

**Hiding in Plain Sight:
Can Disclosure Enhance Insiders' Trade Returns?**

M. Todd Henderson

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

Alan D. Jagolinzer

The University of Colorado
Leeds School of Business
UCB 419
Boulder, CO 80309
jagolinzer@colorado.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: Can voluntary disclosure be used to enhance insiders' strategic trade while providing legal cover? We investigate this question in the context of 10b5-1 trading plans. Prior literature suggests that insiders lose strategic trade value if their planned trades are disclosed. But disclosure might enhance strategic trade because courts can only consider publicly available evidence from defendants at the motion to dismiss phase of trial. This practice can enhance legal protection for firms that disclose planned trades, especially those disclosing detailed information. Consistent with increased legal protection, we find that voluntary disclosure of planned trades increases with firm litigation risk and potential gains to insiders' trades. We also find that insider sales and abnormal returns are higher for disclosed plans, especially those that articulate specific plan details. This suggests that voluntary disclosure, which is conventionally thought to reduce information asymmetries, can create legal cover for opportunistic insider trading.

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1. Introduction

Ever since Louis Brandeis (1933) wrote “[s]unlight is the best of disinfectants,” disclosure has been assumed to be a mechanism for *reducing* the opportunities for strategic trade behavior by insiders who possess private information about a firm. Although disclosure has direct and indirect costs, the prevailing literature assumes disclosure reduces information asymmetries and is therefore good for uninformed market participants. Finance and accounting theory suggests that corporate insiders do not have incentives to disclose pending trades in advance of trading in their own firm’s stock (e.g., Baiman and Verrecchia, 1996). Advance disclosure reveals insiders’ private information about the expected value of the stock price (e.g., Admati and Pfleiderer, 1991; Khan and Lu, 2011), and this can induce investor front-running, i.e., selling before insiders in anticipation of their sales. Either of these have the potential effect of lowering share prices before insiders’ sales execute.¹ Accordingly, prior theoretical research predicts there would be no voluntary disclosure of private information before insiders trade.

We propose that this theory does not fully consider how legal rules can shape firms’ disclosure incentives, and significantly alter insiders’ trading incentives. For instance, voluntary disclosure not only provides information to potential counterparties but, given the process dictated by the Federal Rules of Civil Procedure, also provides incremental litigation risk reduction. We show this litigation risk reduction arising from disclosure of insiders’ trading plans creates opportunities for insiders to *enhance* their profits from trading.

We use an exogenous rule change regarding the legal effect of insiders’ commitment to trade in the future, found in Rule 10b5-1 of the Securities Exchange Act of 1934, as a mechanism to test the impact of voluntarily disclosed trading plans on insiders’ strategic trade potential. Rule 10b5-1 was promulgated in October 2000 to better allow insiders to diversify firm-specific holdings by providing an affirmative legal defense for trades that are prearranged at a time when insiders attested they did not possess material, nonpublic information.² The SEC does not mandate disclosure of information regarding insiders’ 10b5-1 use, which gives rise to considerable variation in whether and what firms voluntarily disclose information about their insiders’ 10b5-1 trading plans. As discussed in detail below, the affirmative defense protection provided by the Rule is most valuable if 10b5-1 trading plans are publicly disclosed, especially when disclosures provide specific details. We examine whether this incremental legal protection arising from disclosure creates greater opportunities for insiders to trade strategically.

We first examine whether the incremental legal protection arising from disclosure of Rule 10b5-1 trades motivates firms to voluntarily disclose information regarding insiders’ planned trades to mitigate

¹ There is typically more insider sales than purchases on the open market, particularly within Rule 10b5-1. See, e.g., Jeng, Metrick, and Zeckhauser (2003) and Jagolinzer (2009).

² See Jagolinzer (2009) and Veliotis (2010) for a detailed discussion of the regulatory development of Rule 10b5-1.

litigation risk concerns, and to satisfy the disclosure demands of outside constituents. We find evidence that the decision to disclose 10b5-1 trading plans is more common for firms with higher overall litigation risk and with greater potential for strategic trade by insiders (i.e., when firm-specific stock price volatility is high). This evidence suggests that firms' decisions to disclose 10b5-1 trading plans are motivated by concerns over litigation risk from insiders' trade. In addition, we find evidence that the decision to disclose is more common for firms with more financially sophisticated boards, larger institutional ownership, and greater analyst following. This evidence suggests that boards with greater financial expertise better understand the benefits arising from the disclosure of 10b5-1 trading plans, and that firm outsiders demand information about 10b5-1 trading plans.

We then examine whether the incremental legal protection arising from disclosure of Rule 10b5-1 trades limits or enhances insiders' ability to trade strategically. Our tests investigate insiders' trade and return patterns, as they are typically considered by courts at the motion-to-dismiss stage of trial to evaluate claims of scienter. We find evidence that the number of sale transactions by participants rises dramatically after the disclosure of 10b5-1 plan participation, and increases with disclosure specificity. In contrast, we do not find evidence of elevated sale transactions by insiders who trade outside of Rule 10b5-1 plans (hereafter, non-participants). This evidence suggests that participants view disclosure of 10b5-1 plans, especially disclosure of specific plan information, as providing significant legal benefits. They trade more freely in these plans in ways that might otherwise give rise to greater legal liability.

Using abnormal return patterns as another benchmark regarding informed trade, we find that the returns following insiders' sales in 10b5-1 trading plans that are voluntarily disclosed are more negative relative to the returns following insiders' sales for those inferred to be trading within, but not disclosing, 10b5-1 plans. In addition, we find evidence that insiders' sales generate the largest abnormal returns when specific plan details are voluntarily disclosed. This behavior appears fortuitously timed, and suggests that greater disclosure occurs when there is greater certainty about pending negative performance (i.e., a strategy of "hiding in plain sight").

Taken together, our findings provide important new insights regarding firms' decisions to voluntarily disclose information to the public. There is little prior research that directly investigates the link between voluntary disclosure and insider trading, which is surprising given the potential legal consequences.³ One notable exception is Rogers (2008), who utilizes a sample that predates Rule 10b5-1 and finds that firms voluntarily disclose higher quality financial information prior to insiders' sales to

³ There is a well-developed literature that examines why firms voluntarily disclose financial or firm-performance information and its association with litigation risk (e.g., Skinner, 1994; Francis, Philbrick, and Schipper, 1994; Kasznik and Lev, 1995; Skinner, 1997; Baginski, Hassell, and Kimbrough, 2002; Field, Lowry, and Shu, 2005; Rogers and Van Buskirk, 2008; Rogers, 2008). However, most of this literature does not consider insider trading implications. There is also some ambiguity regarding the degree to which voluntary disclosure of financial information (e.g., management's earnings forecasts) mitigates litigation risk (Field, Lowry, and Shu, 2005).

limit their litigation risk. While these findings provide evidence that firms attempt to forego insiders' strategic trade advantage to limit their litigation risk through the disclosure of private information, they do not speak to whether litigation-reducing disclosure can actually *enhance* an insiders' strategic trade advantage. Our study provides evidence that it can. This counterintuitive finding arises directly from courts providing affirmative defense protection in motion to dismiss proceedings only to those plans that are publicly disclosed. For this reason, disclosure enhances the probability of early case dismissal, which can therefore provide greater protection for insider trades.

Our findings also provide important new insights regarding the efficacy and consequences of Rule 10b5-1 by showing that insiders' ability to engage in strategic trade appears to vary directly with the extent of disclosure. Jagolinzer (2009) establishes that insiders (identified through voluntary disclosure) can generate abnormal returns through trading within 10b5-1 plans and that these returns are greater than those earned by non-participants from the same firm.⁴ Jagolinzer (2009), however, does not examine why firms disclose 10b5-1 plans, why there is cross-sectional variation in these disclosures, or what implications these choices have on insider trading profitability. More evidence regarding how firms and insiders behave under the Rule should provide useful insights, considering the enormous magnitude of stock being traded within these plans (e.g., in a single year within our sample, insiders sold \$25 billion worth of shares within these plans). We extend this prior research in two ways. First, our cross-sectional analysis of firms within 10b5-1 plans provide new insights regarding firms' decisions to disclose their plans—i.e., that voluntary disclosure increases with firm litigation risk, insider strategic trade potential, financial sophistication of the board and voluntary disclosure demands of institutional owners and financial analysts. Second, and more importantly, our results provide new insights regarding how insiders are able to exploit the Rule—i.e., through enhanced disclosure.

Section 2 of this study provides background information regarding Rule 10b5-1 and outlines expectations regarding disclosure choice determinants and implications. Section 3 outlines sample selection procedures. Section 4 outlines empirical tests and results. Finally, section 5 concludes.

