

Scienter Disclosure

M. Todd Henderson

The University of Chicago Law School
1111 East 60th Street
Chicago, IL 60637
toddh@uchicago.edu

Alan D. Jagolinzer

Stanford University
Graduate School of Business
518 Memorial Way
Stanford, CA 94305
jagolinzer@stanford.edu

Karl A. Muller, III

The Pennsylvania State University
Smeal College of Business
384 Business Building
University Park, PA 16802
muller@psu.edu

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Abstract: This study examines implications of “scienter disclosure” by analyzing voluntary disclosures regarding insiders’ Rule 10b5-1 trading plans. Prior theory suggests that disclosing informed traders’ intent to trade is not strategically advantageous, but this theory does not account for litigation risk reduction resulting from disclosure. Evidence indicates that Rule 10b5-1 disclosure increases with firm litigation risk and insider strategic trade potential. Evidence also indicates that Rule 10b5-1 disclosure is associated with greater abnormal returns to insiders’ trades, especially for firms disclosing specific plan details. These findings suggest that legal risk can compel firms to depart from a non-disclosure strategy and that disclosure might enhance strategic trade through litigation protection. Courts might infer from these findings that 10b5-1 participation does not inherently indicate lack of scienter. Regulators might also infer that a mandate to disclose 10b5-1 participation, by itself, may not mitigate strategic behavior since non-disclosing firm insiders appear the least strategic.

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Introduction

A clear inference from prior theoretical research is that firm insiders with private information about firm performance would garner no strategic advantage by disclosing either their information or their intention to act on their information *in advance* of actually acting on it (Baiman and Verrecchia, 1996; Huddart, Hughes and Williams, 2004). This research, however, characteristically ignores potential reduction in litigation risk associated with disclosures in advance of any insider wrongdoing. When disclosure has the potential to reduce litigation risk, firms (or firm insiders, if they influence disclosure choice) trade off litigation risk reduction against insiders' loss in strategic advantage that results from greater transparency, in choosing an optimal disclosure policy. We refer to the voluntary disclosure of either information or the intention to act on the information in advance of acting on it as "scienter disclosure." In other words, scienter disclosure describes disclosure that attempts to mitigate litigation risks associated with any potential wrongdoing.

This study posits that the disclosure of insiders' participation within Rule 10b5-1 trading plans is an example of scienter disclosure, and examines the determinants and implications of firms' decisions to disclose these plans. The Rule 10b5-1 setting offers a natural opportunity to investigate the influence of litigation risk on insiders' propensity to disclose private information, because legal precedent indicates that Rule 10b5-1 participation disclosure provides clear, legal risk-reduction benefits.

Rule 10b5-1 enables insiders to diversify firm-specific holdings with reduced legal risk if they plan trades while not in possession of material nonpublic information. Despite an April 2002 proposal to mandate 8-K disclosure of insiders' participation in the Rule, the

SEC currently does not require public reporting of insiders' trade plans.¹ Many firms, however, opt to voluntarily disclose information regarding insiders' participation within Rule 10b5-1 trading plans. This disclosure choice is interesting because one would not expect pre-trade voluntary disclosure when there is potential for strategic trade within 10b5-1 plans (Jagolinzer, 2008) and the disclosure may reveal privately held information. It is possible, however, that pre-disclosure of trade may be strategic in the face of high legal risk if it mitigates legal risk and does not fully reveal privately held information.

Our evidence indicates that voluntary Rule 10b5-1 disclosure is associated with the level of firm legal risk and a proxy for insiders' potential strategic trade. Our evidence also indicates that Rule 10b5-1 disclosure is associated with greater abnormal returns to insiders' trades, especially for firms disclosing specific plan details. Finally, our evidence does not indicate that there is an overall negative investor response to Rule 10b5-1 limited or specific participation disclosure. Collectively, our work has three salient implications for voluntary disclosure: 1) litigation risk can play a key role in the propensity to disclose information prior to strategic trade; 2) Rule 10b5-1 participation disclosure does not fully reveal insiders' private information; and 3) disclosure in this setting may actually *enhance* insiders' strategic trade opportunities, which seems inconsistent with the SEC's intent for the Rule.

These findings have important implications with regard to the link between voluntary disclosure and litigation risk. A large body of accounting research has investigated managers' incentives to voluntarily disclose information when facing high litigation risk (e.g., Skinner, 1994; Francis, Philbrick, and Schipper, 1994; Kasznik and

¹ SEC Release No. 33-8090, Proposed Rule: Form 8-K Disclosure of Certain Management Transactions is currently still tabled.

Lev, 1995; Skinner, 1997; Baginski, Hassell, and Kimbrough, 2002; Field, Lowry, and Shu, 2005; Rogers and Van Buskirk, 2008). The literature does not consider, however, managers' incentives to voluntarily disclose their intent to trade shares *prior to* strategic trade. Our study is significant, therefore, because it provides the first evidence that firms trade off the benefit of litigation risk reduction against the loss of strategic trading opportunities for their insiders as a result of greater transparency when choosing an optimal disclosure policy.

These findings also have important implications regarding Rule 10b5-1 governance. Courts, for example, might more carefully consider whether 10b5-1 disclosure mitigates scienter, because strategic trade appears to be associated with enhanced disclosure. The SEC might also consider that a mandate to simply disclose 10b5-1 participation might not, by itself, mitigate strategic trade within the Rule. If evidence in this study is reflective of Rule 10b5-1 use, then firms that currently do not disclose participation (i.e., those most apt to be affected by a disclosure mandate) are likely those that already have the lowest potential for insiders' strategic trade.

The study proceeds as follows. Section 1 provides background information regarding Rule 10b5-1 and outlines expectations regarding disclosure choice determinants and implications. Section 2 outlines sample selection procedures. Section 3 outlines empirical tests and results. Section 4 discusses sensitivity analyses. Finally, section 5 summarizes results and discusses potential governance implications.

1. Rule 10b5-1 background, disclosure choice, and disclosure implications

1.1. Rule 10b5-1 background

U.S. corporate insiders face legal risk (both civil and criminal) when trading their firms' securities because they frequently possess material nonpublic (or "inside") information about pending future firm performance and it is generally unlawful to trade without first disclosing this information.²

The SEC promulgated Rule 10b5-1 in October, 2000, in part, to provide a vehicle through which insiders could more readily diversify their firm-specific holdings.³ The Rule provides an affirmative defense that reduces trade-related litigation risk for insiders who enter into trade plans when they do not possess material nonpublic information. This affirmative defense allows more trade flexibility because it absolves insiders from having to cancel pre-planned trades or disclose subsequently obtained material nonpublic information before pre-planned trades execute.

Rule 10b5-1's guidance suggests that regulators expect uninformed diversification trade from insiders' trade plans. Specifically, the Rule applies if the insider can show that "before becoming aware of the information" the insider: (1) "entered into a binding contract to purchase or sell the security; instructed another person to purchase or sell the security for the [insider's] account, or adopted a written plan for trading securities"; (2) put in the plan ". . . the amount of securities to be purchased or sold and the price at which and the date on which the securities were to be purchased or sold; . . . a written formula or algorithm . . . for determining the amount of securities to be purchased or sold and the price

² See Bainbridge (2000) for a detailed discussion regarding insider trading law.

³ Linda Chatman Thomsen, SEC Director, Division of Enforcement stated recently that "the idea [of Rule 10b5-1] was to give executives opportunities to diversify or become more liquid through the use of plans with prearranged trades without facing the prospect of an insider trading investigation." (Speech by SEC Staff: Opening Remarks Before the 15th Annual NASPP Conference, October 10, 2007).

at which and the date on which the securities were to be purchased or sold; or [did] not permit the [insider] to exercise any subsequent influence over [transactions]”; and (3) did not “alter[] or deviate[] from the contract, instruction, or plan to purchase or sell securities (whether by changing the amount, price, or timing of the purchase or sale), or enter[] into or altered a corresponding or hedging transaction or position with respect to those securities.”⁴

There is evidence, however, that Rule 10b5-1 may provide insiders with strategic trade opportunities that generate abnormal trade returns.⁵ Insiders may, for example, pre-plan trade based on longer-term nonpublic information because of perceived lower legal risk.⁶ Insiders may also strategically modify the content or timing of disclosure to increase profitability of previously planned trades.⁷ Finally, insiders may also terminate Rule 10b5-1 plans when they possess material nonpublic information that indicates that a hold strategy would be more profitable than allowing pre-planned sales to continue.⁸ Jagolinzer (2008) shows that insiders’ 10b5-1 sales are, on average, associated with declines in future firm performance, suggesting there is some strategic behavior within Rule 10b5-1.

⁴ 17 CFR § 240.10b5-1(c)(1)(C).

⁵ This contrasts the affect of other insider trade regulation and case law that has been shown to mitigate the degree to which insiders’ time strategic trade [Seyhun (1992) and Garfinkel (1997)].

⁶ Insiders may perceive lower legal risk when initiating plans while in possession of long term nonpublic information because the possession standard is applied at the plan initiation date. It is likely more difficult for plaintiffs to demonstrate possession as the distance grows between the plan initiation date and the information revelation date.

⁷ Aboody and Kasznik (2000) provide evidence that disclosures are strategically timed to minimize new option grant strike prices.

⁸ Abstaining from trade while in possession of material nonpublic information is not deemed unlawful [see Fried (2003) for a policy discussion]. Therefore, terminating a plan while in possession of material nonpublic information is not deemed unlawful [SEC Division of Corporation Finance, Manual of Publicly Available Telephone Interpretations, Fourth Supplement, Rule 10b5-1, Question 15 (issued May 2001)]. The argument is based on a limit in the statute that fraud be “in connection with the purchase or sale of a security,” and since there is neither when a plan is terminated, there is no securities fraud. The SEC did suggest, however, that early plan termination might raise questions about the good faith of the plan.

1.2. Disclosure choice

In April, 2002, The SEC proposed mandatory disclosure, through 8-K filings, of insiders' use of Rule 10b5-1 trading plans. Specifically, SEC Release No. 33-8090, Proposed Rule: Form 8-K Disclosure of Certain Management Transactions suggested disclosure of the name and title of the director or executive officer, the date on which the director or executive officer entered into the 10b5-1 plan, and a description of the contract, including duration, the aggregate number of securities to be purchased or sold, and the name of the counterparty or agent. The proposal also suggested disclosure if the director or executive officer later terminated or modified a plan.⁹ The proposal was tabled indefinitely, so there is currently no requirement for firms or insiders to provide detail regarding whether or how they participate within their trading plans. Many firms, however, voluntarily disclose information regarding insiders' trade plans and there is substantive variation in disclosure detail regarding insiders' trade plan structures. These disclosure choices are inherently interesting because they potentially offer insight into firms' and insiders' utilization of the Rule.

Firms likely disclose Rule 10b5-1 details to reduce legal risk. The affirmative defense provides some risk reduction without disclosure; however, disclosure can further enhance legal protection by increasing the likelihood of early dismissal for securities class action suits. Private class action suits represent a major component of firms' overall legal risk. If sued, firms face potentially large defense and settlement costs.¹⁰ Since class action

⁹ Specifically, firms would disclose the date of the termination or modification and a description of the modification, including duration, the aggregate number of securities to be purchased or sold, the interval at which securities are to be purchased or sold, the number of securities to be purchased or sold in each interval, the price at which securities are to be purchased or sold, and the identity of the counterparty or agent.

