household Appliances	0	2
364	Electric Lighting and Wiring Equipment	1	3
365	Household Audio and Video Equipment	0	1
366	Communications Equipment	3	30
367	Electronic Components and Accessories	1	57

Table 2
Industry Composition (continued)

SIC		Purchases	Sales
		<u>Firm Freq</u>	<u>Firm Freq</u>
369	Misc. Electrical Equipment & Supplies	1	3
37	Transportation Equipment	0	12
38	Measuring, Analyzing, and Controlling Instruments	1	90
39	Miscellaneous Manufacturing Industries	0	10
40	Railroad Transportation	0	5
42	Motor Freight Transportation and Warehousing	0	3
44	Water Transportation	0	7
45	Transportation by Air	0	5
46	Pipelines, except natural gas	0	1
47	Transportation Services	0	5
48	Communications	2	43
49	Electric, Gas, and Sanitary Services	3	30
50	Wholesale Trade - durable goods	1	20
51	Wholesale Trade - nondurable goods	0	8
53	General Merchandise Stores	0	6
54	Food Stores	0	4
55	Automotive Dealers and Gasoline Service Stations	1	6
56	Apparel and Accessory Stores	2	18
57	Home Furniture, Furnishings, and Equipment Stores	0	6
58	Eating and Drinking Places	0	13
59	Miscellaneous Retail	2	23
60	Depository Institutions	10	34
61	Nondepository Credit Institutions	1	18
62	Security and Commodity Brokers, Dealers	1	8
63	Insurance Carriers	3	37
64	Insurance Agents, Brokers, and Service	0	7
65	Real Estate	0	5
67	Holding and Other Investment Offices	3	30
70	Hotels, Rooming Houses, Camps, and Other Lodging Places	0	4
72	Personal Services	0	5
731	Advertising	0	2
732	Credit Reporting and Collection	0	3
733	Mailing, Reproduction, Stenographic	0	3
734	Services to Buildings	0	1
735	Misc. Equipment Rental & Leasing	0	2
736	Personnel Supply Services	1	2
737	Computer and Data Processing Services	9	177
738	Miscellaneous Business Services	0	10
75	Automotive Repair	0	3
78	Motion Pictures	0	9
79	Amusement and recreation Services	0	12
80	Health Services	3	18
82	Educational Services	0	6
83	Social Services	0	2
87	Engineering, Accounting, Research	2	34
M	Missing	3	37
		<u>74</u>	<u>1,167</u>

Table 3
Buy and Hold Abnormal Returns

Buy and hold dollar-weighted average abnormal returns for 10b5-1 participating insiders and for non participating insiders from the same 74 purchase observation and 1,167 sales observation firms between 2001 and 2005

	Window	10b5-1 Participants		Non Participants		Difference
		<i>n</i>	Mean (<i>t</i> -statistic)	<i>n</i>	Mean (<i>t</i> -statistic)	Mean (<i>t</i> -statistic)
<i>Run-up</i> _{sales}	<i>1-month</i>	3,312	0.046 (24.31)	9,546	0.072 (42.47)	-0.026 (-10.49)
<i>WtAbnRet</i> _{sales}	<i>1-month</i>	3,312	-0.014 (-8.89)	9,546	-0.004 (-3.14)	-0.010 (-4.38)
<i>WtAbnRet</i> _{sales}	<i>3-month</i>	3,312	-0.044 (-14.31)	9,546	-0.015 (-6.47)	-0.029 (-7.51)
<i>WtAbnRet</i> _{sales}	<i>6-month</i>	3,312	-0.060 (-13.51)	9,546	-0.019 (-5.85)	-0.041 (-7.54)
<i>Run-up</i> _{purchs}	<i>1-month</i>	114	-0.013 (-0.87)	449	-0.007 (-0.59)	-0.006 (-0.32)
<i>WtAbnRet</i> _{purchs}	<i>1-month</i>	114	0.058 (3.29)	449	0.135 (6.43)	-0.077 (-2.80)
<i>WtAbnRet</i> _{purchs}	<i>3-month</i>	114	0.093 (2.98)	449	0.177 (7.10)	-0.084 (-2.11)
<i>WtAbnRet</i> _{purchs}	<i>6-month</i>	114	0.079 (2.33)	449	0.222 (7.13)	-0.143 (-3.09)

WtAbnRet is the insider's dollar-size-weighted average abnormal trade return for trades executed between 2001 and 2005. It is computed as $\sum_{j=1}^J \frac{DollarVol_j}{\sum_{j=1}^J DollarVol_j} (BHR_w - VWBHR_w)_j$, where *DollarVol* is the trade

dollar volume, *BHR_w* is the trade's *w*-month buy and hold return, *VWBHR_w* is the *w*-month buy and hold return to the CRSP value-weighted index, and *j* is a subscript for each trade executed.

Run-up is the insider's computed *WtAbnRet* for the 1-month period preceding trade execution.