2. Trading Plan Disclosure Choice and Implications

2.1. Disclosure Choice

The decision to disclose information about insiders' participation in Rule 10b5-1 is a firm-level (e.g., board of directors) choice. We infer this because disclosure is observed through firm-level disclosure instruments (e.g., SEC 8-K, Form 4, 10-Q/K filings and press releases) that often require processing through the firm's legal, media relations, and or investor relations departments. We also infer

⁴ Two other studies investigate the effect of adoption of 10b5-1 trading plans on firms' decisions, but are not focused directly on insider trading activity. Henderson (2012) observes a shift in executive pay arrangements following adoption of 10b5-1 trading plans. Shon and Veliotis (2012) observe a higher propensity for firms to meet or beat analysts' earnings forecasts at firms that adopt Rule 10b5-1 plans.

this because we commonly observe multiple insiders from the firm named in a single firm disclosure document, which seems to indicate that insiders are not individually disclosing their participation. Finally, we infer this because several corporate attorneys and Rule 10b5-1 plan administrators have anecdotally conveyed that firms (e.g., boards) determine policy regarding disclosure of these plans. What is not clear, however, is why firms disclose information about their insiders' use of 10b5-1 plans or why there is considerable variation in how much detail is disclosed about insiders' use of these plans.

Firms likely disclose planned trades (pursuant to Rule 10b5-1) details to reduce legal risk. The biggest component of this legal risk derives from the potential for securities class action lawsuits. If sued in a securities class action, firms face potentially large defense and settlement costs.⁵ These costs do not increase linearly over time, but rather increase substantially after an initial hearing on the validity of the plaintiffs' claims, called a "motion to dismiss" proceeding. Because of the nature of these costs, firms have strong incentives to "win" a class action case at the motion to dismiss stage. Crucially, courts may not consider the 10b5-1 affirmative defense at the motion to dismiss phase if the plans are previously undisclosed. This is because courts cannot consider materials other than the plaintiff's pleadings when considering the motion, and defendants are not typically allowed to rebut factual allegations. Courts can, however, consider publicly available documents that are not a part of the complaint, e.g., taking judicial notice of already released SEC filings, prospectuses, analysts' reports, and other publicly reported data. A publicly disclosed 10b5-1 plan thus has a greater likelihood of influencing a motion to dismiss than a plan that is not publicly disclosed. Numerous cases stand for this proposition.⁶

Corporate advisors share this view. 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 [they] . . . can be considered at the motion to dismiss stage" (White, 2003). Lawyers

⁵ "[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-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 (PricewaterhouseCoopers, 2005).

⁶ See, e.g., *Weiner v. Klais & Co.*, 108 F.3d 86, 88-89 (6th Cir.1997) and *In re Royal Appliance Sec. Litig.*, 1995 WL 490131, at *2 (6th Cir. Aug.15, 1995). 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 (WD. 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 as 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.

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). In short, while undisclosed 10b5-1 plans provide some risk reduction in the event the case goes to trial, disclosure can further enhance legal protection by increasing the likelihood of early dismissal for securities class action suits.

One other detail about trial procedure is relevant to the disclosure decision. Because the motion to dismiss stage consists of a preliminary look at the merits of the case, the degree of detail disclosed 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 information at this stage of litigation to ascertain whether the insider sufficiently complied with the Rule and whether the allegedly fraudulent trades are covered by the plan. If the full details about planned trades (e.g., dates, amounts, or prices) are disclosed, however, 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. A recent decision by the First Circuit reaches exactly this result and thus highlights the importance of making specific disclosures.⁷

The preceding discussion suggests that firms 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. Litigation risk can be measured both in terms of the firm’s propensity for general class action risk and in terms of insiders’ strategic trade potential.⁸

While there are clear legal risk reduction benefits from public disclosure, it may increase costs for insiders if investors can infer insiders’ strategic intent from disclosure (Rogers, 2008) 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 can induce investor front-running, i.e., selling before the insiders, (e.g., Khan and Lu, 2011) or information acquisition that can reveal insiders’ private information (e.g., Admati and Pfleiderer, 1991) and effectively lower price before insiders’ trades execute. Accordingly, firms’ insiders may prefer non-disclosure when litigation risk 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

⁷ *Miss. Pub. Employ. Retire. Sys. v. Boston Scientific Corp.*, ___ F.3d. ___, 2008 WL 1735390 (1st Cir. Apr. 16, 2008) (reversing grant of motion to dismiss because trial court inappropriately considered undisclosed 10b5-1 trading plan at the motion to dismiss phase).

⁸ In models of insiders’ strategic trade (e.g., Huddart and Ke, 2007), insiders’ information advantage is determined by prior stock price variance and the precision of insiders’ private information. 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. Insiders’ strategic trade potential is also increasing in insiders’ private information about pending performance. This construct, however, is not observable.

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” (Cleary, Gottlieb, Steen & Hamilton, 2002).

Relatedly, if disclosure provides investors with insiders’ 10b5-1 plan details, then it allows for ex post reconciliation of plan commitment. As discussed below, Rule 10b5-1 creates a valuable real option by allowing insiders to selectively terminate plans even when they possess material, nonpublic information. If plans are not disclosed, the option’s cost is zero. Disclosure, however, raises the cost of the option by allowing outsiders to reconcile data reported in insiders’ transaction reports with details provided with 10b5-1 disclosures.⁹ Reconciliation could reveal insiders’ use of the strategic early plan termination option, potentially increasing regulatory scrutiny of insiders’ good faith compliance with the Rule.¹⁰ Therefore, greater disclosure reduces insiders’ value of the early termination option. *Ceteris paribus*, insiders should generally prefer no disclosure.

Outside shareholders might infer 10b5-1 disclosure benefits if disclosure provides for better monitoring of or greater insider commitment to disclosed trade plans. In addition, firms with greater demands for voluntary disclosure from other outsiders (e.g., financial analysts) might benefit more by providing more disclosure to meet these demands. Finally, larger and more financially sophisticated boards might better understand the legal benefits of disclosing 10b5-1 plans. Therefore, there is likely a positive relationship between the probability of firm disclosure and outside demand for information and also the size and financial sophistication of the board.

2.2. Disclosure Implications for Strategic Trade

To understand the potential effect of disclosure on strategic trade, it is helpful to consider the type of information an insider might have at 10b5-1 plan initiation and the likelihood that an insider might obtain valuable private information over the duration of her trading plan. Consider, for example, an insider who possesses some information at plan initiation but does not expect to obtain highly valuable information over the duration of her plan (e.g., if the firm exhibits low volatility). This insider may be less concerned with potential trade-based litigation risk because the nature of her information is less likely to generate legal scrutiny and she already obtains some litigation protection from entering a 10b5-1 plan even if it is not disclosed. If the firm discloses information about her plan, this insider may be concerned that she will lose her modest information advantage (e.g., if the market falsely infers that she is privately

⁹ Insiders are required to file a report with the SEC – Form 4 – within two days of all trades.

¹⁰ 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)].”

informed and adjusts price downward before her trades execute). If this were the case, then this particular insider would prefer non-disclosure.¹¹ If this setting describes the case for non-disclosure of plans then non-disclosed 10b5-1 sale transactions are less likely to be associated with patterns of strategic trade.

Consider next an insider who does not possess valuable information at plan initiation (or who may possess valuable information with high uncertainty) and who expects to obtain valuable information (e.g., an updated signal regarding his/her initial information) over the duration of his/her plan. This insider may establish a 10b5-1 sales plan in anticipation of a potential bad outcome yet want the option to terminate the plan if an updated signal subsequently indicates the bad outcome will not materialize. Because this strategy would ex post reveal a suspicious trade pattern if the bad outcome does materialize, the insider would likely value some incremental legal benefit from disclosure. And because a key element to this strategy is preserving the termination option, this insider would not prefer for the firm to disclose specific details about his/her 10b5-1 plan. The insider would prefer for the firm to only disclose limited detail, as this provides some incremental litigation risk reduction and yet preserves the termination option at relatively low cost.¹² If this setting describes the limited disclosure group of trades, then trade patterns would be consistent with ex ante uncertainty and subsequent early termination.¹³ Early termination would remove sales that would otherwise be non-profitable, so sales that are retained likely reveal modest patterns of strategic trade.

Finally, consider an insider who possesses valuable negative (and reasonably certain) information at plan initiation.¹⁴ This insider may establish a 10b5-1 sales plan in anticipation of a reasonably certain bad outcome. Because the probability of the bad outcome is high, the insider does not expect to execute the termination option (as it is unlikely that a subsequent updating signal will indicate the bad outcome will not materialize). This strategy would ex post reveal a suspicious trade pattern when the bad outcome materializes (and this strategy is expressly forbidden by Rule 10b5-1), so the insider would likely value the incremental legal benefit from specific disclosure. And because the insider does not value the early termination option, he/she is willing to forego the option in lieu of enhanced legal protection by providing specific details regarding his/her trade plan. If this setting describes a specific disclosure group of trades, then trade patterns would be consistent with ex ante certainty regarding pending negative performance.