¹⁰ “[C]ompanies are paying the legal costs of...executives defending themselves against fraud allegations. The amount of money being paid...totals hundreds of millions, or even billions of dollars. A company's average cost of defending against shareholder suits last year was \$2.2 million according to Tillinghast-

lawsuits can be “won” or “lost” at the motion to dismiss phase of litigation, firms have incentives to utilize methods, such as 10b5-1 disclosure, that enhance the likelihood of dismissal.

To increase the likelihood of dismissing suits that include insider trading allegations (e.g., to support a claim of scienter), firms may present evidence of Rule 10b5-1 trading plans as an affirmative defense. At the motion to dismiss phase, however, only previously disclosed plans are admissible because courts do not consider materials other than the plaintiff’s pleadings when considering the motion, and defendants are not typically allowed to rebut factual allegations.¹¹ Courts may, however, consider publicly available documents that are not a part of the complaint, for example, taking judicial notice of SEC filings, prospectuses, analysts’ reports, and other publicly reported data.¹² Therefore, a publicly disclosed 10b5-1 plan has a greater likelihood of influencing a motion to dismiss than a plan that is not publicly disclosed.¹³ This view is shared by corporate advisors. For example, Institutional Shareholder Services, the largest proxy advising firm for institutional shareholders, concludes, “such plans should be filed in some form with the SEC so that

Towers Perrin.” Laurie P. Cohen, “Adding Insult to Injury: Firms Pay Wrongdoers’ Legal Fees”, *The Wall Street Journal*, February 17, 2004. Average firm settlements are approximately \$30 million per suit. More than ten suits settled between \$300 million and \$6 billion in 2005 alone (PWC 2005; Buckberg 2005).

¹¹ See, e.g., *Weiner v. Klais & Co.*, 108 F.3d 86, 88-89 (6th Cir.1997).

¹² See, e.g., *In re Royal Appliance Sec. Litig.*, 1995 WL 490131, at *2 (6th Cir. Aug.15, 1995).

¹³ Precedent cases suggest that disclosure is needed to mount a defense at the motion to dismiss stage. For example, *Fener v. Belo Corp.* 425 F.Supp.2d 788 (N.D. Tex. 2006) notes that plaintiffs have an obligation to address in their complaint whether a trading plan was in effect, and if so, “why . . . this does not undercut a strong inference of scienter.” *Friedman v. Rayovac Corp.*, 291 F. Supp. 2d 845 (W.D. Wis. 2003) notes that it would generally not consider the trading plan or any other document appended to the motion to dismiss, but it would in this case since the plan was “publicly available on the SEC’s website and was filed as an exhibit to numerous reports Rayovac filed with the SEC.” *In re Netflix, Inc. Sec. Litig.*, 2005 WL 1562858 (N.D. Cal. June 28, 2005) and *Weitschner v. Monterey Pasta Company*, 2003 WL 22889372, No. C 03-0632 (N.D. Cal. Nov. 4, 2003) the courts consider publicly disclosed trading plans at the motion to dismiss stage to find no strong inference of scienter. *S.E.C. v. Healthsouth Corp.*, 261 F.Supp.2d 1298, 1322-3 (N.D. Ala., 2003) notes the existence and disclosure of a trading plan to rebut the SEC’s allegations of the requisite scienter for securities fraud.

[they] . . . can be considered at the motion to dismiss stage.”¹⁴ Lawyers advising firms on securities fraud litigation matters also think disclosure is a prerequisite to risk reduction: “[t]he adoption of the Rule 10b5-1 trading plans . . . should be publicly disclosed” to reduce the risk of litigation (Roberts and Porritt, 2004; Siegel and Lenahan, 2002).¹⁵

Since courts consider publicly available data at the motion to dismiss phase, the degree of disclosed detail regarding insiders’ Rule 10b5-1 plans likely impacts the probability of dismissal. If only the existence of a plan is disclosed, a court may not have sufficient detail to ascertain whether the insider sufficiently complied with the Rule and whether the allegedly fraudulent trades are covered by an existing plan. If the full plan details are disclosed, a court may better ascertain whether the allegedly fraudulent trades fall within the Rule’s affirmative defense, thereby increasing the probability of a low-cost dismissal.

The preceding discussion suggests that firms and insiders likely obtain litigation benefits from Rule 10b5-1 plan disclosures, and that the benefits are increasing in the specificity of the public disclosures. If so, then one would expect firms with greater ex ante litigation risk to be more apt to disclose the existence and details of Rule 10b5-1 plans.

Insiders bear costs to 10b5-1 disclosures, however, if investors infer insiders’ strategic intent from disclosure or if disclosure enhances investors’ monitoring of insiders’ trade plan commitment. Specifically, if the act of disclosure causes investors to infer strategic intent by insiders then disclosure may induce investor front-running, i.e., selling before the insiders, (Huddart, Hughes, and Williams, 2004) or information acquisition that

¹⁴ See White, T., “More on Trading Plans/Restrictions and Motions to Dismiss: Monterey Pasta Co. and Rayovac Corp.” November 24, 2003, RiskMetrics Group, available at http://slw.riskmetrics.com/2003/11/more_on_trading_plansrestricti.html (last visited April 7, 2008).

¹⁵ “While public disclosure of a trading plan is not required, such disclosure often helps to minimize the market impact and negative implications of insider sales.” (Siegel & Lenahan, 2002).

can reveal insiders' private information (Admati and Pfleiderer, 1991) and effectively lower price before insiders' trade execute. Accordingly, firms' insiders may prefer non-disclosure when strategic trade potential is low, as insiders' front running costs can outweigh the incremental legal protection afforded by disclosure and firms likely bear the costs of making insiders "whole". Interviews and comment letters regarding proposed mandatory disclosure indicate that front-running concerns factor into the decision to not disclose or to disclose little detail regarding 10b5-1 participation: "We do not believe the establishment, modification, or termination of Rule 10b5-1 arrangements should be reported. ...[R]equiring disclosure of the mere presence of these plans would attribute meaning where none may exist."¹⁶

If disclosure provides investors with insiders' 10b5-1 plan details, then it allows for ex post reconciliation of plan commitment. Reconciliation would entail matching data reported in insiders' transaction reports (e.g., SEC Form 4), with details provided with 10b5-1 disclosures. Reconciliation could reveal insiders' use of the strategic early plan termination option, potentially increasing regulatory scrutiny of insiders' good faith compliance with the Rule.¹⁷ Therefore, specific disclosure reduces insiders' value of the early termination option. Ceteris paribus, then, insiders should generally not prefer disclosure; therefore disclosure probability should be lower when insiders have more influence over the disclosure decision.

¹⁶ Cleary, Gottlieb, Steen & Hamilton comment letter to the SEC, dated June 24, 2002 [<http://www.sec.gov/rules/proposed/s70902/clearygottlieb1.htm>, cited September 15, 2008].

¹⁷ The SEC states that "[t]ermination of a plan, or the cancellation of one or more plan transactions, could affect the availability of the Rule 10b5-1(c) defense for prior plan transactions [SEC Division of Corporation Finance, Manual of Publicly Available Telephone Interpretations, Fourth Supplement, Rule 10b5-1, Question 15(b) (issued May 2001)]."

Insiders might infer 10b5-1 disclosure benefits, however, if they perceive that disclosure provides incremental litigation protection for strategic trade. If this is the case, then insiders' preference for disclosure should be increasing with their strategic trade potential. In models of insiders' strategic trade (e.g., Huddart and Ke 2007), insiders' information advantage is determined by: (1) prior stock price variance and (2) the precision of insiders' private information. Specifically, low investor uncertainty—i.e., low prior stock price variance—provides little scope for profitable insider trade, even if the insider possesses perfect private information. For a given level of private information, then, insiders' strategic trade potential is increasing in prior stock price variance. If insiders infer that disclosure provides litigation protection benefits regarding potential strategic trade then disclosure probability should be greater when insiders have control over the disclosure decision and there is higher investor uncertainty.¹⁸

Outside shareholders might infer 10b5-1 disclosure benefits if disclosure provides for better monitoring of or greater insider commitment to disclosed trade plans. Outside shareholders might also infer disclosure benefits if disclosure provides a signal regarding insiders' private information, and provides firm-level litigation protection if insiders trade strategically. These benefits likely increase when insiders have greater strategic trade potential, since governance is likely more relevant, insiders' signals are likely more informative, and firm-level litigation risk is likely greater. If this is the case, then disclosure probability should be greater with high outside investor firm control and should be even greater when investors concurrently have more uncertainty—i.e., when prior stock price variance is high.

¹⁸ Disclosure probability should also be greater when insiders have more precise private information. We cannot empirically test this prediction since insiders' private information about pending performance is unobservable.

1.3. Disclosure implications

1.3.1. Realized trade and firm performance

If the probability of Rule 10b5-1 disclosure is increasing in insiders' strategic trade potential, then disclosure should be associated with greater observed strategic trade. Strategic trade can be inferred ex post from an association between insiders' sales transactions and subsequent declines in fundamental economic and returns performance. Further, if strategic trade litigation protection is increasing in disclosure specificity, then the degree of observed strategic trade should also increase with disclosure specificity.

Consider, for example, three disclosure groups: non-disclosure, limited disclosure, and specific disclosure. The non-disclosure group likely represents firms that infer low litigation, monitoring, plan commitment, or information signal benefits from disclosure because insiders have low strategic trade potential. If this is the case, then this group is likely not associated with strategic trade. The limited disclosure group likely represents firms that infer some litigation, monitoring, plan commitment, or information signal benefits from disclosure because insiders have some strategic trade potential. This group would likely contain, for example, insiders who possess less precise private information at 10b5-1 plan initiation and therefore place greater value in the strategic early termination option. Limited disclosure affords some legal protection, yet still retains the early termination option since ex post reconciliation is not feasible.¹⁹ If this is the case, then this group is likely associated with modest strategic trade. The specific disclosure group likely represents firms that infer substantive litigation, monitoring, plan commitment, or information signal benefits from disclosure because insiders have high strategic trade

¹⁹ Since limited disclosure does not provide sufficient plan detail, one cannot infer, ex post, whether an absence of trade results from early termination, non-execution due to failure to meet limit orders, or natural plan termination.

potential. This group would likely contain, for example, insiders who possess more precise private information at 10b5-1 plan initiation and are therefore less concerned with foregoing the strategic early termination option. If this is the case, then this group is likely associated with the greatest degree of strategic trade.

1.3.2. Investors' disclosure response

If disclosure is associated with insiders' potential for strategic trade, then disclosure may provide a price relevant signal to investors. Investors may respond negatively to limited disclosures regarding 10b5-1 participation, for example, if they infer that insiders have some strategic trade potential for which they seek litigation protection.²⁰ Similarly, investors should respond negatively to specific disclosures regarding 10b5-1 participation, if they infer that insiders have high strategic trade potential for which they seek high litigation protection. Investors' response to disclosure will also likely vary with the degree to which disclosed insiders have access to private information (e.g., insider rank), and with expectations for insiders' sales volume within the plans.