Table 4
Four-Factor Estimation of Returns Following Trades

$$(R_h - R_f)_t = a_0 + \sum_{t=-3}^{+6} a_{t+4} \text{MonthDum}_t + a_{11}(R_{mkt} - R_f)_t + a_{12}\text{SMB}_t + a_{13}\text{HML}_t + a_{14}\text{MOM}_t + v_t$$

Panel A. Sales Trades

Variable	Participant		Non Participant		Difference	
	coeff	t-stat	coeff	t-stat	coeff	t-stat
a_0	0.013	16.55	0.011	13.71		
$\text{MonthDum}_{.3}$	0.000	0.03	0.007	1.22		
$\text{MonthDum}_{.2}$	-0.001	-0.34	0.019	3.29		
$\text{MonthDum}_{.1}$	0.006	1.39	0.021	3.52		
MonthDum_0	-0.007	-1.60	0.016	2.73		
MonthDum_{+1}	-0.026	-6.09	-0.006	-1.16	-0.020	-2.85
MonthDum_{+2}	-0.029	-7.07	-0.012	-2.08	-0.017	-2.44
MonthDum_{+3}	-0.026	-6.43	-0.009	-1.76	-0.017	-2.68
MonthDum_{+4}	-0.022	-5.29	-0.007	-1.46	-0.015	-2.32
MonthDum_{+5}	-0.022	-5.48	-0.012	-2.21	-0.010	-1.52
MonthDum_{+6}	-0.013	-3.23	-0.004	-0.67	-0.009	-1.36
$R_{mkt} - R_f$	1.098	30.09	1.119	31.38		
<i>SMB</i>	0.878	19.97	0.866	19.96		
<i>HML</i>	0.095	2.08	0.073	1.73		
<i>MOM</i>	-0.227	-8.49	-0.240	-9.24		
$a_0 + \text{MonthDum}_{+1}$	-0.013	-3.05	0.005	0.82	-0.018	-2.54
$a_0 + \text{MonthDum}_{+2}$	-0.016	-3.98	-0.001	-0.22	-0.015	-2.14
$a_0 + \text{MonthDum}_{+3}$	-0.013	-3.25	0.002	0.32	-0.015	-2.34
$a_0 + \text{MonthDum}_{+4}$	-0.009	-2.22	0.004	0.71	-0.013	-1.99
$a_0 + \text{MonthDum}_{+5}$	-0.009	-2.27	-0.001	-0.22	-0.008	-1.18
$a_0 + \text{MonthDum}_{+6}$	0.000	0.09	0.007	1.29	-0.007	-1.02
<i>Cumulative 6 mo. Abn Ret.</i>	-0.059	-6.00	0.015	1.19	-0.074	-5.10
Firm obs.		1,116		1,116		
Adj. R^2		0.179		0.220		

Table 4
Four-Factor Estimation of Returns Following Trades (continued)

Panel B. Purchase Trades

Variable	Participant		Non Participant		Difference	
	coeff	<i>t</i> -stat	coeff	<i>t</i> -stat	coeff	<i>t</i> -stat
a_0	0.005	1.26	0.010	2.29		
$MonthDum_{.3}$	-0.021	-1.15	-0.026	-1.08		
$MonthDum_{.2}$	0.007	0.25	-0.022	-1.05		
$MonthDum_{.1}$	0.008	0.23	-0.028	-1.02		
$MonthDum_0$	0.028	0.87	0.010	0.34		
$MonthDum_{+1}$	0.013	0.57	0.020	0.66	-0.007	-0.20
$MonthDum_{+2}$	0.007	0.19	-0.014	-0.59	0.021	0.52
$MonthDum_{+3}$	-0.008	-0.31	-0.026	-1.07	0.018	0.58
$MonthDum_{+4}$	-0.010	-0.61	-0.022	-1.09	0.012	0.25
$MonthDum_{+5}$	0.006	0.24	-0.018	-0.80	0.024	0.74
$MonthDum_{+6}$	0.005	0.30	-0.012	-0.48	0.017	0.57
$R_{mkt} - R_f$	1.308	6.03	1.296	5.79		
<i>SMB</i>	0.697	2.67	0.783	3.33		
<i>HML</i>	0.219	1.50	0.365	1.78		
<i>MOM</i>	-0.229	-2.57	-0.318	-2.39		
$a_0 + MonthDum_{+1}$	0.017	0.80	0.030	1.03	-0.013	-0.35
$a_0 + MonthDum_{+2}$	0.011	0.37	-0.004	-0.24	0.015	0.40
$a_0 + MonthDum_{+3}$	-0.003	-0.13	-0.016	-0.74	0.013	0.44
$a_0 + MonthDum_{+4}$	-0.006	-0.44	-0.012	-0.65	0.006	0.10
$a_0 + MonthDum_{+5}$	0.011	0.45	-0.008	-0.38	0.019	0.58
$a_0 + MonthDum_{+6}$	0.010	0.56	-0.002	-0.09	0.012	0.40
<i>Cumulative 6 mo. Abn Ret.</i>	0.040	0.49	-0.012	-0.28	0.052	0.54
Firm obs.		65		65		
Adj. R^2		0.228		0.261		

Table reports cross-sectional average coefficient and *t*-statistic estimates of firm-specific monthly Fama and French (1993) four factor regressions. The table reflects estimates computed using the following procedure:

- (1) For each firm, one 10b5-1 participant and one non-participant transaction are drawn randomly from all transactions executed between 2001 and 2005. For each participation group, the transaction month is denoted as Month 0 (i.e., $MonthDum_0 = 1$).