¹¹ Any price response may only last for a short duration if market participants subsequently realize that insiders are acting in good faith. However, trading activity typically increases materially after the first disclosure of 10b5-1 trading plan information (see Figure 1). Therefore, participants likely still prefer non-disclosure because it avoids the potential that the earliest trades of each new disclosed plan would be less profitable.

¹² Because 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.

¹³ Insiders' choice to terminate 10b5-1 plans is not observable unless it is voluntarily disclosed (a rare event). Therefore, we are not able to examine directly whether limited disclosures are characterized by this specific strategy.

¹⁴ It seems unlikely that an insider would strategically plan 10b5-1 sales if she possessed reasonably certain positive information at plan initiation.

Therefore, sales that are executed within specifically disclosed plans should reveal strong patterns of strategic trade.

If disclosure is associated with insiders' potential for strategic trade, then disclosure may provide a price relevant signal to investors. Investors might 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. Similarly, investors might respond negatively to specific disclosures regarding 10b5-1 participation, if they infer that insiders have high strategic trade potential for which they seek the utmost litigation protection. Investors' response to disclosure will also likely vary with the degree to which insiders have access to private information (e.g., insider rank), and with expectations for insiders' trading activity within the plans. Limited reactions to disclosure of plan participation can occur, however, if there are frictions to adjusting price conditional on these disclosures or if the market is unable to fully understand the implications of these disclosures.¹⁵

3. Sample Selection Procedures

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. 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 December 2006.¹⁶ 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, management forecasts of earnings from First Call Company Issued Guidance (CIG) database, and earnings performance data from Compustat.

Sample disclosures of 10b5-1 plan participation are categorized by each author into limited or specific partitions. The disclosure is classified as specific if it delineates the specific terms underlying the plan: transaction date(s), transaction volume(s), plan duration, and limit order price (if one exists). Panel A of the Appendix provides one example of a disclosure that is classified as specific. If the disclosure

¹⁵ Several frictions are plausible. First, during the period of this study, Rule 10b5-1 was relatively new, and some time lag may have been necessary for learning, because the data necessary to draw any conclusions would have only been sufficient after a few years. This is especially the case for the "specific" disclosure group, which has fewer than 100 observations over the entire period. Also, investment in the research necessary to identify this anomaly might not have been cost effective. Finally, any investment strategy to capitalize on the anomaly would have required holding short positions for 6 months or more, which increases investment risk.

¹⁶ 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.

does not delineate the specific terms underlying the plan, the disclosure is categorized as limited.¹⁷ Panel B of the Appendix provides one example of a disclosure that is classified as limited. All Form 4 disclosures are classified as limited as they generally state that a particular transaction is Rule 10b5-1 compliant, yet provide no specific details regarding the underlying plan.¹⁸ This classification procedure yields 94 specific and 1,573 limited firm observations that are further constrained for estimation by data availability.¹⁹

Some analyses require identifying a sample of firms where insiders' participation in Rule 10b5-1 is not disclosed.²⁰ The non-disclosure sample is inferred from firms where there is no Rule 10b5-1 participation disclosure, where insiders execute sale transactions 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 announcements.²¹ 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 (Type II error). We estimate that our algorithm results in a relatively low false negative error rate of 30% when applied to disclosing firms—where plan participation is known. If trading outside of pre-earnings windows is typically less strategic (Jagolinzer,

¹⁷ Heterogeneity in disclosure specificity exists within the limited disclosure category. However, attempts to further partition limited disclosures along specificity dimensions are inherently ad hoc, because it is unclear, for example, whether a disclosure that provides details about the maximum shares tradable within a plan is more or less specific than a disclosure that provides details about the approximate timing of transactions within the plan (e.g., “shares will be traded monthly”). Therefore, our tests do not rely on specificity classifications within the limited group.

While this choice results in isolating a relatively small set of firms in the specific category, it provides a clean delineation between specific and limited disclosure firms, which enhances the power and interpretability of our tests.
¹⁸ Form 4 disclosures may provide different inferences than other participation disclosures as 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.

¹⁹ Using a random sample of 100 limited disclosure firms and all of the specific disclosure firms, we find that the decision to disclose 10b5-1 trading plan is “sticky.” Specifically, in untabulated tests, we find during the year (second year) following the first full year after initial disclosure that 35% (35%) of limited disclosure firms continue to provide limited disclosures through 8-K filings, business wire reports, press releases or Form 4 filings, and that 19% (14%) move to providing specific disclosures. In addition, during the year (second year) following the first full year after initial disclosure that 19% (14%) of specific disclosure firms continue to provide specific disclosures through 8-K filings, business wire reports or press releases, and that 30% (43%) move to providing only limited disclosures.

²⁰ Jagolinzer (2009) 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.

²¹ 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.

Larcker, and Taylor 2011), then false negative error should bias towards documenting an association between non-disclosure and strategic trade.

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 (Type I error). We estimate that our algorithm results in a relatively low false positive error rate of 14% when applied to firms surveyed by Jagolinzer (2009) for their participation in 10b5-1 trading plans.²² If trading within pre-earnings windows under general counsel approval is typically less strategic (Jagolinzer, Larcker, and Taylor 2011), then false positive error should bias against documenting an association between non-disclosure and strategic trade. Note that any misclassifications resulting from the use of this algorithm only relate to comparisons involving the non-disclosure subsample—i.e., comparisons of limited versus specific disclosure subsamples are not affected.²³

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, the 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 non-disclosure, limited-disclosure, specific-disclosure, and Compustat population samples, respectively.

4. Empirical Analyses

4.1. Disclosure Choice

Because we are generally interested in understanding the relation between voluntary disclosure, litigation risk, and insiders' strategic trade, our first empirical analysis investigates whether the voluntary disclosure of 10b5-1 plan participation is more prevalent for firms with high litigation risk, high potential for insiders' strategic trade, board governance, and high demand by outside constituents. We investigate firms' first decisions to disclose participation within Rule 10b5-1 trading plans using the following logistic regression model:

$$\begin{aligned} \Pr(\text{Discl}=1) = & a_0 + a_1\text{LitRisk} + a_2\text{Volat} + a_3\text{InstitOwn} + a_4\text{LnNumDirs} + a_5\text{FinExpertDirs} \\ & + a_6\text{InsideDirs} + a_7\text{LnAnalystFollow} + a_8\text{MgmtFcst} + a_9\text{LnMVE} + e \end{aligned} \quad (1)$$

²² Sixty-eight of the firms from the Jagolinzer (2009) survey (discussed earlier) stated that they did not disclose the existence of 10b5-1 plans during the period from October 2000 through December 2002. When we estimate our algorithm (i.e., look for the existence of insiders' sales in short windows before earnings announcements) for all firms during this time period, we yield a sample of 79 inferred non-disclosure firms. Eleven of the 79 firms (14%) are false positive observations.

²³ We investigate the sensitivity of our findings to possible classification errors for undisclosed plans. Specifically, we randomly replaced 14% of our non-disclosure observations with trades drawn from the population of non-10b5-1. Our inferences remain unchanged in these (untabulated) tests. We considered an alternative algorithm to identify non-disclosed 10b5-1 trades by looking for patterns of systematic trade execution through time (e.g., at regular monthly intervals). However, we chose not to pursue this alternative algorithm because it seems less direct than our current algorithm and it would likely induce bias in our tests due to systematic trade patterns being uninformed (Cohen, Malloy, and Pomorski, 2012).

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 (estimated using annual cross-sectional logistic regressions following Rogers and Stocken, 2005); *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); *InstitOwn* is the percentage of institutional firm ownership measured in the year prior to disclosure (CDA/Spectrum); *LnNumDir*s is the natural log of one plus the number of directors on the board in the year prior to disclosure (Equilar and hand collected); *FinExpertDir*s is the ratio of financial experts to total board directors in the year prior to disclosure (Corporate Library); *InsideDir*s is the ratio of officer directors to total board directors in the year prior to disclosure (Equilar); *LnAnalystFollow* is the natural log of one plus the number of unique analysts providing forecasts for the firm measured in the year prior to disclosure (I/B/E/S); *MgmtFcst* is a dichotomous variable that equals one if the firm issues at least one management earnings forecast during the period and equals zero otherwise (First Call); and *LnMVE* is the natural log of market value of equity in the year prior to disclosure (Compustat).

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 firms expect higher litigation risk benefits when insiders' strategic trade potential is greater (which likely increases overall litigation risk relative to *LitRisk* as insiders have better opportunities to profit from private information), then the coefficient for *Volat* 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 larger boards and more financially sophisticated boards better understand the benefits of the disclosure of 10b5-1 trading plans then the coefficients for *LnNumDir*s and *FinExpertDir*s should be positive. Alternatively, if larger boards are less effective monitors of insiders' activities (e.g., Yermack, 1996) then the coefficient for *LnNumDir*s should be negative. If insiders expect front-running or plan commitment costs from disclosure then the coefficient for *InsideDir*s should be negative. If firms with greater demands for voluntary disclosure are more likely to disclose 10b5-1 plan details, then the coefficients for *LnAnalystFollow*, *MgmtFcst* and *LnMVE* 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. The second is an ordered

logistic regression, which is similar to the logistic regression specification but allows the disclosure level to vary for limited and specific disclosure firms. We include industry and year fixed effects to control for prevailing industry and market conditions.