2. Sample

The sample of participation disclosures are collected from keyword searches for variants of the expression "10b5-1" through 8-K filings, business wire reports, and press releases between October 2000 and December 2006.²¹ This keyword search nets 773 firm observations. Additional disclosure observations are collected from keyword searches for variants of the expression "10b5-1" through SEC Form 4 filings between October 2000 and

²⁰ Investors may choose to delay their response to limited disclosure, however, if they recognize that the participation disclosure implies that insiders' private information has low precision. Investors may choose, instead, to respond when insiders update their private information signal with a subsequent sale (Lie, 2005).

²¹ Commonly reported variants of the keyword expression include "10-b-5-1" and "10b5-1(c)".

December 2006.²² This keyword search nets an additional 894 firm observations. Estimation samples are further constrained by the availability of price and returns data from CRSP, insider transaction data from Thomson Financial, institutional ownership data from CDA/Spectrum, governance data from Equilar, and earnings performance data from Compustat.

Sample disclosures of 10b5-1 plan participation are categorized by each author into limited or specific partitions. If the disclosure delineates the specific terms underlying the plan, the disclosure is classified as specific. Figure 1, Panel A provides one example of a disclosure that is classified as specific. If the disclosure does not delineate the specific terms underlying the plan, the disclosure is categorized as limited. Figure 1, Panel B provides two examples of disclosures that are classified as limited. All Form 4 disclosures are classified as limited since they generally state that a particular transaction is Rule 10b5-1 compliant, yet provide no specific details regarding the underlying plan.²³ This classification procedure yields 94 specific and 1,573 limited firm observations that are further constrained for estimation by data availability.

Some analyses require identifying a sample of firms where insiders' participation in Rule 10b5-1 is not disclosed.²⁴ The non-disclosure sample is inferred from firms where there is no Rule 10b5-1 participation disclosure, where insiders execute sales transactions

²² The SEC mandated electronic Form 4 filings as of June 30, 2003. Unlike previously reported paper filings (which are available electronically as image scans), the electronic filings enable global keyword searches. As a result, a substantive proportion of the Form 4-generated sample comes from the period subsequent to June 2003.

²³ Form 4 disclosures may provide different inferences than other participation disclosures since they follow trades made within 10b5-1 plans. Form 4 disclosures are similar to other limited disclosures, however, in that they convey that an insider has initiated a plan and that the insider is likely to execute further trade within the plan. Excluding Form 4 disclosures from the returns analyses does not affect inferences.

²⁴ Jagolinzer (2008) corroborates the existence of firms that choose to not disclose 10b5-1 plan participation, through a survey of nearly 2,700 Nasdaq firms. Nearly 18% of the 378 respondent firms report that they had at least one insider participate within Rule 10b5-1 between October 2000 and December 2002, yet the firm chose to not disclose this information.

within thirty-calendar-day periods that precede quarterly earnings announcements, and where the firm does not appear to have previously allowed trades to execute in short windows before earnings.²⁵ This inference relies on the assumption that most firms generally blackout insiders' trades before earnings announcements, yet allow Rule 10b5-1 transactions to bypass blackout restrictions.

At least two errors can occur from the non-disclosure sample inference algorithm. The first error occurs if the non-disclosure sample inadvertently excludes participating firms whose insiders' transactions do not execute shortly before earnings (false negative error). The algorithm's false negative error rate is estimated from its ability to predict firms known to have 10b5-1 participants (i.e., the disclosure sample). The false negative error rate approximates 30%. The second error occurs if the non-disclosure sample inadvertently includes non-participating firms whose insiders' transactions execute shortly before earnings for reasons other than 10b5-1 plan execution (false positive error).²⁶ The algorithm's false positive error rate is estimated by the degree to which it inadvertently includes non-participant firms when it predicts non-disclosing participants from the Jagolinzer (2008) survey response pool (see footnote 24). The false positive error rate approximates 14%. It is not clear to what degree these errors bias reported results for the inferred non-disclosure sample.²⁷

²⁵ Specifically, firms are excluded if insider trades are observed in pre-earnings windows during the year that precedes Rule 10b5-1 promulgation. Bettis, Coles, and Lemmon (2000) show that fewer than 15% of sample firms authorize insiders' trades in the 30 days that precede earnings announcements.

²⁶ Jagolinzer, Larcker, and Taylor (2008) report that some firms authorize the general counsel to grant blackout window waivers.

²⁷ If trading outside of pre-earnings windows is typically less strategic (Jagolinzer, Larcker, and Taylor 2008), then false negative error should bias towards documenting an association between non-disclosure and strategic trade. If trading within pre-earnings windows under general counsel approval is typically less strategic (Jagolinzer, Larcker, and Taylor 2008), then false positive error should bias against documenting an association between non-disclosure and strategic trade.

Firms across disclosure specificity groups appear generally similar in size and performance, and are modestly larger and more profitable than the general Compustat population during the estimation period. For example, median market value of equity (untabulated) is \$625, \$745, \$603, and \$163 million and return on assets is 3%, 4%, 1.3%, and 1.4% for the no-disclosure, limited-disclosure, specific-disclosure, and Compustat population samples, respectively.

3. Empirical Analyses

We are interested in better understanding the determinants and implications of voluntary disclosure of 10b5-1 plan participation. Our empirical tests, therefore, analyze the first firm-level decision to voluntarily disclose participation in 10b5-1 plans, the association between voluntary disclosure and subsequent firm returns and earnings performance, and investors' response to disclosure.

3.1. Disclosure choice

Our first empirical analysis investigates whether the voluntary disclosure of 10b5-1 plan participation is more prevalent for firms with high litigation risk and with high potential for insiders' strategic trade. Disclosures are observed through firm level disclosure instruments (e.g., SEC filings and press releases), so we estimate the disclosure choice at the firm level.²⁸ We investigate firms' first decisions to disclose participation within Rule 10b5-1 trading plans using the following logistic regression model:

$$\Pr(Discl = 1) = \alpha_0 + \alpha_1 LitRisk + \alpha_2 InstitOwn + \alpha_3 InsideDirs + \alpha_4 Volat + \alpha_5 [Volat * InstitOwn] + \alpha_6 [Volat * InsideDirs] + \varepsilon \quad (1)$$

where *Discl* is a dichotomous variable that equals one if the firm discloses Rule 10b5-1 participation details, and zero otherwise; *LitRisk* is the firm's expected class action

²⁸ We include proxies to capture insiders' potential influence over this disclosure choice.

litigation probability estimated in the year prior to 10b5-1 participation disclosure;²⁹ *InstitOwn* is the percentage of institutional firm ownership (CDA/Spectrum) in the year prior to disclosure; *InsideDir*s is the ratio of officer directors to total board directors in the year prior to disclosure (Equilar); and *Volat* is the standard deviation of residuals from a regression of firm daily returns on the daily returns to the value-weighted CRSP portfolio in the year prior to disclosure (CRSP).

If firms expect the net benefit from disclosure to be increasing in the expected general litigation risk of class action suits then the coefficient for *LitRisk* should be positive. If large outside investors expect monitoring, plan commitment, litigation, or information signaling benefits from disclosure then the coefficient for *InstitOwn* should be positive. If insiders expect front-running or plan commitment costs from disclosure then the coefficient for *InsideDir*s should be negative. If firms expect higher litigation risk benefits when insiders' strategic trade potential is greater (which likely increases overall litigation risk relative to *LitRisk* since insiders have better opportunities to profit from private information), then the coefficient for *Volat* should be positive. If insiders and large

²⁹ Specifically, *LitRisk* is estimated from the following annual cross-sectional logistic regression (similar to Rogers and Stocken, 2005): $Pr(DMGPd = 1) = \gamma_0 + \gamma_1 MinReturn + \gamma_2 SkewReturn + \gamma_3 Turnover + \gamma_4 Log(MVE) + \gamma_5 BHRReturn + \gamma_6 Beta + \gamma_7 BiotechInd + \gamma_8 CompHWInd + \gamma_9 CompSWInd + \gamma_{10} ElecInd + \gamma_{11} RetailInd + \varepsilon$, where *DMGPd* equals one if the fiscal year falls within an alleged class action damage period (data provided by Woodruff Sawyer and Co.) and equals zero otherwise; *MinReturn* is the minimum single day firm return during the fiscal year; *SkewReturn* is the skewness of daily returns during the fiscal year; *Turnover* is the average daily trade volume scaled by shares outstanding during the fiscal year; *MVE* is the average market value of equity during the fiscal year; *BHRReturn* is the prior fiscal year's buy and hold return; *Beta* is the firm's beta coefficient from a regression of daily firm returns on daily market returns; and *BiotechInd*, *CompHWInd*, *CompSWInd*, *ElecInd*, and *RetailInd* are dichotomous variables that equal one if the firm represents the biotechnology, computer hardware, computer software, electric, or retail industries, and equal zero otherwise. For descriptive purposes, pooled estimated coefficients and z-statistics are *MinReturn* (coeff = -0.58, z = -4.16), *SkewReturn* (coeff = -0.92, z = -7.63), *Turnover* (coeff = 3.76, z = 7.30), *Log(MVE)* (coeff = 0.00, z = 9.11), *BHRReturn* (coeff = 0.00, z = 1.45), *Beta* (coeff = 0.22, z = 12.03), *BiotechInd* (coeff = 0.33, z = 5.35), *CompHWInd* (coeff = 0.27, z = 2.78), *CompSWInd* (coeff = 0.24, z = 4.10), *ElecInd* (coeff = 0.09, z = 1.19), and *RetailInd* (coeff = 0.21, z = 2.82). Coefficient estimates differ from those reported by Rogers and Stocken (2005) because of differences in estimation (logit vs. probit) and in variable measurement and selection.

outside investors encourage firms to seek higher litigation risk protection through disclosure when insiders' strategic trade potential is greater then the coefficients for [*Volat * InstitOwn*], and [*Volat * InsideDirs*] should be positive.

Equation (1) is estimated using disclosure observations, both specific and limited, where the fiscal year is the first year in which disclosure is observed between 2001 and 2006, and non-disclosure observations where the fiscal year is the first year in which inferred Rule 10b5-1 participation is observed between 2001 and 2006 and no disclosure is made. We estimate equation (1) using two specifications. The first is a logistic regression that includes all firm-year observations, which compares the disclosure firms in the initial plan adoption year against all non-disclosure firm years. In this specification, we include industry and year fixed effects to control for prevailing industry and market conditions. The second is a conditional logistic regression that includes each disclosure observation and a matched non-disclosure observation from the same fiscal year, 2-digit industry code, and with the closest market value of equity. This specification potentially reduces the power of the tests, however, it better controls for industry and size related factors that might be associated with disclosure choice.

The first two panels of Table 1 report descriptive statistics for the determinants of voluntary disclosure of 10b5-1 participation. Panel B, which reports univariate statistics within disclosure groups, provides evidence that voluntary disclosure of plan participation is more common for high litigation risk firms. Specifically, average *LitRisk* is relatively greater for both the specific and limited firms than for the non-disclosure firms (difference = 0.009 and 0.007, *t*-statistics = 4.37 and 12.00, respectively). Panel B also provides evidence that voluntary disclosure of plan participation is more common for high stock

price volatility firms. Specifically, average *Volat* is relatively greater for both the specific and limited firms than for the non-disclosure firms (difference = 0.011 and 0.002, *t*-statistics = 4.98 and 4.09, respectively). In addition, average *Volat* is relatively greater for the specific firms than the limited firms (difference = 0.009, *t*-statistic = 3.86).