- (2) The firm-specific four-factor regression is estimated for each firm that has at least 20 months of available data.
- (3) Coefficient and t -statistic estimates are collected and cross-sectional averages are computed.
- (4) Steps (1) through (3) are iterated 100 times and the average of the 100 cross-sectional averages is reported.

R_h is the monthly firm return.

R_f is the monthly risk-free interest rate.

$MonthDum$ is a dichotomous variable that equals one if the observation falls within the specified month and is zero otherwise.

R_{mkt} is the monthly value-weighted market average return.

SMB is the monthly size factor mimicking return (Fama and French, 1993).

HML is the monthly book-to-market factor mimicking return (Fama and French, 1993).

UMD is the monthly momentum factor mimicking return (Carhart, 1997).

Cumulative 6 mo. Abn Ret. is $6*a_0 + \sum_{m=+1}^{+6} MonthDum_m$.

t is a subscript denoting the month relative to a randomly drawn insider equity transaction from transactions executed within the firm between 2001 and 2005.

Table 5
Mean Reversion Analysis

Out-of-sample estimation of buy-and-hold returns after observing strong price run-ups

		<i>Non-sample CRSP firms 2001 through 2005</i>		<i>Sample Firms 1997 through Sep 2000</i>	
Window		<i>n</i>	Mean (<i>t</i> -statistic)	<i>n</i>	Mean (<i>t</i> -statistic)
<i>Run-up</i>	<i>1-month</i>	1,167	0.045 (533.21)	1,167	0.045 (534.58)
<i>AbnRet</i>	<i>1-month</i>	1,167	0.006 (1.61)	1,167	0.000 (0.00)
<i>AbnRet</i>	<i>3-month</i>	1,167	0.024 (3.85)	1,167	0.006 (0.72)
<i>AbnRet</i>	<i>6-month</i>	1,167	0.053 (5.81)	1,167	0.030 (2.22)

AbnRet is the buy-and-hold abnormal trade return during the window. It is computed as the firm's buy-and-hold raw return minus the buy-and-hold return to the CRSP value-weighted index.

Run-up is the firm's computed *AbnRet* for the 1-month period preceding trade execution.

The table reflects estimates using the following procedure:

- (1) A sample draw pool is identified from all firm-day observations that observe a 1-month prior buy-and-hold abnormal return of no less than four and no more than five percent.
- (2) A sample of 1,167 firm-day observations is randomly drawn from the sample draw pool to compute cross-sectional averages and *t*-statistics for *AbnRet*.
- (3) Steps (1) and (2) are iterated 1,000 times and the average of the 1,000 cross-sectional averages is reported.

Table 6
Volume Before Earnings Announcements

Tobit estimation of the percentage of firm equity traded within a 20-trading-day window immediately before earnings announcements.

$$PercVol_{hiq} = b_0 + b_1 Part10b5-1_i + b_2 NegEarningsResp_{hiq} + b_3 (Part10b5-1 * NegEarningsResp)_{hiq} + w_{hiq}$$

Panel A. Sales Transactions

Variable	Coeff.	<i>t</i> -statistic	Marg Effect <i>Pr</i> (<i>PercVol</i> > 0)	Marg. Effect E (<i>PercVol</i> <i>PercVol</i> > 0)
<i>Intercept</i>	-0.0420	-6.73		
<i>Part10b5-1</i>	0.0118	6.91	0.03219	0.00129
<i>NegEarningsResp</i>	0.0004	0.60	0.00068	0.00004
<i>Part10b5-1 * NegEarningsResp</i>	-0.0003	-0.33	-0.00045	-0.00002
Left-censored observations		224,205		
Uncensored observations		3,911		
Pseudo <i>R</i> ²		0.462		

Panel B. Purchase Transactions

Variable	Coeff.	<i>t</i> -statistic	Marg Effect <i>Pr</i> (<i>PercVol</i> > 0)	Marg. Effect E (<i>PercVol</i> <i>PercVol</i> > 0)
<i>Intercept</i>	-0.0033	-2.66		
<i>Part10b5-1</i>	0.0004	1.93	0.01520	0.00005
<i>NegEarningsResp</i>	-0.0003	-1.72	-0.00881	-0.00003
<i>Part10b5-1 * NegEarningsResp</i>	-0.0003	-1.26	-0.00926	-0.00004
Left-censored observations		8,938		
Uncensored observations		246		
Pseudo <i>R</i> ²		0.001		

PercVol is the dollar volume of firm equity sold by the insider during the 20-trading-day window preceding a quarterly earnings announcement scaled by the firm's prior quarter market value of equity.

Part10b5-1 is a dichotomous variable that equals one if an insider's trades executed within a Rule 10b5-1 plan and is zero otherwise.