The two panels of Table 1 report descriptive statistics for the determinants of voluntary disclosure of 10b5-1 participation, with comparisons across disclosure groups. Panel B reports univariate statistics within disclosure groups and 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 = 4.22 and 10.67, respectively). Panel B also provides evidence that voluntary disclosure of plan participation is more common for firms with greater stock price volatility, greater institutional ownership, smaller boards, more sophisticated boards, less insider dominated boards, greater analyst following, greater voluntary disclosure of management earnings guidance, and of smaller size. Specifically, average *Volat* is relatively greater for both the specific and limited firms than for the non-disclosure firms (difference = 0.012 and 0.003, *t*-statistics = 5.62 and 5.13, respectively). In addition, average *Volat* is relatively greater for the specific firms than the limited firms (difference = 0.009, *t*-statistic = 4.07). Average *InstitOwn* is relatively greater for the limited firms than for the non-disclosure firms (difference = 0.077, *t*-statistic = 7.83). Average *LnNumDirs* is relatively lower for the specific and limited firms than for the non-disclosure firms (difference = -1.223 and -0.805, *t*-statistics = -2.66 and -6.85, respectively). Average *FinExpertDirs* is relatively greater for the specific and limited firms than for the non-disclosure firms (difference = 0.054 and 0.089, *t*-statistics = 1.82 and 11.03, respectively). Average *InsideDirs* is relatively lower for the limited firms than the non-disclosure firms (difference = -0.012, *t*-statistic = -1.91). Average *AnalystFollow* is relatively greater for the limited firms than the non-disclosure firms (difference = 1.322, *t*-statistic = 3.87). Average *MgmtFcst* is relatively greater for both the specific and limited firms than for the non-disclosure firms (difference = 0.142 and 0.140, *t*-statistics = 2.10 and 7.64, respectively). Average *MVE* is relatively lower for the limited firms than for the non-disclosure firms (difference = -1,639.521, *t*-statistic = -1.89).

The logistic and ordered logistic estimation results are presented in Table 2. We report both coefficient estimates and estimates of average marginal effects. Consistent with evidence reported in Panel B of Table 1, the results indicate that higher class action litigation risk firms are associated with greater disclosure probability of 10b5-1 plan participation (*LitRisk Coeffs.* = 6.498 and 5.152; *z*-statistics = 2.34 and 1.94).²⁴ The results also indicate that firms with higher insider strategic trade potential (i.e.,

²⁴ 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 (2009) suggest that firms consider recent lawsuits as salient to determining disclosure policy.

higher risk that insiders can exploit information when trading within 10b5-1 plans) are more likely to disclose 10b5-1 plan participation (*Volat Coeffs.* = 24.661 and 25.501; *z*-statistics = 5.84 and 6.74). This suggests that firms with higher litigation risk expect benefits from disclosure. In addition, the results indicate that firms with more financially sophisticated boards (*FinExpertDir*s *Coeffs.* = 0.543 and 0.517; *z*-statistics = 2.48 and 2.41) are more likely to disclose 10b5-1 plan participation. This suggests that more financially sophisticated boards better understand the legal protection provided to insiders' trade through the disclosure of 10b5-1 trading plans. Finally, the results indicate that firms with higher institutional ownership (*InstitOwn Coeffs.* = 0.735 and 0.707; *z*-statistics = 3.27 and 3.23) and firms with higher analyst following (*LnAnalystFollow Coeffs* = 0.275 and 0.268; *z*-statistics = 4.24 and 4.22) are more likely to disclose 10b5-1 plan participation. This suggests that institutional investors and analysts may infer disclosure-related information asymmetry, monitoring, plan commitment, or legal protection benefits (Bushee and Noe, 2000; Lang and Lundholm, 1996).

4.2. Evidence of Strategic Trade

The next analyses investigate whether there is a link between the incremental legal protection arising from disclosure and insiders' strategic trade. These analyses are commonly considered by courts to assess whether sales by insiders provide circumstantial evidence of scienter in the motion to dismiss stage. Specifically, we investigate whether insiders' trading activity is greater than expected (based on historical trade patterns) within 10b5-1 plans and we also investigate whether insiders' sales within 10b5-1 plans tend to precede negative return realizations.

4.2.1. Insider Trading Activity

A. Univariate Analysis

Courts might consider trade activity by insiders to be strategic if it seems materially larger than the insiders' prior trading history. Figure 1 plots the average number of trades per insider surrounding the disclosure of insiders' participation in 10b5-1 trading plans. Because the typical plan length is 12 months, our analysis focuses on the 12 months after disclosure, with month 0 being the month of first disclosure. Stock transactions include both insiders' sales and purchases; however, the transactions are almost exclusively insider sales. 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. Because the typical disclosure happens within a month (rather than at the beginning or end of a month), month 0 includes trades before and after the actual disclosure during the month.

Figure 1, Panels A, B and C all show that the average number of trades per insider increases materially following the first disclosure of 10b5-1 trading plan information (or following the first-pseudo-

disclosure date for non-disclosure firms).²⁵ These trading patterns are consistent with abnormal selling activity by insiders following disclosure, with the greatest increase in the number of trades occurring in month 0. The Figure 1 panels also show that the average number of trades per insider is increasing with disclosure specificity, with the largest increase in the average number of trades per insider making specific disclosures. In addition, the Figure 1 panels show that the abnormal trading remains elevated for six to eight months following disclosure, and then returns to a more typical level.

To provide an alternative comparison group that uses a firm as its own control, Figure 2, Panels A and B present the insider trading patterns for non-participants at firms that have disclosed details about 10b5-1 plans during the same time periods as Figure 1. The panels fail to show a similar increase in trading activity following disclosure by non-participants. In addition, the panels also fail to show that trading activity by non-participants is increasing with disclosure specificity.

B. Negative binomial regression analysis

Table 3 formally tests the association between the number of insider transactions and disclosure specificity for plan participants and compares trading patterns relative to non-participants using the following negative binomial regression model:

$$\begin{aligned} NumTrades = & l_0 + l_1 Lim_Partic + l_2 Spc_Partic + l_3 Lim_NonPartic \\ & + l_4 Spc_NonPartic + e. \end{aligned} \tag{2}$$

where *Lim* designates observations from the limited disclosure sample and *Spc* designates observations from the specific disclosure sample. *Partic* designates observations that are participants in 10b5-1 trading plans and *NonPartic* designates observations that are not participants in 10b5-1 trading plans.²⁶ Non-disclosure firm observations are from the inferred non-disclosure sample and are captured by the intercept. We use a negative binomial regression model rather than ordinary least squares because our dependent variable is a count measure (e.g., the number of times insider trades occur). We report *z*-statistics based on standard errors clustered by firm because some firms have multiple insiders trading.

Table 3 indicates that the average number of trades per insider after disclosure is relatively higher for limited and specific disclosure firms than for non-disclosure firms, but is even higher for specific disclosure firms. For instance, during the shortest measurement window of 0 to 3 months following

²⁵ The observed spike in the number of trades in Panel C is mechanically linked to how we identify and construct the non-disclosure sample. Specifically, we identify the non-disclosure sample by isolating insiders who execute sale transactions within 30 calendar days before quarterly earnings announcements. We then use the sixtieth calendar day that precedes the first observed pre-earnings trade as a first-pseudo-disclosure date. This method biases towards observing spikes in trading activity subsequent to the first-pseudo-disclosure date. This issue should not materially affect our investigation of returns performance following these transactions because it is not clear, *ex ante*, whether these transactions should systematically predict a major news event.

²⁶ Some prior studies that investigate the determinants of the number of trades executed by insiders (e.g., Bettis, Coles, and Lemmon, 2000) include the market-to-book ratio and stock price volatility to control for information asymmetry between insiders and investors. We exclude these variables because *Lim* and *Spc* are intended to capture such information asymmetry.

disclosure, limited and specific disclosure insiders trade more than non-disclosure insiders (*Lim* and *Spc Marginal Effects* = 0.323 and 0.8490, *z-statistics* = 6.69 and 3.67, respectively), but specific disclosure insiders trade more than limited disclosure insiders (*Spc – Lim Marg. Effect* = 0.526, *z-statistic* = 2.30).

Table 3 also indicates that the average number of trades per insider for non-participants from limited and specific firms is relatively lower than for participants from non-disclosure firms, and relatively lower than for participants from the same respective firms. For instance, during the window of 0 to 3 months following disclosure, non-participants from limited and specific disclosure firms trade less than participants from non-disclosure firms (*Lim_NonPartic* and *Spc_NonPartic Marg. Effects* = -1.698 and -1.143, *z-statistics* = -50.23 and -2.88, respectively). In addition, non-participants trade less than participants from the same limited and specific disclosure firms [(*Lim_Part* – *Lim_NonPartic*) and (*Spc_Part* – *Spc_NonPartic*) *Marg. Effects* = -2.021 and -1.992, *z-statistics* = -41.64 and -5.10, respectively]. Results during longer measurement windows are similar. Taken together, this evidence suggest that insiders view participation in and disclosure of 10b5-1 trading plans as providing incremental legal protection, and that more specific disclosure provides even greater legal protection.