The logistic and conditional logistic estimation results are presented in Panel C of Table 1.³⁰ We report both coefficient estimates and estimates of marginal effects.³¹ Consistent with evidence reported in Panel B, the results indicate that higher class action litigation risk firms are associated with greater disclosure probability of 10b5-1 plan participation (*LitRisk Marg. Effects* = 1.396 and 2.276; *z*-statistics = 3.46 and 2.52).³² The results also indicate that firms with higher insider strategic trade potential (i.e., higher risk that insiders can exploit information when trading within 10b5-1 plans) are more likely to disclose 10b5-1 participation (*Volat Marg. Effects* = 3.161 and 6.440; *z*-statistics = 6.01 and 4.41). This suggests that firms with higher litigation risk expect benefits from disclosure. In addition, the results indicate that firms with higher institutional ownership are more likely to disclose 10b5-1 plan participation (*InstitOwn Marg. Effects* = 0.176 and 0.243; *z*-statistics = 6.39 and 3.97) and that this association is stronger when there is higher insider strategic trade potential (*Volat * InstitOwn Marg. Effects* = 6.889 and 8.693; *z*-

³⁰*Volat*, *InstitOwn* and *InsideDirs* are recentered to their average values (i.e., the average of each variable has been subtracted from each variable) to provide interpretation of the main effects at their average value.

³¹ The marginal effect for *LitRisk* is $\alpha_1 * (1-P)*P$, where $P = 1/(1+e^{-XB})$. The marginal effect for *InstitOwn* is $(\alpha_2 + \alpha_5 Volat) * (1-P)*P$. The marginal effect for *InsideDirs* is $(\alpha_3 + \alpha_6 Volat) * (1-P)*P$. The marginal effect for *Volat* is $(\alpha_4 + \alpha_5 InstitOwn + \alpha_6 InsideDirs) * (1-P)*P$. The marginal effect for *Volat * InstitOwn* is $\alpha_5 * (1-P)*P - (\alpha_2 + \alpha_5 Volat) * (\alpha_4 + \alpha_5 InstitOwn + \alpha_6 InsideDirs) * (1-P)*P + 2 * (\alpha_2 + \alpha_5 Volat) * (\alpha_4 + \alpha_5 InstitOwn + \alpha_6 InsideDirs) * (1-P)^2 * P$. The marginal effect for *Volat * InsiderDirs* is $\alpha_6 * (1-P)*P - (\alpha_3 + \alpha_6 Volat) * (\alpha_4 + \alpha_5 InstitOwn + \alpha_6 InsideDirs) * (1-P)*P + 2 * (\alpha_3 + \alpha_6 Volat) * (\alpha_4 + \alpha_5 InstitOwn + \alpha_6 InsideDirs) * (1-P)^2 * P$. Marginal effect *z*-statistics are computed utilizing the delta method (Ai and Norton, 2003).

³² Results are similar when *LitRisk* is replaced with an alternative litigation risk proxy, *Lawsuit*, which is a dichotomous variable that equals one if the firm entered a class action lawsuit damage period in the year preceding disclosure and that equals zero otherwise. Rogers and Van Buskirk (2008) suggest that firms consider recent lawsuits as salient to determining disclosure policy.

statistics = 4.85 and 2.49). This suggests that institutional investors infer disclosure-related monitoring, plan commitment, information signaling, or legal protection benefits. Finally, the results indicate that officers prefer disclosure only when there is higher insider strategic trade potential ($Volat * InsideDirs Marg. Effects = 4.480$ and 7.044 ; z -statistics = 2.42 and 2.49). This suggests that insiders prefer greater disclosure to mitigate litigation risk arising from expectations of increased strategic trade when trading within 10b5-1 plans.

3.2. Realized trade and subsequent performance

3.2.1. Returns performance

The next analyses investigate whether Rule 10b5-1 plan participation disclosure is associated with realized strategic trade by insiders. Figure 2 plots the cumulative abnormal return relative to the timing of insiders' sales that are executed after the first disclosure of insiders' participation within the Rule. Returns analyses focus exclusively on insiders' sales transactions since sales comprise nearly all transactions executed within Rule 10b5-1 (Jagolinzer, 2008) and because there are no specific disclosure observations associated with pending insider purchases. Specifically, Figure 2 cumulates the market adjusted firm returns (daily firm return – the daily return to the value-weighted CRSP portfolio) from day – 30 to day + 30 relative to each insider transaction day (executed on day 0) during the one-year period that follows the insider's first participation disclosure.³³ For non-disclosure firms, a first-pseudo-disclosure date is identified as the sixtieth calendar day that precedes the first observed within-blackout-window transaction.³⁴

³³ For all non-disclosure and most limited disclosure observations, it is not possible to discern the length of 10b5-1 plans. A typical disclosed plan length is 12 months, so we assume that trades made within 12 months following plan disclosure are pursuant to the Rule. Misclassification of observed trades likely induces noise to inferences regarding the association between trades and performance.

³⁴ For disclosure firms (excluding Form 4 disclosures), the average number of days between disclosure and the first observed trade is 53. The median number of days is 17. Results are not sensitive to denoting the

Figure 2, Panels A, B, and C all show that 10b5-1 sales trades tend to follow positive market-adjusted returns. These patterns are consistent with some 10b5-1 sales being triggered by limit order formulas.³⁵ Panel A also shows that sales trades that follow specific disclosure are associated with negative market-adjusted returns subsequent to the transaction. Relatedly, Figure 2, Panel B shows that sales trades that follow limited disclosure are also associated with negative market-adjusted returns subsequent to the transaction.³⁶ Finally, Figure 2, Panel C shows that sales trades that follow non-disclosure do not appear to be associated with negative subsequent market-adjusted returns. A comparison of post-trade returns slopes across Figure 2 panels suggests that the degree to which sales transactions are associated with negative performance is increasing in Rule 10b5-1 disclosure specificity.

To more formally test the association between trade returns and disclosure specificity, Table 2, Panel B presents univariate comparisons of abnormal trade returns across disclosure partitions. Specifically, Table 2 reports market adjusted buy-and-hold returns for each insider transaction day during the year that follows disclosure. Market adjusted buy and hold returns are computed as $BHR_w - VWBHR_w$, where BHR is the firm buy and hold return, $VWBHR$ is the buy and hold return to the CRSP value-weighted portfolio, and w is a subscript for holding period time horizon. Consistent with evidence reported in Figure 2, Table 2 Panel B indicates that post-trade market adjusted returns become more negative as disclosure of participation becomes more specific. For example,

first-pseudo-disclosure date as the thirtieth calendar day that precedes the first observed within-blackout-window transaction.

³⁵ Several disclosed 10b5-1 plans delineate minimum price floor limits to trigger transactions. Some disclosed plans also delineate graduated limits that trigger incremental sales volume when higher price thresholds are realized. Results from simple random walk simulations (not tabulated) show that pre-sales “run-up” returns are biased upwards as limit order prices are increased.

³⁶ Panel A and Panel B patterns are consistent with pooled sales transaction results reported in Jagolinzer (2008).

Panel B shows that the average six-month post-trade market adjusted return is -12.1% , -2.2% , and -0.2% (t -statistics = -10.58 , -12.85 , and -0.76) for specific, limited, and non-disclosed trades, respectively.

To control for other factors that might explain differences in post-trade returns, Table 3 provides evidence from a calendar-month portfolio estimation of monthly returns regressed on factors known to explain monthly returns (Fama and French, 1993; Carhart, 1997). Our approach follows the portfolio estimation method suggested by Mitchell and Stafford (2000), to control for potential contemporaneous cross-sectional correlation. Specifically, within each disclosure category, monthly portfolios are formed between January 2001 and July 2007 if a 10b5-1 sales transaction is observed in the preceding calendar month. For each calendar month in which at least three firms are available to form a portfolio, the following regression is estimated:

$$(R_{port} - R_f) = \beta_0 + \beta_1(R_m - R_f) + \beta_2SMB + \beta_3HML + \beta_4UMD + u \quad (2)$$

where R_{port} is the equally-weighted monthly portfolio return, R_f is the one-month treasury bill rate, R_m is the value-weighted monthly market return, and SMB , HML , and UMD are the monthly small-minus-big, high-minus-low, and momentum factors that explain monthly stock returns (Fama and French, 1993; Carhart, 1997, data from CRSP and from Ken French's website as provided through WRDS).

Consistent with evidence presented in Figure 2 and Table 2, results from Table 3 indicate that more specific 10b5-1 plan disclosures are associated with more negative post-trade abnormal returns. Specifically, abnormal returns to the non-disclosure portfolio (0.001, t -statistic = 0.46) from column 1 of Table 3 are not statistically negative. Abnormal returns to the limited-disclosure portfolio (-0.010 , t -statistic = -2.25) from column 2 of

Table 3, however, are statistically negative. Abnormal returns to the specific-disclosure portfolio (-0.047 , t -statistic = -2.94) from column 3 are also statistically negative. Finally, column 4 of Table 3 indicates that post-trade abnormal returns are statistically more negative as disclosure becomes more specific. Formal tests comparing portfolio returns indicate that post-trade abnormal returns are statistically more negative for the limited-disclosure portfolio relative to the non-disclosure portfolio (-0.010 , t -statistic = -1.86), for the specific-disclosure portfolio relative to the non-disclosure portfolio (-0.041 , t -statistic = -4.08), and for the specific-disclosure portfolio relative to the limited-disclosure portfolio (-0.031 , t -statistic = -3.04).

We also present results using a firm-level calendar-time regression for robustness. The Mitchell and Stafford (2000) portfolio method can result in relatively low power tests due to observation aggregation at the month portfolio level (see Loughran and Ritter (2000), Mitchell and Stafford (2000), and Cheng, Nagar, and Rajan (2007) for a discussion). Following Cheng, Nagar and Rajan (2007), the following regression model is estimated:

$$\begin{aligned} (R_j - R_m) = & \delta_0 + \delta_1 None + \delta_2 Limited + \delta_3 Specific + \delta_4 Ln(BTM) \\ & + \delta_5 PriorReturn + \delta_6 PriorVolatility + z \end{aligned} \quad (3)$$

where R_j is the monthly firm return, R_m is the equal-weighted or value-weighted monthly CRSP portfolio market return, *None* is a dichotomous variable that equals one during the month following a non-disclosed inferred Rule 10b5-1 sales transaction and equals zero otherwise, *Limited* is a dichotomous variable that equals one during the month following a limited-disclosed Rule 10b5-1 sales transaction and equals zero otherwise, *Specific* is a dichotomous variable that equals one during the month following a specific-disclosed Rule

10b5-1 sales transaction and equals zero otherwise, *BTM* is the book-to-market ratio measured at the end of the previous month, *PriorReturn* is the buy-and-hold firm return over the preceding 12 months, and *PriorVolatility* is the standard deviation of monthly stock returns over the preceding 36 months. We control for common events within industries using two-digit industry code fixed effects. We also control for potential dependency in firm returns within months through the use of month-clustered standard errors (Gow, Ormazabal, and Taylor, 2008).³⁷

Consistent with earlier results, Table 4 provides evidence that the association between sales transactions and subsequent negative performance is increasing in disclosure specificity, after controlling for other factors that are associated with firm returns. Specifically, when the dependent variable equals the equal-weighted-market adjusted firm monthly return, results indicate that abnormal returns following trade months are 1.2%, 1.6% and 4.3% lower than returns in other months for non-, limited-, and specific-disclosure firms, respectively. When the dependent variable equals the value-weighted-market adjusted firm monthly return, results indicate that abnormal returns following trade months are 1.1%, 2.1% and 4.3% lower than returns in other months for non-, limited-, and specific-disclosure firms, respectively. Formal tests indicate that post-trade abnormal returns are generally statistically more negative as disclosure specificity increases.