NegEarningsResp is a dichotomous variable that equals one if the firm's three day market response to its quarterly earnings announcement is negative and is zero otherwise. The firm's three day market response is computed as the firm's three day raw return, centered on the Compustat quarterly announcement date, minus the three day raw return to the CRSP Value Weighted portfolio for the same period.

h*, *i*, and *q, are subscripts denoting firm, insider, and quarter, respectively.

t-statistics are corrected for firm-level clusters in accordance with Rogers (1993).

Table 7
Abnormal Returns and Timing of Trade in 10b5-1 Plan

OLS Regression of abnormal trade returns in relation to proximity to 10b5-1 plan initiation date.

$$AbnRet_{ij} = c_0 + c_1 Sequence_{ij} + c_2 NumberTrades_i + x_{ij}$$

Variable	<u><i>AbnRet</i>_{sales}</u> (<i>t</i> -statistic)	<u><i>AbnRet</i>_{purchs}</u> (<i>t</i> -statistic)
<i>Intercept</i>	-0.027 (-0.67)	-0.228 (-0.76)
<i>Sequence</i>	-0.009 (-5.01)	0.033 (4.15)
<i>NumberTrades</i>	0.002 (0.74)	0.011 (1.24)
Number of Obs.: Trades	2,219	224
Number of Obs: 10b5-1 participants	178	11
Adjusted <i>R</i> ²	<u>0.041</u>	<u>0.361</u>

Regression is estimated for all 10b5-1 participant observations that disclosed plan initiation dates and then executed at least five trades within the 350 days subsequent to plan initiation disclosure

AbnRet is the trade's abnormal trade return during the window. It is computed as (*BHR6* – *VWBHR6*), where *BHR6* is the trade's six-month buy-and-hold return and *VWBHR6* is the six-month buy-and-hold return to the CRSP value-weighted portfolio.

Sequence is the numerical timing of the trade in relation to other trades executed in the 350 day period following 10b5-1 plan initiation.

NumberTrades is the total number of trades executed by an insider in the 350 day period following 10b5-1 plan initiation.

i and *j* are subscripts for insider and trade, respectively.

t-statistics are corrected for insider-level clusters in accordance with Rogers (1993).

Table 8
Rule 10b5-1 Plan Initiation and Subsequent Adverse News

<i>Draw</i>	<i>Industry</i>	<i>Days after Plan Init.</i>	<i>Adverse News Summary</i>	<i>Three-day Raw Ret.</i>	<i>Three-day Mkt. Adj. Ret.</i>
1	Crude Petroleum and Natural Gas	n/a	None observed	n/a	n/a
2	Special Trade Contractor	147	Lowered qrtly earnings guidance	-24.3%	-25.3%
3	Beverages	108	Weakened sales	-2.5%	-0.9%
4	Greeting Cards	62	Plant closure announcement	1.0%	0.4%
5	Periodicals	n/a	None observed	n/a	n/a
6	Drugs	77	Suspending drug trials	-34.9%	-35.8%
7	Drugs	n/a	None observed	n/a	n/a
8	Drugs	173	Suspending drug trials	-42.7%	-40.0%
9	Drugs	n/a	None observed	n/a	n/a
10	Drugs	58	Qrtly earnings below estimates	-1.4%	-1.4%
11	Drugs	60	Qrtly earnings below estimates	-12.0%	-12.0%
12	Drugs	34	Drug trial delay	-25.5%	-26.2%
13	Petroleum Refining	n/a	None observed	n/a	n/a
14	Blast Furnace and Basic Steel Products	73	Credit rating downgrade	-2.5%	-3.5%
15	Ordnance and Accessories	89	Firm associated with mishap	-3.8%	-4.2%
16	Computer and Office Equipment	39	Weakened sales	-3.9%	-4.5%
17	Computer and Office Equipment	n/a	None observed	n/a	n/a
18	Construction and Related Machinery	n/a	None observed	n/a	n/a
19	Computer and Office Equipment	87	Qrtly earnings below estimates	-43.9%	-43.1%
20	Communications Equipment	171	Forthcoming charge for legal settlement	0.5%	3.1%
21	Electronic Components and Accessories	n/a	None observed	n/a	n/a
22	Electronic Components and Accessories	n/a	None observed	n/a	n/a
23	Communications Equipment	73	Qrtly earnings below estimates	-18.2%	-17.4%
24	Electronic Components and Accessories	16	Forthcoming impairment charge	-12.9%	-12.2%
25	Medical Instruments & Supplies	n/a	None observed	n/a	n/a
26	Measuring and Controlling Devices	50	Analyst downgrade	5.0%	2.7%
27	Medical Instruments & Supplies	n/a	None observed	n/a	n/a
28	Railroads	n/a	None observed	n/a	n/a
29	Trucking and Courier Service	n/a	None observed	n/a	n/a
30	Telephone Communication	41	SEC inquiry and restatement of prior financials	-2.8%	-4.0%

Table 8
Rule 10b5-1 Plan Initiation and Subsequent News Events (continued)