4.2.2. Returns Performance

A. Univariate Analysis

Figure 3 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' sale transactions because sales comprise nearly all transactions executed within Rule 10b5-1 and there are no specific disclosure observations associated with pending insider purchases. Specifically, Figure 3 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.²⁷ 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.^{28,29}

Figure 3, 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

²⁷ 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 our tests.

²⁸ 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 first-pseudo-disclosure date as the thirtieth calendar day that precedes the first observed within-blackout-window transaction.

²⁹ We do not estimate participant versus non-participant comparisons for our tests of insider trade returns (similar to Jagolinzer, 2009), because there are too few insiders in the specific disclosure group and there is also considerable overlap in the timing of trades executed by participants and nonparticipants during our one-month trading windows.

formulas.³⁰ Panel A also shows that sales trades that follow specific disclosure are associated with negative market-adjusted returns subsequent to the transaction. Relatedly, Panel B shows that sales trades that follow limited disclosure are also associated with modest negative market-adjusted returns subsequent to the transaction. Finally, 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 3 panels suggests that the degree to which sale transactions are associated with negative performance is increasing in Rule 10b5-1 plan disclosure specificity.³¹

B. Portfolio and Multivariate Analysis

We formally test the association between trade returns and disclosure specificity in Table 4 using 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, the preceding three calendar months, or the preceding six calendar months (e.g., Jaffe, 1974; Mandelker, 1974; Fama, 1998; Mitchell and Stafford, 2000). Note that less powerful tests are expected the longer the window an insider sales transaction is observed, due to the disclosure signal of an insider's sales transaction losing salience over time (Jaffe, 1974). If at least three firms are available to form a disclosure-month-portfolio, the following regression is estimated:

$$(R_{port} - R_f) = \beta_0 + \beta_1(R_m - R_f) + \beta_2SMB + \beta_3HML + \beta_4UMD + u \quad (3)$$

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).

³⁰ 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.

³¹ Sen (2008) criticizes univariate results, related to those in Figure 3, that were presented in early working paper versions that preceded the published Jagolinzer (2009) paper. The results presented in this paper and in Jagolinzer (2009) are robust to this criticism (e.g., Jagolinzer 2009, footnotes 34 and 37). Jagolinzer (2009) and this paper find evidence of informed trade when using tests that do not rely on the aggregation techniques criticized by Sen (2008). Sen (2008) does not utilize the sample derived in Jagolinzer (2009 and prior versions), specifically omitting all Rule 10b5-1 trade plans voluntarily disclosed in proxy statements, press releases and 8-Ks. This reduces his sample by over 26%, which significantly weakens the power of his tests. Further, the sample selection rule could eliminate the most strategic trades (i.e., those that are difficult to follow because of the high costs of collecting plan information).

Consistent with evidence presented in Figure 3, results in the first three columns of Table 4 indicate that more specific 10b5-1 plan disclosures are associated with more negative post-trade abnormal returns, particularly within the first few months that follow transactions. That is, for the one month following insiders' transactions, Table 4 indicates that post-trade abnormal returns are statistically more negative as disclosure becomes more specific. Formal tests comparing portfolio returns indicate that one month average post-trade abnormal returns are 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). Table 4 also indicates a similar, but not surprisingly weakened, pattern when examining the average one-month abnormal return when an insiders' transaction is observed within the three-month window that precedes the calendar month. Over this window, average one-month post-trade abnormal returns are statistically more negative for the limited-disclosure portfolio relative to the non-disclosure portfolio (-0.011 , t -statistic = -2.04), for the specific-disclosure portfolio relative to the non-disclosure portfolio (-0.024 , t -statistic = -2.83), and for the specific-disclosure portfolio relative to the limited-disclosure portfolio (-0.013 , t -statistic = -1.62). Table 4 further indicates an even weaker pattern in the average one-month abnormal return when an insiders' transaction is observed within an expanded six-month window that precedes the calendar month. This can be seen by the smaller magnitude average one month abnormal returns and the smaller magnitude differences in returns across disclosure partitions. Finally, because non-Form 4 disclosures of 10b5-1 trading are more proactive than waiting for a transaction and disclosing 10b5-1 participation, we separately analyze post-trade abnormal returns after excluding Form 4 disclosure firms. Results in the last three columns of Table 4 are consistent with those examining all trades; however, significance levels are somewhat lower which may be attributable to examining a reduced sample of trades.

4.2.3. *Earnings and Price Relevant News*

To better understand what may economically underlie insiders' strategic trade, we examine the association between 10b5-1 transaction timing and forthcoming news events that reveal fundamental economic information about the firm (e.g., earnings). Untabulated results suggest that the first sales transaction executed under both limited and specific disclosures are associated with a significant decline in earnings performance relative to market expectations.

We also find that specific disclosures are associated with subsequent negative news events that may not be impounded in short-term earnings. For example, 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. These news events include exchange-imposed stock trade suspension, drug trial failure, and announcement of the

intent to acquire another firm. 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.

4.2.4 Investors' Response to 10b5-1 Disclosure

The ability of insiders to retain trade profitability subsequent to voluntarily disclosing information regarding insiders' pending trades depends, in part, on investors' inability to fully impound potentially price relevant information from disclosure. To assess how investors impound these voluntary disclosures, we estimate three day market-adjusted returns centered on the first firm announcement date regarding pending 10b5-1 sales plans. We market-adjust returns by subtracting the same period return to the value-weighted CRSP portfolio, and analyze the market response to disclosure as a function of information detailed in the disclosure. Specifically, we estimate the following regression for the sample of first participation announcements (excluding all initial announcements made through Form 4 disclosures):

$$MktAdjRet = f_0 + f_1 Spc + f_2 CEOCB + f_3 CFO + f_4 LnNumExecs + f_5 LnPriorNumTrades + z. \quad (4)$$

$MktAdjRet$ is the three day cumulative firm return centered on the announcement date minus the three day return to the value weighted CRSP portfolio, Spc is a dichotomous variable that equals one if the disclosure is categorized as specific and equals zero otherwise, $CEOCB$ 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, $LnNumExecs$ equals the log of one plus the number of insiders named in the disclosure as participants, and $LnPriorNumTrades$ equals the log of one plus the cumulative number of insider transaction days in the year that precedes the announcement event.

We observe that the average market adjusted return centered on the announcement date (untabulated) is not significant (-0.215%; t -statistic = -0.96). For equation (4), we observe (untabulated) that the announcement of a CEO or Chairman participating in a plan yields a lower average return of -0.8% (t -statistic = -1.69). In addition, investors tend to respond more negatively to participation announcements when expected trade is greater ($LnPriorNumTrades$ = -0.004; t -statistic = -1.76), with lower average returns of -1.1% for a one standard deviation increase for the number of trades, i.e., -0.004 * $Ln(16.950)$. Other coefficient estimates are not significant. Collectively, this evidence suggests that investors infer strategic trade potential from these announcements, but that the reaction is fairly limited.

4.2.5 Sensitivity Analysis for Potential Selection Bias

Disclosure choice could 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. Accordingly, the possibility exists that we inappropriately attribute observed

results to disclosure choice when, in fact, they evolve from an unobserved characteristic that are correlated with disclosure choice. To investigate this possibility, we first assess whether average abnormal return estimates are sensitive to insiders' frequency of trade or rank, with the expectation that returns could be more negative following higher trade frequency and higher-level executive transactions.³² Because insider trade frequency and rank are measured at the firm-level, we conduct this analysis using a firm-level calendar-time regression (Cheng, Nagar, and Rajan, 2007), that is similar to a disaggregated Mitchell and Stafford (2000) portfolio estimation method.³³ Following Cheng, Nagar, and Rajan (2007), we regress firm-level value-weighted CRSP market-adjusted monthly returns on the firm's book-to-market ratio, its prior return, its prior volatility, and industry fixed effects. We also include the number of insiders' sale transactions during the preceding month and indicator variables that equal one if the firm's CEO or CFO traded in the prior month. Standard errors are adjusted through month clustering (Gow, Ormazabal, and Taylor, 2010). Untabulated results show that our results continue to indicate that abnormal trade returns increase in disclosure specificity after controlling for insider trade frequency and rank. Specifically, abnormal returns estimates for non-disclosure, limited-disclosure, and specific-disclosure firm months are -0.013 (t -statistic = -3.52), -0.022 (t -statistic = -4.65), and -0.043 (t -statistic = -3.30), respectively. Abnormal returns are statistically more negative for the limited-disclosure portfolio relative to the non-disclosure portfolio (-0.009, t -statistic = -2.52), for the specific-disclosure portfolio relative to the non-disclosure portfolio (-0.030, t -statistic = -2.54), and for the specific-disclosure portfolio relative to the limited-disclosure portfolio (-0.021, t -statistic = -1.73).