3.2.2. *Earnings and price relevant news*

To better understand what may economically underlie the association between disclosed Rule 10b5-1 trades and subsequent return performance, Table 5 presents results

³⁷ Lakonishok and Lee (2001) provide evidence that abnormal returns accrue to insiders' sales at firms with high book to market ratios and low market value of equity. This estimation explicitly controls for differences in book to market ratios across firms. Market value of equity is implicitly controlled for because firms in the different disclosure partitions are of similar size (untabulated).

regarding investors' response to releases of earnings news, both before and after the first observed trades that follow voluntary Rule 10b5-1 disclosures. Specifically, Table 5 reports three-day market adjusted returns, centered on the quarterly announcement date (*RDQE* from Compustat), for the four quarters that precede and that follow the quarter in which the first insider trade is observed following disclosure. Returns are adjusted by subtracting the same period return to the value-weighted CRSP portfolio.

Table 5 provides evidence of positive earnings announcement surprises for the four quarters prior to insiders' first sales for firms providing limited and specific disclosure (pooled *t*-statistics = 5.57 and 2.24, respectively). This evidence is consistent with positive earnings performance relative to investors' expectations prior to insiders' sales. Table 5 also provides some evidence of negative earnings announcement surprises for the four quarters following insiders' first sales for firms providing limited disclosure (pooled *t*-statistic = -2.23). This evidence is consistent with overall negative earnings performance shifts from the period before to after insiders' sales. Evidence for firms providing specific disclosure indicates a similar decline in earnings performance across the periods, however, there is no evidence of negative post-sales earnings performance perhaps because of low power or because specific disclosure trades are associated with price relevant events that may not be impounded in short-term earnings. To explore this further, we analyze whether specific disclosures are associated with subsequent news events that may not be impounded in short-term earnings. We find that approximately 25% of the specific disclosure sample exhibits a single news event, not related to earnings, for which the three-day market adjusted return falls between -10% and -75%, within an average 140 calendar days of

disclosure.³⁸ We also find that approximately 33% of the remaining specific disclosure sample exhibit sustained returns declines (between –20% and –80%), for which there is no obvious associated information event, during the 180 calendar days that follow disclosure.

Collectively, this evidence suggests that Rule 10b5-1 trades tend to be associated with fundamental firm economic shifts. This mitigates the likelihood that observed returns patterns result from investors' response to 10b5-1 trade signals.

3.2.3. Investors' response to 10b5-1 disclosure

We assess whether investors respond to 10b5-1 disclosure by estimating three day market-adjusted returns centered on the first firm announcement date regarding pending 10b5-1 sales plans and on the subsequent first insider transaction reporting date for trades executed within plans. We market-adjust returns by subtracting the same period return to the value-weighted CRSP portfolio. Table 6 provides pooled univariate results partitioned by disclosure type. Results do not indicate that investors respond negatively to 10b5-1 participation disclosure or the disclosure of first trades executed within 10b5-1 plans. There is also no evidence that investors respond more negatively to specific disclosures.

Table 7 provides regression estimates of determinants of investors' response to first firm participation announcements and first insider transaction reports. For first participation announcements, the following regression is estimated:

$$MktAdjRet = \phi_0 + \phi_1 Specific + \phi_2 CEOCB + \phi_3 CFO + \phi_4 Ln(NumExecs) + \phi_5 PriorSales + z. \quad (4)$$

$MktAdjRet$ is the three day cumulative firm return centered on the announcement date minus the three day return to the value weighted CRSP portfolio, $Specific$ is a dichotomous variable that equals one if the disclosure is categorized as specific and equals zero if the

³⁸ News event examples include exchange-imposed stock trade suspension, drug trial failure, and announcement of the intent to acquire another firm.

disclosure is categorized as limited, *CEOCB* is a dichotomous variable that equals one if the disclosure names a Board Chairman or Chief Executive Officer participant and equals zero otherwise, *CFO* is a dichotomous variable that equals one if the disclosure names a Chief Financial Officer participant and equals zero otherwise, *NumExecs* equals the number of insiders named in the disclosure as participants, and *PriorSales* is the cumulative percentage of firm shares sold by insiders in the year that precedes the announcement event.

For first insider transaction day announcements, the following regression is estimated:

$$MktAdjRet = \gamma_0 + \gamma_1 Specific + \gamma_2 CEOCB + \gamma_3 CFO + \gamma_4 Ln(DollarVol) + z. \quad (5)$$

MktAdjRet, *Specific*, *CEOCB*, and *CFO* are as described for equation (4), and *DollarVol* equals the dollar volume of sales reported in the transaction day filing.

If investors infer strategic trade potential from these disclosures and that this potential is increasing with insiders with greater private information access and with greater expected trade volume, then one would expect negative coefficients for *Specific*, *CEOCB*, *CFO*, *Ln(PriorSales)*, *Ln(NumExecs)*, and *Ln(DollarVol)*. Table 7 reports some evidence that investors respond more negatively when a CEO or Chairman is announced as participating (*CEOCB* = -0.008, *t-statistic* = -1.69) and as having traded within a 10b5-1 plan (*CEOCB* = -0.005, *t-statistic* = -2.51). There is also some evidence that investors respond more negatively to participation announcements when expected sales volume is greater (*PriorSales* = -26.407, *t-statistic* = -3.40). This evidence is consistent with predictions, however, similar investor response associations may exist for non-10b5-1 trade

activity. Consistent with Table 6, Table 7 does not provide evidence of a differential investor response for specific disclosures relative to limited disclosures.

The lack of negative investor response to 10b5-1 disclosures may indicate that there are frictions to implementing strategies based on 10b5-1 disclosure signals or that investors' do not understand 10b5-1 disclosure implications, which is possible if our sample period reflects the transition period regarding 10b5-1 use.³⁹ It may also indicate that the reported estimation method is misspecified or has low power.

4. Sensitivity Analysis for Potential Selection Bias

Disclosure choice may correlate with unobserved factors (e.g., insiders' control over firm decisions or access to material information) that can influence observed post-trade returns patterns, irrespective of disclosure. It is possible, then, that we inappropriately attribute observed results to disclosure choice when, in fact, they evolve from an unobserved characteristic that is correlated with disclosure choice. Table 2 Panel A, for example, shows that disclosure specificity is correlated with higher ranking corporate officers who may simply be better able to predict or influence future firm performance. To assess this potential, we investigate whether observed returns patterns (and differences across disclosure partitions) exist for insiders' trades during the twelve-month period ending a year prior to being identified as participating in a 10b5-1 plan. If disclosure choice inadvertently proxies for an omitted characteristic (e.g., insiders' ability to predict or influence future performance), then presumably patterns should be consistent through time. Results from estimating equations (2) and (3) during the pre-10b5-1 time period (untabulated) fail to provide evidence of strategic selling behavior for insiders in

³⁹ Anecdotally, some regulators, legal counselors, and institutional investors have noted that they have only recently begun to understand the implications of Rule 10b5-1. Some have noted that their understanding has improved with the increasing availability of historical data.

any of the disclosure partitions, and fail to provide evidence of trade profitability differences across the disclosure partitions. This mitigates the likelihood that the observed patterns are induced by self-selection.

Self-selection could also affect our cross-sectional analysis of the markets' reaction to the announcement of plan 10b5-1 participation and the announcement of the first trade by each insider (Table 7), as the market could ex ante predict which firms and insiders will disclose 10b5-1 participation. We investigate this possibility following Heckman (1979) by estimating equations (4) and (5) with an inverse-Mills ratio constructed using the predicted probabilities from our estimation of equation (1). Our inferences are not affected using these alternative regression specifications.

5. Conclusions

This study examines implications of “scienter disclosure” through an analysis of voluntary disclosures regarding insiders’ Rule 10b5-1 trading plans. Theory suggests that there is no strategic advantage to disclosing an informed insider’s intent to trade (Baiman and Verrecchia, 1996; Huddart, Hughes and Williams, 2004). However, these models do not take into account the reduction in legal risk that disclosure may provide. Evidence indicates that participation disclosure is increasing in firm litigation risk and in insiders’ strategic trade potential, suggesting that firms and/or firm insiders infer legal benefits from disclosure. Evidence also indicates that risk-mitigating disclosure may enhance insiders’ ability to profit from strategic trade. Specifically, evidence indicates that disclosed 10b5-1 insiders’ sales transactions are associated with subsequent declines in fundamental economic and stock returns performance. Evidence also indicates that post-trade stock return performance declines are increasing in disclosure specificity. Collectively, these

findings suggest that 10b5-1 disclosure provides legal protection for strategic trade, which seems inconsistent with regulatory intent.

Several governance implications may be drawn from these results. First, courts might more carefully consider whether 10b5-1 disclosure mitigates scienter, since strategic trade patterns appear more in firms with enhanced disclosure. Second, firms might consider whether specific disclosure reduces or enhances insiders' strategic trade options. In some cases, it may reduce the value of insiders' options since it allows for ex post revelation of early plan termination. However, it may enhance the value of other options, such as planning trade in anticipation of longer-term negative news, since specific disclosure may increase the likelihood of early legal case dismissal. Finally, the SEC might consider that mandating disclosure of 10b5-1 participation may not mitigate strategic trade within the Rule. If evidence in this study is reflective of Rule 10b5-1 use, then firms that currently do not disclose participation (i.e., those most apt to be affected by a disclosure mandate) are likely those that already have the lowest strategic trade potential for their insiders' trades.

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Figure 1
Example 10b5-1 Plan Disclosures

Panel A: Specific

Excerpts from PepsiAmericas Inc. Form 8-K, Filed March 3, 2005

Keiser Trading Plan

On February 28, 2005, we acknowledged the entry by Kenneth E. Keiser, a “named executive officer” as such term is defined in Item 402(a)(3) of Regulation S-K, into a Rule 10b5-1 trading plan with Fidelity Brokerage Services LLC. Pursuant to the trading plan, Mr. Keiser has agreed to exercise certain in-the-money stock options and sell the shares received upon such exercise at a price not less than \$20.50 per share. From March 2005 through December 2005, the trading plan covers the option exercise and disposition of 15,000 shares per month, for a total disposition of 150,000 shares.

The trading plan, which appears as Exhibit 10.2 to this report, is incorporated by reference in response to this Item 1.01.