<i>Draw</i>	<i>Industry</i>	<i>Days after Plan Init.</i>	<i>Adverse News Summary</i>	<i>Three-day Raw Ret.</i>	<i>Three-day Mkt. Adj. Ret.</i>
31	Women's Clothing Stores	65	Review of accounting practices	2.6%	1.4%
32	Eating and Drinking Place	62	Qrtly earnings below estimates	-8.8%	-8.0%
33	Eating and Drinking Place	10	Union boycott	-3.1%	-4.1%
34	Eating and Drinking Place	130	Qrtly earnings below estimates	0.4%	-1.7%
35	Misc. Shopping Goods Store	33	Late qrtly filing; weakened sales	-25.5%	-24.2%
36	Commercial Bank	n/a	None observed	n/a	n/a
37	Nondepository Institution	153	Lowered qrtly earnings guidance	-8.1%	-8.3%
38	Security and Commodity Broker	95	Qrtly earnings below estimates	-6.8%	-8.9%
39	Fire, Marine & Casualty Insurance	n/a	None observed	n/a	n/a
40	Miscellaneous Investing	63	Pending restatement due to accounting error	-0.7%	-0.9%
41	Computer and Data Processing Service	n/a	None observed	n/a	n/a
42	Computer and Data Processing Service	n/a	None observed	n/a	n/a
43	Computer and Data Processing Service	98	Network security breach	0.8%	1.4%
44	Personnel Supply Service	80	Named defendant in class action suit	2.0%	0.8%
45	Computer and Data Processing Service	98	Lowered qrtly earnings guidance; analyst downgrade	-7.2%	-6.4%
46	Computer and Data Processing Service	133	Forthcoming charge for accounting error	-4.7%	-5.2%
47	Computer and Data Processing Service	n/a	None observed	n/a	n/a
48	Computer and Data Processing Service	6	Acctg investigation; lawsuit; execs placed on leave	-17.4%	-15.3%
49	Computer and Data Processing Service	3	Pending delisting	-20.9%	-23.7%
50	Computer and Data Processing Service	41	Qrtly earnings below estimates	-6.5%	-5.7%
51	Computer and Data Processing Service	73	Named defendant in class action suit	1.0%	-1.4%
52	Computer and Data Processing Service	57	Restructuring	-5.6%	-6.2%
53	Computer and Data Processing Service	69	Acctg investigation	-14.1%	-7.8%
54	Advertising	18	Analyst downgrade	-0.9%	0.6%
55	Computer and Data Processing Service	21	Analyst downgrade	9.7%	7.5%
56	Misc. Health and Allied Service	21	Medical treatment deemed ineffective	-45.8%	-42.7%
57	Educational Service	n/a	None observed	n/a	n/a
58	Research and Testing Service	55	Auditor resignation	-8.5%	-9.6%
59	Research and Testing Service	87	Qrtly earnings below prior quarter	-4.0%	-5.5%
60	Management & Public Relations	133	Qrtly revs below estimates	-7.8%	-7.7%
	<u>Mean</u>	<u>72.2</u>		<u>-9.9%</u>	<u>-9.9%</u>

Table documents adverse news disclosures that are observed within 180 days subsequent to randomly drawn Rule 10b5-1 initiation disclosures. Three-day raw and market-adjusted returns are reported for the adverse news disclosure dates. Adverse news disclosures are identified through a Lexis-Nexis business wire search. Market-adjusted returns are computed as the firm's raw return minus the raw return to the value-weighted CRSP portfolio over the same window.

Table 9
Returns in Relation to Early 10b5-1 Termination

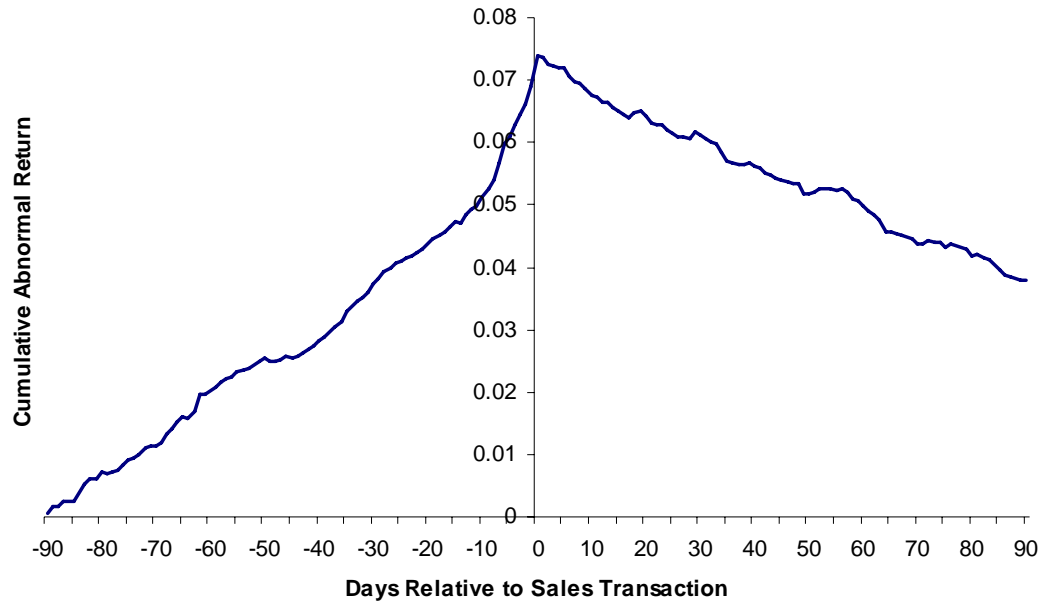
	Window	<i>n</i>	Mean	<i>t</i> -stat.	Relative to 1-mo. before	<i>t</i> -stat.
<i>RawRet</i>	<i>1-month before</i>	54	-0.104	-4.04		
<i>AbnRet</i>	<i>1-month before</i>	54	-0.106	-4.72		
<i>RawRet</i>	<i>1-month after</i>	53	0.056	1.76	0.160	3.80
<i>AbnRet</i>	<i>1-month after</i>	53	0.039	1.34	0.145	3.88
<i>RawRet</i>	<i>3-months after</i>	50	0.073	1.20	0.177	2.92
<i>AbnRet</i>	<i>3-months after</i>	50	0.043	0.75	0.149	2.65
<i>RawRet</i>	<i>6-months after</i>	49	0.099	1.51	0.203	3.25
<i>AbnRet</i>	<i>6-months after</i>	49	0.048	0.81	0.154	2.74