In addition, 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 equation (3) during the pre-10b5-1 time period (untabulated) fail to provide evidence of strategic selling behavior for insiders in 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.

³² We also assess whether the relation between average abnormal returns and disclosure specificity is stronger when insiders' trade frequency or rank is higher. In untabulated tests, coefficients of interactions between disclosure specificity and insider trade frequency or rank are insignificant.

³³ The firm-level estimation is relatively more powerful than the portfolio method, which relies on aggregation (see Cheng, Nagar, and Rajan, 2007 for a discussion), and explicitly controls for differences in book to market ratios across firms, which has been shown to explain insiders' sales returns (Lakonishok and Lee, 2001). The approach also implicitly controls for firm size (Lakonishok and Lee, 2001) because firms in the different disclosure partitions are of similar size.

Self-selection could also affect our cross-sectional analysis of the markets' reaction to the announcement of plan 10b5-1 participation, 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 equation (4) with an inverse-Mills ratio constructed using the predicted probabilities from our estimation of equation (1). Our inferences are not affected using this alternative regression specification.

5. Conclusion

This study investigates whether disclosure can be used to enhance insiders' strategic trade, which is inconsistent with conventional wisdom derived from prior literature that suggests disclosure reduces information asymmetries. This might occur because the legal rules of civil procedure can provide more legal protection at the motion to dismiss phase of litigation when disclosure is higher, which may alter insiders' trading incentives.

We provide evidence that a firm's decision to disclose 10b5-1 trading plan information is increasing in firms' litigation risk and in insiders' strategic trade potential, suggesting that firms infer legal benefits from disclosure. We also provide evidence that a firm's decision to disclose is increasing in the board sophistication and when institutional ownership and analyst following are higher, suggesting that boards respond with more disclosure when they better understand the legal benefits and when there is greater outside demand. In addition, we provide evidence that insider selling increases more and that insiders' sale transactions are associated with greater subsequent declines in fundamental economic and stock returns performance for disclosed plans, which suggests that disclosure is associated with strategic insider trading. Finally, we provide evidence that this strategic trading behavior is increasing in disclosure specificity, suggesting that disclosure enhances insiders' strategic trade opportunities.

Overall, these results suggest, in the 10b5-1 setting, that disclosure provides value to a "hiding in plain sight" strategy because of its incremental legal protection. This evidence expands our understanding of the trade-offs relating to voluntary disclosure, litigation risk, and insider trading. In addition, this evidence potentially offers important insights to court, the SEC and other governance bodies. Because enhanced disclosure appears associated with more strategic trade by insiders, courts might, for example, consider more carefully whether 10b5-1 disclosure mitigates scienter.

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Appendix 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

Panel B: Limited

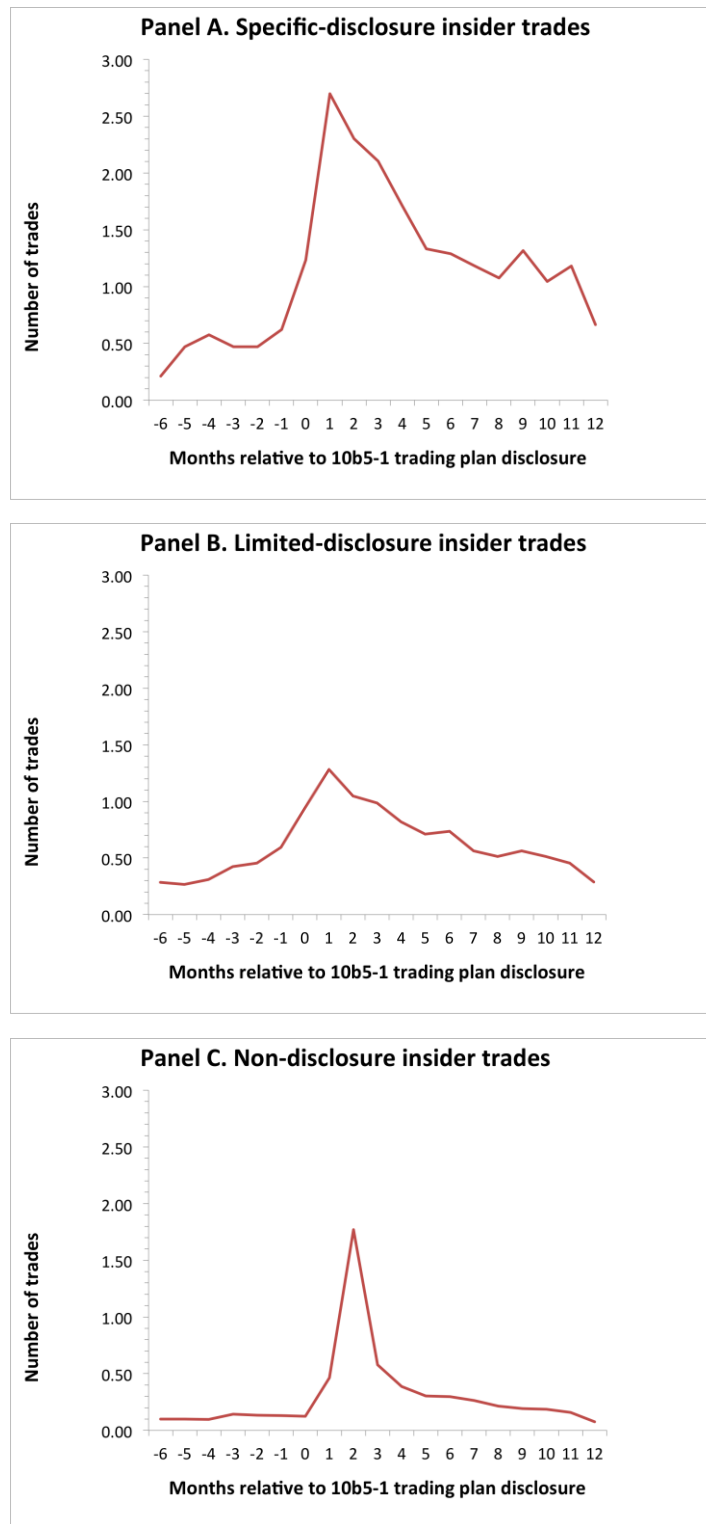
Excerpt from Ariba Inc. Form 8-K, Filed June 16, 2006

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.

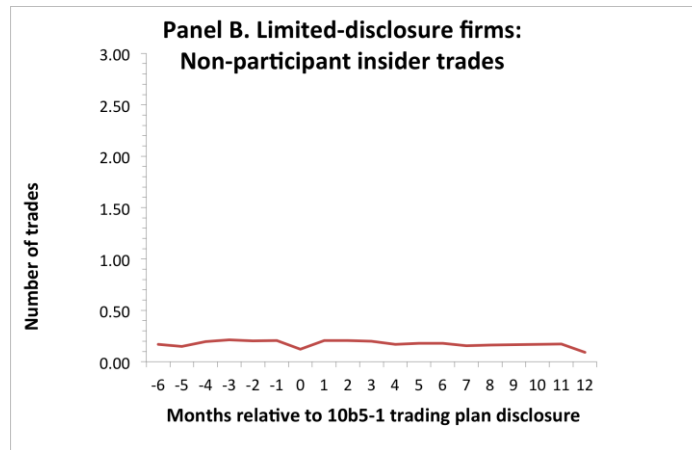
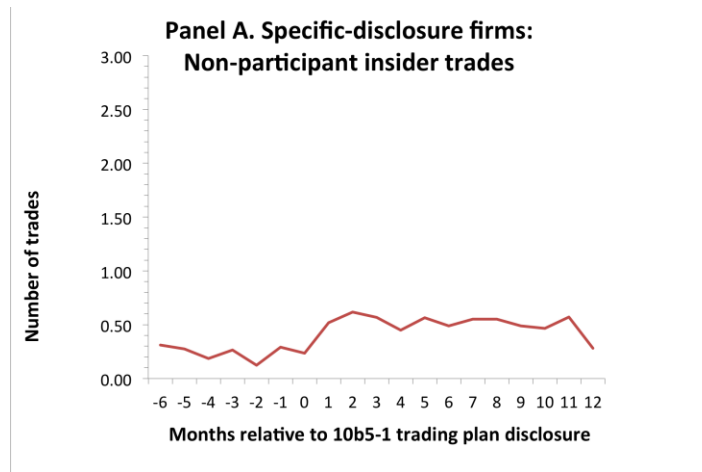
Under Rule 10b5-1, a company’s directors and officers and other persons who are not in possession of material nonpublic information regarding the company may adopt a pre-arranged plan or contract for the sale of company securities under specified conditions and at specified times. As sales are executed 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.