ATTACHMENT A

STOCK OPTION SHARES TO BE SOLD (HELD)

| Option Grant Date | Option Exercise Price | Number of Options to Exercise | Number of Shares to Be Sold | Number of Shares to Be Held | Earliest Possible Sale Date | Type of Order (Market/Limit) | Time in Force (Day/Date Range/GTC) | Limit Price (if any) |
|-------------------|-----------------------|-------------------------------|-----------------------------|-----------------------------|-----------------------------|------------------------------|------------------------------------|----------------------|
| 12-10-98 | \$ 13.09 | 15,000 | 15,000 | | 3-1-05 | Limit | 3-1-05 to 3-31-05 | \$ 20.50 |
| 12-10-98 | \$ 13.09 | 15,000 | 15,000 | | 4-1-05 | Limit | 4-1-05 to 4-30-05 | \$ 20.50 |
| 12-10-98 | \$ 13.09 | 15,000 | 15,000 | | 5-1-05 | Limit | 5-1-05 to 5-31-05 | \$ 20.50 |
| 12-10-98 | \$ 13.09 | 6,301 | 6,301 | | 6-1-05 | Limit | 6-1-05 to 6-30-05 | \$ 20.50 |
| 1-20-00 | \$ 12.17 | 5,578 | 5,578 | | 6-1-05 | Limit | 6-1-05 to 6-30-05 | \$ 20.50 |
| 1-19-01 | \$ 14.5313 | 3,121 | 3,121 | | 6-1-05 | Limit | 6-1-05 to 6-30-05 | \$ 20.50 |
| 1-19-01 | \$ 14.5313 | 15,000 | 15,000 | | 7-1-05 | Limit | 7-1-05 to 7-31-05 | \$ 20.50 |
| 1-19-01 | \$ 14.5313 | 15,000 | 15,000 | | 8-1-05 | Limit | 8-1-05 to 8-31-05 | \$ 20.50 |
| 1-19-01 | \$ 14.5313 | 15,000 | 15,000 | | 9-1-05 | Limit | 9-1-05 to 9-30-05 | \$ 20.50 |
| 1-19-01 | \$ 14.5313 | 15,000 | 15,000 | | 10-1-05 | Limit | 10-1-05 to 10-31-05 | \$ 20.50 |
| 1-19-01 | \$ 14.5313 | 13,879 | 13,879 | | 11-1-05 | Limit | 11-1-05 to 11-30-05 | \$ 20.50 |
| 2-21-02 | \$ 12.68 | 1,121 | 1,121 | | 11-1-05 | Limit | 11-1-05 to 11-30-05 | \$ 20.50 |
| 2-21-02 | \$ 12.68 | 15,000 | 15,000 | | 12-1-05 | Limit | 12-1-05 to 12-31-05 | \$ 20.50 |

Figure 1 (continued) Example 10b5-1 Plan Disclosures

Panel B: Limited

Excerpt from Ariba Inc. Form 8-K, Filed June 16, 2006

Item 8.01. Other Events.

On June 13 and June 14, 2006, certain executive officers of Ariba, Inc. ("Ariba") entered into written sales plans intended to comply with the requirements of Rule 10b5-1 under the Securities Exchange Act of 1934 (the "Sales Plans"). Specifically, Robert Calderoni, Ariba's Chairman and Chief Executive Officer, Kevin Costello, Ariba's Executive Vice President and Chief Commercial Officer, James Frankola, Ariba's Executive Vice President and Chief Financial Officer, and Kent Parker, Ariba's Executive Vice President and General Manager, Ariba Global Services Organization, each entered into a Sales Plan intended to be in effect through July 2007, and Tayloe Stansbury, Ariba's Executive Vice President of Engineering, entered into a Sales Plan intended to be in effect until June 2009.

Under Rule 10b5-1, a company's directors and officers and other persons who are not in possession of material nonpublic information regarding the company may adopt a pre-arranged plan or contract for the sale of company securities under specified conditions and at specified times. As sales are executed in the future under the Sales Plans, they will be reported in accordance with federal securities laws. Using the Sales Plans, insiders can gradually diversify their investment portfolios while avoiding concerns about transactions occurring at a time when they might possess material nonpublic information.

Excerpt from Build-A-Bear Workshop Inc. Form 8-K, Filed August 3, 2005

Item 8.01. Other Events.

Build-A-Bear Workshop, Inc. (the "Company") has been advised that (1) Maxine Clark, Chairman, Board of Directors and Chief Executive Bear, (2) Barry Erdos, Director, President and Chief Operating Officer Bear, (3) James Gould, Director, (4) Tina Klocke, Chief Financial Bear, Treasurer and Secretary, (5) Teresa Kroll, Chief Marketing Bear, and (6) Scott Seay, Chief Workshop Bear, have entered into Rule 10b5-1 trading plans (each, a "Plan" and collectively, the "Plans") to sell shares of the Company's common stock, including upon the exercise of certain options.

Shares may be sold under the Plans at any time that the Company's stock attains certain pre-arranged minimum prices (as set forth in the Plans). Such sales may take place beginning as early as September 1, 2005, and ending with the termination dates of the respective Plans as follows: Ms. Kroll's Plan terminates on June 30, 2006, unless earlier terminated in accordance with the terms of her Plan. Mr. Gould's Plan terminates on February 1, 2006, unless earlier terminated in accordance with the terms of his Plan. Ms. Klocke's Plan terminates on December 29, 2006, unless earlier terminated in accordance with the terms of her Plan. The Plans of Mr. Erdos and Mr. Seay terminate on December 31, 2006, unless earlier terminated in accordance with the terms of their respective Plans. Ms. Clark's Plan terminates on December 31, 2007, unless earlier terminated in accordance with the terms of her Plan.

The participants in the Plans will have no control over the timing of any sales under their respective Plans and there can be no assurance that the shares covered by the Plans actually will be sold. The participants entered into the Plans in order to diversify their respective financial holdings.

The total number of shares and/or options potentially available for sale under all Plans other than that of Ms. Clark is less than 300,000.

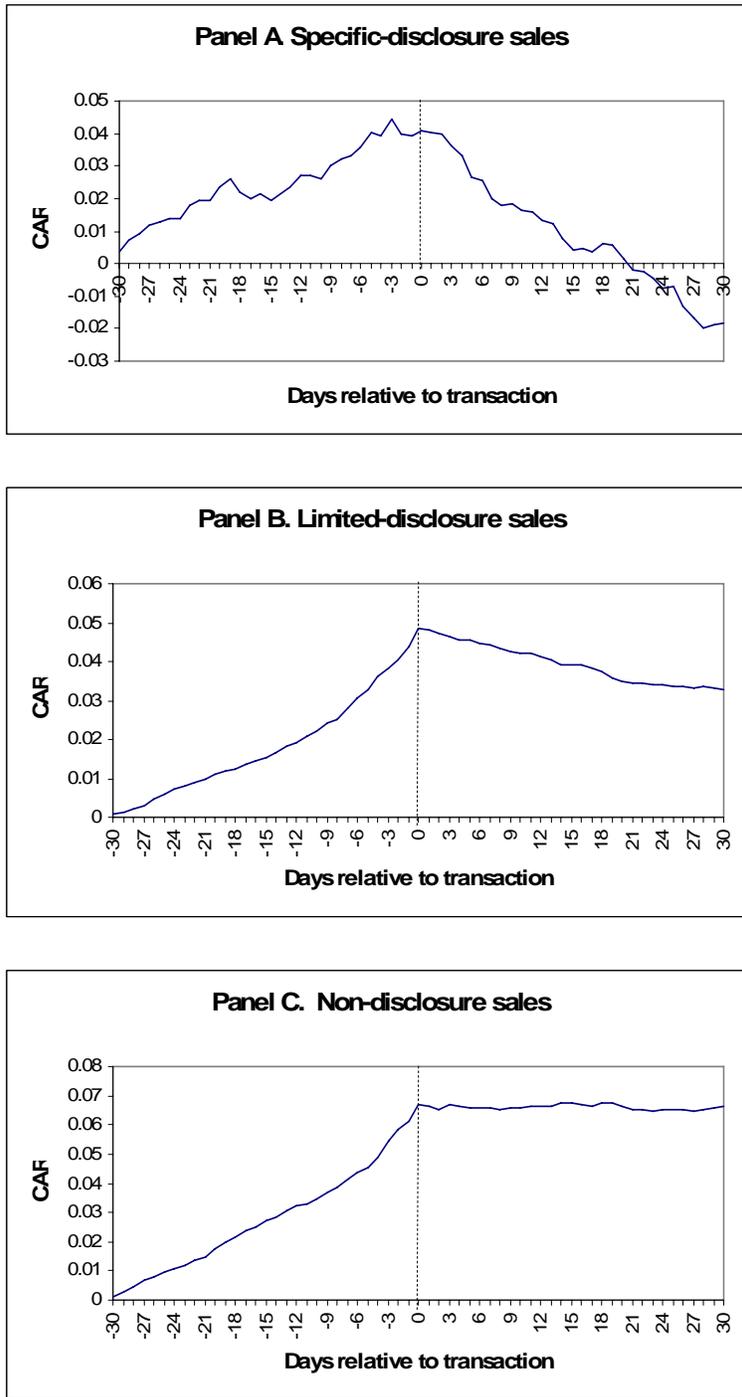
Ms. Clark currently owns 3,657,744 shares (including vested options). Ms. Clark's Plan permits no more than a maximum of 7% of her current share holdings (including vested options) to be sold per year (in each of 2005, 2006, and 2007). Accordingly, Ms. Clark will continue to have a significant ownership interest in the Company.

The Plans are intended to comply with Rule 10b5-1 of the Securities Exchange Act of 1934, as amended, and the Company's insider trading policy. Rule 10b5-1 allows corporate insiders to establish prearranged written plans to buy or sell a specified number of shares of a company stock over a set period of time. The specified number of shares sold may be determined pursuant to a formula or may be at the discretion of a third party, so long as such person is not aware of material non-public information. Among other things, the Company's insider trading policy allows insiders to implement a written trading plan provided such person is not in possession of material non-public information about the Company at the time the plan is entered into, consistent with Rule 10b5-1. The Plans were established during an "open window" under the Company's insider trading policy.

Except as may be required by law, the Company does not undertake to report written trading plans established by other Company officers or directors, nor to report modifications, terminations, transactions or other activities under the Plans or the plan of any other officer or director.

Actual sales made pursuant to the Plans will be disclosed publicly through Form 4 and Form 144 filings with the Securities and Exchange Commission.

Figure 2
Cumulative abnormal return relative to sales transactions



This figure plots the average cumulative abnormal return relative to insiders' sales transactions within Rule 10b5-1. Each firm's cumulative abnormal return is computed as $CAR_t = \sum_{d=-30}^t (R_f - R_{VWCRSP})_d$, where R_f is the firm's daily return, R_{VWCRSP} is the daily return to the CRSP value weighted portfolio, and t denotes a specific day relative to the transaction date. Trade-day observations = 1,108 specific, 23,040 limited, and 20,818 non-disclosure.