RawRet is the firm's raw buy-and-hold return during the window.

AbnRet is the firm's abnormal buy-and-hold return during the window. It is computed as ***RawRet*** minus the buy-and-hold return to the value-weighted CRSP portfolio over the same time horizon.

Figure 1
Cumulative Abnormal Return in Relation to 10b5-1 Transactions

Panel A. Rule 10b5-1 participant sales (1,167 firm observations)



Panel B. Rule 10b5-1 participant purchases (69 firm observations)

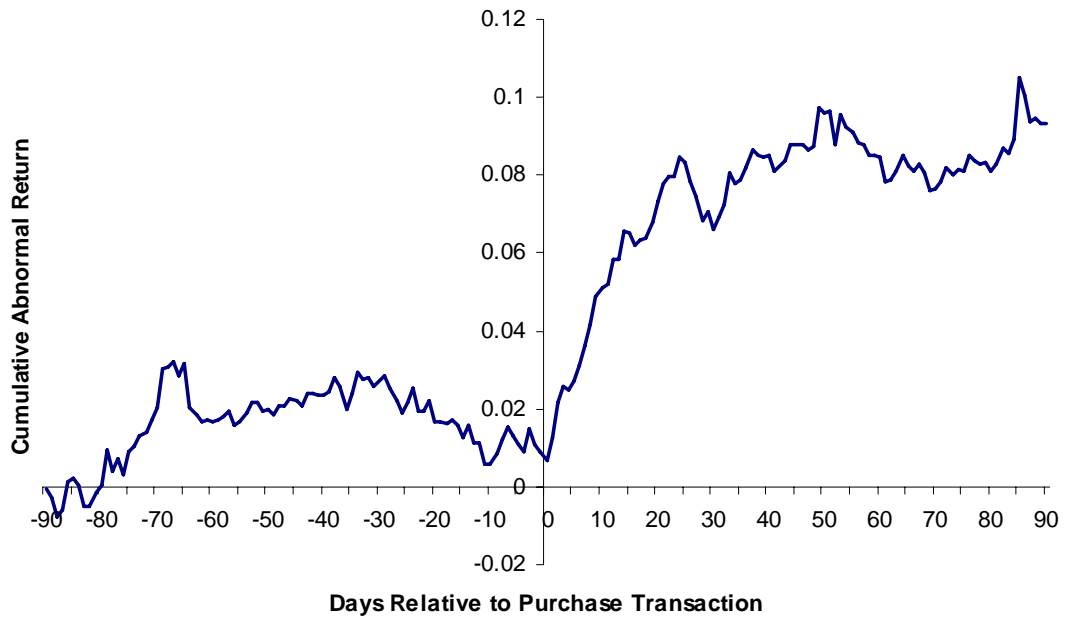
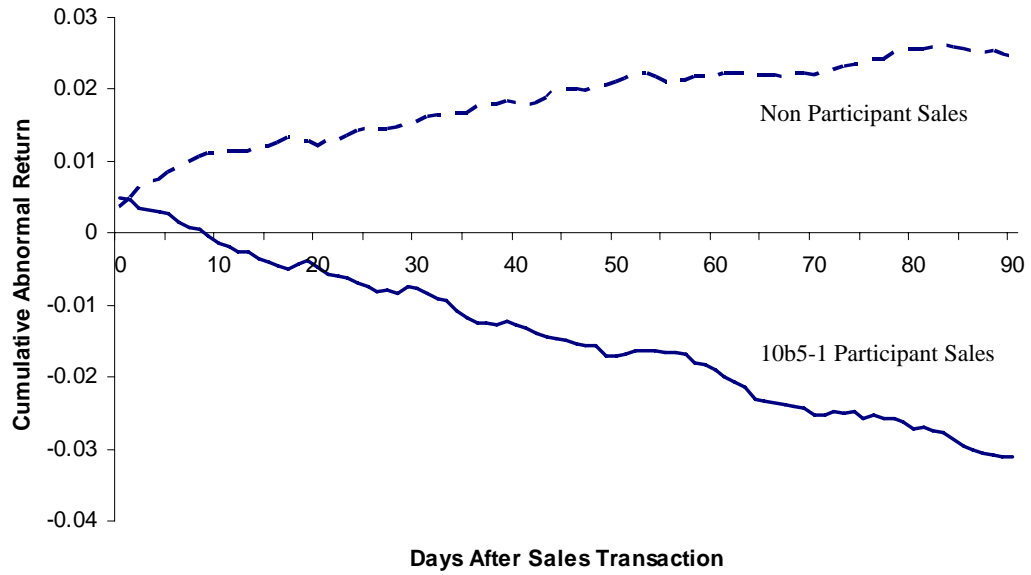
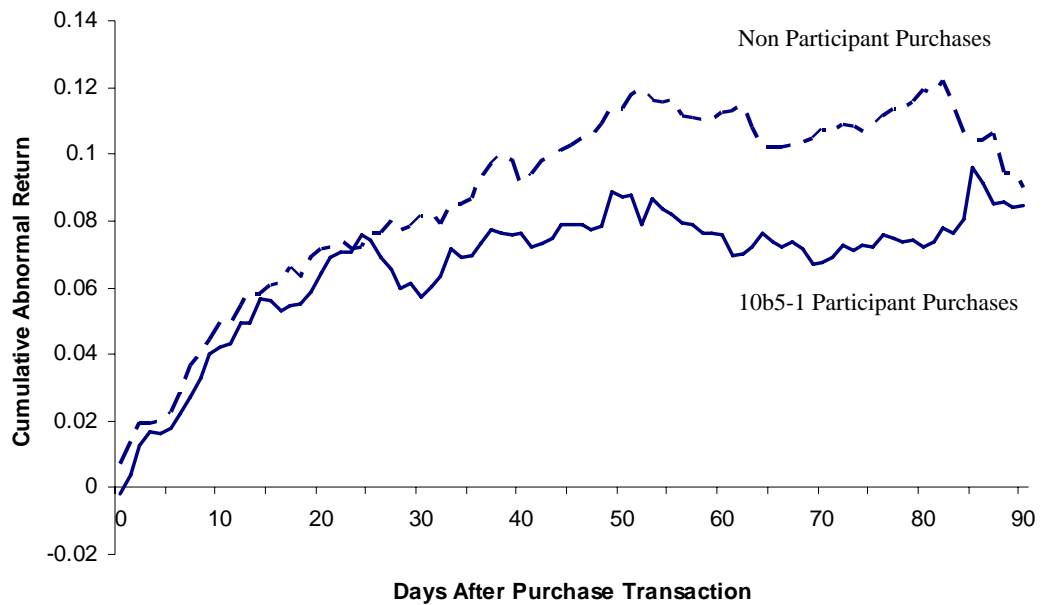