Figure 1
Average Number of Trades per Insider Following Disclosure of 10b5-1 Trading Plans: Participants



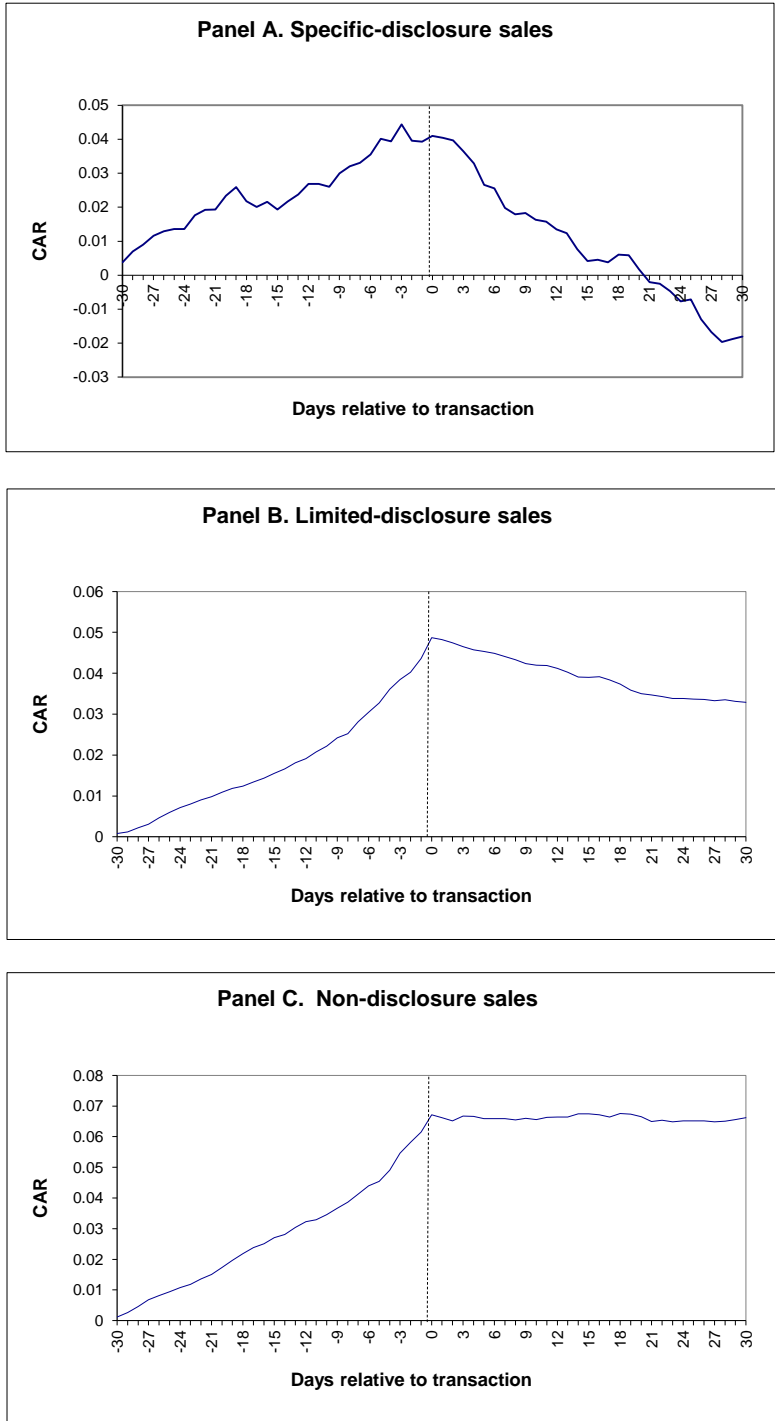
This figure plots the average number of insiders' trades by disclosure type in the months surrounding the first disclosure of participants' plans between 2001 and 2006.

Figure 2
Average Number of Trades per Insider Following Disclosure of 10b5-1 Trading Plans:
Non-Participants



This figure plots the average number of insiders' trades by disclosure type for insiders not participating in the 10b5-1 trading plans in the months surrounding the first disclosure of participants' plans between 2001 and 2006.

Figure 3
Cumulative Abnormal Return Relative to Sale Transactions



This figure plots the average cumulative abnormal return relative to insiders' sale 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>	0.015	0.018	0.006	0.009	0.016	
<i>Volat</i>	0.027	0.016	0.016	0.023	0.034	
<i>InstitOwn</i>	0.526	0.268	0.311	0.555	0.751	
<i>LnNumDirs</i>	9.159	3.204	7.000	9.000	11.000	
<i>FinExpertDirs</i>	0.624	0.290	0.455	0.625	0.777	
<i>InsideDirs</i>	0.364	0.166	0.250	0.348	0.455	
<i>AnalystFollow</i> (#)	9.291	9.265	2.000	7.000	13.000	
<i>MgmtFcst</i>	0.460	0.499	0.000	0.000	1.000	
<i>MVE</i> (\$million)	5,007.321	23,522.18	237.510	679.501	2,399.411	

Panel B. Statistics by disclosure type						
	<i>None</i>	<i>Lim</i>	<i>Spc</i>	<i>Spc - None</i>	<i>Lim - None</i>	<i>Spc - Lim</i>
Variable	Mean	Mean	Mean	Mean (<i>t</i> -stat)	Mean (<i>t</i> -stat)	Mean (<i>t</i> -stat)
<i>LitRisk</i>	0.013	0.020	0.022	0.009 (4.22)	0.007 (10.67)	0.002 (0.93)
<i>Volat</i>	0.026	0.029	0.038	0.012 (5.62)	0.003 (5.13)	0.09 (4.07)
<i>InstitOwn</i>	0.505	0.582	0.529	0.024 (0.64)	0.077 (7.83)	-0.053 (-1.44)
<i>LnNumDirs</i>	9.387	8.581	8.164	-1.223 (-2.66)	-0.806 (-6.85)	-0.417 (-0.95)

<i>FinExpertDirs</i>	0.600	0.689	0.654	0.054 (1.82)	0.089 (11.03)	-0.018 (-1.14)
<i>InsideDirs</i>	0.366	0.354	0.372	0.012 (0.54)	-0.012 (-1.91)	0.024 (1.03)
<i>AnalystFollow</i> (#)	8.929	10.251	10.073	1.144 (0.90)	1.322 (3.87)	-0.179 (-0.14)
<i>MgmtFcst</i>	0.422	0.562	0.564	0.142 (2.10)	0.140 (7.64)	0.002 (0.03)
<i>MVE</i> (\$million)	5,490.160	3,850.639	1,703.048	-3,787.112 (-1.06)	-1,639.521 (-1.89)	-2,147.591 (-0.68)

This table provides summary statistics (Panel A) and univariate comparisons (Panel B) 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. *LitRisk* is the firm's expected class action litigation probability estimated in the year prior to 10b5-1 participation disclosure; *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* is the percentage of institutional firm ownership (CDA/Spectrum) in the year prior to disclosure; *NumDirs* is the number of directors on the board in the year prior to disclosure (Equilar and hand collected); *FinExpertDirs* is the ratio of financial experts to total board directors in the year prior to disclosure (Corporate Library); *InsideDirs* is the ratio of officer directors to total board directors in the year prior to disclosure (Equilar); *AnalystFollow* is the number of unique analysts providing forecasts for the firm measured in the year prior to disclosure (I/B/E/S); *MgmtFcst* is a dichotomous variable equal to one if the management issued at least one revenue or earnings forecast during the period and equals zero otherwise (First Call); and *MVE* is the market value of equity in the year prior to disclosure (Compustat). *LitRisk* is estimated from the following annual cross-sectional logistic regression [similar to Rogers and Stocken (2005)]: $Pr(DMGPd = 1) = g_0 + g_1 MinReturn + g_2 SkewReturn + g_3 StdDevRet + g_4 Turnover + g_5 Log(MVE) + g_6 BHRReturn + g_7 Beta + g_8 BiotechInd + g_9 CompHWInd + g_{10} CompSWInd + g_{11} ElecInd + g_{12} RetailInd + e$, 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; *StdDevRet* is the standard deviation of residuals from a regression of daily firm returns on daily value-weighted CRSP portfolio returns; *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.