Table 1
Determinants of 10b5-1 plan participation disclosure

| Panel A: Summary statistics | | | | | | |
|-----------------------------|-------|-----------|-------|-------|-------|--|
| Variable | Mean | Std. Dev. | 25% | 50% | 75% | |
| <i>LitRisk</i> | 0.014 | 0.016 | 0.005 | 0.008 | 0.015 | |
| <i>InsideDirs</i> | 0.363 | 0.167 | 0.242 | 0.353 | 0.460 | |
| <i>InstitOwn</i> | 0.497 | 0.272 | 0.263 | 0.521 | 0.727 | |
| <i>Volat</i> | 0.029 | 0.017 | 0.017 | 0.024 | 0.036 | |

| Panel B. Statistics by disclosure type | | | | | | |
|--|-------------|------------|------------|-------------------|-------------------|-------------------|
| Variable | <i>None</i> | <i>Lim</i> | <i>Spc</i> | <i>Spc - None</i> | <i>Lim - None</i> | <i>Spc - Lim</i> |
| | Mean | Mean | Mean | Mean | Mean | Mean |
| | | | | (<i>t</i> -stat) | (<i>t</i> -stat) | (<i>t</i> -stat) |
| <i>LitRisk</i> | 0.012 | 0.019 | 0.020 | 0.008 (3.97) | 0.007 (11.95) | 0.001 (0.52) |
| <i>InsideDirs</i> | 0.366 | 0.354 | 0.372 | 0.006 (0.30) | -0.012 (-2.09) | 0.018 (0.83) |
| <i>InstitOwn</i> | 0.472 | 0.583 | 0.532 | 0.060 (1.62) | 0.111 (11.80) | -0.051 (-1.40) |
| <i>Volat</i> | 0.027 | 0.029 | 0.038 | 0.011 (4.98) | 0.002 (4.09) | 0.009 (3.86) |

Table 1 continued
Determinants of 10b5-1 plan participation disclosure

| Panel C: Logistic regression | | | | | |
|------------------------------|-----------|--------------------|--------------------------|--------------------|--------------------------|
| Variable | Exp. Sign | Full Sample | | Matched Sample | |
| | | $Pr(Discl = 1)$ | | | |
| | | Coeff. (z-stat) | Marg. Effect (z-stat) | Coeff. (z-stat) | Marg. Effect (z-stat) |
| <i>LitRisk</i> | + | 9.804 (3.18) | 1.396 (3.46) | 10.471 (2.88) | 2.276 (2.52) |
| <i>InstitOwn</i> | + | 1.237 (5.68) | 0.176 (6.39) | 0.969 (3.94) | 0.243 (3.97) |
| <i>InsideDirs</i> | - | -0.213 (-0.67) | -0.030 (-0.77) | -0.337 (-1.11) | -0.085 (-1.13) |
| <i>Volat</i> | + | 22.196 (5.18) | 3.161 (6.01) | 25.143 (4.45) | 6.440 (4.41) |
| <i>Volat * InstitOwn</i> | + | 48.372 (4.39) | 6.889 (4.85) | 33.789 (2.42) | 8.693 (2.49) |
| <i>Volat * InsideDirs</i> | + | 31.458 (2.14) | 4.480 (2.42) | 29.043 (1.69) | 7.044 (2.49) |
| Fixed Effects | | | Industry, Year | | Match-pair |
| Num obs <i>None</i> | | | 3,652 | | 1,078 |
| Num obs <i>Spc</i> | | | 57 | | 57 |
| Num obs <i>Lim</i> | | | 1,055 | | 1,021 |
| Pseudo R^2 | | | 0.210 | | 0.047 |

This table provides summary statistics (Panel A), univariate comparisons (Panel B), and logistic regressions (Panel C) of the determinants of firms' decisions to disclose participation in 10b5-1 plans. Comparisons are made in the year of first disclosure for disclosing firms and in the first year of inferred 10b5-1 trade for non-disclosing firms. Panel C provides results from estimating: $Pr(Discl = 1) = \alpha_0 + \alpha_1 LitRisk + \alpha_2 InstitOwn + \alpha_3 InsideDirs + \alpha_4 Volat + \alpha_5 Volat * InstitOwn + \alpha_6 Volat * InsideDirs + \varepsilon$, where *Discl* is a dichotomous variable that equals one if the firm discloses Rule 10b5-1 participation details, and zero otherwise; *LitRisk* is the firm's expected class action litigation probability estimated in the year prior to 10b5-1 participation disclosure; *InstitOwn* is the percentage of institutional firm ownership (CDA/Spectrum) in the year prior to disclosure; *InsideDirs* is the ratio of officer directors to total board directors in the year prior to disclosure (Equilar); and *Volat* is the standard deviation of residuals from a regression of daily firm returns on daily value-weighted CRSP portfolio returns in the year prior to disclosure (CRSP). *InstitOwn*, *InsideDirs*, and *Volat* are mean-centered to ease interpretation. *LitRisk* is estimated from the following annual cross-sectional logistic regression [similar to Rogers and Stocken (2005)]: $Pr(DMGPd = 1) = \gamma_0 + \gamma_1 MinReturn + \gamma_2 SkewReturn + \gamma_3 Turnover + \gamma_4 Log(MVE) + \gamma_5 BHReturn + \gamma_6 Beta + \gamma_7 BiotechInd + \gamma_8 CompHWInd + \gamma_9 CompSWInd + \gamma_{10} ElecInd + \gamma_{11} RetailInd + \varepsilon$, where *DMGPd* equals one if the fiscal year falls within an alleged class action damage period (data provided by Woodruff Sawyer and Co.) and equals zero otherwise; *MinReturn* is the minimum single day firm return during the fiscal year; *SkewReturn* is the skewness of daily returns during the fiscal year; *Turnover* is the average daily trade volume scaled by shares outstanding during the fiscal year; *MVE* is the average market value of equity during the fiscal year; *BHReturn* is the prior fiscal

year's buy and hold return; *Beta* is the firm's beta coefficient from a regression of daily firm returns on daily market returns; and *BiotechInd*, *CompHWInd*, *CompSWInd*, *ElecInd*, and *RetailInd* are dichotomous variables that equal one if the firm represents the biotechnology, computer hardware, computer software, electric, or retail industries, and equal zero otherwise. Column 1 of Panel C presents logistic regression results using all available observations and fixed industry and year effects. Column 2 of Panel C presents conditional logistic regression results for the sample where each disclosure firm is matched with a non-disclosure firm from the same year, same 2-digit industry, and closest market value of equity. The marginal effect for *LitRisk* is $\alpha_1 * (1-P)*P$, where $P = 1/(1+e^{-XB})$. The marginal effect for *InstitOwn* is $(\alpha_2 + \alpha_5Volat) * (1-P)*P$. The marginal effect for *InsideDirs* is $(\alpha_3 + \alpha_6Volat) * (1-P)*P$. The marginal effect for *Volat* is $(\alpha_4 + \alpha_5InstitOwn + \alpha_6InsideDirs) * (1-P)*P$. The marginal effect for *Volat * InstitOwn* is $\alpha_5 * (1-P)*P - (\alpha_2 + \alpha_5Volat) * (\alpha_4 + \alpha_5InstitOwn + \alpha_6InsideDirs) * (1-P)*P + 2 * (\alpha_2 + \alpha_5Volat) * (\alpha_4 + \alpha_5InstitOwn + \alpha_6InsideDirs) * (1-P)^2 * P$. The marginal effect for *Volat * InsiderDirs* is $\alpha_6 * (1-P)*P - (\alpha_3 + \alpha_6Volat) * (\alpha_4 + \alpha_5InstitOwn + \alpha_6InsideDirs) * (1-P)*P + 2 * (\alpha_3 + \alpha_6Volat) * (\alpha_4 + \alpha_5InstitOwn + \alpha_6InsideDirs) * (1-P)^2 * P$. Marginal effect z-statistics are computed utilizing the delta method (Ai and Norton, 2003).

Table 2
Buy and hold returns

| Panel A. Insider specific statistics by disclosure type | | | | | | |
|---|-------------|------------|------------|-------------------|--------------------|-------------------|
| Variable | <i>None</i> | <i>Lim</i> | <i>Spc</i> | <i>Spc - None</i> | <i>Lim - None</i> | <i>Spc - Lim</i> |
| | Mean | Mean | Mean | Mean (t-stat) | Mean (t-stat) | Mean (t-stat) |
| <i>Cumulative Sales (\$M)</i> | 6.589 | 8.206 | 5.618 | -0.971 (-0.39) | 1.617 (1.62) | -2.588 (-1.01) |
| <i>Trade Days</i> | 4.878 | 10.720 | 25.065 | 20.187 (3.59) | 5.843 (16.54) | 14.345 (5.84) |
| <i>CEO</i> | 0.126 | 0.240 | 0.541 | 0.415 (6.43) | 0.114 (13.57) | 0.301 (5.44) |
| <i>CFO</i> | 0.079 | 0.126 | 0.148 | 0.069 (1.50) | 0.047 (7.13) | 0.022 (0.47) |
| <i>President</i> | 0.129 | 0.220 | 0.443 | 0.314 (4.88) | 0.091 (10.89) | 0.223 (4.15) |
| <i>Chairman</i> | 0.096 | 0.149 | 0.410 | 0.314 (4.93) | 0.053 (7.26) | 0.261 (5.62) |
| <i>Officer Director</i> | 0.277 | 0.365 | 0.638 | 0.361 (6.64) | 0.088 (8.55) | 0.273 (4.65) |
| <i>Outside Director</i> | 0.282 | 0.109 | 0.203 | -0.079 (-1.45) | -0.173 (-19.08) | 0.094 (2.46) |
| Num Insiders | 5,362 | 3,049 | 61 | | | |
| Num Firms | 1,833 | 1,199 | 49 | | | |

Table 2 (continued)

| Panel B: Post-trade market adjusted buy and hold returns | | | | | | | |
|--|------------------------|-------------|------------|------------|-------------------|-------------------|------------------|
| Horizon | Statistic | <i>None</i> | <i>Lim</i> | <i>Spc</i> | <i>Lim – None</i> | <i>Spc – None</i> | <i>Spc - Lim</i> |
| 6-mo | Insiders | 4,946 | 2,921 | 60 | | | |
| | Firms | 1,736 | 1,151 | 47 | | | |
| | Trade Days | 23,941 | 30,926 | 1,477 | | | |
| | Mean | -0.002 | -0.022 | -0.121 | -0.020 | -0.119 | -0.099 |
| | (<i>t</i> -statistic) | (-0.76) | (-12.85) | (-10.58) | (-7.54) | (-10.27) | (-8.60) |
| | Median | -0.009 | -0.047 | -0.159 | -0.038 | -0.150 | -0.112 |
| | (<i>p</i> -value) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| 3-mo | Insiders | 5,186 | 2,982 | 60 | | | |
| | Firms | 1,794 | 1,177 | 47 | | | |
| | Trade Days | 24,918 | 31,933 | 1,526 | | | |
| | Mean | -0.004 | -0.005 | -0.073 | -0.001 | -0.069 | -0.069 |
| | (<i>t</i> -statistic) | (-2.74) | (-4.01) | (-2.41) | (-0.36) | (-7.36) | (-7.32) |
| | Median | -0.002 | -0.014 | -0.085 | -0.012 | -0.083 | -0.071 |
| | (<i>p</i> -value) | (0.002) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| 1-mo | Insiders | 5,362 | 3,049 | 61 | | | |
| | Firms | 1,833 | 1,199 | 49 | | | |
| | Trade Days | 25,857 | 32,576 | 1,554 | | | |
| | Mean | -0.005 | -0.001 | -0.045 | 0.004 | -0.040 | -0.044 |
| | (<i>t</i> -statistic) | (-6.28) | (-1.53) | (-9.89) | (4.08) | (-8.63) | (-9.58) |
| | Median | -0.001 | -0.004 | -0.034 | -0.003 | -0.033 | -0.030 |
| | (<i>p</i> -value) | (0.004) | (0.000) | (0.000) | (0.506) | (0.000) | (0.000) |

This table provides summary statistics (Panel A) and sales trade return statistics (Panel B) for insiders within specified disclosure classification groups. *Cumulative sales volume* is the dollar volume of sales (in millions) during the one-year period that follows the first observed disclosure between 2001 and 2006. *Trade days* is the number of sales transaction days during the one-year period that follows the first observed disclosure between 2001 and 2006. *CEO*, *CFO*, *President*, *Director*, *Chairman*, and *Officer* are dichotomous variables that equal one if the insider holds the

respective position title and equal zero otherwise. Market-adjusted buy and hold returns are computed by subtracting the same horizon return to the value-weighted CRSP index from the buy and hold firm return.