Figure 1
Cumulative Abnormal Return in Relation to Sales Transactions (continued)

Panel C. Rule 10b5-1 participant and non-participant sales (1,167 firm observations)



Panel D. Rule 10b5-1 participant and non-participant purchases (69 firm observations)



Cumulative Abnormal Return is the cross-sectional mean of each firm's cumulative abnormal return.

Each firm's cumulative abnormal return is computed as $CAR_t = \sum_{d=start}^t (R_f - R_{VWCRSP})_d$.

R_f is the firm's daily return.

R_{VWCRSP} is the daily return to the CRSP value weighted portfolio.

$start$ denotes the beginning CAR estimation date, which is day - 90 for Panel A. and day 0 for Panel B.

t denotes a specific day relative to the transaction execution date.

The figures reflect the following procedure:

- (1) A sample draw pool is identified from all 10b5-1 annotated transactions executed between 2001 and 2005 and from all non-participants' transactions during the same period.
- (2) For each of the sample firms, one 10b5-1 participant and one non-participant transaction is randomly drawn from the sample draw pool. Daily CARs are computed and the cross-sectional average is computed, centered on day 0 in event time.
- (3) Steps (1) and (2) are iterated 100 times and the average of the 100 cross-sectional averages is plotted.

Figure 2
Abnormal Trade Returns in Proximity to 10b5-1 Plan Initiation Date

Mean abnormal trade returns for sales trades in relation to proximity to 10b5-1 initiation date.