Table 2
Determinants of 10b5-1 Plan Participation Disclosure

	Logit Regression			Ordered Logit Regression		
		<i>Pr(Discl = 1)</i>		<i>Pr(Discl = 1, 2)</i>		
	<i>Exp. Sign</i>	<i>Coeff. (z-stat)</i>	<i>Marg. Effect (z-stat)</i>	<i>Coeff. (z-stat)</i>	<i>Marg. Effect Lim (z-stat)</i>	<i>Marg. Effect Spc (z-stat)</i>
<i>LitRisk</i>	+	6.498 (2.34)	1.006 (2.34)	5.152 (1.94)	0.739 (1.94)	0.070 (1.89)
<i>Volat</i>	+	24.661 (5.84)	3.817 (5.92)	25.501 (6.74)	3.656 (6.27)	0.346 (4.85)
<i>InstitOwn</i>	+	0.735 (3.27)	0.114 (3.28)	0.707 (3.23)	0.101 (3.24)	0.010 (2.99)
<i>LnNumDirs</i>	+/-	-0.157 (-0.76)	-0.024 (-0.76)	-0.151 (-0.74)	-0.022 (-0.74)	-0.002 (-0.74)
<i>FinExpertDirs</i>	+	0.543 (2.48)	0.084 (2.49)	0.517 (2.41)	0.074 (2.42)	0.007 (2.30)
<i>InsideDirs</i>	-	0.175 (0.62)	0.027 (0.62)	0.195 (0.71)	0.028 (0.48)	0.003 (0.71)
<i>LnAnalystFollow</i>	+	0.275 (4.24)	0.043 (4.27)	0.268 (4.22)	0.038 (4.25)	0.004 (3.72)
<i>MgmtFcst</i>	+	0.145 (1.54)	0.022 (1.54)	0.140 (1.51)	0.020 (1.51)	0.002 (1.49)
<i>LnMVE</i>	+	0.014 (0.32)	0.002 (0.32)	0.019 (0.46)	0.003 (0.46)	0.000 (0.46)
<i>Cut 1</i>		-	-	3.898 (2.55)	-	-
<i>Cut 2</i>		-	-	7.561 (6.185)	-	-
Fixed Effects			Ind, Year			Ind, Year
Num obs <i>None</i>			2,760			2,760
Num obs <i>Lim</i>			995			995

Num obs <i>Spc</i>	55	55
Pseudo R^2	0.194	0.170

This table provides logistic and ordered regressions 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. Results are based on estimating: $Pr(Disc1 = 1 \text{ or } 2) = a_0 + a_1 LitRisk + a_2 Volat + a_3 InstitOwn + a_4 LnNumDirs + a_5 FinExpertDirs + a_6 InsideDirs + a_7 LnAnalystFollow + a_8 MgmtFcst + a_9 LnMVE + e$, where *Disc1* is a dichotomous variable that equals one if the firm discloses Rule 10b5-1 participation details (or one if the firm discloses limited plan details and two if the firm discloses specific plan details), and zero otherwise; *LitRisk* is the firm's expected class action litigation probability estimated in the year prior to 10b5-1 participation disclosure; *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* is the percentage of institutional firm ownership (CDA/Spectrum) in the year prior to disclosure; *NumDirs* is the number of directors on the board in the year prior to disclosure (Equilar and hand collected); *FinExpertDirs* is the ratio of financial experts to total board directors in the year prior to disclosure (Corporate Library); *InsideDirs* is the ratio of officer directors to total board directors in the year prior to disclosure (Equilar); *AnalystFollow* is the number of unique analysts providing forecasts for the firm measured in the year prior to disclosure (I/B/E/S); *MgmtFcst* is a dichotomous variable equal to one if the management issued at least one revenue or earnings forecast during the period and equals zero otherwise (First Call); and *MVE* is the market value of equity in the year prior to disclosure (Compustat). *LitRisk* is estimated from the following annual cross-sectional logistic regression [similar to Rogers and Stocken (2005)]: $Pr(DMGPd = 1) = g_0 + g_1 MinReturn + g_2 SkewReturn + g_3 StdDevRet + g_4 Turnover + g_5 Log(MVE) + g_6 BHReturn + g_7 Beta + g_8 BiotechInd + g_9 CompHWInd + g_{10} CompSWInd + g_{11} ElecInd + g_{12} RetailInd + e$, 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; *StdDevRet* is the standard deviation of residuals from a regression of daily firm returns on daily value-weighted CRSP portfolio returns; *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. The variables *LnNumDirs* and *LnAnalystFollow* as constructed as the natural log of one plus the number of directors and analysts following the firm, respectively. Column 1 presents logistic regression results with fixed industry and year effects. Column 2 presents ordered logistic regression results with fixed industry and year effects..

Table 3
Average Number of Trades per Insider by Disclosure Type:
Participants and Non-Participants

		0 to 3 months	0 to 6 month	0 to 12 months
		<i>NumTrades</i>		
	<i>Exp. Sign</i>	<i>Marg. Effect (z-stat)</i>	<i>Marg. Effect (z-stat)</i>	<i>Marg. Effect (z-stat)</i>
<i>Lim_Part</i>	+	0.323 (6.69)	0.786 (9.63)	1.617 (12.02)
<i>Spc_Part</i>	+	0.849 (3.67)	1.683 (4.70)	2.933 (5.76)
<i>Lim_NonPart</i>	-	-1.698 (-50.23)	-2.184 (-36.30)	-2.537 (-24.84)
<i>Spc_NonPart</i>	-	-1.143 (-2.88)	-1.186 (-2.02)	-0.914 (-1.03)
<i>Coefficient Comparisons</i>				
<i>Spc_Part – Lim_Part</i>	+	0.526 (2.30)	0.898 (2.55)	1.315 (2.66)
<i>Lim_NonPart – Lim_Part</i>	-	-2.021 (-41.64)	-2.970 (-40.21)	-4.154 (-37.43)
<i>Spc_NonPart – Spc_Part</i>	-	-1.992 (-5.10)	-2.870 (-4.79)	-3.846 (-4.43)
<i>Num obs None</i>		6,615	6,615	6,615
<i>Num obs Lim_Part</i>		3,489	3,489	3,489
<i>Num obs Spc_Part</i>		65	65	65
<i>Num obs Lim_NonPart</i>		17,139	17,139	17,139
<i>Num obs Spc_NonPart</i>		339	339	339
<i>Wald c² (4)</i>		1,077.98	1,129.81	1,208.14

This table provides negative binomial regressions of the number of trades by type of 10b5-1 trading plan disclosure following the first observed disclosure between 2001 and 2006. 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. *None* designates observations from the inferred-non disclosure sample, and is captured by the intercept (not reported). *Lim* designates observations from the limited disclosure sample. *Spc* designates observations from the specific disclosure sample. *Part* designates observations that are participants in 10b5-1 trading plans. *NonPart* designates observations that are not participants in 10b5-1 trading plans. Reported *z*-statistics are based on standard errors clustered by firm.

Table 4
Calendar Time Portfolio Returns

	<i>All Trades</i>			<i>Excluding Form 4 Trades</i>		
	$R_{port} - R_f$			$R_{port} - R_f$		
	1-mo	3-mo	6-mo	1-mo	3-mo	6-mo
<i>None</i>	-0.002 (-0.26)	-0.001 (-0.17)	-0.001 (-0.16)	-0.002 (-0.26)	-0.001 (-0.14)	-0.001 (-0.21)
<i>Lim</i>	-0.012 (-1.86)	-0.012 (-2.04)	-0.009 (-1.56)	-0.011 (-1.78)	-0.011 (-1.63)	-0.007 (-1.08)
<i>Spc</i>	-0.043 (-5.27)	-0.025 (-3.77)	-0.013 (-2.18)	-0.035 (-4.59)	-0.021 (-2.86)	-0.015 (-2.14)
$R_m - R_f$	1.242 (9.42)	1.012 (8.90)	0.990 (8.69)	1.198 (9.29)	1.044 (8.00)	1.072 (8.42)
<i>SMB</i>	0.859 (6.21)	0.913 (7.66)	0.854 (7.11)	0.774 (5.70)	0.839 (6.13)	0.850 (6.33)
<i>HML</i>	0.225 (1.33)	0.053 (0.36)	0.060 (0.41)	0.266 (1.60)	0.116 (0.68)	0.100 (0.60)
<i>UMD</i>	0.022 (0.20)	-0.042 (-0.44)	-0.114 (-1.19)	0.018 (0.17)	-0.099 (-0.90)	-0.156 (-1.46)
<i>Coefficient Comparisons</i>						
<i>Lim - None</i>	-0.010 (-1.86)	-0.011 (-2.04)	-0.008 (-1.56)	-0.009 (-1.78)	-0.009 (-1.28)	-0.006 (-0.64)
<i>Spc - None</i>	-0.041 (-4.08)	-0.024 (-2.83)	-0.012 (-1.53)	-0.032 (-3.34)	-0.020 (-2.09)	-0.013 (-1.46)
<i>Spc - Lim</i>	-0.031 (-3.04)	-0.013 (-1.62)	-0.004 (-0.54)	-0.024 (-2.46)	-0.010 (-1.07)	-0.007 (-1.08)
<i>None</i> Month-Obs	72	72	72	72	72	72
<i>Lim</i> Month-Obs	71	71	71	71	71	71
<i>Spc</i> Month-Obs	45	52	61	41	52	60
Adj R^2	0.589	0.609	0.592	0.578	0.539	0.568

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 1-, 3- or 6-month period, 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. *None* designates observations from the inferred-non disclosure sample. *Lim* designates observations from the limited disclosure sample. *Spc* designates observations from the specific disclosure sample.