Table 3
Calendar time portfolio returns

| | $R_{port} - R_f$ | | | |
|--------------------------------|------------------|-------------------|-------------------|-------------------|
| <i>None</i> | 0.001 (0.46) | | | -0.002 (-0.26) |
| <i>Limited</i> | | -0.010 (-2.25) | | -0.012 (-1.86) |
| <i>Specific</i> | | | -0.047 (-2.94) | -0.043 (-5.27) |
| $R_m - R_f$ | 1.036 (21.33) | 1.394 (9.53) | 1.088 (2.13) | 1.242 (9.42) |
| <i>SMB</i> | 0.574 (10.70) | 0.753 (4.93) | 1.477 (3.12) | 0.859 (6.21) |
| <i>HML</i> | 0.195 (3.00) | 0.027 (0.15) | 0.387 (0.59) | 0.225 (1.33) |
| <i>UMD</i> | 0.172 (4.56) | 0.025 (0.20) | -0.359 (-0.81) | 0.022 (0.20) |
| <i>Coefficient Comparisons</i> | | | | |
| <i>Limited – None</i> | | | | -0.010 (-1.86) |
| <i>Specific – None</i> | | | | -0.041 (-4.08) |
| <i>Specific – Limited</i> | | | | -0.031 (-3.04) |
| None Month-Obs | 72 | | | |
| Limited Month-Obs | | 71 | | |
| Specific Month-Obs | | | 45 | |
| Adj R^2 | 0.871 | 0.793 | 0.429 | 0.589 |

This table provides results from a regression of $(R_{port} - R_f) = \beta_0 + \beta_1 (R_m - R_f) + \beta_2 SMB + \beta_3 HML + \beta_4 UMD + u$, where R_{port} is the equally-weighted monthly return to a portfolio of firms selected if an insider initiates a sales transaction within Rule 10b5-1 in the preceding month, R_f is the one-month treasury bill rate, R_m is the equal-weighted monthly market return, and *SMB*, *HML*, and *UMD* are the monthly small-minus-big, high-minus-low, and momentum factors discussed in Fama and French (1993) and Carhart (1997). At least 3 firms must be present in each calendar-month to form a portfolio.

Table 4
Calendar time returns

| | $R_j - R_{m(ew)}$ | $R_j - R_{m(vw)}$ |
|--------------------------------|--------------------|-------------------|
| <i>None</i> | -0.012 (-5.41) | -0.011 (-4.18) |
| <i>Limited</i> | -0.016 (-7.58) | -0.021 (-5.61) |
| <i>Specific</i> | -0.043 (-3.67) | -0.043 (-3.54) |
| <i>Ln(BTM)</i> | -0.021 (-12.08) | -0.021 (-9.82) |
| <i>PriorReturn</i> | -0.003 (-2.60) | -0.004 (-2.32) |
| <i>PriorVolatility</i> | 0.006 (0.14) | 0.020 (0.45) |
| <i>Intercept</i> | -0.019 (-2.38) | -0.011 (-1.70) |
| <i>Coefficient Comparisons</i> | | |
| <i>Limited – None</i> | -0.004 (-1.35) | -0.010 (-2.97) |
| <i>Specific – None</i> | -0.031 (-2.63) | -0.032 (-2.70) |
| <i>Specific – Limited</i> | -0.027 (-2.34) | -0.022 (-1.81) |
| Fixed Effects | Industry | Industry |
| Std Error Clusters | Month | Month |
| Number Firms None | | 1,840 |
| Number Firms Limited | | 1,200 |
| Number Firms Specific | | 46 |
| Adj R^2 | 0.013 | 0.012 |

This table provides results from a regression of $(R_j - R_m) = \delta_0 + \delta_1 \text{None} + \delta_2 \text{Limited} + \delta_3 \text{Specific} + \delta_4 \text{Ln}(\text{BTM}) + \delta_5 \text{PriorReturn} + \delta_6 \text{PriorVolatility} + z$, where R_j is the monthly firm return, R_m is the equal-weighted or value-weighted monthly CRSP portfolio market return, *None* is a dichotomous variable that equals one during the month following a non-disclosed inferred Rule 10b5-1 sales transaction and equals zero otherwise, *Limited* is a dichotomous variable that equals one during the month following a limited-disclosed Rule 10b5-1 sales transaction and equals zero otherwise, *Specific* is a dichotomous variable that equals one during the month following a specific-disclosed Rule 10b5-1 sales transaction and equals zero otherwise, *BTM* is the book-to-market ratio measured at the end of the previous month, *PriorReturn* is the buy-and-hold firm return over the preceding 12 months, and *PriorVolatility* is the standard deviation of monthly stock returns over the preceding 36 months.

Table 5
Investors' response to earnings

| Qtr Relative to Disclosure | <i>Limited</i> | <i>Specific</i> |
|--|---------------------------|---------------------------|
| | Mean (<i>t</i> -stat) | Mean (<i>t</i> -stat) |
| <i>Qtr</i> ₋₄ | 0.008 (2.49) | 0.030 (2.16) |
| <i>Qtr</i> ₋₃ | 0.004 (1.48) | -0.007 (-0.29) |
| <i>Qtr</i> ₋₂ | 0.008 (3.08) | 0.034 (2.06) |
| <i>Qtr</i> ₋₁ | 0.011 (4.30) | 0.030 (2.16) |
| <i>Qtr</i> ₀ | 0.003 (0.92) | -0.002 (-0.12) |
| <i>Qtr</i> ₊₁ | -0.001 (-0.35) | -0.000 (-0.03) |
| <i>Qtr</i> ₊₂ | -0.000 (-0.06) | 0.020 (1.18) |
| <i>Qtr</i> ₊₃ | -0.005 (-1.93) | -0.005 (-0.35) |
| <i>Qtr</i> ₊₄ | -0.006 (-2.10) | 0.007 (0.63) |
| <i>Qtr</i> ₋₄ to <i>Qtr</i> ₋₁ | 0.008 (5.57) | 0.024 (2.24) |
| <i>Qtr</i> ₊₁ to <i>Qtr</i> ₊₄ | -0.003 (-2.23) | 0.005 (0.75) |

This table provides statistics regarding three day market-adjusted returns centered on quarterly earnings announcement dates (*RDQE* from Compustat). Firm quarters are selected based on their proximity to the quarter in which the first insider trade is executed following 10b5-1 disclosure (*Qtr*₀). Firm returns over the three days centered on the quarterly announcement are adjusted by subtracting the same period return to the value-weighted CRSP portfolio. Sample reflects 902 limited and 33 disclosure firms with data for all quarters.

Table 6
Investors' response to disclosure

| Event | | <i>Specific</i> | <i>Limited</i> | <i>Specific - Limited</i> |
|--|--------------------------------|-------------------|-------------------|---------------------------|
| <i>First Firm Announcement</i> | Mean (<i>t</i> -statistic) | -0.002 (-0.18) | -0.002 (-0.97) | 0.000 (0.08) |
| | Median (<i>p</i> -value) | -0.003 (0.700) | 0.000 (0.930) | -0.003 (0.885) |
| | <i>N</i> | 63 | 560 | |
| <i>First Insider Transaction Day</i> | Mean (<i>t</i> -statistic) | -0.005 (-0.69) | 0.004 (5.94) | -0.009 (-1.30) |
| | Median (<i>p</i> -value) | -0.009 (0.276) | 0.002 (0.000) | -0.011 (0.062) |
| | <i>N</i> | 60 | 3,053 | |

This table provides statistics regarding three day market-adjusted returns centered on *First Firm Announcement*, the Rule 10b5-1 disclosure event date, and on *First Insider Transaction Day*, the SEC report date for the first sales transaction subsequent to *Announcement*. *Announcement* observations do not include Form 4 disclosures, since the Form 4 disclosures are reflected as *Transaction* events. Returns denoting market adjustments are adjusted by subtracting the same period return to the value-weighted CRSP portfolio.

Table 7
Investors' response to disclosure

| | <i>First Firm Announcement</i> | | <i>First Insider Transaction Day</i> |
|---------------------------|--------------------------------|---------------------------|--------------------------------------|
| | <u><i>MktAdjRet</i></u> | | <u><i>MktAdjRet</i></u> |
| <i>Intercept</i> | 0.004 (1.01) | <i>Intercept</i> | 0.003 (0.45) |
| <i>Specific</i> | -0.000 (-0.01) | <i>Specific</i> | -0.008 (-0.98) |
| <i>CEOCB</i> | -0.008 (-1.69) | <i>CEOCB</i> | -0.005 (-2.51) |
| <i>CFO</i> | 0.002 (0.26) | <i>CFO</i> | -0.001 (-0.22) |
| <i>Ln(NumExecs)</i> | -0.001 (-0.17) | <i>Ln(DollarVol)</i> | 0.000 (0.52) |
| <i>PriorSales</i> | -26.407 (-3.40) | | |
| <i>Firm Annc Days</i> | 623 | <i>Insider Trade Days</i> | 3,105 |
| <i>Adj.R</i> ² | 0.009 | <i>Adj.R</i> ² | 0.003 |

This table provides results from two regression estimations of determinants of market adjusted three day event returns. For first firm announcement event days, the estimation is $MktAdjRet = \phi_0 + \phi_1 Specific + \phi_2 CEOCB + \phi_3 CFO + \phi_4 Ln(NumExecs) + \phi_5 PriorSales + z$, where $MktAdjRet$ is the three day cumulative firm return centered on the announcement date minus the three day return to the value weighted CRSP portfolio, $Specific$ is a dichotomous variable that equals one if the disclosure is categorized as specific and equals zero if the disclosure is categorized as limited, $CEOCB$ is a dichotomous variable that equals one if the disclosure names a Board Chairman or Chief Executive Officer participant and equals zero otherwise, CFO is a dichotomous variable that equals one if the disclosure names a Chief Financial Officer participant and equals zero otherwise, $NumExecs$ equals the number of insiders named in the disclosure as participants, and $PriorSales$ is the cumulative percentage of firm shares sold by insiders in the year that precedes the announcement event. For first insider trade event days, the estimation is $MktAdjRet = \gamma_0 + \gamma_1 Specific + \gamma_2 CEOCB + \gamma_3 CFO + \gamma_4 Ln(DollarVol) + z$, where $MktAdjRet$, $Specific$, $CEOCB$, and CFO are as described above, and $DollarVol$ equals the dollar volume of sales reported in the transaction day filing. Standard errors are corrected for firm clusters.