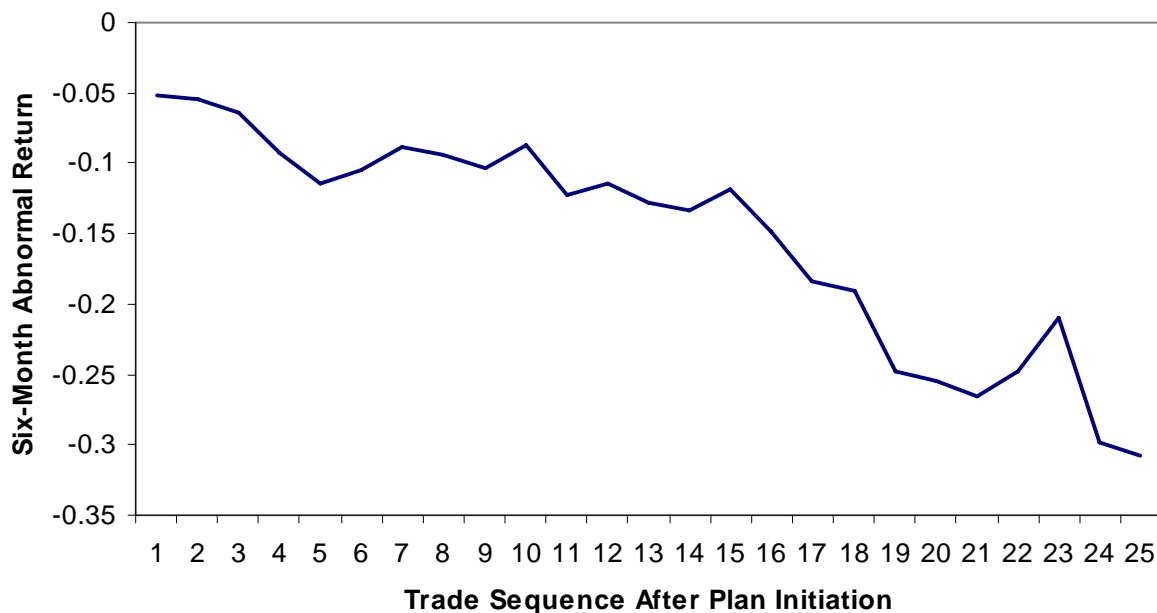


Figure is estimated for all 10b5-1 participant observations that disclosed plan initiation dates and then executed at least five trades within the 350 days subsequent to plan initiation disclosure.

Six-Month Abnormal Return is the mean buy-and-hold abnormal return computed as $(BHR6 - VWBHR6)$, where $BHR6$ is the trade's six-month buy and hold return and $VWBHR6$ is the six-month buy and hold return to the CRSP value-weighted index.

Trade Sequence is a transaction's timing rank relative to other transactions executed by the insider during the 350 day window subsequent to plan initiation disclosure (e.g., sequence 1, 2, and 3, denote the insider's first, second, and third trades, respectively, subsequent to plan initiation disclosure).

Figure 3
Abnormal Returns and Early 10b5-1 Plan Termination

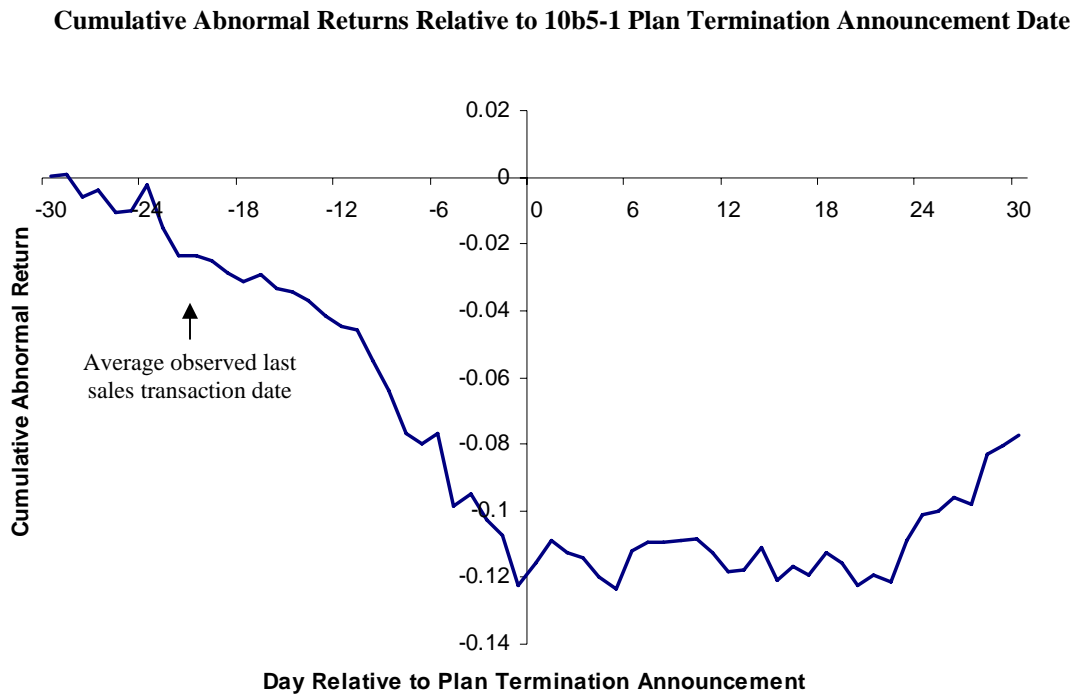


Figure is estimated for 54 observed 10b5-1 early plan terminations.

Cumulative Abnormal Return is the cross-sectional mean of each firm's cumulative abnormal return.

Each firm's cumulative abnormal return is computed as $CAR_t = \sum_{d=-33}^t (R_f - R_{VWCRSP})_d$.

R_f is the firm's daily return.

R_{VWCRSP} is the daily return to the CRSP value weighted portfolio.

t denotes a specific day relative to the plan termination announcement.